



**EduScience UK**  
We Contribute To Future Education

## “COMPLETE SOLUTIONS OF EDUCATIONAL SUPPLIES”

EduScience is a UK based science equipment's Manufacturer, partnered with Reputed Science Education Factories one of the oldest established companies in the field of science education. It was foremost in the development of the Nuffield Science Project acting as consultants to British Government to revolutionize science teaching across the world.

EduScience provide the highest quality and support service possible to meet today's demands from science education.

- Design, bringing new equipment to school's laboratories
- Manufacture, state of the art manufacturing
- Quality and Safety, all products meet or exceed all EU and international regulations on safety, quality and performance
- Curriculum Relevant, focused on products precisely matched to your curriculum requirements
- Technical Support, through advice, teacher and technician training and field support in your school.

### More than a supplier of Science Education Supplies

#### Technical Expertise

Our team consists of specialists in Physics, Chemist and Biology as well as ICT and Math

As a designer and manufacturer, we understand the equipment you have in your lab.

We can provide advice and experimental notes, spare parts, repair and calibration.

#### Specialist in the Field

Everything one needs for teaching science including laboratory design and furniture.

#### Confidence Builder

Our teaching notes help with lesson planning and our support team is on hand to build teacher confidence and remove the feeling of isolation for specialist and non-specialist teachers.

#### Apparatus matched precisely to your Curriculum

Spend your budget wisely, buy purchasing relevant equipment. We match apparatus to your practical lesson requirements exactly to your curriculum needs.

#### International Regulations

Our rigorous Quality Assurance policy means that all of our products usually exceed those in place throughout the world.

#### Product Development

A progressive development programmer ensures that science teaching keeps in step with progress to provide your students with the experience of higher education, industry or research.

**EduScience with Its heritage has always been about progressive design and development since the 1960s. and continues today offering curriculum development to Governments around the world and produces bespoke equipment to meet their specific needs. You can tap into this vast experience and knowledge.**

# PRODUCTS

From Analogue Meter to Zoological specimens, a true comprehensive provider of everything you could need for your lab whether an established or brand new facility.

## STEM

- Science, specialist in integrating science into Technology, Engineering and Math
- Technology, from design through to robotics, data logging and cross curricula links
- Engineering, the latest technology from 3D printing to workshop resources
- Math, designed by educationalist and maths experts with software and practical lessons

### Stem Kits,

For teachers with busy schedules EduScience STEM kits help lesson planning and preparation leaving you more time to inspire your students with exciting resources.



## ROBOTICS

The buzz word around the world today, is Robotics, even if students are not destined to work in the field a knowledge of robotics is essential for an understanding of industry and even domestic applications

EduScience robotic kits help students to develop problem solving ability and logical thinking skills while learning about robotics and science principles.

## SCIENCE DATA LOGGING AND SENSORS

Our innovative new data logging system using Data logger and direct USB sensors and our specialized software for data capture and analysis making science much more easy and joyful.



## PRACTICAL PHYSICS

Take the fear out of leading practical physics lessons. Using EduScience Kits or teaching systems provides easy to prepare practical lessons in your lab which inspire the students and enhance their learning experience.

EduScience Kits or teaching systems cover every area in physics

Electricity, Electrostatics, Optics, Energy, Alternative Energy, Atomic and Nuclear, Forces etc.

## CHEMISTRY LAB RESOURCES

EduScience offer complete range of chemistry lab equipment's including glassware, Chemicals and disposables we keep many of those products in our store to cater the immediate needs.





### **BIOLOGY LAB RESOURCES**

EduScience have produced a complete comprehensive range of resources for practical work for biology students from elementary to high school to first year teaching labs in universities.

As experts in the field of microscopy we can offer training for teachers and technicians in the application for microscopes and maintenance

### **ENVIRONMENTAL AND FORENSIC SCIENCE.**

Environmental science along with the study of forensics grips the imagination and curiosity of students across all age ranges.

EduScience Kits and models support student's learning of principles, concepts and methodology. All of these skills are transferable within current curricula. Our Kits, excite and inspire as well as supporting teachers in lesson planning and reducing technical time in preparation and lesson management.



### **EDUCATIONAL AND LABORATORY FURNITURE**

EduScience produce complete range of laboratory and class room furniture's in standard and custom made, we promise to provide you comprehensive furnishing solutions that convert your school into a place where everyone feels comfortable. It's also our challenge to remain committed to setting new standards in quality, design, and service.

### **PRIMARY EDUCATION SCIENCE AND MATH**

EduScience aim is to support teachers by providing unique, high-quality educational tools that enhance instruction and provide engaging learning experiences that meet children's individual needs. EduScience versatile products include play and learning activity sets, manipulatives and games that build foundational skills in all subject areas through exploration, imagination and fun.



### **SMART MATERIAL AND FUN SCIENCE**

EduScience have been working with teachers and educational specialists to deliver playful learning experiences that bring subjects to life in the classroom and make learning fun and impactful. We have a wide range of physical and digital educational resources that encourage students to think creatively, reason systematically and release their potential to shape their own future.

# SERVICES



## **TEACHER AND TECHNICIAN TRAINING**

We provide comprehensive teacher training program and lab technicians with hands on experiments

## **CURRICULUM DEVELOPMENTS**

We work with Ministries of education worldwide to identify the best bespoke scenario for developing science, mathematics and technology education curriculum for their country, to support national aims and objectives. And introduce STEM concepts that complement the current curriculum

## **MICROSCOPE SERVICING**

Our experienced engineers are able to service your microscopes.

## **BALANCE SERVICING**

Our experienced engineers will service your balances and ensure that they are accurately calibrated.

## **PROJECTS HANDLING**

We have a wealth of expertise identifying your needs and according to your curriculum requirements, packing, delivering with our own transport, and helping you unpack and check off your new laboratory equipment.













## **HAZARDOUS CHEMICAL WASTE DISPOSAL**

We employ a specialist team of chemists to pack and label hazardous chemicals ready for removal. Our trained ADR drivers will then transport to a registered waste station, and we provide full documentation for your peace of mind.

## **CLASSROOM AND LABORATORY REFIT**

We use a professional furniture manufacturing company to assess your needs and design a tailored solution, using your chosen materials, including modern and innovative designs

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# How to order

## Contact & Technical Support

### Our Team is here to Help!

If you have questions about orders, products, services, or would like to place an order by phone, or email, Customer Service is ready to assist you.

- Phone: + 441376340506 (8am to 5pm, ET, Monday-Friday)
- Email: [Services@eduscienceuk.com](mailto:Services@eduscienceuk.com)

### Quotes and Contracts

Forward your quotation requests to the attention of our Quotations Department via mail, or email. You can speed up the quote process by emailing your inquiry list to our Quotations Department. Or through our contact form in the website or mail, please include a contact name, your complete address, and your fax and telephone numbers, products name, required qty and our product number

- Phone: +441376340506
- Email: [sales@eduscienceuk.com](mailto:sales@eduscienceuk.com)

### Quotations Department

EduScience uk Ltd Company  
27, Kestrel Park,  
Springwood Industrial Estate,  
Braintree, Essex,  
United Kingdom



### International Sales

For customers outside the United Kingdom, forward your quotation requests to the attention of our International Quotations Department via mail, fax, or email. or through our contact form in the website, please include a contact name, your complete address, and your fax and telephone numbers, products name, required qty and our product number

For more detailed information about International ordering, please read the following international ordering information

- Phone: +441376340506
- Email: [intsales@eduscienceuk.com](mailto:intsales@eduscienceuk.com)
- Mail:



### International Quotations Department

EduScience uk Ltd Company  
27, Kestrel Park,  
Springwood Industrial Estate,  
Braintree, Essex,  
United Kingdom



### Emergencies

In the event of a serious spill, contamination, ingestion, or other emergency situations,

Please call +44 7796264499 (8am to 5pm, ET, Monday-Friday).

## International Ordering

### EduScience Serves the World!

For over 60 years, EduScience UK Ltd Company has served the needs of educators and distributors in more than 70 countries worldwide. This level of experience and world-class support means that EduScience understands your unique needs.

### Request a Quotation Quickly and Easily

1. Please send us your inquiry by email to [Salesint@eduscienceuk.com](mailto:Salesint@eduscienceuk.com)
  2. Make sure to put your complete contact information
  3. Please indicate your inquired products qty and unit
  4. Please indicate your bid closing date
- . Please allow up to 2 business days for us to review your request and get in touch with you. You may also provide inquiry details to us via contact us form in our online. Platform

### Our International Sales Team is ready to help you

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- Phone: +44 1376340506

Braintree, Essex-United kingdom

### Does EduScience Have a Distributor in Your Country?

1. If you would like to be referred to a EduScience distributor in your country, or if you are interested in becoming a distributor for EduScience, please send an email to [Salesint@eduscienceuk.com](mailto:Salesint@eduscienceuk.com)

### Special Considerations about Placing International Orders

Please be aware that on all international quotations, shipping charges and product specific fees may apply. Because of the complexity of international orders, EduScience's experienced International Sales team can assist you with the quote and order process, and can advise you on products that require special requirements prior to being exported:

- UK Fish & Wildlife
- Hazardous materials
- Agricultural products
- Voltage requirements

Note: Custom's related "taxes and duties" are your responsibility and are not paid for by EduScience UK Ltd Company.

## Payment Options

### Purchase Orders & Net 30 Accounts

If your school or organization in the UK has Net 30 payment terms with EduScience, you will be able to enter a Purchase Order during Checkout. If you are not sure if you have an account, please Contact us accounts@eduscienceuk.com (8am - 5pm, ET, Mon-Fri). If you are a new customer and wish to apply for credit, please call our accounts and fill our Credit Application form.

### Credit Card Payments

All online customers may purchase securely with a credit or purchasing card during Checkout. When you place an order, EduScience UK Ltd Company authorizes your credit card to make sure sufficient credit is available. A hold is placed on funds equal to your order total until the order is shipped. When you shop at EduScience.com, you can rest assured that you or your institution's credit/purchasing card and personal information is completely safe and secure. We currently take the following credit cards on our website:

- MasterCard
- Visa

### International Letter of credit Payments

When goods value above 10,000 USD then payments of goods can be made by letter of credit we would like to ask that particular attention to be given to the following when instructing your bankers. Adherence to this point will avoid delays or inconvenience and the expenses of amending letters of credit

The credit must be:

In favor of Edu Science uk  
Irrevocable and Confirmed  
Payable at 100% at sight

For the full value of the order

Claused to allow partial shipments

Claused to all transshipment

Payable against the usual documents evidencing shipments from agreed Port/Airport

Allowing 21 days from shipments date for personation of documents



### Prepayments

To prepay send Telex transfer or money order with your purchase order, call us for exact shipping charges in advance or add your courier account number.

All payment to be in USD to Edu Science UK bank account.

## Shipping Information

### Shipping Methods for Online Orders

We offer three convenient shipping methods for online orders. Please note that many products can only ship using limited shipping methods, such as living/perishable items, which can only ship Second Day or Overnight. Please see details lower on this page.

Standard delivery—Orders arrive in 15-20 business days.

### Shipping Rates and Fees

Shipping rates and handling fees are based on the type of purchasing you are doing. See Shipping Information for Special Item Types for details.

All Customers - our sales specialist will calculate your freight and handling charges based on the weight of the items in your order and the

distance to your shipping destination.

Schools, Institutions, and Organizations - for qualified customers, our website will calculate your freight & handling charges based on the weight of the items in your order, the destination/distance, and your freight terms and discounts.

During Checkout, you will see a Freight & Handling total for your entire order. You must be logged in and your User Profile must be associated to your school in order to get the appropriate freight terms and applicable discounts.

### Shipping Information for Special Item Types

#### Hazardous Materials

The shipment of many hazardous items is regulated by the UK Department of Transportation. Items subject to regulation are identified by one of three hazardous material icons on our website. Hazardous materials shipments incur an additional transportation fee which is charged by the carrier.

Orders for hazardous materials (and kits and sets containing these items) can only be accepted from schools, research institutions, medical facilities, and businesses. Hazardous materials cannot be shipped to individuals, homeschoolers, and other customers, but there is often a safe item that can be substituted.

#### Drop-Shipped Items

Some of our items are drop-shipped directly from the manufacturer. Drop-shipped items vary in their shipping timeframes and this information is available on the item's detail page—such as "This item ships from the manufacturer and will arrive in 4-6 weeks". These items are also separated from in-stock products on the Shipping Methods step of Checkout.

#### Backordered Items

When an item is not in stock, but we have more on the way, you can backorder the item. Backorder information along with the expected availability date is provided at the order confirmation stage

#### The EduScience Pledge: 100% Satisfaction Guarantee

All of our products are unconditionally guaranteed. If for any reason you are not satisfied with any item, you may return it for a replacement, a refund, or credit. It's that simple.

#### Return an Item

- Contact Customer Service at + 44 1376340506 or info@eduscienceuk.com (8 am to 5 pm, ET, Monday–Friday).
- Have your purchase order number and EduScience Performance invoice/confirmed order number available.

A Customer Service Representative will give you a Return Authorization Number and any additional instructions. The number allows us to quickly credit your account or credit card once the item has been returned and processed.

#### Items not in Resalable Condition

Items not in resalable condition cannot be returned unless damaged or defective. Items held more than 1 month and returned in resalable condition are subject to Preapproval and a 25% restocking fee.

#### Drop-Shipped Items

For drop-shipped items (such as furniture or equipment), a 25% restocking fee will apply if you return the product for any reason other than shipping damage or manufacturing defect. You are responsible for shipping the product back to the manufacturer in resalable condition and in the original packing

# Product highlights



**1M Tall Robot For Research And Developments**

**Cat.No**  
**ESR61107**

**Page No.**  
**22**



**Robot Basic Combination**

**Cat.No**  
**ESS60903**

**Page No.**  
**23**



**Industrial Automatic Manufacturing Line**

**Cat.No**  
**ESS60946**

**Page No.**  
**41**





**Human Muscular Skeleton Model with Ligaments**

Cat.No Page No.

**ESB51038 96**



**Flexible Spinal Column Model With Colour Coded Regions**

Cat.No Page No.

**ESB51061 100**



**Mitosis Cell Model**

Cat.No Page No.

**ESB51391 126**



**Microscope USB Digital With 3.5" Screen**

Cat.No Page No.

**ESB52743 159**

# Product highlights



**Electricity and Magnetism Kit 3**

Cat.No	Page No.
<b>ESP59117</b>	<b>344</b>



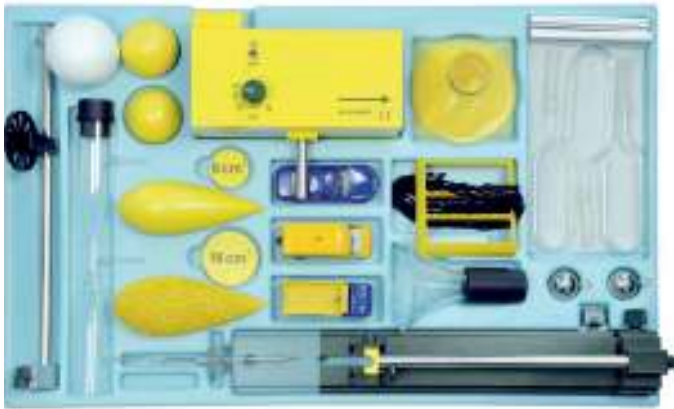
**Resonance Tube And Complements, Set**

Cat.No	Page No.
<b>ESP60343</b>	<b>448</b>



**Ripple Tank With Digital Stroboscope**

Cat.No	Page No.
<b>ESP60279</b>	<b>437</b>



## Aerodynamics Kit

Cat.No      Page No.  
**ESP60193**      **430**

## Alternative Energy Conversion, KIT

Cat.No      Page No.  
**ESP59972**      **415**



## WiLab Wireless Sensor Connector

Cat.No      Page No.  
**ESD50159**      **49**



## Planck's Constant Compact Apparatus

Cat.No      Page No.  
**ESP60669**      **467**

# Product highlights



**Bunsen Burner**

Cat.No      Page No.  
**ESL57367**      **504**



**Balance Digital Analytical**

Cat.No      Page No.  
**ESL57683**      **517**



**Water Still 4 Ltr /Hour Metal Element**

Cat.No      Page No.  
**ESL58353**      **542**



**Hot Plat Magnetic Stirrer LCD**

Cat.No      Page No.  
**ESL58441**      **548**

## Mobile Science Bench

Cat.No      Page No.  
**ESA62324**      **554**



## Charging Cabinet

Cat.No      Page No.  
**ESA62414**      **562**





**EduScience UK**



# ROBOTIC & STEAM



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**+447404985528**

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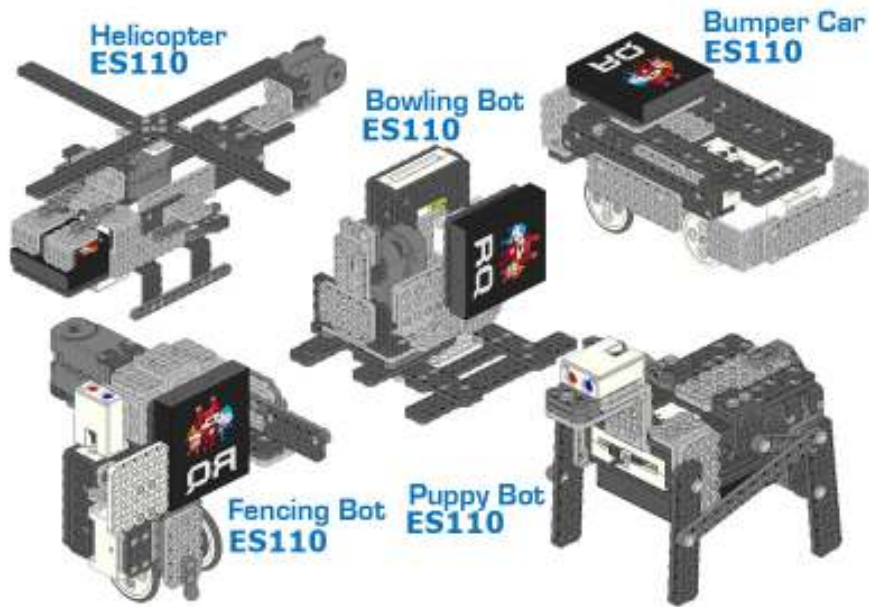
# ROBOTIC & STEAM

- Robotic Kit
- Humanoid Robot
- Steam Activity Kits
- Technology



**Robot Construction Kit Introductory Level**

Reconfigurable, upgradable(ES110 & ES120 & ES130) and programmable kit



**Programmable Kit**

Kit for kids and parents.  
 Robotic construction kit for robot and coding education.  
 10 different robot models in each level (Total 30 models).  
 Includes sensors: IR, sound, touch and more.

Includes a workbook for basic principles and assembly.  
 Includes a coding book for Scratch coding.

ES Robotic KIT is an educational robot kit for kids and parents or school education. It is consisting of 3 connected levels and each level comes with 10 different robot models with instructions. ES KIT helps children to develop problem solving and logical thinking skills while teaching them about robotics, science principle and coding.

For more and higher level of examples, try ES 120 and ES 130 as they comes with more servo motors, frames, sensors and more interesting robot models.

**Robot Construction Kit Introductory Level 1 ES110**



**Consist of the following :**

- 10 Robot examples
- Main parts: DC motors x 2, Touch Sensor, ESR Controller, IR remote controller, Battery case (4 x AAA: Not included), Assembly tool.
- Compatibility with ES KIT parts and frames.
- Book: Workbook, Scratch coding book

**Robot Examples:**

- Punching Bot
- Cultivator
- Swing Bot
- Fish Bot
- Rolling Bot
- Helicopter
- Bumper Car
- Bowling Bot
- Puppy Bot
- Fencing Bot.

ESR61101



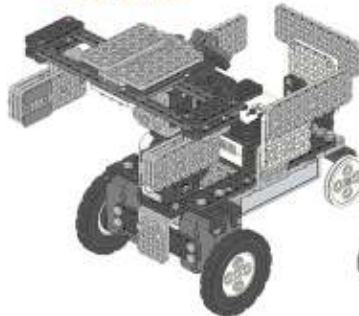


Robot Construction Kit Upgrade Level 2 ES 120

Bug Bot  
ES120



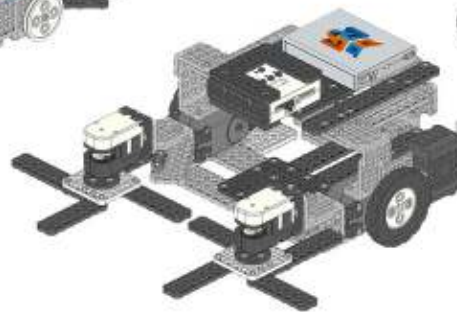
Transport Bot  
ES120



Shooting Bot  
ES120



Crayfish Bot  
ES120



Cleaning Bot  
ES120

Consist of the following :

- 10 Robot examples
- Main parts: Smart servo motors x 2, LED, Touch sensor,
- Soccer ball, Big gears, Tires
- Book: Workbook

Robot Examples:

Battle Bot  
ES120



Black/White Flag  
ES120



Walking Bot  
ES120



Soccer Bot  
ES120



Side Car  
ES120

- Battle Bot
- Black/White Flag
- Walking Bot
- Side Car
- Soccer Bot
- Bug Bot
- Transport Bot
- Shooting Bot
- Crayfish Bot
- Cleaning Bot.

ESR61102

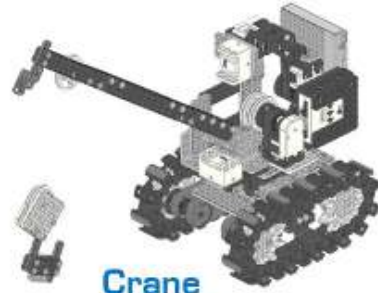


Robot Construction Kit Upgrade Level 3 ES 130

Curling Bot  
ES130



Exploration Bot  
ES130



Crane  
ES130



Excavator  
ES130



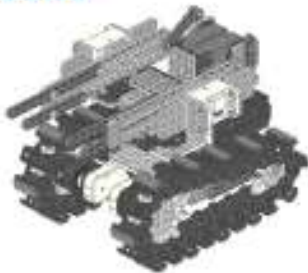
HU Tank  
ES130

Consist of the following :

- 10 Robot examples
- Main parts: Smart servo motors x 2, IR sensor,
- Battery case, Serial board, Dice, Caterpillar
- Book: Workbook

Robot Examples:

Tank Bot  
ES130



Four-Wheeled Bot  
ES130



Dino  
ES130



Vulcan Bot  
ES130



Fork Lift  
ES130

- Tank Bot
- Four-Wheeled Bot
- Dino
- Vulcan Bot
- Fork Lift
- Curling Bot
- Exploration Bot
- Crane
- Excavator
- HU Tank.

ESR61103





### Highend Humanoid Robot Kit(Assembly Kit)

16 Servo motors(w/CK Exclusive Actuators)  
 Obstacle/Sound Detection and Acceleration Sensors  
 Control by Android Apps (Blue-tooth)  
 Programmable by various platforms

#### FEATURES

Obstacle Sensor  
 Remote Control  
 Sound Detection Sensor  
 Acceleration Sensor  
 16 Servo Motors (LED Illumination)  
 UART Serial Communication  
 Quick and simple joint assembly  
 160 Degree of Freedom  
 3 Different sensors for creative programming

#### SPECIFICATION

Size/Weight:28.5x17x5x10.5cm/1.25kg  
 DOF (Degree of Freedom):16 servo motors  
 IR sensor : Obstacle detection  
 Sound sensor : Sound detection  
 Acceleration sensor : Gravity detection  
 Battery(11V Li-poly):30 minutes Approx.  
 Blue-tooth : Optional  
 External case : Engineering plastic.

ESR61106





### Humanoid Robot Kit(Pre-Assembles)

For Robot education and hobby  
Kit for people of age 12 and older.  
Programmable by SCRATCH.  
Easy assembly and programming guide.  
Includes sensors: IR and sound sensor.  
16 degrees of freedom.

#### FEATURES

All round robot kit for education, entertainment, robot soccer and competition.  
Easy step by step assembly guide for beginners.  
Patented joint connection method.  
Includes IR and sound sensor.  
Includes programming examples for Motion builder and Scratch builder software.  
Compatibility with ES Robotic KIT parts and frames.  
Includes IR remote controller (Game pad type).

#### ES Robotics Smart controller

Processor: ARM Cortex™-M3  
Core/speed: 32bit/24MHz  
Memory: 64KB  
Voltage: 2V ~ 3.6V  
Internal Mic/Buzzer  
Servo, motor and sensor ports

#### SPECIFICATION

Height / Weight: 19cm / 620g  
DOF (Degree of Freedom): 16 degrees of freedom  
IR sensor : Obstacle detection  
Sound sensor : Sound detection  
Sound output:9 melody songs  
Battery (11V Li-poly):Operation: 50~60 Min Approx.  
Blue-tooth :Supported.

ESR61105





### Humanoid Robot Kit (Assembly Kit)

For Robot education and hobby  
 Kit for people of age 12 and older.  
 Programmable by SCRATCH.  
 Easy assembly and programming guide.  
 Includes sensors: IR and sound sensor.  
 16 degrees of freedom.

### FEATURES

All round robot kit for education, entertainment, robot soccer and competition.  
 Easy step by step assembly guide for beginners.  
 Patented joint connection method.  
 Includes IR and sound sensor.  
 Includes programming examples for Motion builder and Scratch builder software.  
 Compatibility with ES Robotic KIT parts and frames.  
 Includes IR remote controller (Game pad type).

### ES Robotic Smart controller

Processor: ARM? CortexTM-M3  
 Core/speed: 32bit/24MHz  
 Memory: 64KB  
 Voltage: 2V ~ 3.6V  
 Internal Mic/Buzzer  
 Servo, motor and sensor ports

IR sensor : Obstacle detection  
 Sound sensor : Sound detection  
 Sound output:9 melody songs  
 Battery (11V Li-poly):Operation: 50~60 min Approx.  
 Blue-tooth : Supported.

ESR61104

### SPECIFICATION

Height / Weight: 19cm / 620g  
 DOF (Degree of Freedom): 16 degrees of freedom



## 1M Tall Robot For Research And Developments

Multi-purpose Humanoid Robot Platform  
 Well-proportioned 1m tall humanoid robot.  
 Walking algorithm for biped humanoid robot.  
 Fall detection algorithm utilizing a 9-axis IMU sensor.  
 Fully support soccer mode for Robocup competition.  
 300FPS vision processing

### FEATURES:

#### Front

Vision Camera microphone  
 Speaker  
 Cooling Fan  
 Expandable Hand Module  
 Expandable FSR Module

#### Back

Power and Emergency Switch  
 MU 9 Axis  
 Built-in PV  
 Interface Module  
 Battery Pack  
 Main battery switch and DC Power Input

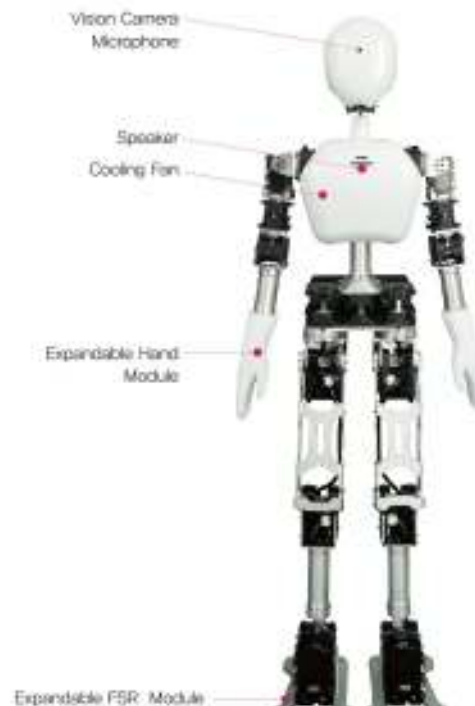
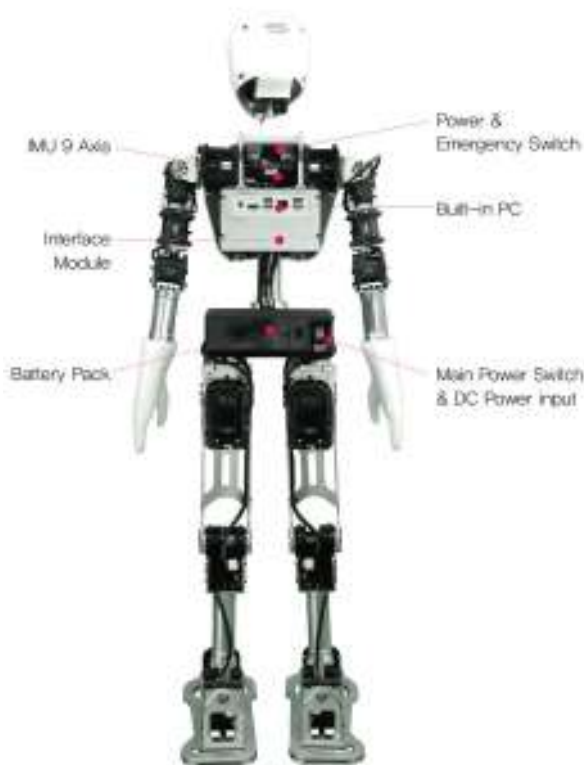
### SPECIFICATIONS:

Weight:9.5kg  
 Height:100 cm  
 Width:35 cm  
 DOF (Degree fo Freedom):23 DOF  
 12 DOF for legs  
 8 DOF arms  
 1 DOF for waist  
 2 DOF for head  
 Sensor : IMU 2G 9Axis, ?180?(Roll/Yaw), ?90?(Pitch)  
 Wireless:802.11 b/g/n  
 External interface:USB2.0 x 2 , Ethernet 10/100/1000 Base T,USB3.0 x 2,  
 HDMI x 1



Speaker:1 ea  
 Microphone:1 ea  
 Vision Camera : Logitech C905 / HD 1600x1200 pixel  
 Battery : Lithium Polymer 18.5V, 2250mA  
 Operation hour:20min ~ 40min  
 Charging time:30min  
 O/S: Window7; Linux Ubuntu 14.04.

ESR61107



**Skrbot**

Skrbot: playful companion, a robot developing along with a child's skill

Models of programmable robots with 40 indicated mobile app and driving in CV++

Skrware offers specially designed electronics kit, which act as Skrbot's brain, enabling to build any personalized construction and keep upgrading it

Users can either purchase a 3D model via 3DPrinter and print it themselves or buy a DIY Skrbot Kit

Skrware is developing a series of mobile hardware bricks responsible for indicated functions, automatically recognized by the Skrbot App



ESR61117

**Skrbot: personalized & programmable robot**

Skrbot can be upgraded with new electronic parts and brick modules, developing along with children's skills

The image displays three different configurations of the Skrbot robot, illustrating its modularity. From left to right: 1) A basic configuration with two large wheels and a simple body. 2) A configuration with a more complex body and additional sensors or modules. 3) A configuration with a gripper mechanism at the end of its body, designed for picking up objects.



**Drive around**

move Skrbot whenever you want with a set of motors



**Follow the line**

code Skrbot to follow any path you set for it



**Avoid obstacles**

develop Skrbot so that no obstacle stops it on its way



**Grab and carry**

use the gripper to move objects on your way

**Skrbots App**

Skrbots App: a personal mobile Skrbot controller with a programming interface

Skrbots App is a mobile app that breaks the barriers to programming by making complex problems much easy to understand, logical way with a user-friendly block-coding interface

Skrbots App is required to communicate with every Skrbot firmware:

- Task mode** - where users code Skrbot's functions while learning programming with a simple, graphic interface
- Play mode** - where the app is used as a remote control of a robot, drone or droid



ESR61118





**Orbit Material for Mathematics Class Set**

“No matter what geometry topic your students are learning, there is a place for a set of Orbit Material for Mathematics.”

ATM Equipment Review.

Completely revised and updated in 2012, the Orbit Material for Mathematics provides a flexible and fun hands-on construction resource with which to teach a wide range of curriculum topics from lower primary to secondary school.

Using this material, pupils will be able to explore the features and properties of a wide range of 2D and 3D geometric shapes and patterns, following the simple instructions and visual guides on the work cards. Topics for study include simple polygons and polyhedra, complex polyhedra and duals, angles, tessellations, number patterns, symmetry and perimeter.

Class set includes: 406 moulded joiners, 680 straws, 74 work cards and teachers notes. Please note colours of joiners may vary from those pictured.

The material is compatible with the Construct-o-straws™ construction sets, kubic bubbles and Orbit molecular modelling sets.

The set is particularly suitable for extension work, gifted and talented students and can be used for extra curricular activities such as engineering clubs..

ESS60846



**Cubic Bubble Set**

Soap film always makes the shape with least surface area. With this Kubic Bubble set you can make unusual and complex three dimensional film shapes supported by cubes, tetrahedrons, octahedrons, and triangular prisms.

Pupils will love constructing the sets and making film shapes. Use the sets to discuss a variety of scientific and mathematical principles, from basic geometry to surface tension, light refraction and minimum energy surfaces.

This set includes the pieces to make 1 set of 4 frameworks - tetrahedron, cube, prism & octahedron. Supplied with teachers notes and suitable from primary to higher level education depending on the topics studied..

ESS60847



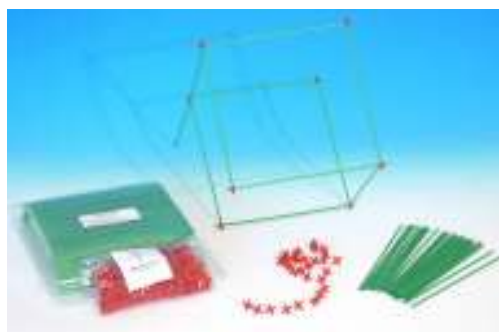
**Construct-O-straws Class Pack**

The very young are attracted by the bright colours and easy method of joining pieces together. Older children are intrigued by making more complex models. The system imposes very few restrictions on a child’s imagination, which allows them freedom of expression in a three dimensional medium.

Contents packed in a plastic bag

180 coloured straws, 108 joiners, 4 wheels, 8 bases / large wheels.

ESS60848



**Maths and Art Kit**

Special starter pack based on the Maths and Art project run by Devon Learning & Development Partnership in association with sculptor Simon Thomas.

Pre-packed angular nodes and flexible straws to enable follow up and extension work based on the Maths and Art Project.

Contains 500 Minit Oxygen OI joiners and 1000 Minit green straws..

ESS60849



**Minit Buckyball activity kit**

A fascinating group activity using free lecture material from Professor Sir Harry Kroto. Each pack has 100 kits making it a great outreach or extension activity in addition to using in the classroom.

The Buckyball kits use the Minit molecular modelling system.

Each kit makes either a C60 ‘buckyball’ or C70 ‘rugby-ball’ fullerene. The diameter of the assembled C60 model is 12cm.

ESS60850







**Science and Technology Innovation Kit**

Contain more than 200 components, which can make twelve standard reference models: three motorcycles, three tractors, three cars, three aircrafts, etc. This model can cultivate students' operational ability and cognitive and thinking ability. Besides, it can also arouse students' interest in products and inspire their innovative thinking ability and exploring consciousness.

Size : 43\*32\*8 (cm).

ESS60851



**Bionic Combination**

Contain more than 300 components, which can make six standard reference models: bipedalism chicken, quadruped dog, cattle, six foot reptile, etc.

These six standard reference models simulate and imitate natural animals with two, six or more feet. They also imitate the correlation and methods of controlling among joints when animal walks.

Students can grasp knowledge of different mechanical transmissions and structures like crank connecting rod. It enhances their ability to use knowledge flexibly and understand basic knowledge of bionics.

Size : 43\*32\*8 (cm).

ESS60853



**Universal Combination of Structural Basis**

Contain more than 400 components, which can make forty-one standard reference models: tricycle, trolley, single axle tractor, truck, tractor, racing car, garage with car, lifting platform with car, TV Tower, fan, windmill, aircraft, etc.

By putting together different structures, students can understand basic knowledge of machine and engineering. For example, this model can let students get a general knowledge of gear transmission, lever principle, pulley principle, relationship between structure and force and structural stability.

Size : 43\*32\*8 (cm)

ESS60852



**Sanitation Clean Machinery**

Contain more than 310 components, which can make five different types of sanitation vehicles. Good tool for students to master comprehensive application of chain drive and belt drive, as well as basic elements of vehicle design.

Size : 43\*32\*8 (cm).

ESS60854





**Super Intelligence Remote-control Crane Combination**

Contain more than 2000 components, which can make three standard reference models: large-sized movable Longmen crane, heavy duty crane, crane for architectural construction. Arm of each model is over 1.1meters and equipped with wireless remote control system. This combination can support four-control signal, four-independent motor and drive, so that we can realize manual control, electric control and wireless control. The skip can lift down and up, move back and forth. The arm can rotate 360 degrees at freedom.

By assembling the production line, students can know block and tackle, lever, transmission, and wireless control well. The combination is based on structural engineering, mechanical engineering and electrical comprehensive application

**Size :** 43\*32\*8 (cm)

ESS60856



**Engineering Machinery**

Contain more than 740 components, which can make five standard reference models: radar vehicle, four-wheel track drive engineering vehicle, road wrecker, snow removal truck, and bulldozer.

Students can understand characteristics of engineering machinery and its application in special environments. This is a wonderful guide for students to think about how to design special-purpose machines.

**Size :** 43\*32\*8 (cm)

ESS60855



**Mechanical and Structure**

Contain more than 360 components, which can make thirty standard reference models: transmission rail, turntable, crank transmission mechanism, gear transmission mechanism, mobile lifting ladder, lifting machine, etc.

Students can understand power transmission model and gear shift of the car, calculate gear ratio, analyze the realization of car steering, grasp working principle of rear wheel drive and four wheel drive and differential gear.

**Size :** 43\*32\*8 (cm)

ESS60857





### Energy Technology

Contain more than 260 components, which can make eight standard reference models: hydraulic forging machine, hydro generator, wind turbine, solar pump, solar guidance device, solar energy rotary cradle, etc. This combination elaborates correlative knowledge of natural energy. Participants can understand how's electricity produced, stored and drive these models. It contains solar energy, wind energy, water energy, etc. With this unit, participants can also understand conversion and utilization between various energies; Advantages and disadvantages of various energy; Definition, calculation, work and power calculation of energy; storage of energy, etc. Hence, we can cultivate students' environmental consciousness and understand the use of clean energy in the low carbon economy development.

Size : 43\*32\*8 (cm)

ESS60858



### Electronic Technology

Contain more than 300 components, which can make sixteen standard reference models: flashlight, logic gating circuit, refrigerator light, stair floodlight, circuit tester, elevator, series-parallel circuit, simple flashlight, signal beacon, punching machine, lamp controller, automatic door, alarm equipment, electric fence gate, hand dryer, sorting machine, etc. It covers correlative knowledge of electronic technology, application and detection of sensor, single chip microcomputer and programming, etc. By using this equipment, participants can understand simple circuit and application and detection of all kinds of sensors.

Size : 43\*32\*8 (cm)

ESS60860



### Pneumatic Technology Portfolio

Contain more than 400 components, which can make nine standard reference models: pneumatic lifting platform, air compressor, pneumatic sliding door, pneumatic turntable, linear pneumatic feeding device, pipe laying machine, etc.

It covers correlative knowledge of pneumatic technology. With this model, participants can know the working principle of air produces motion, transmission of force, press, pressure, cylinder, charging valve, manual valve, etc.

Size : 43\*32\*8 (cm)

ESS60859



### Industrial Technology Revolution

Contain more than 270 components, which can make twelve standard reference models: safety elevator, motor, generator, helicopters, wiper, Morse telegraph, hair hygrometer, cardan shaft, etc. Students can know how industrial technology revolution changed and improved people's life during Renaissance period. With this, students' interests in inventing and creating will be cultivated; the capacity of applying knowledge will be increased.

Size : 43\*32\*8 (cm)

ESS60861





**Leonardo Da Vinci machinery**

Contain more than 230 components, which can make ten standard reference models: wing, forge tongs, crane with braking claw, catapult, chariots, ladders, revolving bridge, etc. Students can experience the relationship between art and design, innovative thinking and mechanical structure by making different models.

**Size :** 43\*32\*8 (cm)

ESS60862



**Cantilever crane**

Contain more than 670 components, which can make three different types of cantilever cranes. Through piecing these models, students can know correlative knowledge about machine, force and lever block and tackle, motor control. It can also cultivate students' thinking ability and problem solving ability.

**Size :** 43\*32\*8

ESS60863



**Ball Traveling Kits**

ESS60864



**Housekeeping Kits**

The kit contain 50 kinds of parts, using more than 170 components to be able to stitch and create different Robots : home guards, cleaning robots, lawn robots, feeding robots and other 4 standard models and their instructions. All robots are wheeled stitching. The main device deceleration Metal Gear motor 3, voltage 9V, speed 128 rpm, load torque 0.4 kg.cm, high-speed motor 2, voltage 9 V, speed 8900 rpm, 4 fan 2, Flame sensor 1, Gray-scale sensor 2, seven lanterns 1,

Bluetooth sensor 1 and provide programmable app control software, rechargeable wireless camera 1, focal length 3.6 mm, support 5 meters away from black and white Night vision, 4 light-free infrared lights, with mobile alarm function, wireless monitoring, wireless remote control function, fire warning, independent inspection of remote alarm function



TRC Controller Kit Included

ESS60866



**Darwin Bio Kits**

This Kit contain 52 Kinds of parts, using more than 340 components can be stitched together so you can create different Models including : dog, Scorpion, Meerkat, Dragonfly, Mandrill and other 5 standard models and their guidance books. All robots are wheeled stitching. The main device deceleration Metal Gear motor 2, voltage 9V, speed 128 rpm, load torque 0.4 kg.cm, ultrasonic sensor 1 detection distance 7-250 cm, gray-scale sensor 2, seven lights 1, Bluetooth sensor 1 and provide programmable app control software, rechargeable wireless camera Focal length 3.6 mm, support 5 meters away from black and white Night vision, 4 light-free infrared lamps, with mobile alarm function, wireless monitoring, wireless remote control function, fire warning, independent inspection of remote alarm function.

ESS60865



**Motion & Energy Kits (Exploratory)**

ESS60867





### Remote Control Kit

Using 16-bit processor, 128X64 dot-matrix liquid crystal display, high-speed USB interface, 4 RJ12 input and online communication interface, can measure 4 analog signals simultaneously, 4 serial devices, 4 I2c devices, 4 digital. The device has 4 channels of synchronous counters. Four RJ12 output ports can simultaneously drive four 9V/2A high current output stepless speed regulating power motors, eight servo motor outputs, and four relays or lamps. Both internal and external power supply modes are available. Can be connected to sound, digital thermometer, ultrasonic, color sensor can identify red, yellow, blue, green and other 8 colors, infrared ranging, compass and other sensors

ESS60871



### Polar Robots Kits

This kit contains 49 kinds of parts, using more than 560 components to be able to stitch and create different Robots: roaming robots, polar flight robots, polar pioneers, polar special warfare robots, polar guard robots and other 5 standard models and their guidance books. All robots are crawler stitching. The main device deceleration Metal Gear motor 3, voltage 9 V, speed 128 rpm, load torque 0.4 kg.cm, high-speed motor 2, voltage 9 V, speed 8900 rpm, sound sensor 1, color sensor 1, identify 9 colors, ultrasonic sensor 1 detection distance 7-250 cm, Gray-scale Sensor 2, seven lanterns 2, Bluetooth sensor 1 and provide programmable app control software.

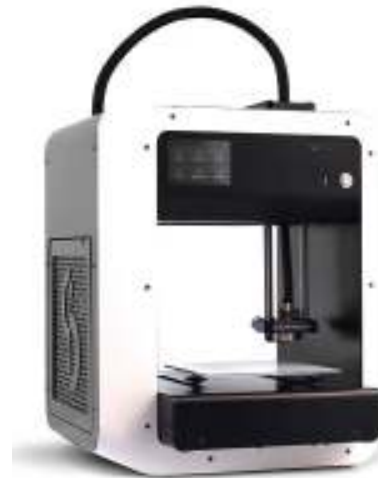
TRC Controller Kit Included

ESS60872

### Textbook E & R Experiments guide

Engineering and Robotics Technology Experiments Guide

ESS60874



### 3D Printer Skriware 1

3D printer ideal for Education and Personal use Ideal for the first start in 3D printing technology Robust, steel & polycarbonate construction enhancing precision Small and price competitive with other high-quality producers

Magnetic Bed Easily Removable, Durable Body HQ Materials.

Precision 0,05-0,3mm

Filament PLA support

Connectivity WiFi, Ethernet.

ESS60875

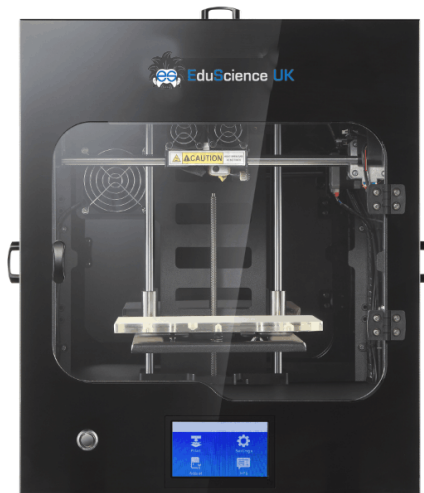


### 3D Printer Skriware 2

3D printer ideal for school use Ideal for beginners as well as more advanced users interested in multi-material 3D printing Most effective construction in terms of building volume and size on the market A revolutionary UX at the centre of 7" multi-touch, full-colour touchscreen, Live Camera Feed, Automatic Material Detection, Innovative, User-Oriented Interface, Extended Material Support, Dual Extruder, Removable PEI Bed

ESS60876





### 3D Printer Portable ES3-D150

Fully-enclosed, metal frame 3D Printer for middle school and high school, with three layer filter extraction system

With 3.5" color touch screen

Printing volume is 200mm\*150mm\*150mm, quick release acrylic platform

Nozzle diameter : 0.4mm, quick release single nozzle

Resolution : 0.1-0.5mm

Printing speed : 20-130mm/s

Accuracy of positioning : (Z) 0.0025mm; (X,Y) 0.011mm

Filament Size : 1.75mm; 9.

Compatible filament : ABS/PLA

Voltage input : 110-240V

Maximum power : 240W

Include : 500g PLA filament with each printer

With Wi-Fi function, Android phone/pad App control.

ESS60877



### 3D Printer Desktop ES-3D250

Printer size : L520xW430xH450mm

Valid print range : L250\*W250\*H250mm

Printer weight : N.W. 17kgs, G.W. 21kgs

Body material : Alluminum & Plastic frame body, sillent printing state.

Print material : PLA, ABS, PETG, WOOD

Printing method : FDM Payment

Print accuracy : 0.1MM

Operating system Windows7 +, Mac OS X

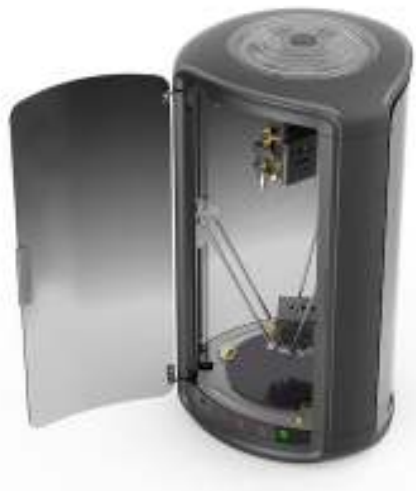
Noise : <50dB

Electrical performance Voltage power: AC100-240V, 120W

Enter the file Support : stl / .obj / G-code.

Connection method : WIFI, USB, TF card

ESS60878



### 3D Printer Desktop ES3-DF3

Printer size  $\Phi 305 \times 510$ mm Quantity 1 set

Valid print range :  $\Phi 150 \times 175$ mm

Printer weight : N.W. 7.2kgs, G.W. 10kgs

Body material : ABS+PC

Print material : PLA

Printing method : FDM .

Print accuracy : 0.1MM

Operating system : Windows7 +, Mac OS X

noise : <50dB

Electrical performance Voltage power: AC100-240V, 120W

Enter the file Support : stl / .obj / .dedi / .jpg / .png / .bmp / .3mf format

Connection method : WIFI, USB, TF card

ESS60879





### 3D Printing Library

3D model library and online store for custom 3D designs Skrimarket works as a cloud-based platform enabling users to store saved 3D models and trade them with others

It has two fundamental features:

Personal library of 3D models, both uploaded and created by the user - coming from 3rd-party modelling tools and from Skribot Creator Online marketplace, where users can purchase new updates for Skribot models -both new parts and electronic modules.

[ESS60893](#)



### 3D Robotic Creator Software

Unleash your creative spirit and share with others Skribot Creator is an online 3D design tool for prototyping new 3D-printable models and modifying existing ones. A smart tool linking a creative design with electronics and engineering, allowing to create personalized, programmable models, whose abilities and design quality depend on the skill of their creator. Direct link with an online library of models, enabling 1-click-printing via Skriware 3D printers and sharing within a community. Creator will be constantly developed adding pay-per-click special modules upgrading Skribot functionalities.

[ESS60895](#)



### Filament For 3D Printer

- [ESS60880](#) PLA filament
- [ESS60881](#) ABS+ filament
- [ESS60882](#) PET-G filament
- [ESS60883](#) PLA+ filament
- [ESS60884](#) TPU filament
- [ESS60885](#) PC-ABS filament
- [ESS60886](#) Glassbend filament
- [ESS60887](#) PVA+ filament





### TRC Controller With Bag

Controller: using 16 bit or higher, processor, 128\*64 dot matrix LCD, high-speed USB interface, four RJ12 input and online communication interface, measuring four analog signals, four-way serial port equipment, four-way I2C equipment, four-way digital equipment and four-way synchronous counter.

Four RJ12 output ports can simultaneously drive four 9V/2A current output stepless speed control motors, eight-way servo motor output, four-way relay or lamp control.

Apply two kinds of power supply modes: Internal and external power supply.

The controller can connect different sensors: sound sensor, digital thermometer, ultrasonic sensor, color sensor, infrared distance and compass.

**Size :** 37\*19\*8 (cm)

**ESS60900**



### IMC controller

It adopts 16-bit processor or more with 128X64 dot LCD display, 1 high-speed USB interface and 4 RJ12 interfaces. It is both an input port and an output port. It handles various types of sensors, output devices and online communication. 8 independent digital interfaces, 4 dedicated analog interfaces, 4 I2C interfaces 4 9V/2A high current output stepless speed motor interface, 4 servo motor output, 4 synchronous counters, single bus interface, etc. Can be connected to sound, digital thermometer, ultrasonic, color, infrared ranging, compass and other sensors.

**Size :** 37\*19\*8 (cm)

**ESS60901**



### Robot Basic Combination

Contain more than 140 components and several sensors, which can make six standard reference models: traffic lights, automatic hand dryer, robot engineer, tracing robot, etc.

Main device: two reducing motor with metal gear, one high-speed motor, one touch sensor, one 9V red light, one 9V green light, one 9V yellow light, one line-tracking sensor, one infrared sensor and one magnetic sensor.

**Size :** 43\*32\*8 (cm)

**ESS60903**



### Software Development Platform

DFT robot software development system:

The system is matched up with TRC and IMC intelligent controller device, which can provide students with computer terminal Windows programming software. The development platform, which is graphics visualization programming software, is totally composed of three modules: process module, control module and built-in module. Beginners can use graphical programming; advanced players can use C language programming, or interactive programming of graphical language and C language.

The interface is beautiful and friendly, easy to learn and use.

**ESS60902**







### Bionic Robot Combination

Bionic is a kind of inter discipline which is developed from engineering technology and biology science. More and more people have found out that some functions about plants and animals have exceeded technological design scheme that human has done. Bionic attempts to simulate plants' and animals' such functions, which is also the subject of this bionic robot combination.

Contain more than 300 components and several sensors, which can make four standard reference models: beetle, crab, quadruped animal and multi-legged animal.

**Size :** 43\*32\*8 (cm)

ESS60905



### Industrial Robot

Contain more than 400 components, which can make four standard reference models: flipping robot, welding robot, 3-DOF manipulator and multi-DOF manipulator.

The flipping robot may be flipped and grasped firmly and relaxed. The welding robot can realize multipoint welding in any space. 3-DOF manipulator can grab things in vertical and horizontal direction with the level of 360 degrees. The 4-DOF manipulator can grab arms and expand freely in any space.

Main device: Eight touch sensors, one light, four gear boxes and four motors.

**Size :** 43\*32\*8 (cm)

ESS60906



### Mobile Robot Combination 1

Contain more than 460 components and several sensors, which can make six standard reference models: exploration robot, light search robot, trace exploration robot, obstacle avoidance robot, etc.

Main parts: two reducing motor with metal gear, one high-speed motor, one touch sensor, one 9V red light, one 9V green light, one 9V yellow light, one line-tracking sensor, one infrared sensor and one magnetic sensor.

**Size :** 43\*32\*8 (cm)

ESS60904



### Automatic Robot

Contain more than 480 components, which can make four standard reference models: catching robot, intelligent three-dimensional warehouse, rotary manipulator and three axis robot. Four robots can also be connected into a mutual collaborative system.

Main device: six touch sensor, two 9V/1A high power metal gear box motors, two 9V/0.4A motors and two gear boxes.

**Size :** 43\*32\*8 (cm)

ESS60907





**Exploration robot**

Contain more than 240 components, which can make six standard reference models: automatic tracked vehicle, trail search robot, color recognition robot, tunnel robot, exploration robot and rescue robot. The exploration robot refers to one gray  
Main device: one grey scale sensor, one flame sensor, one ultrasonic distance measuring sensor, one color sensor, one 9V-red light, a 9V-green light and two 9V high torque motors.  
**Size** : 43\*32\*8 (cm)

ESS60908



**Small Car Washing Line**

Working voltage: 24VDC  
Sensor: Limit switch: 4  
Reflected light sensor: 2  
Actuator: Two-way motor: 2  
50W light bulb: 3  
**Size** (length\*width\*height) : 540\*390\*400 mm

ESS60909



**Small Transmission Belt**

Working voltage: 24VDC  
Sensor: Limit switch: 2  
Magnetic switch: 2  
Actuator: Two-way motor: 1  
Light-emitting diodes: 2  
**Size** (length\*width\*height) : 350\*200\*120 mm

ESS60911



**Small Kiln with Electronically Controlled Open**

Working voltage: 24VDC  
Sensor: Limit switch: 2  
Magnetic sensor: 2  
Temperature sensor: 1  
Actuator: Two-way motor: 1  
50W light bulb: 1  
**Size** (length\*width\*height) : 187\*259\*150 mm

ESS60910

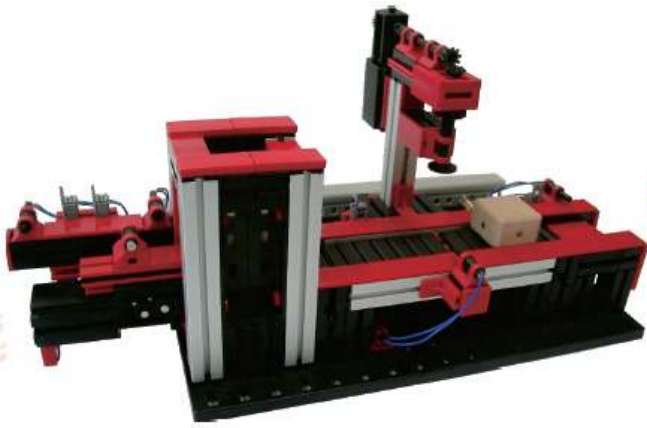


**Small Elevated Warehouse**

Working voltage: 24VDC  
Sensor: Limit switch: 16  
Magnetic switch: 1  
Actuator: Light-emitting diodes:2  
Two-way motor: 3  
**Size** (length\*width\*height) : 550\*300\*470 mm

ESS60912





### Small Single Machine Assembly Line

Working voltage: 24VDC

Sensor: Limit switch: 3

Magnetic switch: 4

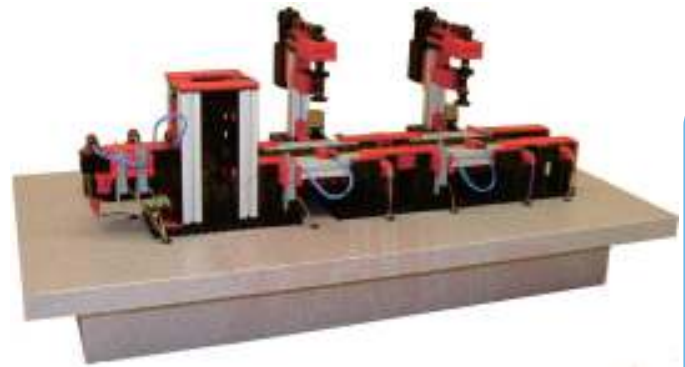
Actuator: Two-way motor: 1

One-way motor: 4

Light bulb: 2

Size (length\*width\*height) : 550\*270\*270mm

ESS60913



### Small Flexible Processing Line

Working voltage: 24VDC

Sensor: Limit switch: 3

Magnetic switch: 4

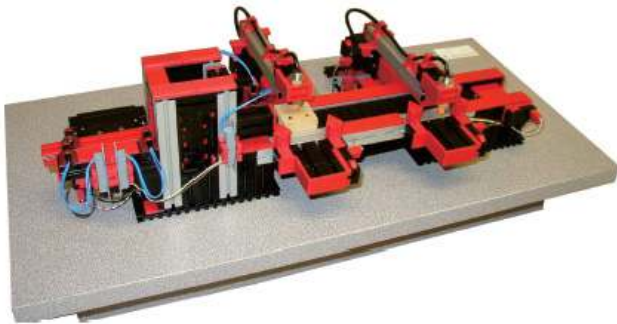
Actuator: Two-way motor: 1

One-way motor: 4

Light bulb: 2

Size (length\*width\*height) : 550\*270\*270 mm

ESS60914



### Small Transmission & Sorting Line

Working voltage: 24VDC

Sensor: Magnetic switch: 5

Actuator: Two-way motor: 1

One-way motor: 2

Size (length\*width\*height) : 350\*185\*150mm

ESS60915



### Operation Assembly Line with Double Workbench

Working voltage: 24VDC

Sensor: Limit switch: 4

Correlation light sensor: 4

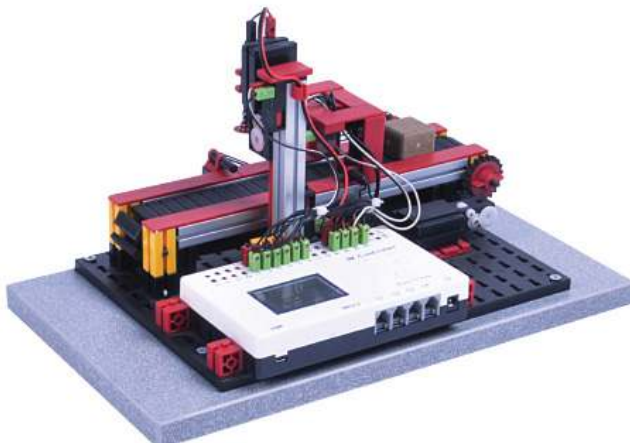
Actuator: Two-way motor: 2

One-way motor: 6

Light bulb: 4

Size (length\*width\*height) : 550\*410\*190mm

ESS60916



### Punch Machine With Detection

Working voltage: 9V/24VDC

Sensor: Limit switch: 2

Magnetic sensor: 3

Actuator: Two-way motor: 1

One-way motor: 1

Control part: Digital input: 5

Digital output:

ESS60917





**Punching Machine with Transmission Belt**

Working voltage: 9V/24VDC  
 Sensor: Limit switch: 2  
 Correlation light sensor: 2  
 Actuator: Two-way motor: 1  
 One-way motor: 1  
**Size** (length\*width\*height) : 550\*410\*190mm

ESS60918



**PLC LOGO Training Experiment Kit**

Working voltage 12~24V DC|0.5A  
 4 potentiometer adjustable voltage 0~10 VmA (simulation input)  
 1 Potentiometer Belo simulation 60Hz~5 kHz  
 1 Infrared receiver, used to receive 10 frequencies chosen by remote control.  
 8 Signal input  
 4 LED status indication output.  
 4 Slide switch: from digital to simulation  
 1 Slide switch: from digital to infrared receiver  
 1 Slide switch: from digital to sound output  
 1 The slot is used to extend module  
 1 Infrared receiver  
 34 Learning card  
**Size** : 565\*340\*185mm

ESS60919



**PLC S1200-7 Training Experiment Kit**

Configurations  
 A training device without S7-1200 CPU  
 DVD learning CD  
 34 learning cards  
 Power source: AC220V/DC24/1A  
 One infrared remote control  
**Size** (length\*width\*height) : 330\*230\*160mm

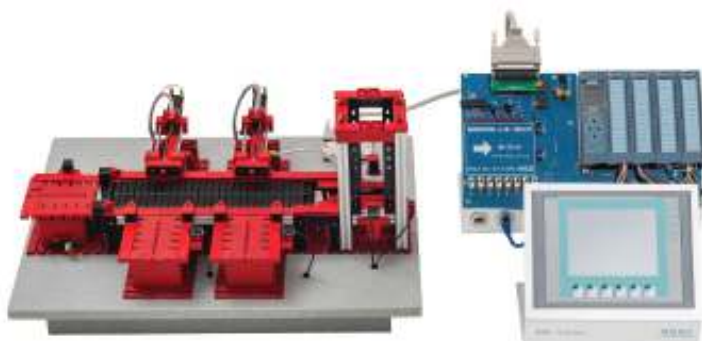
ESS60920



**PLC S300-7 Training Experiment Kit**

Configurations  
 A training device without S7-300CPU  
 DVD learning CD  
 34 learning cards  
 Power source: AC220V/DC24/1A  
 One infrared remote control  
**Size** (length\*width\*height) : 565\*340\*185mm

ESS60921



**PLC S1500-7 Training Experiment Kit**

Configurations  
 A training device  
 DVD learning CD  
 34 learning cards  
 Power source: AC220V/DC24/1A  
**Size** (length\*width\*height) : 350\*235\*230mm

ESS60922





### CNC Pneumatic Processing Assembly Line

Working voltage: DC 9V  
 Sensor: Limit switch: 10  
 Photoelectric sensor: 5  
 Proximity sensor: 2  
 Actuator: Two-way motor: 14  
**Size** (length\*width\*height) : 1100\*750\*340 mm

ESS60923



### Three-Axis Gantry Crane Rack

Working voltage: 24VDC  
 Sensor: Inductive proximity switch: 1  
 Mechanical switch: 8  
 Incremental encoder: 2  
 Actuator: Two-way motor: 5  
 Electromagnet: 1  
 Control part: Digital input: 9  
 Counting input: 6  
 Digital input: 7  
**Size** (length\*width\*height) : 660\*540\*450 mm

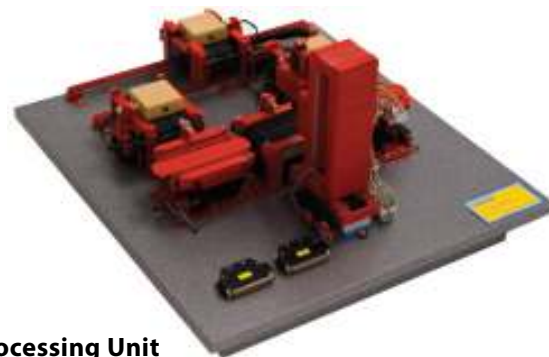
ESS60925



### Automatic Car Washing Line

Working voltage: 24VDC  
 Sensor: Unidirectional light sensor: 4  
 Magnetic induction switch: 9  
 Limit switch: 12  
 Actuator: One-way motor: 4  
 Two-way motor: 8  
 Control part: Digital input: 25  
 Digital output: 20  
**Size** (length\*width\*height) : 1100\*750\*600 mm

ESS60926



### Processing Unit

Working voltage: 24VDC  
 Sensor: Inductive proximity switch: 6  
 Limit switch: 10  
 Actuator: One-way motor: 6  
 Two-way motor: 6  
 Control part: Digital input: 11  
 Digital output: 18

ESS60927



### Processing Line

Working voltage: 24VDC  
 Sensor: Inductive proximity switch: 5  
 Limit switch: 10  
 Actuator: One-way motor: 2  
 Two-way motor: 3  
 Control part: Digital input: 15  
 Digital output: 18  
**Size** (length\*width\*height) : 600\*350\*330mm

ESS60928





**Eccentric Press**

Working voltage: 24VDC  
 Sensor: Unidirectional light sensor: 3  
 Limit switch: 7  
 Actuator: One-way motor: 1  
 Two-way motor: 1  
 Control part: Digital input: 10  
 Digital output: 3  
**Size** (length\*width\*height) : 390\*270\*260mm

ESS60929



**Elevated Warehouse**

Working voltage: 24VDC  
 Sensor: Magnetic sensor: 6  
 Limit switch: 13  
 Actuator: Two-way motor: 4  
 Luminous tube: 5  
 Control part: Digital input: 20  
 Digital output: 29  
**Size** (length\*width\*height) : 600\*550\*500mm

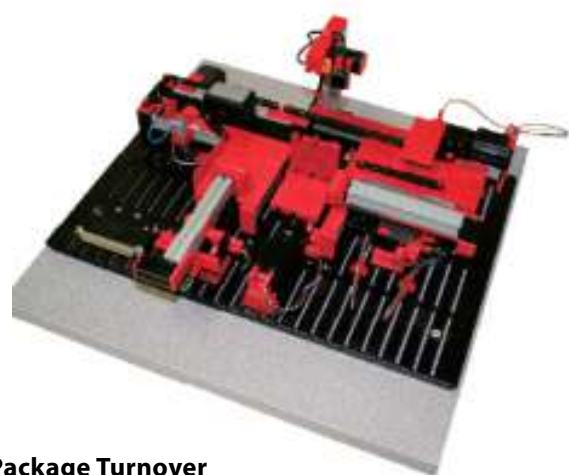
ESS60930



**Assembly Line**

Working voltage: 24VDC  
 Sensor: Reflected light sensor: 1  
 Unidirectional light sensor: 2  
 Limit switch: 23  
 Actuator: Two-way motor: 5  
 Relay: 1  
 Control part: Digital input: 26  
 Digital output: 11  
**Size** (length\*width\*height) : 1290\*470\*600mm

ESS60931



**Package Turnover**

Working voltage: 24VDC  
 Sensor: Unidirectional light sensor: 1  
 Inductive proximity switch: 3  
 Limit switch: 4  
 Actuator: Two-way motor: 1  
 Buzzer: 1  
 Light-emitting diodes: 4  
 Control part: Digital input: 8  
 Digital output: 7  
**Size** (length\*width\*height) : 675\*390\*130mm

ESS60932



**Elevator**

Working voltage: 24VDC  
 Sensor: Reflected light sensor: 2  
 Unidirectional light sensor: 2  
 Limit switch: 10  
 Actuator: Two-way motor: 5  
 Control part: Digital input: 14  
 Digital output: 10  
**Size** (length\*width\*height) : 400\*400\*250mm

ESS60933

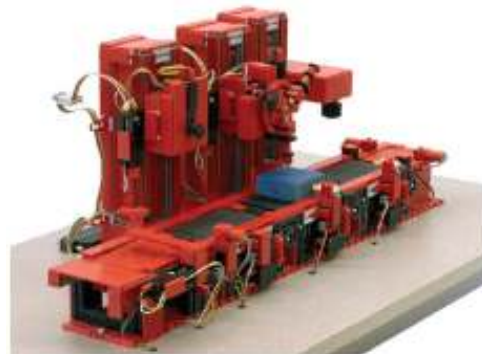




### Climate Chamber

Working voltage: 24VDC  
 Sensor: Inductive proximity switch: 2  
 Limit switch: 2  
 Actuator: Two-way motor: 3  
 Control part: Digital input: 4  
 Digital output: 6  
**Shape size** (length\*width\*height) : 390\*270\*215mm

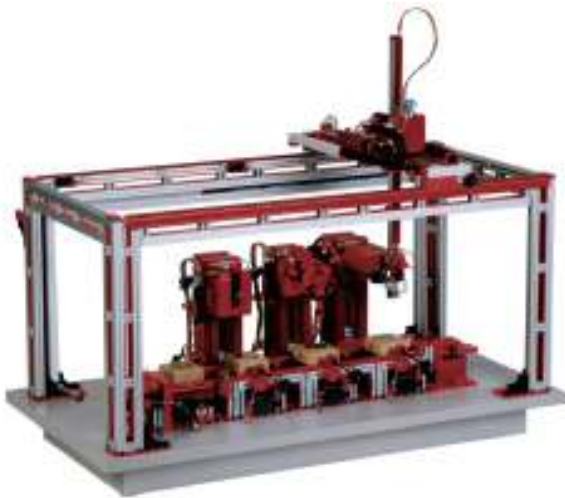
ESS60934



### Flexible Manufacturing Line

Sensor: PT temperature sensor: 2  
 Limit switch: 4  
 Actuator: Two-way motor: 2  
 One-way motor: 1  
 50W filament lamp: 1  
 Control part: Digital input: 4  
 Digital output: 4  
**Size** (length\*width\*height) : 540\*390\*350 mm

ESS60935



### Transmission and Processing Line

with Tri-axial Door Frame  
 Working voltage: 24VDC  
 Sensor: Unidirectional light sensor: 2  
 Inductive proximity switch: 3  
 Limit switch: 12  
 Actuator: One-way motor: 7  
 Two-way motor: 5  
**Size** (length\*width\*height) : 860\*450\*270mm

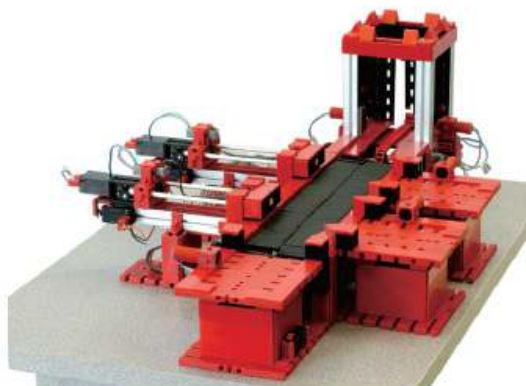
ESS60936



### Automatic Door Model

Working voltage: 24VDC  
 Sensor: Reflected light sensor: 4  
 Unidirectional light sensor: 1  
 Inductive proximity switch: 3  
 Actuator: One-way motor: 2  
 Two-way motor: 3  
 Electromagnet: 1  
 Cylinder: 3  
**Size** (length\*width\*height) : 860\*450\*450mm

ESS60937



### Transmission & Sorting Line

Working voltage: 24VDC  
 Sensor: Reflected light sensor: 3  
 Unidirectional light sensor: 1  
 Inductive proximity switch: 2  
 Magnetic sensor: 3  
 Limit switch: 5  
 Actuator: One-way motor: 2  
 Two-way motor: 2  
**Size** (length\*width\*height) : 540\*390\*270mm

ESS60938

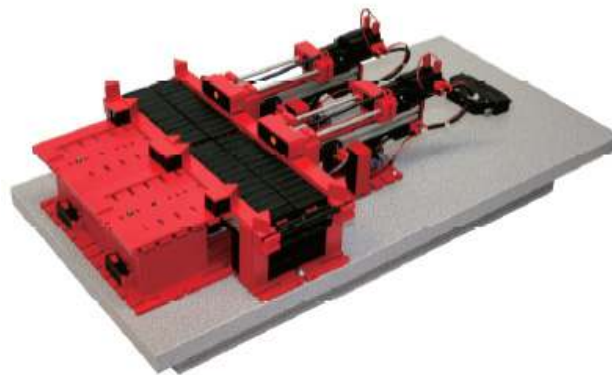




**Transmission and Classification with Three-axis Door Frame**

Working voltage: 24VDC  
 Sensor: Reflected light sensor: 4  
 Unidirectional light sensor: 1  
 Inductive proximity switch: 3  
 Actuator: Two-way motor: 3  
 Cylinder: 3  
**Size** (length\*width\*height) : 860\*450\*450mm

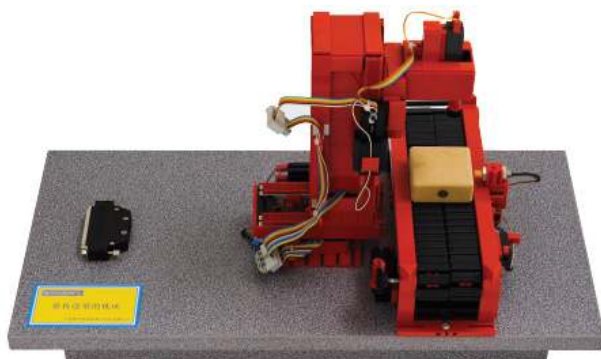
ESS60939



**Double Push Rod Conveyor Belt**

Working voltage: 24VDC  
 Sensor: Inductive Proximity Switch: 2  
 Limit switch: 6  
 Magnetic switch: 2  
 Actuator: Light-emitting diodes: 2  
 Two-way motor: 3  
**Size** (length\*width\*height) : 270\*550\*200mm

ESS60940



**Conveyor Belt with Machine Processing**

Working voltage: 24VDC  
 Sensor: Inductive proximity switch: 4  
 Limit switch: 5  
 Actuator: Light-emitting diodes: 1  
 Two-way motor: 3  
 One-way motor: 1  
**Size** (length\*width\*height) : 270\*550\*350mm

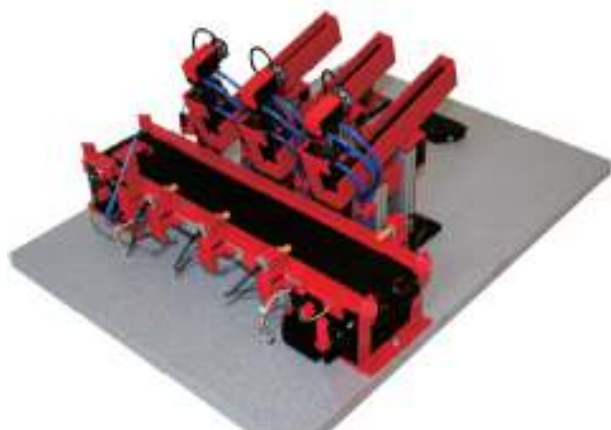
ESS60941



**Conveyor belt**

Rotation/Sliding Table Conveyor  
 Working voltage: 24VDC  
 Sensor: Inductive proximity switch: 4  
 Limit switch: 4  
 Optical inductor: 1  
 Actuator: Light-emitting diodes: 1  
 Two-way motor: 4  
**Size** (length\*width\*height) : 450\*550\*180mm

ESS60942



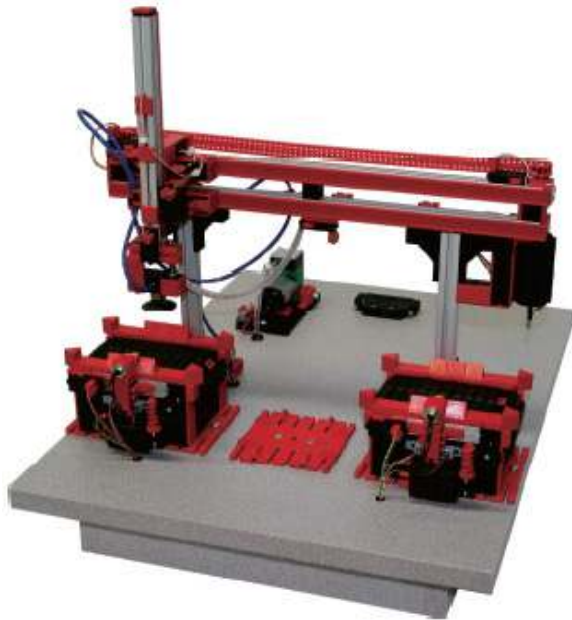
**Pneumatic Sorting Machine**

Sensor: Inductive proximity switch: 4  
 Limit switch: 2  
 Magnetic switch: 2  
 Optical inductor: 3  
 Press sensor: 1  
 Actuator: Light-emitting diodes: 2  
 Two-way motor: 3  
**Size** (length\*width\*height) : 405\*550\*260mm

ESS60943



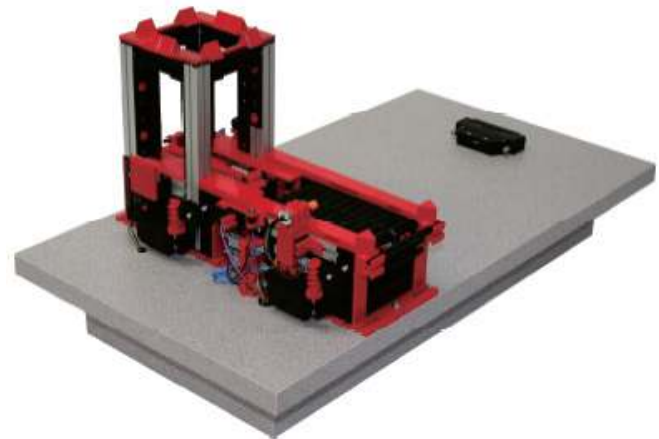




### Chunk Handling Machine

Working voltage: 24VDC  
 Sensor: Inductive proximity switch: 2  
 Limit switch: 7  
 Magnetic switch: 1  
 Incremental encoder: 1  
 Actuator: Two-way motor: 4  
 Pneumatic valve: 1  
 Air pump: 1  
 Magnet: 1  
**Size** (length\*width\*height) : 405\*550\*260mm

ESS60945



### Conveyor Belt with Bin

Working voltage: 24VDC  
 Sensor: Magnetic switch: 3  
 Inductive proximity switch: 1  
 Unidirectional light sensor: 1  
 Limit switch: 1  
 Actuator: One-way motor: 1  
 Light-emitting diodes: 1  
**Size** (length\*width\*height) : 300\*550\*270mm

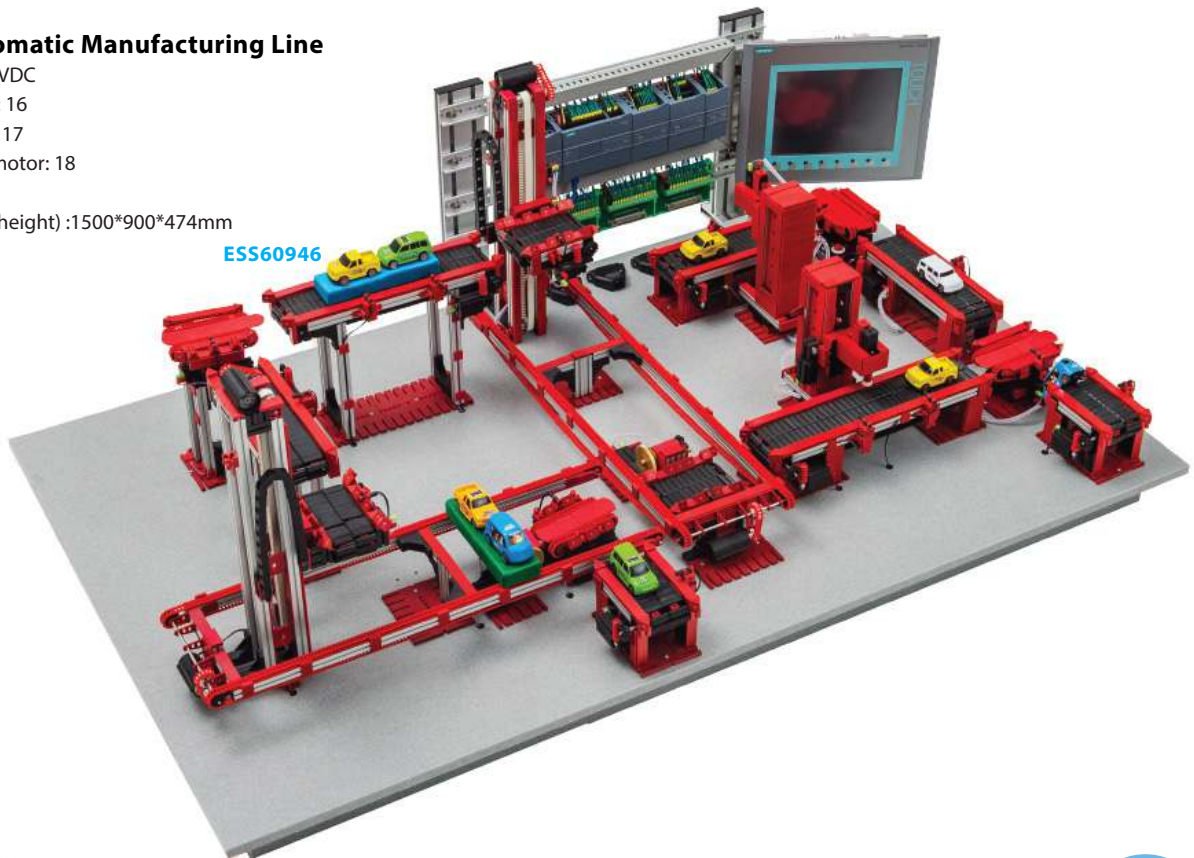
ESS60944

### Industrial Automatic Manufacturing Line

Working voltage: 24VDC  
 Sensor: Limit switch: 16  
 Magnetic switch: 17  
 Actuator: Two-way motor: 18

**Size** (length\*width\*height) : 1500\*900\*474mm

ESS60946





EduScience UK



# BIOLOGY



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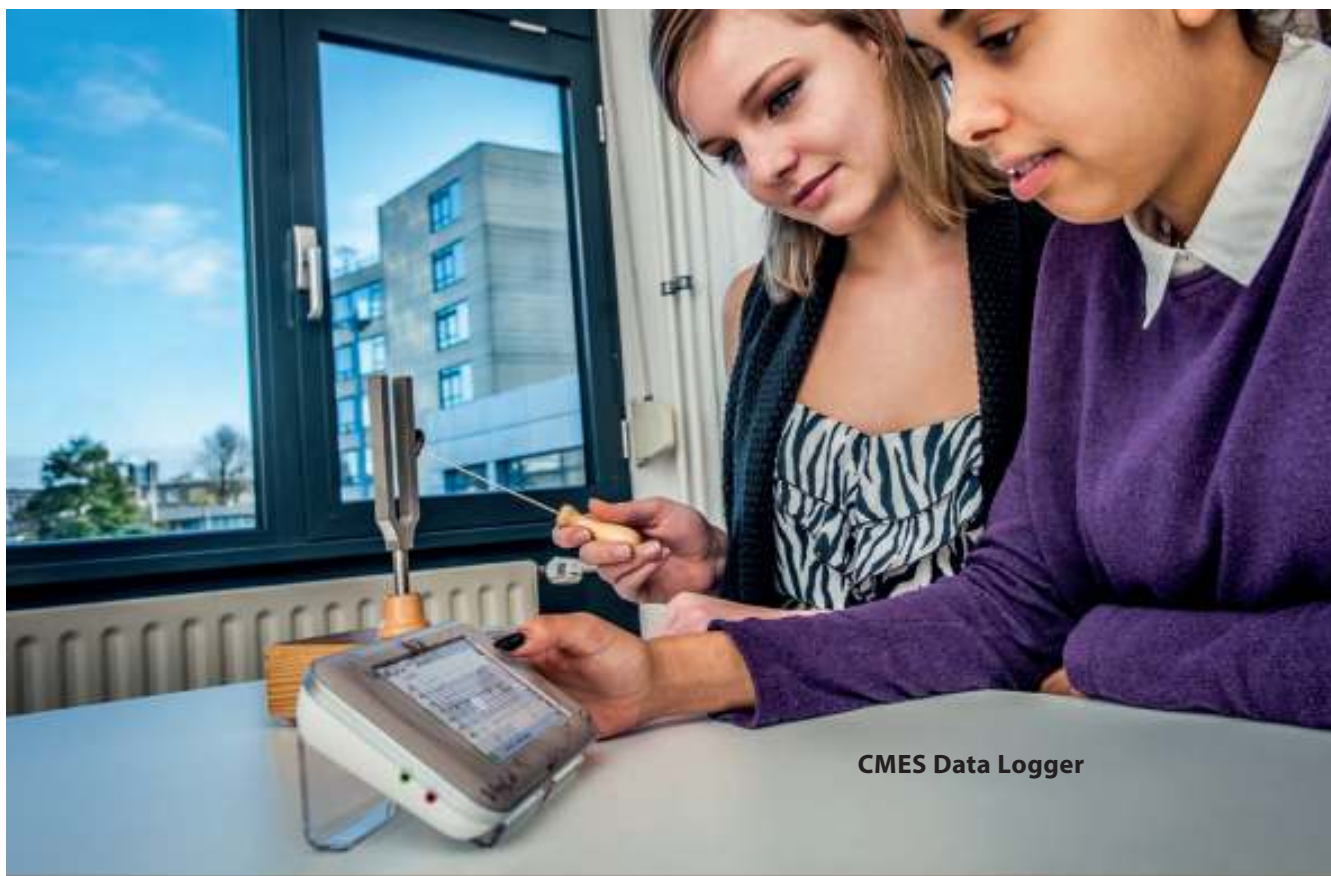
+447404985528

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# BIOLOGY

- Data Logging & Sensors
- Animals & Ecology
- Human Body
- Plants and Organisms
- Genetics
- Microbiolog





CMES Data Logger

# VinciLab

Modern Data-logger for Science



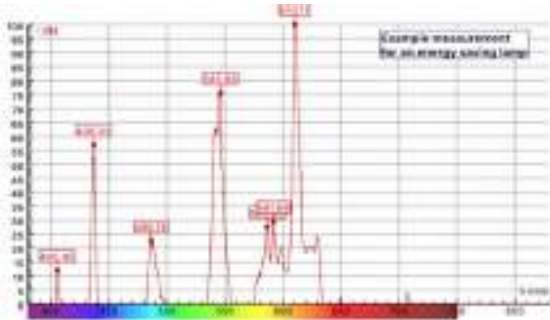
VinciLab is an advanced mobile graphic data acquisition system. It is a handheld Linux device equipped with two processors and 4GB memory. Its 5" capacitive color touch screen offers easy control of the device. For wireless connectivity VinciLab is equipped with Wi-Fi and Bluetooth. VinciLab can be used standalone and with a computer, in the classroom and in the field.



ESD50000

Operating System	Linux
Display	5" (800 x 480 pixel) capacitive color touch screen
Processors	Two: main (ARM 720 MHz) and measurement
Memory	4 GB, of which 1.5 GB user memory in the 'My Files' folder Expandable with a USB flash drive
Power	Rechargeable battery Li-Ion 3.7 V, 4000 mAh USB Power Adapter (100-240 V AC, DC 5V/2A) included
Connectivity	Wi-Fi 802.11 b/g/n Bluetooth® 2.1 + EDR
Computer connection	Mini USB port also used for powering
USB port	Full USB for USB peripherals
Other ports	Audio In/Audio Out
Sensor inputs	4 analog BT (right-hand) inputs and 2 digital BT (left-hand) inputs. Each analog input can work as a counter
Built-in sensors	Sound sensor, max. frequency 44 100 Hz 3-axis Accelerometer (2g, 4g, 8g), max. frequency 400 Hz
ADC resolution	12 bits
Sampling frequency	Max. 1 MHz, simultaneously on 2 analog inputs
Outputs	Via digital sensor inputs Eight 1-bit or two analog outputs
Software on board	Dedicated Desktop Applications Coach 6 Application for data collection, graphing and analysis





**Coach 7 Desktop**

Our Coach software is the most versatile and complete software for STEM Education.

Coach integrates ICT tools, which resemble technologies used by professional scientists and facilitate an inquiry-based approach to education. By collecting high-quality, real-time data, constructing and using models, using simulations and visualizations, comparing results from experiments and models, students can be actively involved in authentic learning activities.

Coach 7 is the successor of Coach 6 and offers new features and enhancements of our unique and powerful environment.

5 years Single User License

ESD50013



**Blood Pressure Sensor**

The Blood Pressure sensor 0377i is used to measure arterial blood pressure in humans (non-invasive). It measures the pressure signal caused by the interaction between the cuff and the blood flow through the brachial artery.

**Range:** 20 .. 250 mm Hg

**Accuracy:** 3 mm-Hg

**Includes:** standard adult size adjustable cuff (27 cm to 39 cm) and bulb pump (with release valve).

**Can be used to:**

- Blood pressure as a vital sign
- Effect of exercise on blood pressure.

ESD50025



**CO2 Gas Sensor Low-range**

The CO2 sensor BT24i is used to monitor low concentrations of gaseous carbon dioxide. The sensor uses the Non-Dispersive Infrared Detection (NDIR) method.

**Range:** 0 .. 5000 ppm

**Typical resolution:** 20 ppm

**Includes:** 250-mL sampling bottle.

**Can be used to:**

- Investigate CO2 level during respiration of small animals and insects,
- Monitor CO2 changes during photo-respiration and photosynthesis in light/dark.
- Measure CO2 level during cellular respiration of peas or beans.

ESD50026





### Dissolved Oxygen sensor \*

The Dissolved Oxygen sensor BT34i can be used to measure the concentration of dissolved oxygen in water samples. The sensor is automatically temperature compensated, using a thermistor built into the sensor. Disposable caps with pre-fit membranes allow you to quickly and conveniently change membranes.

**Range:** 0 to 15 mg/L

**Resolution** (12-bit): 0.2 mg/L

**Includes:** replacement membrane cap, polishing strip, oxygen probe electrolyte, filling pipette, empty calibration bottle and Sodium Sulphite Calibration Standard.

**Can be used to:**

- Monitor dissolved oxygen concentration in an aquatic systems, measure Biological Oxygen Demand (B.O.D.) in water samples.
- Determine the relationship between the dissolved oxygen concentration and the temperature of water.

ESD50028



### CO2 Gas Sensor High-range

The CO2 sensor BT25i is used to monitor high concentration of gaseous carbon dioxide. The sensor uses the Non-Dispersive Infrared Detection (NDIR) method.

**Range:** 0 .. 100000 ppm

**Typical resolution:** 1000 ppm

**Includes:** 250-mL sampling bottle.

**Can be used to:**

- Investigate CO2 levels of human breath,
- Monitor production of CO2 during chemical reactions,
- Monitor production of CO2 during decomposition of organic materials in soils.

ESD50027



### ECG Sensor

The ECG sensor BT36i measures voltages that are produced by the heart. These voltages are measured at the skin of the wrists and elbow through electrodes. The voltages are amplified by the sensor and filtered and transferred through an optical coupler.

**Range:** 0 .. 5 mV

**Resolution** (12-bit): 1.2  $\mu$ V

**Includes:** a package of 100 electrode patches.

**Can be used to:**

- Monitor ECG in rest and after mild exercise,
- Investigate CG changes with mild stimulants,
- Record the electrical activity of a muscle (EMG).

ESD50029



### Exercise Heart-rate Sensor

The Exercise Heart-rate sensor BT47i monitors a person's heart beat. Each time the heart beats, an electrical signal is generated. This signal is measured at the surface of the skin by electrodes embedded in the chest belt of the sensor. The system consists of a transmitter belt, plug-in receiver, and an elastic strap.

**Transmitter:** T31 by Polar Transmitter

**Range:** 90 cm

**Can be used to:**

- Compare the heart rate of different individuals,
- Check the person's heart rate before, before, during and after a vigorous activity,
- Monitor the recovery rate.

ESD50030



### Flow Rate Sensor \*

The Flow rate sensor 0387i measures the velocity of flowing water. It can be used to study the discharge, flow patterns, and sediment transport of flowing water. The Flow rate sensor is equipped with impeller rod with 5-m cable.

**Range :** 0 .. 4.0 m/s

**Resolution** (12-bit): 0.005 m/s

**Can be used to:**

- Measure stream flow rates,
- Investigate sediment transport,
- Determine stream discharge values

ESD50031

**NOTE** All \* Marked sensors need a sensor cable (IEEE1394-BT) ESD50250, which has to be purchased separate.





### Heart-rate Sensor \*

The Heart-rate sensor 027i provides a simple way to study the heart's function. The sensor clip consists of a small infrared LED and an infrared light sensor. The sensor measures the light level transmitted through a tissue of the ear lobe that occur as the blood volume changes in the tissue.

**Range** : 0 .. 5 V, each heartbeat gives a peak.

**Can be used to :**

- Investigate the heart rate of different individuals.
- Measure of the heart rate before and after a vigorous activity.
- Determine the recovery rate of the heart after physical exercise.
- Measure the heart rate before and after drinking coffee or Coca-Cola.

ESD50032



### Oxygen Gas Sensor \*

The Oxygen Gas sensor BT59i measures the gaseous oxygen concentration. The wide measurement range allows it to be used in study of human and cellular respiration.

**Range** : 0 .. 100 %

**Resolution** (12-bit): 0.03 %

**Lifetime** : 5 years in open air

**Can be used to :**

- Monitor changes in oxygen concentration during photosynthesis and respiration of plants,
- Monitor respiration of animals, insects, or germinating seeds,
- Measure the oxygen levels during human respiration.

ESD50033



### Spirometer Sensor

The Spirometer BT82i measures air flow rate during human respiration. The sensor consists of a flow tube through which the air is inhaled and exhaled and a differential pressure sensor.

**Range** : -5 .. 5 L/s

**Resolution** (12-bit): 0.01 L/s

**Includes** : disposable bacterial filter and 10 disposable mouthpieces.

**Can be used to:**

- Record breathing patterns before, during and after exercise,
- Measure important lung capacities like Forced Expiratory Volume, Forced Vital Capacity and Tidal Volume.

ESD50035



### Temperature Sensor \*

This Temperature sensor BT01 is a low-cost, general-purpose temperature sensor that can be used to measure temperature in the range of -40°C to 140°C, in liquids (water, mild acidic solutions) and air. The sensing element of the sensor is an NTC thermistor, which is positioned in a stainless steel tube. The thermistor is a variable resistor whose resistance decreases non-linearly with increasing temperature.

**Range** : -20 °C .. 140 °C

**Accuracy** : 2°C at -40°C, 0.6 at 30°C, 1.8°C at 140°C

**Can be used to:**

- Monitor indoor and outdoor temperatures,
- Monitor freezing and boiling water,
- Investigate the temperature during endothermic and exothermic reactions,
- Investigate evaporation

ESD50036



### Relative Humidity Sensor

Relative Humidity Sensor The Relative Humidity sensor BT72i measures relative humidity. The sensor consists of an integrated circuit, which uses a capacitive polymer to sense humidity. The holes in the sensor box provide air circulation

**Range** : 0 to 100 %, Resolution (12-bit): 0.04 % RH

**Can be used to:**

- Study transpiration rates of plants,
- Optimize conditions in a greenhouse or terrarium,
- Determine good days for static electric demonstration.

ESD50034

**NOTE** All \* Marked sensors need a sensor cable (IEEE1394-BT) ESD50250, which has to be purchased separate.



**Light Sensor \***

The Light sensor 0142i measures light intensities in the range between 0 and 200 lux. It consists of a photo-transistor, which receives light through a glass fibre. Because of its range the sensor is suitable for measurements in normal indoor situations.

The sensor can also be used as a light gate.

**Range:** 0 .. 200 lx

**Resolution** (12-bit): 0.05 lx

**Can be used to:**

- Verify inverse square law,
- Monitor changes in light caused by a chemical reaction,
- Investigate light reflection and absorption,
- Investigate light interference patterns.

ESD50037

**pH Sensor**

The pH sensor BT61i is a general-purpose pH measurement system that allows measuring the degree of acidity/pH value. The sensor consists of a pH amplifier and pH electrode.

The pH Electrode is not delivered with the pH sensor and has to be purchased separately (Order Code 031).

**Range:** 0.. 14 pH

**Resolution** (12-bit): 0.005 pH

**Can be used to :**

- Measure pH values of different acids and bases,
- Monitor pH in acid-base titration experiments,
- Monitor pH during chemical reactions,
- Investigate of water quality in streams and lakes

ESD50038

**Thermocouple \***

The Thermocouple sensor 0135i measures temperatures in two ranges, which can be selected using the switch. The sensor uses a thermocouple type K, which consists of Chromega and Alomega wires that are welded together to form a measuring junction.

**Range:** -200.. 1300 °C, -20 .. 110 °C

**Resolution** (12-bit): 0.39 °C, 0.035 °C

**Can be used to :**

- Measure the temperature inside a Bunsen burner flame or candles,
- Determine the melting point of copper, bismuth, or other solids,
- Measure temperature in specific heat experiments.

ESD50039

**Turbidity sensor**

The Turbidity sensor BT88i measures the turbidity of water samples in the range between 0 ... 200 NTU.

**Range:** 0 .. 200 NTU

**Resolution** (12-bit): 0.2 NTU

**Includes:** one empty cuvette and one cuvette containing 100 NTU Stable CAI Formazin Standard, which is used to calibrate the sensor.

**Can be used to :**

- Measure turbidity of a water sample from various locations,
- Determine the rate of settling of a sample,
- Measure the formation of a precipitate.

ESD50040

**Pressure Sensor**

The Pressure sensor BT66i is designed to measure absolute gas pressure. The pressure is measured via a pressure valve, which is located on the side of the box. The sensor has two measurement ranges, which can be selected using a switch.

**Range:** 0 .. 700 kPa, 0 .. 130 kPa

**Resolution** (12-bit): 0.2 kPa, 0.04 kPa

**Includes:** a plastic 20-ml syringe with Lure-lock, two plastic tubes (5 cm and 45 cm long), a three-way valve with Lure-lock connectors, two Lure-lock connectors.

**Can be used to :**

- Measure pressure changes in gas-law experiments, Boyle's and Gay-Lussac's laws,
- Measure vapour pressure of liquids,
- Measure air pressure for weather studies.

ESD50041

**NOTE** All \* Marked sensors need a sensor cable (IEEE1394-BT) ESD50250, which has to be purchased separate.







**Basic Biology Sensors Bundle Kit**

- CO2 Gas Sensor (Low) BT24i
- ECG Sensor BT36i
- Heart-rate Sensor 027i
- Light Sensor BT50i
- PH Sensor BT61i and Electrode 031
- Temperature Sensor BT01
- Thermocouple 0135i
- Relative Humidity Sensor BT72i
- 4 Sensor Cables BTsc\_4

ESD50042



**Biology Sensor Bundle Extension Kit**

- CO2 Gas sensor (High) BT25i
- Dissolved Oxygen sensor BT34i
- Oxygen Gas sensor BT59i
- Pressure sensor BT66i
- Spirometer BT82i
- Turbidity sensor BT88i

ESD50043



**WiLab Wireless Sensor Connector**

The WiLab is an easy-to-use data-logger for STEM Education that can be used for measurement and control. WiLab offers two types of connectivity:

wired via USB cable for computers (Windows and Mac), and Android tablets (via OTG cable), wireless via Bluetooth®1 for tablets (iPad, Android) and Chromebooks.

The following items are included with WiLab:

USB cable for connecting WiLab to a USB port or to the USB power adapter.

USB Power Adapter for powering WiLab and charging its battery.

User's Guide.

ESD50159

**Xlogger System Introduction :**

Xlogger is an innovative new data logging system using direct USB sensors & Excel\* for data capture and analysis. Our sensors plug straight into USB ports on any Windows computer. No dedicated software program just Microsoft Excel\*

Data is logged directly into Excel\* and graphed automatically

Simple toolbar commands control everything

Completely intuitive - start logging straight away

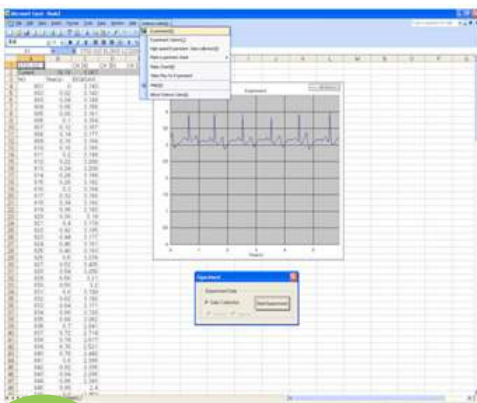
Students work in the familiar Excel\* environment

All the power of Excel\* for analysing data is immediately available

All the standard sensors with new ones being developed

Simply plug them in and start logging (no calibration needed)

Robust construction and encapsulated leads



**ES Data-Logging Software**

Xlogger is an innovative new data logging system using direct USB sensors & Excel\* for data capture and analysis. Our sensors plug straight into USB ports on any Windows computer. No dedicated software program just Microsoft Excel\*

Data is logged directly into Excel\* and graphed automatically  
 Simple toolbar commands control everything  
 Completely intuitive - start logging straight away  
 Students work in the familiar Excel\* environment  
 All the power of Excel\* for analysing data is immediately available  
 All the standard sensors with new ones being developed  
 Simply plug them in and start logging (no calibration needed)  
 Robust construction and encapsulated leads



ESD50014





**USB Temperature Sensor**  
Xlogger Stainless Steel Temperature Sensor.  
**Range** : -25°C to 125°C  
**Resolution** : ±0.1°C

ESD50185



**USB Oxygen Sensor**  
Xlogger Oxygen Sensor.  
**Range** : 0 - 100% Oxygen

ESD50184



**USB Barometer Sensor**  
Xlogger Barometer.  
**Range** : 0 to +2068 hPa (mbar)  
**Resolution** : 0.6 hPa

ESD50188



**USB Relative Humidity Sensor.**  
Xlogger Relative Humidity Sensor.  
**Range** : 0 to 100%  
**Resolution** : ±0.4%  
**Accuracy** : ±2% at 25°C

ESD50187



**USB Light Sensor**  
Xlogger Light Sensor.  
**Range** : 0 - 15,000 Lux

ESD50186



**PH electrode**  
The pH electrode 031 is a gel-filled Ag-AgCl combination-electrode in a plastic tube. It has a coax cable, with a BNC connector. It is supplied in a bottle filled with a protective solution. The electrode cannot be refilled.

ESD50242



**USB Turbidity Sensor**  
Xlogger Turbidity Sensor.  
**Range** : 0-200 NTU  
**Accuracy** : ±2NTU under 25NTU, ±5% over 25NTU

ESD50189





**Disposable Bacterial Filter**

Disposable bacterial filter for Spirometer BT82i.

ESD50243



**Disposable Mouthpiece**

Package of 100 disposable mouthpieces for Spirometer BT82i.

ESD50244



**Electrode Patches**

Package of 100 electrode patches for ECG sensors 0628i, BT36i and ML84m.

ESD50245



**Adapter 4mm – BT**

For connecting sensors with 4-mm plugs to interfaces with BT inputs such as CMES,

ESD50248



**BT-BT Extension Cable (Analogue)**

A 5-m long cable for extending the length of analogue BT sensor cables.

ESD50247



**CO2 to O2 Tee**

The CO2-O2 Tee allows connecting a CO2 Gas Sensor and O2 Gas Sensor to be used at the same time.

ESD50246



**Disposable Bacterial Filter**

(Pkg of 1)

For BT82i Spirometer

ESD50252



**Disposable Mouthpiece**

(Pkg of 100)

For BT82i Spirometer

ESD50253



**Data Logger Stand**

Plastic stand for the CMES data-logger.

ESD50249



**Photosynthesis set incl.**

Chamber and LED lamp

ESD50254



**Replacement Membrane Cap**

for BT34i DO sensor

ESD50251



**BT - IEEE1394 Cable**

The BT – IEEE1394 sensor cable (1.5 m length) is used for BT sensors, which are equipped with the IEEE1394 socket.

These sensor cables are sold per piece (BTsc\_1) and in packages of four (BTsc\_4).

ESD50250

**4 X BT-IEEE1394 Sensor Cable**

set of 4 nos bt ieee1394 sensors cable

ESD50255





**Butter Fly Net**  
Butter fly net with metal handle  
ESB50351



**Insect Net**  
Insect net with metal handle  
ESB50352



**Insects Set Jumbo**  
Set of different insect made of plastic, large size  
ESB50354



**Bug Bot**  
Plastic viewers with 2X lenses and grid printed on the base. Diameter: 50mm.  
ESB50353



**Magnifier 2 Way**  
These ideal first microscopes consist of a slide tray, a vertical microscope which allows the pupils to study specimens from above, and a horizontal viewer which allows the study of specimens from below. The vertical section, when in place, forms a sealed unit which prevents any live insects from escaping, but can also be lifted off and used as a magnifying glass.  
ESB50461



**Soil Test Apparatus**  
Use to measure soil pH.  
**Consist of :**  
Test Tube  $\varnothing$  16 x 150 mm 4 pcs  
Test Tube  $\varnothing$  13 x 100 mm 6 pcs  
Dropping Pipette 15 cm, Red Bulb 2 pcs  
Barium Sulphate (100 g/bottle) 1 pc  
Aquadest (200 ml/bottle) 1 pc  
Spoon, Stainless Steel 1 pc  
Universal Indicator (10 booklet/pack) 1 pc  
Test Tube Brush  $\varnothing$  24 mm 1 pc  
Manual Book Soil Test Apparatus 1 pc  
Wooden Box 1 pc  
**Dimension :**  
(L) 20.00 x (W) 19.00 x (H) 19.00 cm  
**Weight :** 1.330 kg

ESB50356



**Trundle Wheel**  
Clicker can be set to 3 positions (off, every 100mm or every metre). Moulded in strong plastic with a hard wearing tyre for use indoors or outside.  
ESB50355



**Sieves SET**  
15cm dia. 5 mesh, 10 mesh, 40 mesh, 60 mesh, 120 mesh, 250 mesh with cover & bottom plate.  
ESB50357



**Hydrometer**

HYDROMETER measuring range : 1.0001.200-

HYDROMETER measuring range : 1.2001.400-

ESB50358

ESB50359

**Crystallizer Cold Chamber**

EduSciences convenient portable Crystallizer Cold Chambers provide an inexpensive alternative to the traditional chill table. Feature removable 60 mm x 15 mm clear polystyrene specimen dishes ideal for handling live insects such as *Drosophila* and mosquitoes. Insects are immobilized for study by subjecting them to cold temperatures. Product includes two 9 cm diameter polypropylene Crystallizers, which are placed in a freezer for one to two hours until they reach a temperature of  $-18^{\circ}\text{C}$  ( $0^{\circ}\text{F}$ ). The polystyrene specimen dish is placed on the chilled metal surface of the Crystallizer to protect insects as they remain chilled for examination. Each Crystallizer will require re-chilling after approximately one hour. Two Crystallizers are provided so that one may be chilled while the other is being used. Prior to first use, freeze Crystallizers overnight. Specimen Chambers Pack of 10 Grades 9-14

ESB50360

**Cells I**

The focus of this kit is to learn about cell structures and organelles and correlate cell structure with function. Students view living and dead cells, prokaryotic and eukaryotic cells, live plant and animal cells, and live micro-organisms from pond water. Students gaining experience making wet mounts and stain cells using iodine and methylene blue. Includes cell theory, mitosis and cytokinesis. Designed to share reagents in groups of four. Requires microscopes, goggles, gloves, pond water, potato, and onion. Grade 7-10. Box dimensions B-Box 12 x 11 x 4-1/2 inches, Grades 7-10.

ESB50462

**Cells II**

(Lab Supports Photosynthesis and Respiration, Energy Storage and Transport)

Students model cellular osmosis and diffusion in the lab and study the different methods of cellular transport; passive transport, active transport, facilitated diffusion, pinocytosis and phagocytosis. Students learn how plant and animal cells obtain and store chemical energy. They learn how energy is released during cellular respiration and stored as ATP. They compare the energy content of carbohydrates, lipids, and proteins using calorimetry. They compare the processes of anaerobic and aerobic respiration and the organisms in which each occurs. Students study the process of photosynthesis and separate simulated plant pigments using paper chromatography.

Requires thermometers, beaker, test tubes, test tube support, goggles, scissors, coloured pencils, matches, and food samples for calorimetry. Grades 7-10..

ESB50463





### Chart - General Zoology-I Set

Set of 8 charts covering different topics General Zoology - each Size 50x70cm

Includes : Typical Animal Cell \* Animal Mitosis \* Hydra \* Paramecium\* Amoeba Proteus \* Hookworm \* Tapeworm \* Earthworm.

ESB50375

### Chart - General Zoology-II Set

Set of 8 charts covering different topics General Zoology - each Size 50x70cm

Includes : Euglena \* Animal Kingdom \* L.H. Of Frog (Metamorphosis)\* L.H. of Mosquito \* Epithelial & Connective Tissue \* Simple & Complex Tissue \* Rabbit Dissection & Skeleton

ESB50376

### Chart - General Zoology-III Set

Set of 8 charts covering different topics General Zoology - each Size 50x70cm

Includes : Frog Anatomy and Skeleton\* Frog Digestive \* Frog Circulatory \* Frog Respiratory System\* Frog Nervous System\* Frog Reproductive System (Male)\* Frog Reproductive System (Female)\* Frog Heart

ESB50377

### Chart - General Zoology-IV Set

Set of 8 charts covering different topics General Zoology - each Size 50x70cm

Includes : Rat Excretory System\* Rat Digestive System\* Rat Circulatory System\* Rat Reproductive System (F)\* Rat Reproductive System (M)\* Rat Anatomy, Dissection showing internal organs (F)\* Rat Brain and Heart

ESB50378





**The Fish Factory**

The purpose of this exercise is to stress the relationship between structure and function and to study the adaptability of fish to their environments. The activities teach about classification systems, anatomy, habitats, and behaviour. Students create a new fish and assign their creation a genus and species name. Then they coordinate its habitat, survival techniques, behaviour, and feeding patterns. At the end of their project, students defend the characteristics they have selected for their new fish species in a five minute presentation. Designed for 24 students working in groups of two. Grades 5-9

ESB50464



**Resources Of The Living Ocean**

The activities in this kit examine the uniqueness and importance of fish and elodea algae; two of the main living resources of the ocean. Students study the relationship of form and function in fish as they examine fin shapes and sizes, body shapes, mouth size and shape, colour and camouflage. Students predict habitats and behaviours by observing structures on fresh fish and may use a dichotomous key to identify the fish by genus species. They will study oxygen production through photosynthesis in elodea. Required, but not included: microscopes, fresh whole fish, elodea, lamps or sockets with bulbs, ice and a cooler, and glassware. Designed for 24 students working in six groups of four. Grades 9-12

ESB50465



**American Beaver Skull**

Highly detailed, anatomically correct plastic replica of an American Beaver skull. This robust, high-quality replica is perfect for classroom studies at any level.

The American beaver is the largest rodent found in North America. These aquatic herbivores make large dams of wood and mud to flood and create habitat. Using their large incisors, beavers can chew through the biggest trees. It is for this reason that the American beaver has become a nuisance in some areas where they are overpopulated.

ESB50466



**Animal Adaptation Skull Kit - Birds**

Highly detailed, anatomically correct plastic replicas of a selection of birds. This robust, high-quality replica is perfect for classroom studies at any level. This kit examines some unique beak adaptations used for feeding and communication. Kit includes: Curriculum and teaching guide, Toucan, Ibis, Great-horned owl, and Spoonbill skull replicas.

ESB50467





**American Black Bear Skull**

Highly detailed, anatomically correct plastic replica of an American Black Bear skull. This robust, high-quality replica is perfect for classroom studies at any level. The American black bear is found in disjointed populations from Alaska to Mexico. Black bears are omnivorous feeding on plants, berries, insects, small vertebrates and carrion. Black bears grow to reach six feet tall and can weigh over 300 pounds. The American black bear is a skilful climber and can run up to 25 miles per hour. Also available, black bear articulated fore paw. This specimen is perfect for comparative anatomy with a human hand.

ESB50468



**Badger Skull Model**

A life size plastic cast of a carefully selected adult Badger (Meles Meles) skull. The mandible is articulated and the dentition is complete, clearly showing the characteristics of a typical carnivore. The skull has the excellent surface detail typical of ES skulls, is robust enough for students to handle and easily cleaned with soapy water.

ESB50470



**Animal Adaptation Skull Kit - Mammals**

Highly detailed, anatomy Mammals are a very diverse order of animals. They inhabit nearly every corner of the Earth. This kit focuses on a few of the extreme adaptations mammals have made to occupy their many niches. Kit includes: Curriculum and teaching guide, Owl monkey, Giant anteater, and Sea otter skull replicas.

ESB50469



**Cat Skull, Model Plastic**

A life size plastic cast of a carefully selected adult cat skull. The mandible is removable and the dentition is complete, showing the characteristics of a typical carnivore. This robust cast shows excellent detail and is ideal for handling by students. It is easily cleaned with soapy water.

ESB50472

**Bird Of Prey Skull Kit**

Highly detailed, anatomically correct plastic replicas of a selection of birds of prey. This robust, high-quality set is perfect for teaching about birds of prey (raptors) and their unique predatory adaptations and lifestyle. Kit includes: Curriculum and teaching guide, Red-tailed hawk, Great-horned owl - P Eregreine falcon, and Bald eagle skull replicas.

ESB50471







**Chimpanzee Skull Model, Plastic**

A life size plastic cast of a carefully selected adult female Chimpanzee. The mandible is removable and the dentition is complete. The skull is robust enough for students to handle and is easily cleaned with soapy water.

Size 13x13x21cm.

ESB50473



**Comparative Skull Set**

Highly detailed, anatomically correct plastic replicas of a selection of animals. This robust, high-quality skull set gives the student the opportunity to compare the skulls and dentition of two carnivores, two herbivores and one omnivore, as well as a bird and a reptile.

Set Contains: Turtle, Fox, Turkey, Rabbit, Bobcat, Skunk and Porcupine.

ESB50474



**Dietary Skull Set**

Highly detailed, anatomically correct plastic replicas of a selection of mammals. This robust, high-quality skull set is perfect for classroom studies at any level. These mammal skulls demonstrate their dietary differences - illustrated by each animals dentition. The coyote and mink show the typical slicing carnivore teeth, while the beaver and muskrat show the grinding crushing molars consistent with herbivorous diets. The raccoon and skunk, both being omnivorous, possess both sharp, slicing canines and broad flat molars.

Set Contains: Coyote, Beaver, Raccoon, Mink, Muskrat and Skunk.

ESB50475



**Domestic Pig Skull Model**

Highly detailed, anatomically correct plastic replica of a Domestic Pig skull. This robust, high-quality replica is perfect for classroom studies at any level.

The domestic hog, also known as swine, wild boar or feral hog, descended from introductions of Eurasian wild hogs. Pigs are believed to have been domesticated in Asia between 7000 and 10,000 years ago. Today, the domestic hog is farmed world wide as a food source. Feral, or wild, hog populations exist in the US from escaped domestic swine and introduced specimens for sport hunting.

ESB50477



**Dog Skull Model , Plastic**

A life size plastic cast of a carefully selected medium size adult dog skull. The mandible is removable and the dentition is complete, clearly showing the characteristics of a typical carnivore. The skull has the excellent surface detail typical of ES skulls, is robust enough for students to handle and easily cleaned with soapy water.

ESB50476





### Gorilla Skull, Plastic

A life size plastic cast of a carefully selected adult male Gorilla, the largest of the primates. The mandible is removable and the dentition is complete. The skull is robust enough for students to handle and is easily cleaned with soap and water.

**Size** 18x20x40cm.

ESB50478



### Hare Skull

Highly detailed, anatomically correct plastic replica of a Hare skull. This robust, high-quality replica is perfect for classroom studies at any level. The Hare, also called the Jack-rabbit in the United States, is found throughout most of the world. They are born precocial, meaning they are born with hair and are independent shortly after birth. Hares and Jack-rabbits are probably best known for their large ears and powerful hind jumping legs.

ESB50479



### Hedgehog Skull

Highly detailed, anatomically correct plastic replica of a Hedgehog skull. This robust, high-quality replica is perfect for classroom studies at any level.

Hedgehogs are covered with sharp quills that aid in their protection. Many species of hedgehogs can roll into a ball, hiding all vulnerable areas of the body under the protective spines. Hedgehogs live under logs or in burrows that they dig. They eat a wide variety of foods, including invertebrates, reptiles, carrion, roots, and fruits. Hedgehogs are active only at night, and some species hibernate in the winter.

ESB50480



### Mountain Goat Skull

Highly detailed, anatomically correct plastic replica of a Mountain Goat skull. This robust, high-quality replica is perfect for classroom studies at any level.

The mountain goat is found in North America from southern Alaska, throughout much of British Columbia and into north-western United States. This agile species inhabits mountainous rocky cliffs and hillsides generally above the tree line. The mountain goat is an herbivorous browser feeding on shrubs, grasses, berries and lichens. Horns are found in both male and females of this species.

ESB50481



### Mouse Skull

Highly detailed, anatomically correct plastic replica of a House Mouse skull. This robust, high-quality replica is perfect for classroom studies at any level.

The term «mouse» can refer to any number of small rodents within the Muridae family. The House mouse *Mus musculus*, is often associated with human populations and can be found on every continent. Mice, like all rodents, have ever growing incisors, and therefore, need to chew on wood or other materials to wear them down. This, along with their appreciation for human food and crops, and the propensity to spread disease, causes the mouse to be one of humanity's worst pests..





**Orangutan Skull, Plastic**

A life size plastic cast of a carefully selected adult male Orang Utan. The mandible is removable and the dentition is complete. The skull is robust enough for students to handle and is easily cleaned with soap and water.  
**Size** 16x16x18cm.

ESB50483



**Predator & Prey Skull Set**

Highly detailed, anatomically correct plastic replicas of a selection of predator and prey skulls. This robust, high-quality replica skull set is perfect for classroom studies at any level. Offers two of the most common and abundant predators found in North America and three of the most common prey. The Coyote & Bobcat also fill similar prey niches on the North American food chain. Nicely demonstrates the natural order of things in the predator/prey world and shows anatomical features that make a predator successful. Set Contains: Coyote, Bobcat, Rabbit, Squirrel & Turkey.

ESB50484



**Rabbit Skull, Plastic**

A life size plastic cast of a carefully selected adult rabbit skull. The mandible is removable and the dentition is complete. This robust cast shows excellent detail and is ideal for handling by students. It is easily cleaned with soapy water..

ESB50485



**Sheep Skull Model, Plastic**

A life size plastic cast of a carefully selected adult sheep skull. The mandible is removable and the dentition is complete, clearly showing the characteristics of a typical herbivore. The skull has the excellent surface detail typical of ES skulls, is robust enough for students to handle and easily cleaned with soapy water.

ESB50488



**Rainforest Skull Kit**

Highly detailed, anatomically correct plastic replica of a selection of Rainforest animal skulls. This robust, high-quality replica skull set is perfect for classroom studies at any level. The tropical rainforest is home to the most biodiversity on the planet. This unique habitat has many wonderful species that have adapted to living in this lush environment. Kit includes: Curriculum and teaching guide, Spider monkey, Sloth, Toucan, and Ocelot skull replicas.

ESB50486





**Red Fox Skull Model**

Highly detailed, anatomically correct plastic replica of a Red Fox skull. This robust, high-quality replica is perfect for classroom studies at any level.

The red fox is native to North America, Europe and most of Asia and has been introduced to Australia and Africa. Although a member of the order Carnivora, the red fox is essentially an omnivore. It mostly eats rodents, lagomorphs, insects, fruit and occasionally carrion. Red foxes have a characteristic manner of hunting mice. The fox stands motionless, listening and watching intently for a mouse it has detected. It then leaps high and brings the forelimbs straight down forcibly to pin the mouse to the ground.

ESB50487



**Small Clawed Otter Skull**

Highly detailed, anatomically correct plastic replica of a Small-clawed Otter skull. This robust, high-quality replica is perfect for classroom studies at any level.

The small-clawed otter is native to south-eastern Asia. This species, as its name suggests, has greatly reduced claws, a characteristic shared by all three species within the Aonyx genera. The small-clawed otter is carnivorous feeding on crustaceans, molluscs and small amphibians. This intelligent species has been trained and employed by Malaysian fishermen to catch and deliver fish.

ESB50489



**Transparent Canine Jaw, Life-Size**

A life-size model of a canine jaw from a medium to large dog. This upper and lower jaw is modelled in transparent material to facilitate the illustration of the individual tooth roots in the canine jaw. The teeth are individually moulded and anatomically correct. Model is supplied as an upper and lower jaw complete with articulator.

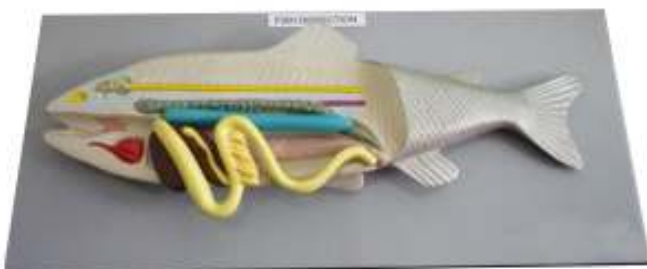
ESB50490



**Star Fish Model**

The model features a detailed study of star fish. Three arms and the central disc of the star-fish are greatly enlarged. Asterias are dissected to show ventral and dorsal surfaces, digestive and water vascular systems, gonads, nerve ring and radial nerves, and the skeleton. A fourth arm is cross-sectioned to show the coelom and tube feet. The surface illustrates the podia and pedicel-lariae. The model can be removed from its stand for closer examination. With numbered Key Card.

ESB50460



**Fish Model**

Lateral view of a general dissection of a typical bony fish. The features shown include digestive tract, gills, fins, gonads and swim bladder. Some detail of the nervous, circulatory and skeletal systems also shown. Carefully painted and mounted on a plastic

**Base Size** 37.5x17cm.

ESB50491





**Rat Dissection Model**

This 6-part life-size model is an important tool to study zoology, providing a realistic reproduction the anatomy of the rat. The ventral dissection exposes heart and lungs, liver, intestine, male and female genital systems. The internal organs are removable for closer examination

**Size** :23\*18\*5.5cm

**Net weight** : 430g

ESB50492

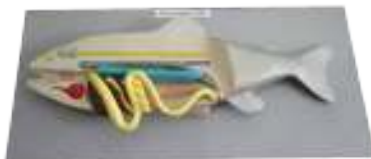


**Rat Model General Dissection**

An ideal introduction to mammalian anatomy, which can be used in the classroom in place of some dissections. Clearly coloured, the model is male, life size and mounted on a plastic base. The heart and lungs, liver and stomach, and intestines are removable to show other internal organs. A key card with 5 detailed diagrams is supplied.

**Base size** 30x15cm.

ESB50494



**Rat Model / Fish Model / Paramecium Model**

Set Of 3

A set of three models: Rat Model / Fish Model / Paramecium Model

**Rat Model** : An ideal introduction to mammalian anatomy, which can be used in the classroom in place of some dissections. Clearly coloured, the model is male, life size and mounted on a plastic base. The heart and lungs, liver and stomach, and intestines are removable to show other internal organs. A key card with 5 detailed diagrams is supplied.

**Base size** 30x15cm.

**Fish Model** : Lateral view of a general dissection of a typical bony fish. The features shown include digestive tract, gills, fins, gonads and swim bladder. Some detail of the nervous, circulatory and skeletal systems also shown. Carefully painted and mounted on a plastic base

**Size** 37.5x17cm.

**Paramecium Model** : A detailed model showing internal and external features of Paramecium, including mega nucleus, micronucleus, oral groove, buccal cavity, food vacuoles, contractile vacuoles, trichocysts and locomotory cilia. Mounted on base and supplied with key card.

**Size** 25x12cm.

ESB50493



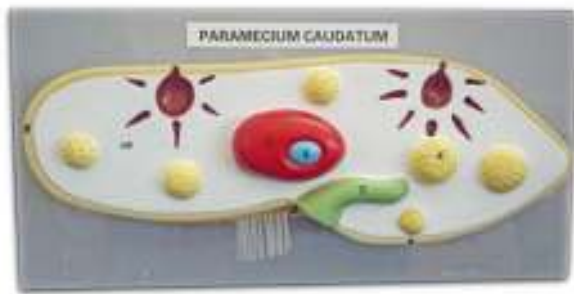
**Bird Dissection Domestic Hen Model**

Natural size, right side shows the feathers and other side shows all the internal organs. Mounted on base.

Supplied with English Key Card.

ESB50495





### Paramecium Model

A detailed model showing internal and external features of Paramecium, including mega nucleus, micro nucleus, oral groove, buccal cavity, food vacuoles, contractile vacuoles, trichocysts and locomotory cilia. Mounted on base and supplied with key card.

**Size** 25x12cm.

ESB50496



### Paramecium Model

Paramecium Model (3D-Dimension) : The model shows the internal & the external features of Paramecium including mega nucleus, micro nucleus, oral groove, buccal cavity, food vacuoles, contractive vacuoles, trichocysts and cilia. Mounted on a base.

Catalogue or Shrink wrap key card of the numbered structures all labelled in English

**Size** 26x39.5x16 cm

ESB50497



### Model Of Amoeba

Enlarged 1000 times, 2 part amoeba model. Operable small pseudo podium for display of internal structures as magnified by electron microscope. Mounted on base. Numbered with key card for identification of features.

ESB50498



### Animal Cell Model

The two piece animal cell model shows the form and structure of a typical animal cell as viewed by an electron microscope. All important organelles are shown in raised relief and displayed in colour. Features included are:

Nucleus

Mitochondrion

Smooth Endoplasmic Reticulum (ER)

Rough Endoplasmic Reticulum (ER)

Basal membrane

Collagen fibres

Golgi apparatus

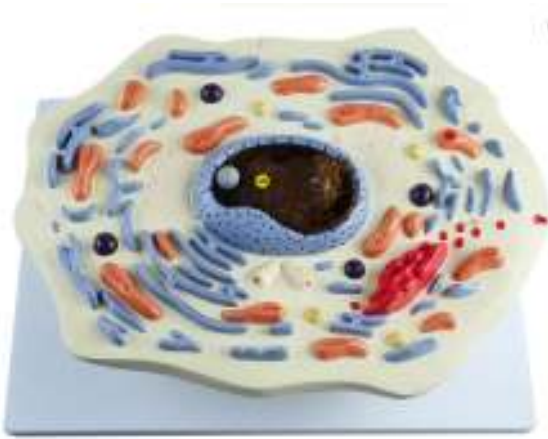
Microvilli

Lysosome

**Size** 21x11x31 cm

ESB50499





**Animal Cell Model, 20000 Times Enlarged**

Animal cell Model has been magnified 2000 times, mounted on board

**Size :** 33\*47\*17cm

**Net weight :** 3000g

ESB50500



**Frog Model**

This 3X life size model provides a highly accurate illustration of the morphology of a frog.

The ventral part is open for a closer study of the inner anatomy.

**Removable components include the following:**

- Heart and lungs
- liver
- Stomach
- Intestine.

On the accompanying multilingual k-card more than 15 structures are identified

**Size :** 17\*22\* 39cm

**Net weight :** 1500g

ESB50501



**Frog Dissection**

Model showing dissectable structure of frog. Mounted on board .Numbered with English Key card.

ESB50502



**Frog Embryology Set**

Five models showing near median sections through the egg during development from early gastrula to neurula. Features shown include dorsal lip, blastophore, blastocoel, rudimentary gut and CNS.

The models are 10cm high on the pedestal.

ESB50503

**Simulated Frog Dissection Kit**

- Authentically detailed frog body
- Removable texture organs
- Cross sections show muscle structure

ESB50622





**Life Cycle Of House Fly**  
Specimen of house fly life cycle stages

ESB50504



**Life Cycle Of Mosquito**  
Specimen of mosquito life cycle stages

ESB50505



**Life Cycle Of Silk Worm**  
Specimen of silk worm life cycle stages

ESB50506



**Life Cycle Of Frog- PE**

The butterfly life cycle epoxy resin block is the perfect tool for teaching pupils about the life cycle of the butterfly. From egg to caterpillar and then to chrysalis and finally to an adult butterfly, see all of the details up close.  
The block is made of epoxy resin so it will not break even if it is accidentally dropped.

ESB50507

**Life Cycle Of Cabbage Butterfly - PE**

The butterfly life cycle epoxy resin block is the perfect tool for teaching pupils about the life cycle of the butterfly. From egg to caterpillar and then to chrysalis and finally to an adult butterfly, see all of the details up close.  
The block is made of epoxy resin so it will not break even if it is accidentally dropped.

ESB50508



**Life Cycle Of Butterfly I - PE**

The butterfly life cycle epoxy resin block is the perfect tool for teaching pupils about the life cycle of the butterfly. From egg to caterpillar and then to chrysalis and finally to an adult butterfly, see all of the details up close.  
The block is made of epoxy resin so it will not break even if it is accidentally dropped.

ESB50509

**Life Cycle Of Butterfly II - PE**

The butterfly life cycle epoxy resin block is the perfect tool for teaching pupils about the life cycle of the butterfly. From egg to caterpillar and then to chrysalis and finally to an adult butterfly, see all of the details up close.  
The block is made of epoxy resin so it will not break even if it is accidentally dropped.

ESB50510



**Life Cycle Of Grasshopper - PE**

See the full life cycle of a Grasshopper in this 9 stage development specimen. The real life grasshoppers are encased in break proof epoxy resin.

ESB50511







**Life Cycle Of Honey Bee - PE**

Shows the full life cycle of a Honey Bee, from the egg right through to the full sized bee, including honey, pollen and beeswax. Each stage is clearly displayed and encased in break proof epoxy resin.

ESB50512

**Life Cycle Of Silkworm - PE**

Shows the full life cycle of silkworm, from the egg right through to the full sized silkworm. Each stage is clearly displayed and encased in break proof epoxy resin.

ESB50513



**Life Cycle Of Dagn fly - PE**

Shows the full life cycle of a Dragonfly, from the egg right through to the full sized Dragonfly. Each stage is clearly displayed and encased in break proof epoxy resin.

ESB50514

**Life Cycle Of Cicada - PE**

Shows the full life cycle of a Cicada, from the egg right through to the full sized Cicada .Each stage is clearly displayed and encased in break proof epoxy resin.

ESB50515



**Life Cycle Of Cockroach - PE**

Shows the full life cycle of a Cockroach, from the egg right through to the full sized Cockroach. Each stage is clearly displayed and encased in break proof epoxy resin.

ESB50516

**Life Cycle Of Housefly - PE**

Shows the full life cycle of a Housefly, from the egg right through to the full sized Housefly. Each stage is clearly displayed and encased in break proof epoxy resin.

ESB50517



**Life Cycle Of Damselfly - PE**

Shows the full life cycle of a Damselfly, from the egg right through to the full sized Damselfly. Each stage is clearly displayed and encased in break proof epoxy resin.

ESB50518





**Life Cycle Of Mantis, PE**

Shows the full life cycle of Mantis, from the egg right through to the full sized Mantis. Each stage is clearly displayed and encased in break proof epoxy resin.

ESB50519

**Life Cycle Of Scorpion - PE**

Shows the full life cycle of a Scorpion, from baby right through to the full sized Scorpion. Each stage is clearly displayed and encased in break proof epoxy resin.

ESB50520



**Life Cycle Of Chick Development - PE**

Shows the full life cycle of a Chick, from the egg right through to the full sized Check. Each stage is clearly displayed and encased in break proof epoxy resin.

ESB50521

**Life Cycle Of Insects Collection Set - PE**

Shows the full life cycle of 12 different insects , from the egg right through to the full sized Each stage is clearly displayed and encased in break proof epoxy resin. Includes : butterfly I, cabbage butterfly , grasshopper , silkworm , dragonfly , cockroach , housefly , mantis , honeybee, cicada , silkworm and mosquito.

ESB50522

**Animal Kingdom Set I - PE**

This real different type of animals has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. .Epoxy resin block will not break even if it is accidentally dropped. Set includes 12 pcs

ESB50523



**Animal Kingdom Set II - PE**

This real different type of animals has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. .Epoxy resin block will not break even if it is accidentally dropped. Set includes 20 pcs

ESB50524



**Animal Evolution Set - PE**

This real different type of animals has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. Epoxy resin block will not break even if it is accidentally dropped. Set includes 12 pcs

ESB50525



**Marine Animal Set -PE**

this real different type of Marine animals has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. Epoxy resin block will not break even if it is accidentally dropped. Set includes 8 pcs

ESB50526

**Beneficial Insects Set - PE**

This real 6 different type of Beneficial Insects has been embedded in one block block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. Epoxy resin block will not break even if it is accidentally dropped.

ESB50527



**Harmful Insects Set - PE**

This real 6 different type of Harmful insects has been embedded in one block block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. Epoxy resin block will not break even if it is accidentally dropped.

ESB50528

**Beneficial & Pest Specimen Set - PE**

This real different type of Beneficial Insects and pests has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. Epoxy resin block will not break even if it is accidentally dropped.

ESB50529



**Pest Sets - PE**

This real 10 different type of pests has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. Epoxy resin block will not break even if it is accidentally dropped.

ESB50530





**Insects Specimens Set I - PE**

This real 10 different type of insects has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. .Epoxy resin block will not break even if it is accidentally dropped.

ESB50531

**Insects Specimens Set II - PE**

This real 16 different type of insects has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. .Epoxy resin block will not break even if it is accidentally dropped.

ESB50532



**Insects Specimens Set III - PE**

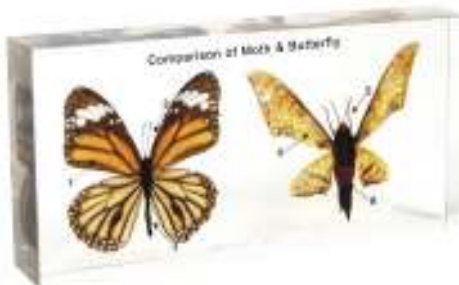
This real 27 different type of insects has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. .Epoxy resin block will not break even if it is accidentally dropped.

ESB50533

**Insects Specimens Set IV - PE**

This real 30 different type of insects has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. .Epoxy resin block will not break even if it is accidentally dropped.

ESB50534



**Comparison Of Moth and Butterfly - PE**

This real Moth and Butterfly has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. .Epoxy resin block will not break even if it is accidentally dropped.

ESB50535

**Arthropod Representatives - PE**

This real Arthropod Representatives has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. .Epoxy resin block will not break even if it is accidentally dropped.

ESB50536





**Annelid Representatives- PE**

This real Annelid Representatives has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. .Epoxy resin block will not break even if it is accidentally dropped.

ESB50537

**Types Of Insects Legs I - PE**

This real different type of insects legs has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. .Epoxy resin block will not break even if it is accidentally dropped.

ESB50538



**Types Of Insects Legs II- PE**

This real different type of insects legs has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. .Epoxy resin block will not break even if it is accidentally dropped.

ESB50539

**Types Of Insects Wings - PE**

This real different type of insects wings has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. .Epoxy resin block will not break even if it is accidentally dropped.

ESB50540



**Types Of Insects Mouth Parts - PE**

This real different type of insects mouth parts has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. .Epoxy resin block will not break even if it is accidentally dropped.

ESB50541

**Types Of Insects Antennas - PE**

This real different type of insects antennas has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. .Epoxy resin block will not break even if it is accidentally dropped.

ESB50542





**Types Of Insects Pupae I- PE**

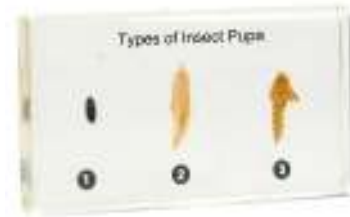
This real different type of Insects Pupae has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. .Epoxy resin block will not break even if it is accidentally dropped.

ESB50543

**Types Of Insects Pupae II- PE**

This real different type of Insects Pupae has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. .Epoxy resin block will not break even if it is accidentally dropped.

ESB50544



**Soldier Crab - PE**

This real Soldier Crab has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. .Epoxy resin block will not break even if it is accidentally dropped.

ESB50545

**Soldier Crab and Mutualist, Embedded - PE**

This real Soldier Crab and Mutualist has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. .Epoxy resin block will not break even if it is accidentally dropped.

ESB50546



**Roundworm - PE**

This real Roundworm has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. .Epoxy resin block will not break even if it is accidentally dropped.

ESB50547

**Toad - PE**

This real TOAD has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. .Epoxy resin block will not break even if it is accidentally dropped.

ESB50548





**Water Snake - PE**

This real Water snake has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. .Epoxy resin block will not break even if it is accidentally dropped.

ESB50549

**Comparative Brains - PE**

Of 5 Classes

This real different type of Brain has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. .Epoxy resin block will not break even if it is accidentally dropped.



ESB50550



**Comparative Hearts Of 5 Classes - PE**

This real different type of Hearts has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. .Epoxy resin block will not break even if it is accidentally dropped.

ESB50551

**Fish Dissection - PE**

This real dissected fish has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. .Epoxy resin block will not break even if it is accidentally dropped.

ESB50552



**Pigeon Dissection - PE**

This real dissected Pigeon has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. .Epoxy resin block will not break even if it is accidentally dropped.

ESB50553

**Frog Dissection - PE**

This real dissected frog has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. .Epoxy resin block will not break even if it is accidentally dropped.

ESB50554





**Lizard Dissection,- PE**

This real Dissected Lizard has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. .Epoxy resin block will not break even if it is accidentally dropped.

ESB50555

**Rabbit Dissection,- PE**

This real Dissected Rabbit has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. .Epoxy resin block will not break even if it is accidentally dropped.

ESB50556



**Rat Dissection - PE**

this real Dissected Rat has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. .Epoxy resin block will not break even if it is accidentally dropped.

ESB50557

**Marine Clam Dissection - PE**

This real Dissected Marine Clam has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. .Epoxy resin block will not break even if it is accidentally dropped.

ESB50558



**Squid Dissection - PE**

This real Dissected squid has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. .Epoxy resin block will not break even if it is accidentally dropped.

ESB50559

**Rabbit - PE**

This real Rabbit has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. .Epoxy resin block will not break even if it is accidentally dropped.

ESB50560







**Sea Anemone - PE**

This real Sea Anemone has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. .Epoxy resin block will not break even if it is accidentally dropped.

ESB50561

**Jellyfish - PE**

This real Jellyfish has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. .Epoxy resin block will not break even if it is accidentally dropped.

ESB50562



**Pork Tapeworm Parasite Cysticercus,- PE**

This real Pork tapeworm has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. .Epoxy resin block will not break even if it is accidentally dropped.

ESB50563

**Cuttlefish - PE**

This real Cuttlefish has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. .Epoxy resin block will not break even if it is accidentally dropped.

ESB50564



**Mimesis Of Stick Insect,- PE**

This real Mimesis of Stick Insect has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. .Epoxy resin block will not break even if it is accidentally dropped.

ESB50565

**Bat - PE**

This real bat has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. .Epoxy resin block will not break even if it is accidentally dropped.

ESB50566



**Freshwater Mussel - PE**

This real fresh water mussel has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. .Epoxy resin block will not break even if it is accidentally dropped.

ESB50567



**Neries - PE**

This real Neries has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. .Epoxy resin block will not break even if it is accidentally dropped.

ESB50568

**Coral - PE**

This real Coral Simulation has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. .Epoxy resin block will not break even if it is accidentally dropped.

ESB50569



**Centipede and Millipede - PE**

This real Centipede Millipede has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. .Epoxy resin block will not break even if it is accidentally dropped.

ESB50570

**Sea Urchin -PE**

This real sea Urchin has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. Epoxy resin block will not break even if it is accidentally dropped.

ESB50571



**Insect Collection - PE**

This real different type of Insect collection has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. .Epoxy resin block will not break even if it is accidentally dropped.

ESB50572

**Conformation Of Grasshopper - PE**

This real Grasshopper has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. .Epoxy resin block will not break even if it is accidentally dropped.

ESB50573



**Conformation Of Lobster PE**

This real Lobster has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. Epoxy resin block will not break even if it is accidentally dropped.

ESB50574

**Conformation Of Octopus - PE**

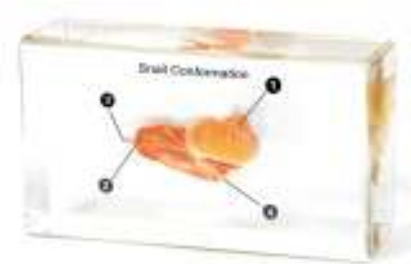
This real Octopus has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. Epoxy resin block will not break even if it is accidentally dropped.

ESB50575

**Snail Conformation - PE**

This real Snail has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. Epoxy resin block will not break even if it is accidentally dropped.

ESB50576

**Carp Conformation - PE**

This real Carp has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. Epoxy resin block will not break even if it is accidentally dropped.

ESB50577

**Squid Conformation - PE**

This real Squid has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. Epoxy resin block will not break even if it is accidentally dropped.

ESB50578

**Lizard Skeleton - PE**

This real Turtle skeleton has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. Epoxy resin block will not break even if it is accidentally dropped.

ESB50584



**Turtle Skeleton - PE**

This real Turtle skeleton has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. Epoxy resin block will not break even if it is accidentally dropped.

ESB50585

**Bat Skeleton - PE**

This real Bat skeleton has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. Key features have been labelled and identified on an information card. Epoxy resin block will not break even if it is accidentally dropped.



ESB50586

**Bird Skeleton - PE**

This real Bird skeleton has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. Key features have been labelled and identified on an information card. Epoxy resin block will not break even if it is accidentally dropped.

ESB50587

**Rat Skeleton - PE**

This real Rat skeleton has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. Key features have been labelled and identified on an information card. Epoxy resin block will not break even if it is accidentally dropped.



ESB50588

**Rabbit Skeleton - PE**

This real rabbit skeleton has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. Key features have been labelled and identified on an information card. Epoxy resin Block will not break even if it is accidentally dropped.

ESB50589

**Toad Skeleton - PE**

This real toad skeleton has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. Key features have been labelled and identified on an information card. Epoxy resin block will not break even if it is accidentally dropped. Due to nature of the product it may differ slightly from the image shown. Includes information cards.



ESB50590





**Fish (Crucian) Skeleton - PE**

This crucian skeleton has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. Key features have been labelled and identified on an information card. Epoxy resin block will not break even if it is accidentally dropped.

ESB50591

**Snake ( Non-Venomous) Skeleton,PE**

This real Snake Skeleton has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. Epoxy resin block will not break even if it is accidentally dropped.

ESB50592



**Pigeon Skeleton,PE**

This pigeon skeleton has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. Key features have been labelled and identified on an information card. Epoxy resin block will not break even if it is accidentally dropped.

ESB50593

**Skull,Cat**

This natural bone skeleton has been meticulously prepared and mounted in a natural position. Enclosed key card identifies various bone structures. The specimen is mounted on an attractive base that features a removable epoxy resin cover.

ESB50594



**Skull Comparison Of Rabbit, Pigeon, Turtle, Toad, Fish**

This natural bone skeleton has been meticulously prepared and mounted in a natural position. Enclosed key card identifies various bone structures. The specimen is mounted on an attractive base that features a removable epoxy resin cover.

ESB50595



**Skeleton,Chicken**

This natural bone skeleton has been meticulously prepared and mounted in a natural position. Enclosed key card identifies various bone structures. The specimen is mounted on an attractive wooden base that features a removable epoxy resin cover.

ESB50596



**Skeleton Of Lizard**

This natural bone skeleton has been meticulously prepared and mounted in a natural position. Enclosed key card identifies various bone structures. The specimen is mounted on an attractive wooden base that features a removable epoxy resin cover.

ESB50597



**Bat Skeleton**

This natural bone skeleton has been meticulously prepared and mounted in a natural position. Enclosed key card identifies various bone structures. The specimen is mounted on an attractive wooden base that features a removable epoxy resin cover.

ESB50598

**Skeleton Of Toad**

This natural bone skeleton has been meticulously prepared and mounted in a natural position. Enclosed key card identifies various bone structures. The specimen is mounted on an attractive wooden base that features a removable epoxy resin cover.

ESB50599



**Skeleton Of Pigeon**

This natural bone skeleton has been meticulously prepared and mounted in a natural position. Enclosed key card identifies various bone structures. The specimen is mounted on an attractive wooden base that features a removable epoxy resin cover.

ESB50600

**Skeleton Of Rabbit**

This natural bone skeleton has been meticulously prepared and mounted in a natural position. Enclosed key card identifies various bone structures. The specimen is mounted on an attractive wooden base that features a removable epoxy resin cover.

ESB50601



**Skeleton Of Snake**

This natural bone skeleton has been meticulously prepared and mounted in a natural position. Enclosed key card identifies various bone structures. The specimen is mounted on an attractive wooden base that features a removable epoxy resin cover.

ESB50602

**Skeleton Of Fish ( Crucian )**

This natural bone skeleton has been meticulously prepared and mounted in a natural position. Enclosed key card identifies various bone structures. The specimen is mounted on an attractive wooden base that features a removable epoxy resin cover.

ESB50603

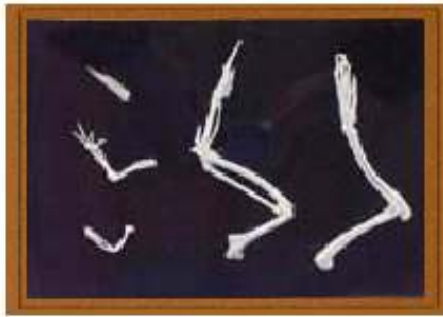




### Vertebra Comparison Of Rabbit, Pigeon, Turtle, Toad, Fish.

This natural bone skeleton has been meticulously prepared and mounted in a natural position. Enclosed key card identifies various bone structures. The specimen is mounted on an attractive wooden base that features a removable epoxy resin cover.

ESB50604



### Forelimb Comparison Of Rabbit, Pigeon, Turtle, Toad, Fish.

This natural bone skeleton has been meticulously prepared and mounted in a natural position. Enclosed key card identifies various bone structures. The specimen is mounted on an attractive wooden base that features a removable epoxy resin cover.

ESB50605



### Hind Leg Comparison Of Rabbit, Pigeon, Turtle, Toad, Fish.

This natural bone skeleton has been meticulously prepared and mounted in a natural position. Enclosed key card identifies various bone structures. The specimen is mounted on an attractive wooden base that features a removable epoxy resin cover.

ESB50606



### Rabbit Dissected In Formalin

This real rabbit specimen dissected and reserved in clear container filled with formalin, Key features have been labelled and identified on an information card.

ESB50612



### Snake Dissected In Formalin

This real snake specimen dissected and reserved in clear container filled with formalin, Key features have been labelled and identified on an information card.

ESB50613





**Frog Dissected In Formalin**

This real frog specimen dissected and reserved in clear container filled with formalin , Key features have been labelled and identified on an information card.

ESB50614



**Lizard Dissected In Formalin**

This real lizard specimen dissected and reserved in clear container filled with formalin , Key features have been labelled and identified on an information card.

ESB50615



**Pigeon Dissected In Formalin**

This real pigeon specimen dissected and reserved in clear container filled with formalin , Key features have been labelled and identified on an information card.

ESB50616



**Fish (Crucian) Dissected In Formalin**

This real crucian specimen dissected and reserved in clear container filled with formalin , Key features have been labelled and identified on an information card.

ESB50617



**Toad Dissected In Formalin**

This real toad specimen dissected and reserved in clear container filled with formalin , Key features have been labelled and identified on an information card.

ESB50618



**Grass-frog Developmental Stages Dissected In Formalin**

This real Grass frog Developments in clear container filled with formalin , Key features have been labelled and identified on an information card.

ESB50619





**Dissecting Tray**

Dissecting Tray

Material: Stainless Steel Complete with 10mm paraffin wax filler

**Size:** 280 x 190 x 50 mm

ESB50626

**Dissecting Pan With Pad And Cover**

The pads are reusable and there is no need to melt sticky wax

The cover closes up for the day, it is excellent for large specimens (starfish, bullfrogs)

**Size:** 31 x 22.5 cm

ESB50627

**Dissecting Scissor Fine Point 110 mm**

Stainless steel, open shanks. 110mm. EACH.

ESB50630

**Dissecting Scissor Blunt Ends 125 mm**

Stainless steel, closed shanks. Overall length: 125mm. EACH.

ESB50628

**Dissecting Scissor Blunt Ends 150 mm**

Stainless steel, open shanks. 130mm. EACH.

ESB50629

**Dissecting Kit**

Stainless steel instruments in leather case consist of the following:

preparation needle, 130 mm long, pointed end.

preparation needle 130 mm long pointed curved end.

scalpel handle 140 mm long.

scalpel handle stainless 130mm, slotted to accept blades.

Ten scalpel sharp blades suitable for scalpel handle 4 packed in quick peel off aluminium foil.

One dissecting stainless scissors, fine pointed ends, 110 mm long.

One dissecting stainless scissors, sharp/blunt ends, 113 mm long.

One forceps, pointed ends with plastic slip cover, 110mm long.

One forceps, blunt ends with plastic slip cover, 130 mm long.

Brush



ESB50631

**Dissecting set Basic**

Designed for elementary, junior, and senior high school students. Kit contains the following:

Semitransparent hinged case with snap cover and insert for the seven instruments.

Attractive and reusable.

6 in. chrome replacement blade scalpel

4-1/2 in. stainless steel dissecting scissors

4-1/2 in. chrome-plated forceps

Straight dissecting needle

Bent dissecting needle

Pipette

6 in. ruler

ESB50632





**Forceps Disposable , Plastic Pk/10**

Blunt-end forceps of glass-filled nylon, serrated at tips with finger-grips along the shaft. Ideally suited to microbiology work where they may be destroyed after use. Length: 125mm (Colour may vary). Pack of 10.

ESB50634



**Forceps Pointed Ends**

Stainless steel. Pointed tip Forceps,

130mm length. EACH

ESB50635

100mm length. EACH

ESB50636

130mm length. EACH

ESB50637



**Insert Needle Wooden Handle Pk/10**

Needle length: 33mm. Mounted in 100mm hardwood handle. Pack of 10.

ESB50638



**Insert Needle St. Steel Handle**

Straight, stainless steel throughout. Needle length: 34mm. Handle length: 95mm. EACH.

ESB50639



**Scalpel Handle No 3**

Strong nickel-alloy handle, handle No. 3. Length: 95 mm. EACH.

ESB50641

**Scalpel Handle No 4**

Strong nickel-alloy handle, handle No. 4. Length: 100 mm. EACH.

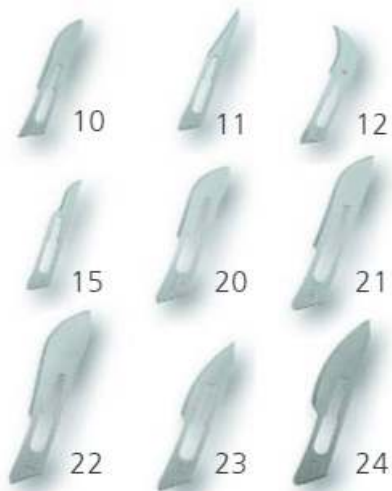
ESB50642



**Scalpel 130 mm**

St. Steel length 130 mm handle with blade.

ESB50640



**Scalpel Blades**

Surgical-quality steel blades for use with the Scalpel Handles

Cat. No	Size	No
ESB50643	3	10 Pk/3
ESB50644	3	11 Pk/5
ESB50645	4	21 Pk/5
ESB50646	4	22 Pk/5
ESB50647	4	23 Pk/5
ESB50648	4	24 Pk/5



**Protozoa**

Our high quality protozoa and algae are sold in jar sizes for your convenience. The small jar is approximately 30ml

- ESB50651 Amoeba proteus
- ESB50652 Chlamydomonas
- ESB50653 Colpidium
- ESB50654 Chilomonas
- ESB50655 Protozoa Mixed
- ESB50656 Ciliates Mixed
- ESB50657 Flagellates Mixed

**Mixed cultures not suitable for sub culturing.**

- ESB50658 Euglena gracilis
- ESB50659 Paramecium
- ESB50660 Protozoan Pellets

- ESB50661 Protoslow



Ideal for feeding Paramecium, Chilomonas and other protozoa. Add 1 pellet to 1 litre of previously boiled water, then divide culture into dishes of approx 150-200ml. Full instructions provided. pack of 25

A viscous solution used to slow mobile organisms making them easier to observe. Sold in an easy to use dropper bottle 30ml

**Algae / Hydra / Platyhelminthes / Nematodes**

**Algae**

- ESB50662 Alga gro Concentrate
- ESB50663 Anabena
- ESB50664 Mixed Algae
- ESB50665 Scenedesmus quadricauda
- ESB50666 Chlorella
- ESB50667 Chara/ Nitella
- ESB50668 Spirogyra Vegetative
- ESB50669 Dunaliella
- ESB50670 Volvox

For both fresh water and sea water, producing an almost universal algal medium. Each tube makes one litre of medium.20 ML

for making algae balls) Starter culture

per bag



**Coelenterates**

- ESB50671 Hydra
- ESB50672 Hydra Viridissima
- ESB50673 Hydra Vulgaris

Our choice of species per 10

Green Hydra per 10

Brown Hydra per 10

**Nematodes**

- ESB50674 Vinegar Eel

Anguilla Aceti

**Platyhelminthes**

- ESB50675 Planarian Species
- ESB50676 Polycelis
- ESB50677 Dugesia

per 10

per 10

Large brown species per 10



**Locusts**

High quality locusts selectively bred for study in the classroom. Locusts are an easy insect to maintain from 1st instar through to adult, feeding on fresh grass twice a day. Feed on lettuce, apple and carrot if grass is not available.

**Schistocerca**

- ESB50678 Desert Locust Adult. Schistocerca pack of 10
- ESB50679 5th Instar Male. Schistocerca pack of 10
- ESB50680 5th Instar Female. Schistocerca pack of 10
- ESB50681 5th Instar Mixed. Schistocerca pack of 10
- ESB50682 4th Instar Mixed Schistocerca pack of 10
- ESB50683 Mixed Instars Schistocerca pack of 10
- ESB50684 Hoppers Schistocerca pack of 30



**Insects and Worms for Feeding**

- Crickets An easily maintained & ideal food for a variety of lizards and frogs.
- ESB50685 Medium Sized pack of 100
- ESB50686 Cricket Adults pack of 100
- ESB50687 Cricket Hatchlings pack of 500
- ESB50688 Wax Moth Larvae A culture of larvae, excellent for feeding to reptiles and amphibians. pack of 25-30
- ESB50689 Dendrobena Small worm, ideal for feeding. pack of 100



**Black Crickets**

- ESB50690 Gryllus Adults and large nymphs pack of 70
- ESB50691 Adult males pack of 70
- ESB50692 Adult females pack of 70
- ESB50693 Tenebrio Culture «A typical beetle to use as an example of an insect life history. Easily kept on bran & fruit. Contains all the stages per culture
- ESB50694 Mealworm Larvae Tenebrio per 50g
- ESB50695 Mealworm Beetles Tenebrio. Enquire for availability. Pk/10

**Drosophila - Fruit Flies (Melanogaster)**

Drosophila are sold in living cultures, each containing approximately 30 specimens of each stage; Adult, Pupae, Larvae and Eggs.  
The chromosomal position of the different characteristics are shown in brackets after each strain. Vestigial wing are a popular food source for spiders, small praying mantis and other invertebrates

**Segregated flies**

Please enquire for availability of Virgin Female Drosophila. There may be a delay during busy periods. Segregated Males can be supplied within 5 days. Both are supplied in packs of 30. Segregated flies must be sent by a recorded delivery.

**Wild Type**

- ESB50697 Small culture
- ESB50698 Large culture
- ESB50699 Virgin fem
- ESB50700 Male
- ESB50701 Adults 100



**Ebony Vestigial (3/2)**

- ESB50702 Small culture
- ESB50703 Virgin fem
- ESB50704 Male



**Vestigial Wing (2)**

- ESB50705 Small culture
- ESB50706 Large culture
- ESB50707 Virgin fem
- ESB50708 Male
- ESB50709 Adults 100



**Ebony Body (3)**

- ESB50710 Small culture
- ESB50711 Virgin fem
- ESB50712 Male

**White Eyed (sex linked)**

- ESB50713 Small culture
- ESB50714 Large culture
- ESB50715 Virgin fem
- ESB50716 Male
- ESB50717 Adults 100



**Scarlet Eyed (3)**

- ESB50718 Small culture
- ESB50719 Virgin fem
- ESB50720 Male
- ESB50721 Drosophila Kit

Contains all the essential equipment and media to culture fruit flies. Contents: 25 small vials, bungs and ladders, 2 funnels, 2 brushes, 250g medium and a relaxing jar. Complete with instructions

- ESB50722 Fly Nap Kit

An easy to use anaesthetic for Drosophila. They can remain anaesthetized for up to 60 minutes. The kit includes 10ml of Fly Nap, 12 wands and full instructions.



**Butterflies**

- ESB50723 Painted Lady Butterfly Kit

«Ten caterpillars supplied with sufficient nutrient for complete development. Kit includes a net cage (ACS 015) with full instructions. Individual pots, papers and lids. Available March to September per kit»

**flies**

Please check availability for all adult flies. All our maggots are the last stage before pupation.

- ESB50724 Blowfly Maggots Calliphora pk/100
- ESB50725 Blowfly Pupae Calliphora pk/100
- ESB50726 Blowfly Adults Calliphora pk/101
- ESB50727 Greenbottle Maggots Lucilia pk/100
- ESB50728 Greenbottle Pupae Lucilia pk/100
- ESB50729 Greenbottle Adults Lucilia pk/100
- ESB50730 House Fly Pupae Musca domesticae pk/100
- ESB50731 House Fly Adults Musca domesticae pk/100



**Cockroaches**

- ESB50732 Periplaneta Americana Adult mixed sex PK/5
- ESB50733 Periplaneta Adult females PK/10
- ESB50734 Periplaneta Adult males PK/10
- ESB50735 Periplaneta Egg cases PK/10
- ESB50736 Periplaneta Nymphs PK/10
- ESB50737 Blatta Orientals Adults mixed sex PK/100



**Giant Cockroaches**

- ESB50738 Giant Hissing Cockroaches A large forest floor species. Easily maintained and handled. Hisses when touched. Pack of 5
- ESB50739 Giant Death Head Cockroach Blaberus craniifer pack of 5
- ESB50740 Giant Peruvian/Peppered Cockroach Archimandrita tessellata pack of 5

**Beetles and Land Invertebrates**

- ESB50741 Flour Beetles Tribolium castanum. Wild type / Sooty
- ESB50742 per culture
- ESB50743 100 adults
- ESB50744 Tribolium Confusum Wild type , per culture
- ESB50745 Tribolium Confusum Wild type , per 100 adults
- ESB50746 Larder Beetles Dermesties. A medium sized beetle used in the laboratory for skeletal preparation. per culture»
- ESB50747 Seed Beetle «Callosobruchus maculatus. Seed beetles feed on black eyed or mung beans, easy to maintain culture. Culture contains egg laiden beans plus 20-25 adult beetles. per culture»
- ESB50748 Grain Weevil Sitophilus. A large species of weevil that infest wheat, oats and barley. Useful for population growth experiments. per culture



**Land Invertebrates**

<b>ESB50749</b>	Land Invertebrate Collection
<b>ESB50750</b>	Woodlice
<b>ESB50751</b>	Spiders
<b>ESB50752</b>	Spiders Mixed species
<b>ESB50753</b>	Beetles Land species
<b>ESB50754</b>	Millipedes Native species
<b>ESB50755</b>	Giant Millipedes adult
<b>ESB50756</b>	Centipedes Native species
<b>ESB50757</b>	Red Ants <i>Myrmica rubra</i> (Apr-Oct.)
<b>ESB50758</b>	Yellow Meadow Ants
<b>ESB50759</b>	Black Ants <i>Lasius niger</i> (May-Sept)

**Molluscs / Slugs**

<b>ESB50760</b>	Giant African Snails
<b>ESB50761</b>	Cuttlefish Bones
<b>ESB50762</b>	Giant African Land Snail Kit
<b>ESB50763</b>	Garden Snail
<b>ESB50764</b>	Mixed species of slugs

**Ecotoxicology**

Beneficial Organisms Grassland and Aquatic

<b>ESB50765</b>	<i>Gammarus pulex</i>
<b>ESB50766</b>	<i>Gammarus pulex</i>
<b>ESB50767</b>	<i>Asellus</i>
<b>ESB50768</b>	<i>Crangonyx</i>
<b>ESB50769</b>	<i>Lumbriculus variegatus</i>
<b>ESB50770</b>	<i>Eisenia foetida foetida</i>
<b>ESB50771</b>	Chironomous
<b>ESB50772</b>	<i>Lemna minor</i>

**Annelids**

<b>ESB50773</b>	Brandling Worm
<b>ESB50774</b>	Brandling Worm
<b>ESB50775</b>	<i>Dendrobena</i>
<b>ESB50776</b>	Earthworms
<b>ESB50777</b>	Brandling Worm Media

**Pond Life**

<b>ESB50778</b>	Damselfly Nymphs
<b>ESB50779</b>	Mayfly Nymphs
<b>ESB50780</b>	Pond Skater
<b>ESB50781</b>	Dragonfly
<b>ESB50782</b>	Freshwater Blackworms
<b>ESB50783</b>	Water Beetles

An exciting display of ground dwelling mini beasts. This collection contains over 60 Specimens including Centipedes, Slugs, Spiders, Woodlice, Beetles etc. Plus a full colour name trail identity car , per pk»

Pk/10

*Pardosa*. Male - May / June. Female - May / Sept pk/10

Pk/10

Pk/10

Pk/10

pk/10

Per 100

Suitable for forming a temporary colony ,per 100

Per 100



*Achatina*. Juvenile , per 5

Pack of 3

This kit contains 5 juvenile snails, 1 medium tank, cuttlefish bones and peat plus full instructions on how to care for them.

*Helix aspersa* Pk/5

Pk/10 Please enquire about specific species. Slugs



Many species are needed to comply with the EEC registration requirements. Listed below are the species available from stock or on a seasonal basis.

If you have a special requirement for unlisted specimens please enquire. Ecotoxicology items must be sent by courier or sp. del.

2-3 Months, juvenile per 100

Adult, Mixed sex per 100

Adult, Mixed sex per 100

Adult, Mixed sex per 100

Fresh water black worms per 100

300 - 600mg Sexually mature, hand selected per 100

Midge larvae, mature aquatic bloodworm per 100

Lesser duckweed, cultured per 100g



«Hand selected mature worms, weighing between 300 - 600mg. *Eisenia foetida foetida* pk/100»

«*Eisenia* species. A small alternative to lumbricus. Easily bred. Supplied in a tub with medium. approx 30»

Composter worms - 500g

*Lumbricus terrestris*. Mature lob worms each with clitellum , per 10

1kg

Demoiselle per 10

Chloen per 10

*Gerris* (May-Oct)per 10

Nymph, mixed species per 5

*Lumbriculus variegatus* approx 30

each



- ESB50784 Water Boatman
- ESB50785 Lesser Water Boatman
- ESB50786 Water Louse
- ESB50787 Freshwater Shrimp
- ESB50788 Mosquito Larvae
- ESB50789 Mosquito Pupae
- ESB50790 Caddisfly
- ESB50791 Blood Worm

**Leeches**

- ESB50792 Pond Leeches

**Pond Snails**

- ESB50793 Pond Whelk
- ESB50794 Trapdoor Snail
- ESB50795 Pond Whelk
- ESB50796 Ramshorn Snails
- ESB50797 Mixed Pond Snails
- ESB50798 Freshwater Aquarium Collection

- ESB50799 Daphnia Water Fleas
- ESB50800 Daphnia Bulk Bag

**Living Marine**

- ESB50801 Brine Shrimp Kit
- ESB50802 Brine Shrimp Eggs
- ESB50803 Brine Shrimp Adult
- ESB50804 Dunaliella
- ESB50805 Microbial Culture
- ESB50806 Alga Gro
- ESB50807 Marine Tube Worm
- ESB50808 Anemone
- ESB50809 Prawns
- ESB50810 Seaweed
- ESB50811 Limpets
- ESB50812 Periwinkle
- ESB50813 Mussel
- ESB50814 Red Rag Worm
- ESB50815 Shore Crab

- Notonecta per 10
- Corixa per 10
- Asellus per 10
- Gammarus per 10
- Culex per 10
- Culex per 10
- Larvae, Sept - April per 10
- Chironomus per 10

Mixed species per 10

- Lymnaea stagnalis per 10
- Viviparus viviparus per 10
- Lymnaea peregra per 10
- Planorbis corneus per 10
- This is a selection of snails per 10

A collection of pond life which consists of over 60 specimens. The collection includes: Planaria, Asellus, Gammarus, Daphnia etc. Plus a full colour name trail identity key card. The collection will vary at different times of the year. Used for a temporary class room setup. per bag c300

This bulk bag can be used to help clear algae from ponds.

This kit contains all the items needed to set up a brine shrimp culture. A full online PDF manual from the British Ecological Society can be found and downloaded by searching for 'Brine Shrimp Ecology' online. This kit is ideal for key stages 3 and 4 and the individual items can be replaced as and when needed. Brine shrimp egg cysts 60ml Liquid fertiliser 150ml Microbial culture 65ml Living culture Dunaliella 65ml Marine salt 50g Marine sand 250g

Artemia Franciscana. Brine shrimp eggs can lie in a dormant state for 10 years or more, waiting for the right environmental conditions and then spring into life to start their life cycle again. (Marine salt required). 60ml

Full grown shrimps feed on marine filter feeder diet. Available with 1 weeks notice.approx 30-50

Large culture

A sample of micro organism and algae from our own brine shrimp culture. 65ml

20ml

Pomatoceros. Supplied on stone. Used to demonstrate fertilisation. pack of 10

Actinia equina pack of 5

Leander pack of 10

Fucus species pack of 10

Patella pack of 10

Littorina pack of 10

Mytilus pack of 10

Nereis diversicolor pack of 100

Carcinus maenas. (Available May-Oct) pack of 100



**PRESERVED**

- ESB50816 Locust
- ESB50817 Millipede
- ESB50818 Centipedes species
- ESB50819 Woodlice species
- ESB50820 Housefly
- ESB50821 Blowfly Calliphora. Adult
- ESB50822 Blowfly Calliphora Larvae
- ESB50823 Blowfly Calliphora Pupae
- ESB50824 Cockroach
- ESB50825 Cockroach
- ESB50826 Giant Cockroach
- ESB50827 Spider Species
- ESB50828 Scorpion Species
- ESB50829 Butterfly Adult
- ESB50830 Butterfly Larvae
- ESB50831 Butterfly Pupae
- ESB50832 Ants (Garden)
- ESB50833 Beetles
- ESB50834 Wasp
- ESB50835 Mosquito Adult
- ESB50836 Mosquito Larvae
- ESB50837 Mosquito Pupae
- ESB50838 Flea
- ESB50839 Louse Species
- ESB50840 Bed Bug Species
- ESB50841 Aphids Species
- ESB50842 Prawn
- ESB50843 Shore Crab
- ESB50844 Freshwater Shrimp
- ESB50845 Crayfish
- ESB50846 Marine Shrimp
- ESB50847 Water Louse
- ESB50848 Water Beetle

**Molluscs**

- ESB50849 Garden Snail
- ESB50850 Cuttlefish
- ESB50851 Squid
- ESB50852 Freshwater Mussel
- ESB50853 Octopus Species
- ESB50854 Sea Mussel Mytilus edulis

**Coelenterates**

- ESB50855 Hydra
- ESB50856 Jelly Fish
- ESB50857 Sea Anemone

**Poriferans**

- ESB50858 Marine Sponge Species

- Schistocerca adult pack of 10
- Species pack of 10
- Pack of 10
- Pack of 10
- Musca domesticae. Adult pack of 10
- Pack of 10
- Pack of 10
- Pack of 10
- Periplaneta americana Pk/10
- Blatta orientalis Pack of 10
- Species each
- Pack of 10
- Each
- Pack of 10
- Pack of 10
- Pack of 10
- Pack of 10
- Pack of 10
- Pack of 10
- Pack of 5
- Pack of 5
- Pack of 5
- Pack of 10
- Leander serratus Pack of 5
- Carcinus maenas Pack of 5
- Gammarus pulex Pack of 10
- Astacus Vaccum packed unless requested in a jar. each
- Crangon pack of 5
- Asellus pack of 10
- Adult species each





**Nematodes**

**ESB50859** Pig Round Worm Ascaris Ascaris , pack of 5

**Annelids**

**ESB50860** Lugworm Arenicola marina Pack of 5

**ESB50861** Earthworm Lumbricus mature Pack of 10

**ESB50862** Rag Worm Nereis Pack of 5

**Echinodermata**

**ESB50863** Starfish Asterias small Each

**ESB50864** Starfish Asterias Large Each

**Platyhelminthes**

**ESB50865** Tape Worm Monezia Each

**ESB50866** Sheep Liver Fluke Fasciola hepatica Pack of 5

**Preserved Chordata - Carosafe**

Colour injections of preserved specimens:

PLAIN: No colour.

SINGLE: Arterial system injected with red latex.

DOUBLE: Second injection of blue latex in systemic veins.

TRIPLE: Third injection of yellow latex in hepatic system

All of our specimens are ethically sourced.

Chordata on these pages are stored in Carosafe or Phenoxetol (odourless preservative)

**ESB50867** Jumbo Frog Rana 12-14cm

**ESB50868** Frog Rana Adult. 8-10cm

**ESB50869** Frog Rana Double injected 10-12cm

**ESB50870** Sheep Brain With dura matter

**ESB50871** Sheep Kidney Each

**ESB50872** Sheep Heart Roots of vessels intact each

**ESB50873** Cow Eyes Pack of 5

**ESB50874** Sheep Eyes Pack of 5

**ESB50875** Bony Fish Large 10cm+ , Each

**ESB50876** Stickleback Gasterosteus , pack of 10

**ESB50877** Rat - Rattus 20cm-22cm Each

**ESB50878** Rat - Rattus Single injected Arterial system injected with red latex.

**ESB50879** Rat - Rattus Double injected Second injection of blue latex in systemic veins.

**ESB50880** Rat - Rattus Triple injected Third injection of yellow latex in hepatic system.

**ESB50881** Lancelet Pack of 5

**ESB50882** River Lamprey Each

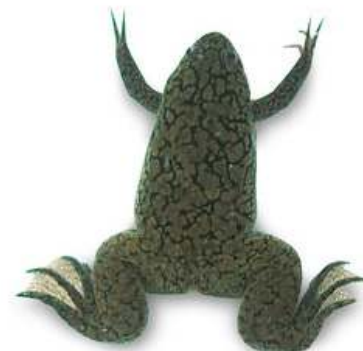
**ESB50883** Lizard Anole , Each

**ESB50884** Pregnant Rattus Each

**ESB50885** Vertebrate Survey Kit-Carosafe «The set includes 9 specimens to show the diversity of vertebrate organisms. Set includes: Amphioxus, Lamprey, Dogfish, Perch, Necturus (salamander), Frog, Turtle, Pigeon, Rat, Teachers manual, Student guide»

**ESB50886** Pigeon Plain

**ESB50887** Pig Kidney Plain





### Biochemistry I Kit

This kit was designed to introduce students to the chemistry of living things and relate biochemistry to everyday life. Includes five basic biochemistry experiments in which students use chemical methods to test for proteins, carbohydrates and lipids, use Pepsin to digest protein and Ninhydrin to detect amino acids, test the activity of salivary amylase (both in vitro and in vivo), develop a technique for determining ascorbic acid concentration and use it to evaluate the vitamin C levels in substances, and determine of the alkalinity of acidity of foods. A great exploratory or introductory experience is gained by performing the test procedures. Ideal for students in biology, general science, or biochemistry courses. Required, but not included: a hot plate or water bath, glass rods, and food samples for testing. Designed for 24 students working

in six groups of four. Grades 8-12

ESB50904



### Biochemistry II Kit

Expose upper level students to an expansive survey of fascinating biochemistry experiments. The kit introduces students to scientific techniques while examining ten different topics at a more in-depth level than Biochemistry I. Includes: Determining the pH of Foods, Saliva, and Soil; Starch Determination, Sugar Determination, Fat Determination, Protein Determination, Amino Acid Determination - Pepsin to Digestion of Protein, Ninhydrin Amino Acid Detection, Effects of Varying Conditions on Salivary Amylase Activity, Modelling How Digestion Works, Determination of Ascorbic Acid Concentration, Paper Chromatography of Various Dyes and Plant Pigments

Using Different Solvents. Ideal for biology, nutrition, general science, or biochemistry courses. Required, but not included: a hot plate or water bath, 50mL beakers, forceps, storage jars with caps, funnels, and food samples for testing. Designed for 24 students working in six groups of four. Grades 9-12

ESB50906

### Biochemistry I Refill

Refill for Biochemistry I. Grades 8-12

ESB50905



### Enzymes (Introduction) Kit

Enzymes are often present in such small quantities that the amount of enzyme is determined by measuring its activity. Through the disappearance of a substrate or the appearance of a product. This kit is designed to study the enzyme activity of Invertase, Amylase, and Pepsin using specific enzyme assay systems. It includes five introductory experiments: Demonstrating Invertase Activity, Demonstrating Amylase Activity, Demonstrating Pepsin Activity, Demonstrating the Presence of Amylase in Saliva, and The Effect of Time on the Activity of Invertase. Invertase and amylase activity are measured using DNS colour change systems. Visual examination or a spectrophotometer can be used to determine enzyme reaction rates for these systems. Kit includes all necessary chemicals and a reply card for Invertase, Amylase - Pepsin & Haemoglobin to be shipped separately upon request. Reply card items are only shipped within the continental United States. Requires lab glassware; including beakers, test tubes, and graduated cylinders; a hot plate or water bath, and a spectrophotometer or colorimeter, absorption 540 nm (optional). Designed for a class of 24 working in groups of 4. Activities are appropriate for advanced biology classes and recommended for Grades 10 - 14.

ESB50907



**Effect Of PH On Enzymes Kit**

This kit demonstrates the effect of pH on enzyme activity using the enzymes Invertase and Amylase. The pH affects the activity of enzymes in two ways: by affecting the charges on groups in the enzyme's three-dimensional active site and by altering the charges which hold the enzyme molecule together. Altering the charges in the active site can greatly change enzyme activity, but these changes are usually reversible. When an enzyme molecule is denatured by pH changes, the effects are usually not reversible and the enzyme becomes permanently inactive. Enzyme activity is measured using DNS reduction to ANS, which may be assessed visually or by spectrophotometer. Required, but not included: lab glassware; including beakers, test tubes, and graduated cylinders; a hot plate or water bath, use of a spectrophotometer or colorimeter is optional (absorption 540 nm). Reply card must be returned to obtain Invertase and Amylase enzymes. Reply card items are only shipped within the continental United States. Designed for advanced biology classes and includes sufficient chemicals for 24 students working in six groups of four. Grades 10-14

ESB50908

**Enzymes In The Home Kit**

Using this kit, students will examine enzymatic processes that are commonly used in the home for making cheeses, tenderizing meat, and cleaning. Includes three experiments: Curds & Whey Using Rennet, Proteases and Other Meat Tenderizers, and Detection of Enzymes in Wash Detergents. Required, but not included: a balance, water bath, laboratory glassware including test tubes, graduated cylinders, and beakers; thermometers, test tube racks, distilled water, and ice. Designed for 24 students working in groups of four. Grades 9-14

ESB50909

**Advanced Enzymology Kit**

The enzyme Invertase hydrolyses sucrose into glucose and fructose. The amount of these reducing sugars can be measured with the chemical DNS which creates a distinctive colour change. Students use a spectrophotometer to determine the reaction rate of Invertase when subjected to varied substrate concentrations, competitive and non-competitive inhibitors, changes in pH, and changes in temperature. Kit includes all necessary chemicals and a reply card for the Invertase enzyme and glucose solutions to be shipped separately upon request. Reply card items are only shipped within the continental United States. Required, but not included: lab glassware; including beakers, test tubes, and graduated cylinders; a hot plate, and a spectrophotometer. Designed for advanced biology classes and includes sufficient chemicals for 24 students working in six groups of four.

ESB50910

**Physicalproperties Of Protein Kit**

This kit demonstrates the important effects of physical parameters such as temperature, pH, salt concentration, and dielectric constants on proteins and illustrates how these effects are used in the isolation and purification of proteins. A protein's amino acid composition and structure influence its physical characteristics. Experiments include: Isoelectric Precipitation of Casein, Separation of Albumin and Gelatin by Ammonium Sulphate Fractionation, Effects of Acetone on Albumin and Gelatin Solutions, Heat Denaturation of Albumin, and Precipitation of Protein by Lead Acetate. Required, but not included: Bunsen burner, glassware, test tube holders. Contains lead acetate. Designed for 24 students working in six groups of four. Grades 9-14

ESB50911

**Physical properties Of Protein Refill**

ESB50912





### Properties Of Lipids Kit

Lipids constitute a heterogeneous collection of compounds grouped together because of their solubility properties. In nature they are essential for membrane structure and function and for energy storage. The tests in this kit demonstrate the properties of lipids, teach students how to identify lipids, show students how to dissolve lipids in polar substances, and allow students to distinguish between saturated and unsaturated lipids. Experiments include: Solubility of Lipids, Emulsification of Lipids, Grease Spot Test for Fats, Saponification of Fats, and Iodine Test for Absorption. This kit includes chloroform - Petroleum ether, and methanol. Required, but not included: a fume hood, water bath - Personal protective equipment, test tubes, and watch glasses. Designed for 24 students working in six groups of four. Grade: College Level

ESB50913



### Qualitative Analysis Of Carbohydrates

With this kit students learn about the unique properties of carbohydrates and how to run analytical tests for characterizing various carbohydrates, starches, and sugars. Experiments includes the Anthrone test for carbohydrates, iodine test for starch, Benedict's test for reducing carbohydrates, Barfoed's test for reducing monosaccharides, Seliwanoff's test for ketosis, and Bial's test for pentoses. Required, but not included: Hot plate or burner, concentrated and 3M hydrochloric acid, concentrated sulphuric acid, glassware. Designed for 24 students working in six groups of four. Grades 10-14

ESB50914



### Sequence Of A Peptide

Students will determine the amino acid sequence of a tri peptide isolated from a protein hydrolysate. The experiments in this kit enable students to determine the chain length of the peptide by formal titration, determine the amino acid content and composition of the tripeptide using chromatographic techniques to determine Rf values, and identify which amino acids are the N-terminal and C-terminal residues using solvent extraction, enzymatic digestion, and chromatographic techniques. This kit contains formaldehyde. Includes student data sheets. Designed for 24 students working in groups of four. Grade: College Level.

ESB50915

### Sequence Of A Peptide Refill

Grades College

ESB50916



### Amino Acid Analysis By TLC

Students learn the theory of chromatography; then separate two different unknown amino acid mixtures using thin layer chromatography (TLC) with amino acid standards run alongside the unknowns. Ninhydrin is used as a visualizing agent; then the rate of flow (Rf) values are calculated for each spot identified on the chromatograms. Students are challenged to predict the migration of the amino acids on the TLC after looking up the structures and pKa values of the four amino acid standards. The unknown components are identified by comparing the Rf values from the unknown amino acid mixtures to Rf data obtained from the four known amino acid standards. Required, but not included: hair dryer, 600 mL beakers for chromatography chambers, clear plastic rulers, and standard laboratory supplies. Designed for 24 students working in six groups of four. Grades 10-14

ESB50918

### Amino Acid Analysis By TLC Refill

ESB50919





### Qualitative Analysis Of Protein And Amino Acids

This kit demonstrates the principles of protein and amino acid analysis and enables students to identify unknown compounds. In this set of lab activities, students work with the proteins, albumin and gelatin, as well as the amino acids, glutamic acid, glycine, cystine, cysteine, tyrosine, tryptophan, and arginine. Ninhydrin is used to detect the presence of amines, indicating the presence of amino acids and/or proteins, the Biuret test is used to detect the presence of peptide bonds, and specific analytical tests are used for determining the presence of individual amino acids. Protein and amino acid analysis techniques are an integral part of biochemistry and the range of tests available for analysing amino acids and proteins are indicative of their importance. Required, but not included: concentrated nitric acid, ethanol, hot plates, balances, glassware, and distilled water. Designed for 24 students working in six groups of four. Grades 10-14

ESB50920

### Amino Acid Kit

This molecular kit can be utilized to demonstrate 8 models of L-configuration amino-acids. The amino acid molecular model collection set includes 125 atom parts and 180= NV links. There is no better way to demonstrate the structure and function of amino acids than with this molecular model set.

The following amino acids can be assembled. Group 1 Valine, Group 2 Threonine, Group 3 Phenylalanine, Group 4 Methionine, Group 5 Histidine, Group 6 Aspartic acid, Group 7 Glutamine and Proline. Extra parts are included to form peptide bonds and hydrogen bonds to make a polypeptide chain and part of a beta-pleated sheet.

Diameter of atom parts ranges from 14.5 – 15 mm.

#### Contents:

- 24 Carbon black, 4-hole
- 19 Carbon black, 3-hole
- 77 Hydrogen white
- 10 Oxygen red -angular
- 10 Oxygen red - linear
- 1 Sulphur yellow
- 1 Nitrogen blue
- 9 Nitrogen blue trigonal
- 1 Nitrogen blue angular
- 8 Hydrogen
- 90 NV-links
- 2 Short link remover tools



ESB50917





**Blood Pressure Monitor Digital**

- Upper Arm Blood pressure Monitor
- One Upper Arm Digital Blood Pressure Monitor
- Detachable Upper Arm Cuff
- Fitted with World Health Organisation classifications
- Ideal for measuring blood pressure at home
- Easy to use, one touch system
- Large display with back-light coloured screen
- Highly cost effective
- Requires 4 x AA batteries (not included)
- Clear easy to see buttons for operation
- Automatic power off 3 mints

ESB50986



**Blood Pressure Monitor Wrist Typel**

- Easy to Use Wrist Blood pressure Monitor
- The Wrist cuff has a circumference of 13.5cm- 21.5cm
- Measuring Accuracy of +/- 3mmHg of pressure
- Measuring Accuracy of +/- 5% Pulse reading
- Measuring pressure range of 0-299 mm-Hg
- Measuring Pulse range of 40-199 pulse per minute
- Auto power off feature to conserve battery life (3 Mins)
- Electronic Inflation
- Back-light display
- IHB indicator
- Supplied with a handy hard case for storage
- Powered by 2 x AAA batteries not included

ESB50987

**Blood Pulse Oximeter Fingertip**

- Fingertip Pulse Oximeter
- Large Clear LED Screen
- 4 way movement for comfort
- Automatic Power off
- Highly accurate
- SP02 measurement 70%-99%
- Powered by 2x AAA batteries
- lanyard supplied
- Two Measurement types SP02 and Pulse rate (BPM)



ESB50988



**Pumping Heart Model**

Scientific experiments, pumping heart

ESB50991



**Stethoscope Training , Dual Head**

Chrome-plated binaural, lightweight anodized- aluminium chest piece (1-3/4 in. Dia.), 22 in. Vinyl Y-tubing, spare diaphragm, and a pair of soft mushroom ear tips. Overall length: 30 in.

ESB50989

**Stethoscope**

With very sensitive Chest-piece covers an essential range of sounds to listen to the heartbeats and functional sound of lungs. Very convenient to use and more suitable for medical students and colleges.

ESB50990





**Human Disarticulated Skeleton, Full**

This life size model shows the complete human skeleton with separated bones: skull, axial section, hyoid bone, ribs, sternum with rib cartilage, upper and lower limbs, sacrum and coccyx are represented in high detail. One hand and foot (left) are on wire, the other set is removed. The skull can be disassembled into 3 parts: skullcap, base of skull and mandible.

**Size :** 54\*39\*21cm  
**Net weight :** 8000g

ESB51032



**Human Skeleton Model 85cm**

Mini skeleton The skull can be dissembled into 3 parts: skullcap, base of skull and mandible. All the main joints are articulated. Arms and legs can be removed easily. Mounted on a stand

**Size :** height 85 CM

ESB51033



**Human Skeleton Model 170cm**

This model is a replica of a life size human skeleton and shows all the skeleton parts in high details. Its hand-assembled to provide intricate details and long-lasting durability. The main joints are articulated; the upper and lower limbs can be removed easily. The following parts are detachable: Calvarium, Skull, Jaw, Arms, Legs. **Size :** 176cm height

**Net weight :** 9000g

ESB51035



**Human Skeleton Model With Nerves 85cm**

Mini skeleton with nerves outlined , The skull can be dissembled into 3 parts: skullcap, base of skull and mandible. All the main joints are articulated. Arms and legs can be removed easily. Mounted on a stand

**Size :** 85 CM

ESB51034





**Human Skeleton Model With Ligaments**

Full-size model is mounted upright and carefully casted in durable moulding with natural colour plastic. Arms and legs are joined by connectors and can be moved to demonstrate natural movement around the joints. Both the arms and the legs are removable for further study. The skull features a moveable jaw, suture lines, Includes a roller base  
**Size** : 176cm height  
**Net weight** : 9000g

ESB51036



**Human Muscular Skeleton Model**

Full-size model is mounted upright and carefully casted in durable moulding with natural colour plastic. Arms and legs are joined by This model is a replica of a life size human skeleton and shows all the skeleton parts in high details. Its hand-assembled to provide intricate details and long-lasting durability. The main joints are articulated; the upper and lower limbs can be removed easily. The following parts are detachable: Calvarium, Skull, Jaw, Arms, Legs. The left side of the skeleton shows the points of origin (red) and the points of insertion (blue) of the muscles.  
**Size** : 176cm height

ESB51037



**Human Muscular Skeleton Model with Ligaments**

Full-size model is mounted upright and carefully casted in durable moulding with natural colour plastic. Arms and legs are joined by connectors and can be moved to demonstrate natural movement around the joints. Both the arms and the legs are removable for further study. The skull features a moveable jaw, suture lines, Includes a roller base  
**Size** : 176cm height  
**Net weight** : 9000g

ESB51038







**Skull Mini Model**

Mini human skull model

Size : 10\*7\*8cm

Net weight : 110g

ESB51039



**Skull With Muscle Insertion**

This life-size model reproduces the human skull in great detail. All the most important anatomical structures are numbered; the left side of the skull shows the points of origin (red) and the points of insertion (blue) of the muscles. It can be disassembled into three parts: skullcap, base of skull and mandible.

Size : 19.5\*15\*13cm

Net weight : 800g

ESB51043



**Classic Skull Model**

A detailed reproduction of a life size human skull with all structural details. The skullcap is removable to show the internal structure of the skull. The mandible is articulated and removable. All of the joints, sutures, fissure, foramina and processes are portrayed with utmost accuracy.

Size : 19.5\*15\*13cm

Net weight : 800g.

ESB51041



**Numbered Skull Model**

A detailed reproduction of a life size human skull with all structural details. The skullcap is removable to show internal details. The mandible is articulated and removable. All of the joints, sutures, fissure, foramina and processes are portrayed with utmost accuracy. Significant structures are numbered.

Size : 19.5\*15\*13cm

Net weight : 800g

ESB51042



**Coloured Skull Model**

This life size model is a detailed reproduction of the human skull. The skullcap is removable to show internal details; the mandible is articulated and removable. All the joints, sutures, fissures, foramina and processes are portrayed with utmost accuracy. All the bones are depicted in different colours, making this model a useful tool to study the correct position and the relationship of all the structures. Size :19.5\*15\*13cm

Net weight : 800g

ESB51044





**Baby Skull Model (Foetus Skull)**

This model represents a human foetal skull in the 30th week of pregnancy.  
**Size :** 21\*16\*33cm

ESB51040



**Skull With Cervical Vertebra Model**

Life-size skull is highly detailed with representations of the fissures, foramina, processes, sutures, and cervical spine, including the seven cervical vertebrae, spinal cord, cervical nerves, vertebral arteries, basilar arteries, and rear cerebral arteries. Three-part skull can be disassembled into the skull cap, skull base, and mandible. Mandible is spring mounted to demonstrate natural movement and has three removable teeth. Mounted on stand.

**Size :** 21\*16\*33cm

**Net weight :** 1400g

ESB51045



**Coloured Skull With Cervical Vertebra**

This life size model of skull with Cervical Vertebra is a detailed reproduction of the human skull. The skullcap is removable to show internal details; the mandible is articulated and removable. All the joints, sutures, fissures, foramina and processes are portrayed with utmost accuracy. All the bones are depicted in different colours, making this model a useful tool to study the correct position and the relationship of all the structures.

**Size :** 21\*16\*33cm

**Net weight :** 1400g

ESB51046



**Arm Bone Model**

A life size plastic skeleton of the hand with forearm bones (radius and ulna). All the joints are articulated.

**Net weight :** 1400g

ESB51047



**Shoulder Joint Model**

This life size model shows the shoulder joint with ligaments.

**Size :** 16.5\*11\*23cm

**Net weight :** 430g

ESB51050



**Foot Bone Model**

A life size skeleton of the human foot with articulated joints. Natural movements of the foot can be demonstrate easily and effectively.

ESB51049



**Hand Bone Model**

A life size plastic skeleton of the human hand with articulated joints.

ESB51048





**Knee Joint Model**

This life size model represents a functional model of knee joint with lateral ligaments, meniscus and patellar ligament.

**Size :** 12\*12\*32cm  
**Net weight :** 440g

ESB51051



**Elbow Joint Model**

This single-piece life-size model is a realistic representation of the human elbow with ligaments.

**Size :** 11\*11\*25.5cm  
**Net weight :** 300g

ESB51052



**Hip Joint Model**

This single piece life-size model illustrates the right hip joint with ligaments.

**Size :** 15\*12\*24.5cm  
**Net weight :** 600g

ESB51053



**Foot Joint Model With Ligaments**

This detailed foot skeleton model displays numerous important ligaments and tendons including the Achilles and peroneus longus tendons of the ankle. The foot skeleton consists of the foot bone and lower portions of the tibia and fibula, including the introsseous membrane found between them.

**Size :** 23 x 18 x 30 cm  
**Net weight :** 0.6 kg

ESB51054



**Hand Joint Model With Ligaments**

This hand skeleton model shows the anatomical detail of main joint ligaments and tendons found in the hand, wrist,.

**Size :** 11\*11\*24cm,  
**Net weight :** 300g

ESB51055



**Male Skeletal Pelvis Model**

A complete life size plastic skeleton of a human male pelvis consisting of the pelvic bones (ischium, ilium and pubis), sacrum, coccyx and symphysis.

**Size :** 24\*18\*21cm,  
**Net weight :** 1100g

ESB51056



**Female Skeletal Pelvis Model**

A complete life size skeleton of a female human pelvis consisting of the pelvic bones (ischium, ilium and pubis), sacrum, coccyx and symphysis.

**Size :** 24\*18\*21cm  
**Net weight :** 1100g

ESB51057



**Model Of Pelvis With 4th And 5th Lumbar Vertebra**

A complete life size plastic skeleton of a human male pelvis consisting of the pelvic bones (ischium, ilium and pubis), sacrum, coccyx and symphysis.

**Size :** 21\*20\*24cm  
**Net weight :** 1300g

ESB51058





**Classic Flexible Spinal Column Model**

A fully flexible life size vertebral column including the occipital plate, cervical, thoracic and lumbar vertebrae, sacrum, coccyx, complete pelvis with symphysis, removable femur heads. The model also features representations of the vertebral arteries, spinal nerve branches and prolapsed L3-L4 inter vertebral disc

**Size :** 89\*24\*18cm  
**Net weight :** 3500g

ESB51059



**Flexible Spinal Column Model With Femur**

A fully flexible life size vertebral column including the occipital plate, cervical, thoracic and lumbar vertebrae, sacrum, coccyx, complete pelvis with symphysis, removable femur heads. The model also features representations of the vertebral arteries, spinal nerve branches and prolapsed L3-L4 intervertebral disc

**Size :** 89\*24\*18cm  
**Net weight :** 3500g

ESB51060



**Flexible Spinal Column Model With Colour Coded Regions**

A full flexible life size vertebral column including the occipital plate, cervical, thoracic and lumbar vertebrae, sacrum, coccyx and complete pelvis. Included are the vertebral arteries, spinal nerves and a prolapsed L3-L4 intervertebral disc. The various regions of the spinal column are colour coded for ease of identification.

**Size :** 89\*24\*18cm  
**Net weight :** 3000g

ESB51061



**Flexible Spinal Column With Femur**

A fully flexible life size vertebral column consisting of the occipital plate, cervical, thoracic and lumbar vertebrae, sacrum, coccyx, complete pelvis with symphysis, removable femur heads. The model also features representations of the vertebral arteries, spinal nerve branches and a prolapsed L3-L4 intervertebral disc.

**Size :** 89\*24\*18cm  
**Net weight :** 3500g

ESB51062





### Cervical Vertebrae Occipital Bone With Spinal Cord Model

This real life replica of the anatomy of the cervical spinal column is a high quality model. Consisting of, occipital plate, the 7 cervical vertebrae with intervertebral discs, cervical nerves, vertebral arteries and spinal cord. The cervical spinal column is delivered on a stand.

**Size :** 19 cm

**Net weight :** 0.3 kg

ESB51063



### Vertebra Column Flexible With Femur Head

A fully flexible life size vertebral column including the occipital plate, cervical, thoracic and lumbar vertebrae, sacrum, coccyx, complete pelvis with symphysis, removable femur heads. The model also features representations of the vertebral arteries, spinal nerve branches and prolapsed L3-L4 inter-vertebral disc. The left side of the skeleton shows the points of origin (red) and the points of insertion (blue) of the muscles.

**Size :** 89\*24\*18cm

**Net weight :** 3500g

ESB51064



### Lumbar Vertebra, Sacrum Bone With Spinal Nerves Model

This life size model consists of 5 lumbar vertebrae with inter-vertebral discs, lumbar nerves and spinal cord. The sacral crest and coccyx are removable to show the sacral segment of the spinal cord and associated nerve branches.

**Size :** 37\*12\*12cm

**Net weight :** 800g

ESB51065



### 2 Lumbar Vertebra With Hernia

This life size model shows 2 lumbar vertebrae with spinal nerves, dura mater and an inter-vertebral disc affected by medial hernia. On the base you can see in high detail 2 pathological inter-vertebral discs with the correct position of medial and lateral hernia.

**Size :** 12\*12\*14cm

**Net weight :** 300g

ESB51066





**Lumbar Vertebra With Hemocyte**

This life size model shows 2 lumbar vertebrae with spinal nerves

ESB51067



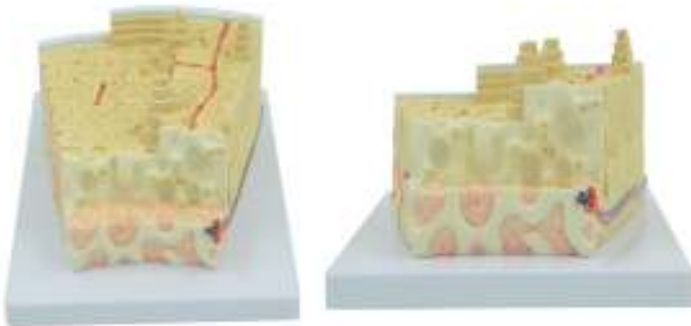
**Bone Tissue Model**

This model is composed of 4 parts and shows different structures of the human bones. The external structure of the femur with periosteum, blood vessels, spongy bone, compact bone and haversian system.

Size : 44\*10\*32cm,

Net weight : 1500g

ESB51068



**Bone Structure Model**

This 80X life-size enlarged model demonstrates a 3-D section of a lamellar bone, along with the normal structure of a tubular bone. Extremely detailed model utilizes various planes in cross, longitudinal, and two-plane sections through all the levels of bone to demonstrate the interaction between the individual bone structure elements. Mounted on a base.

ESB51069



**Skeletal Muscle Fiber Model**

This model, enlarged approximately 40000X, shows the structure of skeletal muscle fibres, including the anatomical features of sarcomeres with sarcoplasmic reticulum, myosin and actin myofibrils and the neuromuscular plate.

Size : 26\*25\*19cm

Net weight : 1300g

ESB51073



**Female Perineum Model**

This life size model shows the female perineal area, including the anus and the external genitalia. The pelvic diaphragm, urogenital perineum with opening of the vagina and the anal perineum are well represented. Distribution of blood vessels and nerve endings is included.

Size : 39.5\*25.5\*8.5cm

Net weight : 1900g

ESB51078





**Muscle Figure  
50 Cm Height Model**

This 1/4 life-size model is a useful tool to study human superficial musculature.

**Size :** 25\*20\*53cm  
**Net weight :** 1500g

ESB51070



**Muscles Of Human Arm Model**

This 7-part life size model shows, in great detail, the anatomical structure of the arm, complete with superficial and deeper muscles, vascular structures, nerves and ligaments. The hand and the shoulder are also well represented. The following parts are removable: - Deltoid muscle - Biceps muscle - Triceps muscle - Long palmar muscle with radial flexor muscle of wrist - Brachioradial muscle with radial extensor muscle of wrist - Palmar aponeurosis, **Size :** 72\*32\*24cm, **Net weight :** 4700g

ESB51071



**Muscles Of Human Leg Model**

This 13-part model shows, in great detail, the anatomical structure of the leg, complete with superficial and deeper muscles, vascular structures, nerves and ligaments. The following parts are removable: - Sartorius - Long head of biceps - Gluteus

maximus - Soleus - Gastrocnemius - Gracilis - Semitendinosus and Semimembranosus - Rectus femoris - Extensor digitorum longus - Sole of foot - tensor fasciae latae

**Size :** 88cm  
**Net weight :** 4700g

ESB51072



**Anatomy Of The Hand Model 3-Parts**

This 3-part model, enlarged 2X life size, shows the anatomy of the hand, including muscles, nerves, ligaments, vessels and bone structures. Aponeurosis is removable for closer examination.

ESB51074



**Shoulder Model With Deep Muscle**

This model illustrates in great details the muscles, ligament and bones of the shoulder. Through different muscles section it is possible to observe the profound musculature as far as to get bone. Life size model in 1 piece.

**Size :** 11\*11\*25cm  
**Net weight :** 530g

ESB51075

**Muscles Of The Hand Model 4-Parts**

This life size model is composed of 4 parts. The palmar aponeurosis and the palmaris brevis can be removed to reveal the underlying network of muscles, tendons, vessels and nerves. A deeper palmar dissection allows observation of the palmaris longus tendon, the palmar carpal ligament and the median nerve. Part of the thenar muscles can be removed to expose the superficial palmar branch of the radial artery. A superficial dorsal dissection shows ligaments, nerves and vessels.

**Size :** 39.5\*25.5\*8.5cm,  
**Net weight :** 1900g

ESB51077



**Anatomy Of The Foot Model , 9-Parts**

This 9-part model shows significant structures of the foot such as muscles, nerves, vessels and ligaments.

ESB51076





**Torso Mini Dual Sex**

This half life size torso is an excellent tool in basic anatomy teaching. Composed of 16 parts, as follows:

- Head (2 parts) showing a section of the brain and the upper respiratory tract
- Half of the brain, showing internal structures
- 2 lungs
- Heart (2 parts) showing the atria, ventricles and valves
- Liver with gallbladder
- Stomach
- Single piece, including small intestine, large intestine and pancreas
- Removable cover that expose interior of caecum
- Male reproductive organs (2 parts)
- Female reproductive organs (2 parts).

**Size :** 43.5\*19\*11cm

**Net weight :** 2200g

**ESB51080**



**Human Mini Torso Model ,50cm Height**

This half life size torso is an excellent tool in basic anatomy teaching. Composed of 12 parts, as follows:

- Head (2 parts) showing a section of the brain and the upper respiratory tract
- Half of the brain, showing internal structures
- 2 lungs
- Heart (2 parts) showing the atria, ventricles and valves
- Liver with gallbladder
- Stomach
- Single piece, including small intestine, large intestine and pancreas
- Removable cover that expose interior of caecum.

**Size :** 52\*25\*13cm

**Net weight :** 3000g

**ESB51079**

**Torso Sexless Open Back - 17 Parts**

This sexless life size torso is composed of 17 parts. Accurate in all of its detailing, this model is appropriate for use in any human anatomy classroom. Anatomical structures of the major body systems are numbered and identified on the accompanying key. The head is sectioned to expose one half of the brain. The neck is dissected through the central surface to show muscular, glandular, vascular and neural structures. The thorax and abdomen are completely open to afford an unrestricted view of internal organs and associated structures. The back is dissected revealing the muscular layers, vertebral column, spinal cord and nerve branches. One thoracic vertebra is removable for detailed examination of its structure and association with spinal cord.

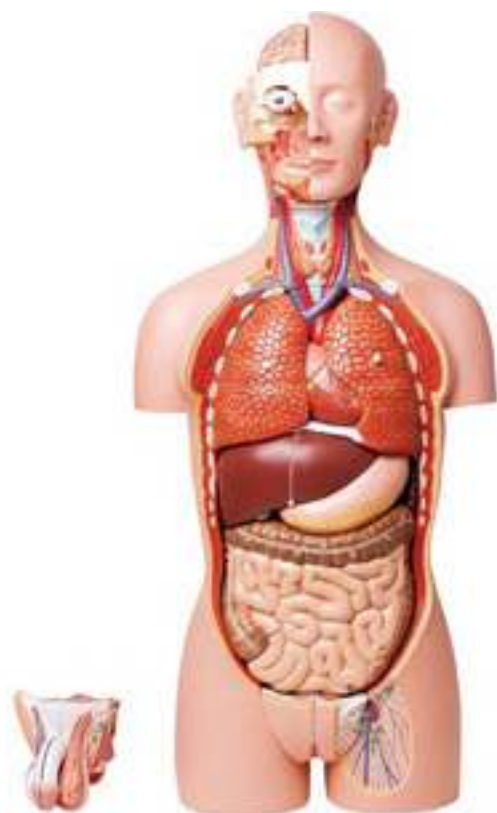
Removable parts include the following:

- Half of the brain, divided along the longitudinal fissure to show internal structure and blood vessels
- Eye with optic nerve and extraocular muscles
- Right and left lungs showing the bronchial tree and vasculature
- Descending thoracic aorta and oesophagus
- 2-part heart showing the atria, ventricles, cardiac valves and section through the ventricular heart wall
- Half of one kidney, sectioned along the frontal plain to show the internal structure and vessels
- Kidney, urethra and urinary bladder with prostate (removable in two parts)
- Stomach showing muscular and vascular structures
- Pancreas, duodenum and spleen with vessels and ducts
- Liver
- Small and large intestine with removable cover over portion of caecum
- 12th thoracic vertebrae with spinal cord.

**ESB51082**







### Human Dual Sex Exchangeable Deluxe Torso ,Open Back,27 Parts

This life size torso with open back is composed of 27 parts and provides an exceptionally realistic reproduction of anatomical structures in their finest detail. All of the body systems are represented with full accessibility. This model is without question a valuable addition to any biology or anatomy course. The open back exposes muscular layers as well as the vertebral column and associated nerve branches. A thoracic vertebra, including a section of spinal cord, is removable for dose examination of its anatomical details. The head is open and the brain is fully exposed on one side. The neck is dissected to expose muscular, neural, vascular and glandular structures. Significant structures are numbered and referenced on the accompanying key. The dissectable male and female urogenital systems are interchangeable.

Removable structures include the following:

Eye with optic nerve and extraocular muscles

Half of the brain, divided along the longitudinal fissure, showing internal structures and blood vessels

Trachea

Descending thoracic aorta and oesophagus

Right and left lungs (2 parts each), showing the bronchial tree and vasculature

Liver with gallbladder

Half of one kidney sectioned along the frontal plane, showing the internal structure and vessels

2-part heart with clear depiction of atria, ventricle, valves and section of heart wall

Stomach dissected in 2 parts

Pancreas, duodenum and spleen with vessels and ducts

Small and large intestines with removable cover portion of caecum

Male and female urogenital system (4 parts each) sectioned medially with excellent views of internal structures

Thoracic vertebra with spinal cord

ESB51081



### Human Circulatory System Model - 2 Parts

The model represents a general view of the human circulation. It includes the heart (2 parts), lungs, liver, spleen, kidneys and relevant connections with the pulmonary and systematic circulatory pathways.

Size : 93\*33\*14cm

Net weight : 5000g.

ESB51083



### Nervouse System Model

This 1/2 life-size relief model shows a general view of the peripheral and central human nervous system: the head is open to reveal the brain and the cerebellum; the pathway of the main nerves is well illustrated in relation to the skeleton.

Size : 89\*29\*1cm

Net weight : 5000g.

ESB51143





**Heart Model, Life Size**

This life size model shows the compensatory hypertrophy heart disease. This pathology is characterized by the myocardium thickening of the muscular fibres of the left ventricle. Hypertrophy heart disease is the complication of a chronic hypertension. The model is divided in 2 parts and mounted on base with stand.

**Size :** 26\*11\*12cm  
**Net weight :** 380g

ESB51084



**Heart Pass Model, Life Size**

This life-size two-part model provides an extremely detailed illustration of the anatomy of the human heart with three coronary bypasses. The anterior wall can be detached to expose the inner chamber and valves.

**Size :** 26\*11\*12cm  
**Net weight :** 380g

ESB51085



**Heart Model, 2 Times Enlarged**

This 2X life-size model describes all the main structures of the human heart in great detail. The right part is detachable, to expose the inner chambers and valves. The left auricle and ventricle wall can be removed to show the atrium, the mitral valve, the ventricle and papillary muscles.

**Size :** 17\*15\*18cm,  
**Net weight :** 1000g,

ESB51086



**Mediastinum Model**

This life size model is composed of 5 parts, including a 2-part heart that provides an interior view of the chambers and valves. The sternum and thymus are removable to reveal the pericardial sac and the major pulmonary and systematic vessels. The trachea and oesophagus are shown entering the mediastinum through the superior thoracic aperture; the inferior thoracic aperture is delimited from the diaphragm musculature.

**Size :** 39.5\*26\*30.5cm  
**Net weight :** 2800g

ESB51088



**Heart Model Giant 3 Times Enlarged**

Life size. It is sectioned along the anterior plane to show internal structures, including the cardiac valves and the comparative morphology of the right and left ventricles. The right atrium is also removable.

**Size :** 26\*29\*31cm  
**Net weight :** 3000g

ESB51087





**Blood Cell Model, 2000 Times Enlarged**

Enlarged 2000 times, this model shows the various types of blood cells, including red blood cells, white blood cells (lymphocytes, monocytes, neutrophils, eosinophils and basophils) and blood platelets.

**Size :** 55\*39\*8cm

**Net weight :** 3300g

ESB51089



**Structure Of Artery And Vein Model**

An important support for understanding the difference between artery and vein histology. In this single-piece model one artery and two veins are represented in great detail. One vein is longitudinally sectioned to show the closed and open venous valves; the artery and the right vein are cross-sectioned so the different layers, such as tunica media, elastic membrane and tunica adventitia, can be easily recognized. 20X life size.

ESB51090



**Larynx Model, 2 Times Enlarged**

This 5-part model is sectioned longitudinally to reveal intimate details of internal structures, including the hyoid bone, cartilages, ligaments, muscles, vessels, nerves and thyroid gland.

**Size :** 24\*14\*16cm

**Net weight :** 800g

ESB51091



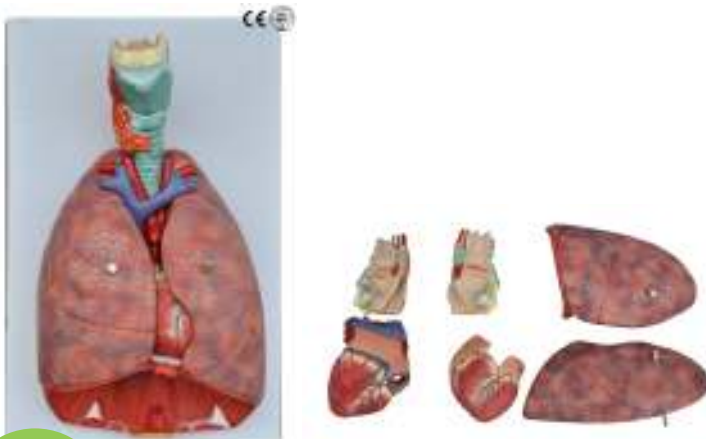
**Larynx Model, Life Size**

This life size model can be opened into 2 parts to show the anatomy of the human larynx and related structures: hyoid bone, cartilages, ligaments, muscles, vessels, nerves and thyroid gland.

**Size :** 10\*5.5\*5cm

**Net weight :** 170g

ESB51093



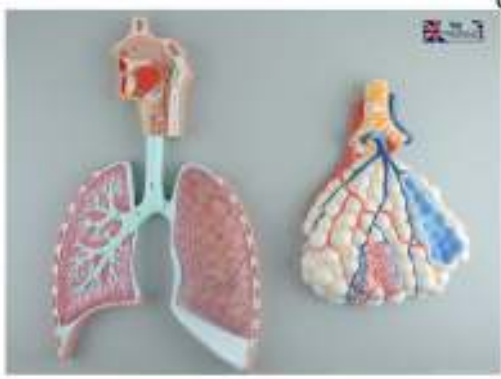
**Larynx, Heart And Lung Model**

A life size reproduction of the complete human respiratory system. It is composed of 7 parts showing the larynx (dissected along the sagittal plane), the lungs (dissected along the frontal plane) and a 2-part heart.

**Size :** 26\*40\*14cm

ESB51092





**Respiratory System Model With Pulmonary Alveoli Relief**

A relief model of the respiratory system, including the oronasal cavity, larynx and trachea, primary bronchi and bronchial tree. The upper respiratory tract is sectioned along the medial sagittal plane. An alveolus with blood vessels (about 150X life size) is shown with excellent internal detail. **Size : 55\*39\*5cm**

**Net weight : 2500g**

ESB51094



**Segmented Lungs Model**

This life size model shows clearly the segmental anatomy of the left and the right lungs. The various lobes are painted with different colours to highlight their locations.

**Size : 23\*33\*32cm**

**Net weight : 1800g**

ESB51095



**Lung Demo Model**

This simple, yet effective apparatus consists of two sacks which represent the lungs, a rubber membrane which serves as the diaphragm and a clear plastic enclosure which models the chest cavity. By making the diaphragm relax and contract the students can see how the lungs are emptied and filled with air.

ESB51096



**Nasal Cavity , Oral Cavity ,Throat ,Larynx Model**

This life size model shows a section of the nasal cavity.

**Size : 12\*13\*26cm**

**Net weight : 450g**

ESB51097



**Nasal Cavity Model ,Life Size**

This life size model shows a section of the nasal cavity.

**Size : 15\*25\*11cm**

**Net weight : 600g**

ESB51098





**Human Digestive System Model**

This life size model shows the human digestive tract from mouth cavity to rectum. The oral cavity, the pharynx and the first part of the oesophagus are dissected along the medial sagittal plane.

The liver is shown together with the gall bladder and the pancreas is dissected to expose internal features. The stomach is open along the frontal plane; the duodenum, caecum, part of the small intestine and the rectum are open to expose the interior. The transverse colon is removable.

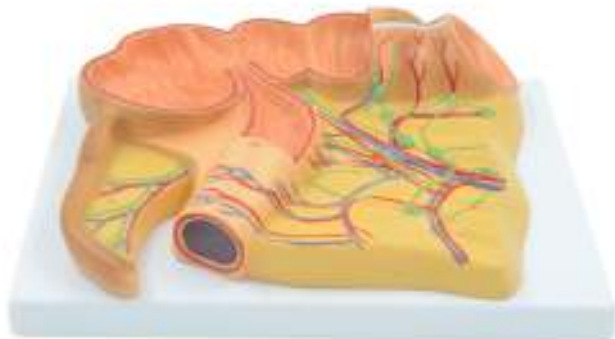
An additional relief model of the head shows the anatomy of the mouth with salivary glands.

Mounted on board.

**Size :** 91\*31\*11cm,

**Net weight :** 5000g

ESB51099



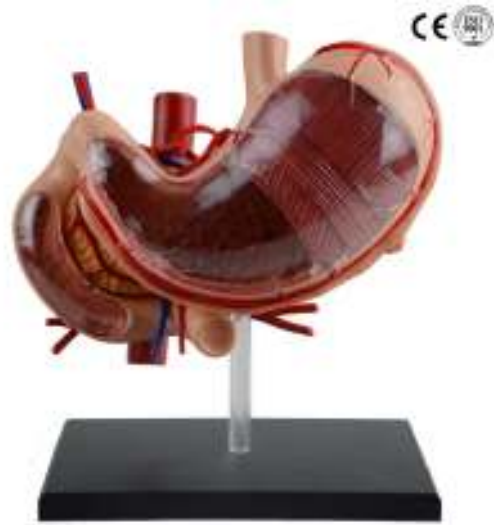
**Caecum And Appendix Model**

This model is 2X life size; it shows the open caecum with appendix, ileum, ilocaecal orifice and valve. Blood vessels and lymph nodes are also represented.

**Size :** 26.5\*19.5\*5.5cm

**Net weight :** 900g

ESB51100



**Stomach Model 4d**

4D Stomach model life size model showing details, Dissectable into 10 parts

ESB51101



**Stomach Model, Life Size**

This life size model is dissected along the medial plane and can be opened to show the internal structure of the stomach, including the mucosa, the pylorus, a section of the gastric wall. The model also shows the superficial muscular layers and the blood vessels.

**Size :** 19\*13\*24cm

**Net weight :** 500g

ESB51102





**Stomach Model, 2 Times Enlarged**

This model is dissected along the medial plane and can be opened to show the internal structure of the stomach, including the mucosa, the pylorus and a section of the gastric wall. Superficial dissections expose the longitudinal, circular and oblique muscle layers, with nerves and vascular structures.

**Size :** 22\*16\*27cm  
**Net weight :** 1000g

ESB51103



**Liver With Gall Bladder And Duodenum**

This life size model shows a section of the liver with gall bladder, pancreas and duodenum, hepatic and pancreatic ducts.

**Size :** 19\*15\*4cm  
**Net weight :** 710g

ESB51105



**Pancreas, Duodenum And Spleen Model**

This life size model is an accurate representation of the pancreas, spleen and duodenum. The pancreas is open to show the entire pancreatic duct. The duodenum is partially dissected to expose its internal structure.

**Size :** 12\*19\*24cm  
**Net weight :** 500g

ESB51107



**Liver Model, Life Size**

This realistic model reproduces a life size liver with the gall bladder. The hilus vessels are shown as well as the extrahepatic ducts and the main ligaments.

**Size :** 21\*18\*15cm  
**Net weight :** 550g

ESB51104



**Liver Section With Gall Bladder Model**

The model, 1,5X life size, shows the liver and gallbladder in open section with the complex network of vessels and bile ducts, displayed in different colours for clarity of examination.

**Size :** 28\*17\*35cm  
**Net weight :** 1300g

ESB51106



**Pancreas, Gallbladder, Spleen Model**

Full size model shows pancreatic cancer, the gallbladder with stones, a ruptured spleen and duodenal ulcer.

**Size :** 12\*19\*24cm  
**Net weight :** 500g

ESB51108





**Dental Care Model (Oral Hygiene)**

A 3X life size model that is useful for teaching the correct way to brush teeth. A giant toothbrush is included.

ESB51109



**Skin Model, 70 Times Enlarged**

This 70X relief model compares a section of hairy skin . All structures, including sensitive corpuscles, hair follicles, sebaceous and sweat glands, are shown in great detail

Size : 19\*26\*26cm

Net weight : 1600g

ESB51111



**Staged Model Of Decaying Tooth**

This model, composed of 7 parts, is 4X life size. It consists of 3 teeth, seated in their sockets, that shows the progressive deterioration of tooth structure by dental caries. The first tooth shows the caries in the enamel. In the second tooth, the caries invades the dentine. In the third tooth, the pathology affects the pulp, jeopardizing the vitality of the tooth.

Size : 20\*11\*16cm

Net weight : 700g

ESB51110



**Skin Model, 50 Times Enlarged**

This 50X relief model compares a section of hairy skin . All structures, including sensitive corpuscles, hair follicles, sebaceous and sweat glands, are shown in great detail

Size : 13\*24\*24cm

Net weight : 1000g

ESB51112



**Skin Section Model**

This 70X relief model shows the main structures through 3 layers of the hairy skin: hair follicles, sebaceous and sweat glands, erector muscles, sensitive corpuscles, nerves and blood vessels are well defined.

ESB51113



**Kidney Model, Life Size**

A life size model of the kidney with the adrenal gland. The model is sectioned along the front plane; it can be divided in 2 parts to show internal structures, including the cortex, medulla, pyramids with papillae, partially opened renal pelvis, ureter, blood vessels.

Size : 10.5\*10.5\*21cm

Net weight : 220g

ESB51114





### Kidney With Adrenal Gland Model , 1,5 Times Enlarged

This 2-part model, 1.5X life size, shows the human kidney in frontal region. Internal structures are clearly revealed, including cortex, medulla, pyramids, calyces, renal pelvis (partially opened), ureter and origins of the renal artery and vein. The front of the model is removable for inner examination.

ESB51115



### Deluxe Kidney With Adrenal Gland Model, 3 Times Enlarged

This model shows a frontal section of the human kidney enlarged 3 times. The kidney is shown with the renal capsule. Additional structures include: the cortex, medulla, pyramids with papillae, partially dissected renal pelvis, renal calyces, ureter, blood vessels, supra-renal gland with cortex and medulla. A schematic representation of the renal corpuscle with the system of collecting tubules is included.

**Size :** 28\*21\*10cm

**Net weight :** 1100g

ESB51116



### Kidney, Nephron And Glomerulus Model

Right Kidney, Nephron and Glomerulus combined on one base plate. Model in one piece.

#### Right Kidney

Enlarged approx. 3 times, . Frontal section seen from behind; pyramids of the kidney with their papillae entering the partly open pelvis. Schematic Presentation of a nephron with its loop of Henle. Model in one piece. On a green board.

#### Nephron

Enlarged approx. 120 times. The model shows two nephrons with little knots of kidney, renal tubules and collecting tube system. Model in one piece. On a green base plate.

#### Glomerulus

Enlarged approx. 700 times, The model shows the arteriola afferens and the arteriola efferens, the capillaries of the glomerulus, urinary pole and Bowman's capsule. Model in one piece. On Gray board.

**Size :** 30\*65\*9cm

**Net weight :** 3000g

ESB51117



### Kidney, Nephron And Glomerulus Model Solid

This 3 models set shows the basic structure of the kidney. We can find as a first model a kidney, illustrates adrenal gland, cortex, medulla, pyramids with papillae, renal pelvis and blood vessels. The second model, representing a nephron enlarged 120 times, shows a renal tubules, a collecting tube system and Henle's loop. The third one illustrates Malpighian corpuscle with the Bowman's capsule, 700 times life size. All these models are a great instrument to understand the kidney anatomy in all the inner details.

**Size :** 31.5\*9.5\*22cm

**Net weight :** 510g

ESB51118







**Deluxe Kidney, Nephron And Glomerulus Model**

This 3 model set shows the basic structure of the kidney. The first model shows a frontal section of the kidney enlarged 3 times. It presents the adrenal gland, cortex, medulla, pyramids with papillae, renal pelvis and blood vessels.

The second model, representing a nephron enlarged 120 times, shows a renal tubule, a collecting tube system, and Henle's loop.

The third model illustrates Malpighian corpuscle with the Bowman's capsule at a scale of 700x life size.

**Size :** 70\*29\*12cm

**Net weight :** 4100g

All these models are an excellent way to understand the inner details of human kidney anatomy.

ESB51119



**Kidney Model Section ,3 Times Enlarged**

This model shows a frontal section of the human kidney enlarged 3 times. The kidney is shown with the renal capsule. Additional structures include: the cortex, medulla, pyramids with papillae, partially dissected renal pelvis, renal calices, ureter, blood vessels, suprarenal gland with cortex and medulla

**Size :** 28\*21\*10cm

**Net weight :** 1100g

ESB51121



**Kidney Model Section ,3 Times Enlarged**

This model shows a frontal section of the human kidney enlarged 3 times. The kidney is shown with the renal capsule. Additional structures include: the cortex, medulla, pyramids with papillae, partially dissected renal pelvis, renal calices, ureter, blood vessels, suprarenal gland with cortex and medulla , **Size :** 28\*21\*10cm

**Net weight :** 1100g

ESB51120



**Urinary System Model**

Free-standing model comes with four parts and represents the major components of the urinary system. The right kidney is dissected to show the cortex, medulla, pyramids, calyces - PELvis, and origins of the renal artery and vein. The bladder can also be removed and opened for more detailed learning. Durable and a great learning tool in all classrooms and laboratories. 36\*22.5\*12.5cm model is mounted on a 26 \*18.8cm board.

ESB51123



**Urinary System, Dual Sex Model**

This all-in-one-model shows:

Structures of retroperitoneal cavity Large and small pelvis with bones and muscles Inferior vena cava Aorta with its branches including iliacal vessels Upper urinary tract Rectum Kidney with adrenal gland

The front half of the right kidney is removable. With easy-to-change male insert (bladder and prostate, front and rear half) and female insert (bladder, womb and ovaries, two lateral halves). Parts are numbered. On baseboard.

**Size :** 42\*23\*10.5cm

**Net weight :** 3000g

ESB51125





**Urinary System Relief Model**

This model features sections of the urinary bladder, urethra, the inferior vena cava with tributaries, the abdominal aorta with branches, ureters, the kidneys with adrenal glands, a section showing internal renal structures (cortex, medulla, pyramids with papillae, vessels)

**Size :** 42\*31\*5cm  
**Net weight :** 1000g

ESB51124



**Male Pelvis Model ,Life Size**

This life size model, composed of 4 parts, presents an open view through a median sagittal section of the pelvis. Internal structures of the male urogenital system are represented in fine detail. The removable parts include a half penis divided into medial and transverse sections, and half of the male reproductive system with an open dissection of a testis showing details of the internal structure.

**Size :** 28\*24\*29cm  
**Net weight :** 2100g

ESB51127



**Male Genital Organ Model,Life Size**

This life size model, composed of 4 parts, is dissected through the median sagittal plane to provide excellent views of external and internal structures. The removable parts include two halves of the penis, showing medial and transverse cuts and 2 halves of the male reproductive system with excellent detailing of internal structures.

**Size :** 20\*13\*12.5cm  
**Net weight :** 500g

ESB51129



**Bladder Model**

This model, enlarged 3 times, shows the male urinary bladder with the prostate gland surrounding the urethra. The model is dissected medially to expose both internal and external structures of the bladder and prostate, including the urethric and urethral orifices, ductus deferens, seminal gland, ejaculatory duct.

ESB51126



**Male Pelvis Model**

Male-half scale Midline-sagittal cross-section which shows the anatomy of the pelvis and testis.

ESB51128



**Testis Model ,10 Times Enlarged**

This model shows the medial and sagittal section of the human testis including epididymis, ductus deferens, seminiferous tubules and rete testis

**Size :** 11x11x26 cm  
**Net weight :** 260g

ESB51130



**Spermiogenesis Model,10000 Times Enlarged**

This model shows the process of spermatogenesis from spermatid to the mature spermatozoon.

**Base Size :** 26\*40 cm

ESB51131





**Female Internal Genital Organ Model**

1.5X life size model shows a dissected view of the vagina, cervix, uterus and ovary with follicles at various stages of development.

ESB51136



**Female Pelvis, Life Size**

This life size model, composed of 3 parts, shows an open dissection through the median sagittal section of the pelvis. Internal structures of the female urogenital system are portrayed in great detail. Removable parts include half of the female reproductive system with the uterus opened to reveal medial and transverse sectional views.

Size : 28\*24\*29cm

Net weight : 2100g

ESB51132



**Female Internal Genital Organ Model**

1.5X life size model shows a dissected view of the vagina, cervix, uterus and ovary with follicles at various stages of development.

Size : 20\*17.5\*9cm

Net weight : 350g

ESB51137



**Female Pelvis Model**

this half scale mid-sagittal cross-section of the pelvis showing female anatomy, including the ovary and fallopian tube.

Size : 19\*15\*10cm

Net weight : 400g

ESB51133



**Female Pelvis Cavity With 2 Lumbar Vertebra's**

This single-piece life-size model is a very useful tool to study the female pelvic anatomy and to understand the relationship between pelvic bones, muscles and female genital organs. It shows a complete skeleton of a female human pelvis associated with ligaments, muscles, internal and external female urogenital organs. Both the urinary bladder and the uterus can be opened along the longitudinal plane to show their inner anatomy. All the structures are reproduced with great detail and accuracy.

Size : 25\*24\*13cm

Net weight : 1150g

ESB51134



**Female Genital Organ Model ,4 Parts**

This life size model, composed of 4 parts, is a detailed representation of the female reproductive system as viewed through a median sagittal dissection. Removable parts include a 2-part uterus and 2 halves of the female reproductive apparatus with details of the internal structure.

Size : 14.5\*13\*12cm

Net weight : 500g

ESB51135





**Ovary Structure Model**

This 2-part, 5X life-size model shows the anatomy of the human fallopian tube and ovary. The follicles are shown at different stages of maturation, from the primary ovarian follicle to the corpus albicans. A primary follicle is cross-sectioned, to illustrate the inner structure, the oocyte, zona pellucida and granulosa cells.

**Size :** 35\*25\*25cm  
**Net weight :** 2000g

ESB51138



**Uterus Model, 2 Parts**

Full-size cross-section model illustrates multiple pathologies, dissected into 2 parts

**Size :** 23\*17.5\*9.5cm  
**Net weight :** 550g

ESB51139



**Pregnancy Pelvis With Mature Foetus Model**

This life-size model, foetus in uterus with closed and opened uteri, the beginning of the emergence of the head.

ESB51141



**Deluxe Pregnancy Pelvis Model**

This life size model depicts the female human pelvis in median section with a foetus in the 40th week of pregnancy. The foetus is in the normal position prior to birth, showing the anatomical relationship between various structures of the maternal pelvis and the foetus. Foetus is detachable for closer examination.

**Size :** 24\*40\*38cm  
**Net weight :** 4000g

ESB51140



**Foetus Development Model, Life Size**

Set of eight model illustrates the detailed stages of pregnancy development. Includes a first-month embryo, second-month embryo, third-month embryo, fourth-month foetus in transverse lie position, fifth-month foetus in breech position, fifth-month foetus in transverse lie position, fifth-month twin foetuses, and seventh-month foetus. Each model is on a base

**Size :** 51\*22\*29cm  
**Net weight :** 4000g

ESB51142





**Nerves Of Neck Region Model**

This life size model shows the distribution of superficial branches of the cervical plexus.

**Size :** 40\*11\*28cm

**Net weight :** 2100g

ESB51144



**Sagittal Section Of Human Head Model**

Life size representation of the superficial and the internal structures of the head and neck. This relief model shows all relevant structures of the human head in great detail.

**Size :** 26.5\*20.5\*5cm

**Net weight :** 950g

ESB51145



**Half Head Model**

Life size model shows the right half of the human head and neck, sectioned along the sagittal plane. A superficial dissection exposes the facial muscles, the superficial blood vessels and nerve branches of the face and scalp, the parotid and submandibular glands. A median dissection expose the brain with its internal structure, the pharynx and upper respiratory tract, a section of the cervical vertebrae.

**Size :** 23\*18\*27.5cm

**Net weight :** 850g

ESB51146



**Head With Larynx Muscles Model**

This life size head model is dissociated along the sagittal plane into 2 halves. Details of the oronasal cavity and larynx as well as musculature of the pharynx are exceptionally well represented.

**Size :** 23\*15\*12.5cm

**Net weight :** 1000g

ESB51159



**Head With Brain Model**

Life size head model is composed of 4 parts, as follows: half brain, features the internal structure of the cerebrum, including blood vessels half of the cerebellum eye with optic nerve

The right side of the face is dissected in sagittal and horizontal section, showing many significant internal features of the skull and brain, as well as the entire oronasal cavity.

**Size :** 24\*22\*19cm

**Net weight :** 1500g

ESB51147





**Right Brain Model**

A life size half brain model along the sagittal plane. It shows the right cerebrum, cerebellum, brain stem and blood vessels.

**Size :** 18\*14\*16.5cm  
**Net weight :** 370g

ESB51148



**Brain Model With Artery ,Life Size**

This extremely realistic life size brain model can be divided into 9 parts showing the temporal and occipital lobes, the frontal and parietal lobes, the cerebellum, the brain stem and the basilar artery. All structures, including blood vessels, are shown in great detail

**Size :** 19\*16\*17cm  
**Net weight :** 2000g

ESB51149



**Brain Model With Functional Region Painted**

Life size brain with distinct colour coding for the following regions: frontal lobe, parietal lobe, occipital lobe, temporal lobe .motor cortex, somatosensory cortex, limbic cortex, cerebellum, brain stem.

**Size :** 19.8\*16.5\*14.5cm  
**Net weight :** 1400g

ESB51150



**Right Brain Model With Functional Region Painted**

A life size half brain model with distinct colour coding for the following regions: frontal lobe, parietal lobe, occipital lobe, temporal lobe, motor cortex, somatosensory cortex, limbic cortex, cerebellum, and brain stem

**Size :** 18\*14\*16.5cm  
**Net weight :** 370g

ESB51151



**Deluxe Brain Model,1.5 Times Enlarged**

A life size half brain model with distinct color coding for the following regions: frontal lobe, parietal lobe, occipital lobe, temporal lobe, motor cortex, somatosensory cortex, limbic cortex, cerebellum, and brain stem

**Size :** 36\*23\*20cm  
**Net weight :** 2500g

ESB51153



**Brain Model,9 Parts,Life Size**

This extremely realistic life size brain model can be divided into 9 parts showing the temporal and occipital lobes, the frontal and parietal lobes, the cerebellum, the brain stem and the basilar artery. All structures are shown in great detail.

**Size :** 19\*16\*17cm

ESB51154





**Brain Model 4d**

A life size half brain model with Artery with distinct color coding for the following regions: frontal lobe, parietal lobe, occipital lobe, temporal lobe, motor cortex, somatosensory cortex, limbic cortex, cerebellum, and brain stem .

**Size :** 9\*9\*8cm

**Net weight :** 200g

ESB51152



**Diencephalon Model**

This 4-part model, 5X life-size, shows the human diencephalon: all the main parts of thalamus, epithalamus, metathalamus and hypothalamus are represented in great detail. The hypothalamic nuclei are displayed in different colours; the thalamus is removable and divisible into two parts to show the inner anatomy

**Size :** 25\*18\*24.5cm

**Net weight :** 1600g

ESB51155



**Ventricles and Basal Nuclei Model**

This life-size model is an important tool to study the topography of the cerebral ventricles related to the basal nuclei. All the different structures are reproduced in great detail

**Size :** 9.5\*9\*7.5cm

**Net weight :** 130g

ESB51156



**Neuron Model, 2500 Times Enlarged**

Magnified to 2,500 times life size, this typical myelinated neuron shows all the internal cellular structures. The neuron model displays the cell body, and the myelin sheath with nodes of Ranvier and Schwann cells can be revealed by removing a part of the dendrite. Mounted on base.

**Size :** 42\*32\*12cm

**Net weight :** 1500g

ESB51157



**5th Cervical Vertebra Model , 7 Times Enlarged**

7X life size. This model shows in great detail the structure of the 5th cervical vertebra; a transverse section of the spinal cord with grey and white matter, the nerve branches, the spinal ganglion and the blood vessels. **Size :** 40\*26\*10cm

**Net weight :** 1300g

ESB51158





**Eye Model,3 Times Enlarged**

3X life size. The model can be dissected on the horizontal plane to show internal details. Cornea, iris, lens, and vitreous body can be removed. Muscular attachments on the sclera and part of the choroid are also shown.

**Size :** 12\*13\*13cm

**Net weight :** 400g

ESB51160



**Eye Model,6 Times Enlarged**

6X life size. The model can be dissected on the horizontal plane to show internal details. Cornea, iris, lens, and vitreous body can be removed. Muscular attachments on the sclera and part of the choroid are also shown.

**Size :** 18\*16\*26cm,

**Net weight :** 1400g

ESB51161



**Ear Model,3 Parts, 3 Times Enlarged**

3X life size. The model shows details of the external, middle and inner ear. The eardrum with malleus, incus and stapes are removable. The other removable part is composed of the cochlea and labyrinth with vestibular and cochlear nerves.

**Size :** 23\*23\*34cm

**Net weight :** 1300g

ESB51162



**Ear Model,5 Parts, 3 Times Enlarged**

3X life size. Te model shows the external, middle and inner ear. The eardrum with malleus, incus and stapes are removable. The other removable parts are composed of: cochlea and labyrinth with vestibular and cochlear nerves, 2 bone sections that define the middle and inner ear

**Size :** 23\*23\*34cm

**Net weight :** 1300g

ESB51163



**Arteriosclerosis Model With Thrombus**

Atherosclerosis is the most common acquired disease of arteries in developed countries. This pathology. Characterized by thickening of the arterial walls with subsequent loss of elasticity, is associated with the build up of plaque (mainly cholesterol) in the arterial lumen. This model, approximately 10X life size, shows the atheromatous plaque in various pathological stages along with local intra vascular clotting (thrombosis) due to the arterial narrowing.

**Size :** 17\*15\*5cm

**Net weight :** 400g

ESB51164



**Four Staged Vessels Model**

Four-stage cross-section of an artery demonstrating progressive atherosclerosis in which the narrowing of the artery is due to a build up of fatty tissue (cholesterol) and plaque shown in. Shown in four stages: normal artery, fatty streak, fibrous plaque, and blockage. The stages cause a decrease in blood flow, which can lead to a blood clot or thrombus. All stages rotate on hinge pin.

**Size :** 18\*14\*5cm,

ESB51165







**4-Stages Diseased Vertebra Model**

4-Stage Vertebrae Model Set of four, full size two-piece vertebrae models one each of the following conditions: normal, herniated disc, bone and disc degeneration, and advanced osteoporosis with marked bone compression and bone spurs.

**Size :** 26.7\*15.5\*9cm,  
**Net weight :** 650g

ESB51166



**4-Stage Vertebrae Model**

Set of four, full size two-piece vertebrae models - one each of the following conditions: normal, (bulging) herniated disc, bone and disc degeneration, and advanced osteoporosis with marked bone compression and bone spurs.

**Size :** 18\*15\*14cm,  
**Net weight :** 800g

ESB51167



**Diseased Tooth Model**

This 4X life size model shows the process of dental caries in its progressive stages. The tissues forming the tooth (enamel, dentine and pulp) are shown, along with the way in which they are affected by the caries process.

ESB51168



**Diseased Tooth Model With Base**

This 1-piece model is approximately 10X life size; it shows the most important dental pathologies, including dental caries, pulpitis, gingivitis and periapical periodontitis.

**Size :** 12\*11\*20cm,

ESB51169



**Diseased Stomach Model**

This life size model is dissected and it show the internal structure of the stomach, including the mucosa, the pylorus, a section of the gastric wall. The model also shows the superficial muscular layers and the blood vessels, diseases also presented there,

**Size :** 19\*18\*15cm,

ESB51170



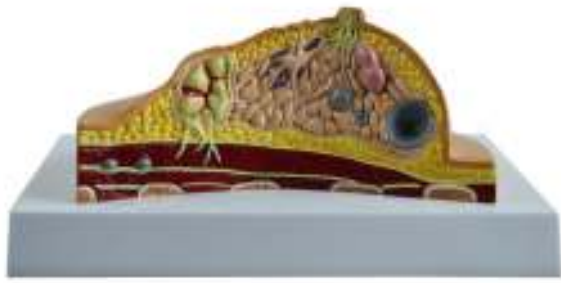
**Diseased Kidney Model**

This oversized two-sided kidney model has a normal anatomy cutaway on one side and a diseased anatomy cutaway on the other side depicting: infection, scarring, atrophy, urinary (kidney) stones, tumor, polycystic disease, hypertension effects,

**Size :** 19\*11\*15cm

ESB51171





**Diseased Breast Model**

Full size cross-section model depicts common pathologies such as adenocarcinoma, cysts, fibroadenoma, and infiltrating scirrhous carcinoma.

Model also shows breast structures such as suspensory ligaments, fat tissue, lymph nodes, muscles, and ribs.

**Size :** 21\*15\*10cm  
**Net weight :** 500g

ESB51172



**Diseased Uterus / Uterus-Ovary Model**

Full size cross-section model illustrates multiple pathologies, some of which include: adhesions, carcinoma in four common areas, cysts, endometriosis, fibroids - PEDunculated fibroid tumour, polyps and salpingitis,

**Size :** 24\*12\*20cm  
**Net weight :** 600g

ESB51173



**Diseased Large Intestines Model**

Cut-away view model with the following common pathologies: adhesions, appendicitis, bacterial infection, cancer, Crohn's disease, diverticulitis, diverticulosis, polyps, spastic colon, and ulcerative colitis.

**Size :** 19\*15\*23cm  
**Net weight :** 700g

ESB51174



**Normal and Diseased Prostate Gland**

This is an excellent educational tool for studying common prostate pathologies. The model consists of three prostate sections, including the rectum and urinary bladder. The first model shows the internal and external structures of a normal prostate. The second one illustrates benign prostatic hyperplasia, characterized by variable fibromuscular and epithelial predominance. The third model illustrates prostatic adenocarcinoma.

**Size :** 20\*15\*17cm  
**Net weight :** 580g

ESB51175



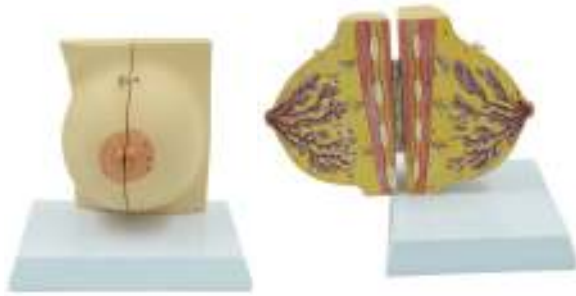
**Thyroid Diseases Model - 4 Parts**

This model is composed by 2 thyroid models divided four ways. The first thyroid illustrates the Graves autoimmune disease, the most common cause of hyperthyroidism. The other model shows thyroid adenoma and carcinoma as compared to the normal right side of the thyroid.

**Size :** 16.5\*12.5\*2.5cm  
**Net weight :** 500g

ESB51176





**Breast Model**

Full size cross-section model depicts common pathologies ,Medially divided into 2 halves, Model also shows breast structures such a suspensory ligaments, fat tissue, muscles, and ribs.

**Size :** 14.5\*12\*10cm, **Net weight :** 650g

ESB51178



**Lactation Breast Model**

Life size Breast model Medially divided into 2 halves Healthy lactating breast tissue on the cut surface of the external half

Breast gland inflammation (mastitis) on the cut surface of the inner half

**Size :** 20\*20\*25cm, **Net weight :** 1500g

ESB51177



**Pathological Model Of The Lung**

This 1-part, 2/3 life size model illustrates some of pathologies of the pulmonary stem caused by microbial infections (lung abscess, pneumonia and tuberculosis). The surface of the model is black to show the visible effect of smoking. A cancerous tumour is also shown with excellent detail. All pathologies are showed separately in the model with a realistic representation of their morphology.

**Size :** 11\*11\*20cm,

**Net weight :** 290g

ESB51179



**Pathological Model Of The Liver**

This 1/3 life size model is divided into 2 parts; the following diseases are represented with great detail and realism: - Viral hepatitis - Liver abscess - Fatty liver - Cirrhosis - Liver cancer - Gallstones All the pathologies are showed separately in the model with a realistic representation of their morphology.

**Size :** 11\*11\*16cm,

**Net weight :** 240g

ESB51181



**Pathological Model Of Bronchial**

This 10X life size, 1-part model, shows 2 pathologies of the bronchi (bronchitis and bronchiectasis), referring to an inflammation and an abnormal chronic dilatation of one or more of the bronchi, respectively.

**Size :** 11\*11\*20.5cm,

**Net weight :** 240g

ESB51180



**Pathological Model Of The Pancreas ,Duodenum And Gallbladder**

This life size model is a representation of the most important diseases of the gallbladder, pancreas and duodenum. The gallbladder, partially opened, shows the stones located in various locations, cholecystitis, polyposis and carcinoma. Diseases of the pancreas include pancreatitis in the pancreas tail and cancer in the pancreas head. Also included is a section of the duodenum with a duodenal ulcer.

**Size :** 17\*11\*11cm,

**Net weight :** 280g

ESB51182





**Pathological Model Of Burned Skin**

This model, approx. 30 times enlarged, compares normal skin with first, second and third degree burnt skin, showing also the subsequent pathological changes. The first level of injury shows scarf skin hurt and erythema; the second one includes hypodermic skin hurt and vesicles, the third one reveals a subcutaneous damage.

**Size :** 18\*14\*7.5cm,  
**Net weight :** 360g

ESB51183



**Pathological Model Of The Skin**

This model approximately 30X life size, features, on the one side, detailed and realistic depictions of closed and open acne lesions, 2 primary lesions (papule and macule), 1 deeper lesion (nodule) and an abrasion. On the other side the model shows cyst, fissure, pustule, ulcer, scale and blister. All the pathologies are showed separately in the model with a realistic representation of their morphology.

**Size :** 18\*14\*11.5cm,  
**Net weight :** 340g

ESB51184



**Pathological Model Of The Rectum**

This 1-piece model, approximately 5X life size, shows various pathologies of the rectum and anus. Common anorectic conditions, including haemorrhoids, anal fistula and fissures and 2 types of abscesses are shown in great detail. The model also illustrates ulcerative colitis, polyps and rectal carcinoma.

**Size :** 11\*12\*24cm

ESB51185



**Diabetes Model**

This model shows the effects of diabetes on eye, heart, kidney and foot. The organs can be rotated for a detailed examination.

**Size :** 18\*14\*35cm

ESB51186

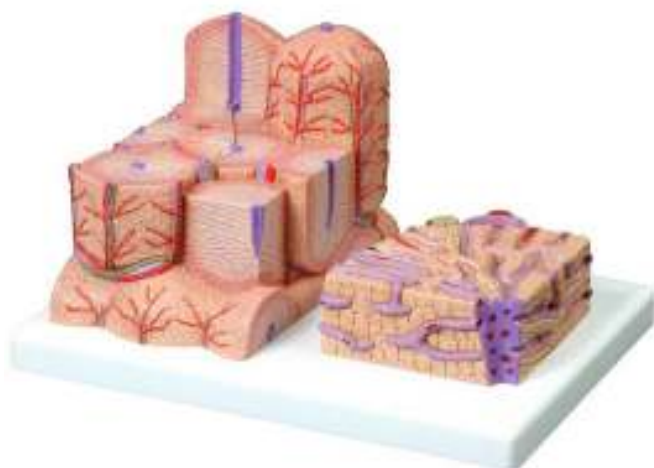




### Micro Anatomy Of Artery & Veins

The model shows a medium-sized muscular artery with two adjacent veins from the ante-bronchial area with adjoining fat tissue and muscle enlarged 14 times. The model illustrates the reciprocal anatomical relationship of artery and vein and the basic functional techniques of the venous valves ("valve function" and "muscle pump"). The left vein and the middle artery are fenestrated in the upper anterior segment, revealing the various layers of the wall structure in a cross and longitudinal section and in top view. The right vein is opened throughout in the anterior segment, revealing the orifice of a feeder vein and two venous valves, i.e. "flap valves" formed by a duplication of the tunica intima. On the rear of the model, the relief of two veins is shown to illustrate the functional aspect of the venous valves. This model mounted on a base.

ESB51191



### Micro Anatomy Of Liver

This two part model shows a highly magnified diagrammatic view of a section of the liver. It illustrates the structure of the functional and structural components of the liver in two different enlargements. The left part of the model shows a section of the liver that comprises several liver lobules. The right part of the model is a highly magnified view of the sectional liver lobule on the left.

ESB51192



### Taste Discrimination

Can you taste it? Students explore their ability to taste four sensations: sweet, sour, salt, and bitter in a blind taste test. Students examine PTC inheritance, as well as their tendency to eat certain types of foods. An ideal biology lab for learning about genetic inheritance or for studying human anatomy. This kit features two lab experiments which can be completed in one hour or separated into two thirty minute activities. Required, but not included: dedicated lab-ware for measuring taste test substances, which may be consumed. Designed for 24 students working in groups of two. Grades 9-12

ESB51187

### Taste Discrimination Refill

ESB51188

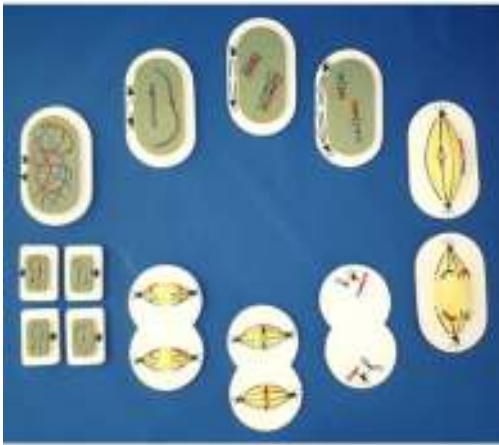


### Micro Anatomy Of Eye

The model illustrates the microscopic structure of the retina with choroid and sclera. The left block-like, layered side of the model side shows the complete structure of the retina including the supplying vascular layer and parts of the sclera from a light microscopic view. The right part of the model is a sectional enlargement. It shows the microscopic structure of the photoreceptors and the cells of the pigmented layer.

ESB51190





**Meiosis, Unmounted Model**

The ten separate stages of ESB51389, numbered, with key. 13 parts.

ESB51390



**Mitosis Cell Model**

This item is composed of 8 different pieces showing the main stages of the cell mitosis (prophase, metaphase, anaphase and telophase) at an enlargement of approx. 10000 times. During all stages you can observe the different characteristics of the cellular structures such as chromosomes, centrioles, spindle and nucleus. Every single piece is numbered to indicate the correct sequence of steps.

ESB51391



**Mitosis, mounted Model**

The eight separate stages of ESB51392 numbered , with key. 9 parts.

ESB51393



**Mitosis (Mitotic Cell Division)**

A robust plastic model showing eight stages of mitosis. The model is carefully coloured for maximum clarity and teaching value. Each stage is numbered and a key is attached. Base size 33\*39cm.

ESB51392



**Meiosis (Reduction Division) Model**

10 stages of the process of Meiosis are depicted on this unique and high quality model. Each stage is expertly hand painted and mounted on a perspex base.

ESB51389



**Spirometer**

The Spirometer can be used for investigating tidal volumes, respiratory rate, pulmonary ventilation, reserve volumes and vital capacity. Oxygen consumption can also be measured which is useful in metabolic studies.

A simple lever control enables the subject to be connected either to atmosphere or to the float for recording. A container for soda-lime crystals is fitted which can be used to absorb carbon dioxide. The spirometer is designed to offer minimum resistance to air flow. This means greater comfort for the subject and more realistic results. The tank is one piece stainless steel pressing housed in a durable painted outer case. The float is constructed from lightweight plastic. The float is calibrated 0 to 7 x 0.5 litres and has a metal counterpoise. The pen arm corresponds to approximately 0.5 litres.

Supplied with a mouth piece that fits into the corrugated breathing hoses which snugly connects into Spirometer Also included a nose clip and pen arm for fitting data logger sensors.

**Notes**

1. Soda lime crystals are not supplied.

Dimensions External : 720w x 320d x 230h mm

Packed : 800 x 430x 330mm.

ESB51430

**Spirometer Digital Hand Held**

Digital Spirometer duplicates the performance of professional instruments by quickly and accurately measuring lung volume. Digital spirometer includes 50 disposable mouth pieces and is a nice addition to physiology, anatomy and health classes. Ideal to use with the included AC adapter or with two AA batteries for the field. The large digital display gives instant volume readouts, without having to see anymore lengthy calculations.

ESB51431

**Respirometer, Simple**

The Simple Respirometer BFS 74 is an apparatus which is used to determine how much O<sub>2</sub> which consumed by insect or plants. Consisting of two main parts, viz.: a glass capillary pipe and a glass bottle.

The capillary pipe has scale printed clearly, not easy fade. One end of the pipe is bigger and finely grinded, used as the connector to the bottle.

The glass bottle is sized 40 ml, made of borosilicate glass which is used as the specimen container. The bottle neck is also finely grinded, so it makes strong connection and free of leakage when it is attached to the capillary pipe.

The main part is mounted using clamps made of steel spring on a plastic base sized 400 x 50 cm.

ESB51433

**Respiration Apparatus**

For inhaled and exhaled air test. Comprises two boiling tube each with stopper and two lengths, one short and one long of 5 mm glass tubing, connected by PVC tubing and plastic T.

ESB51432

**Respirometer Simple**

The apparatus consists of two stoppered boiling tube connected by three-way taps to either limb of graduated manometer. Complete with wire baskets for supporting organisms.

Comprising rates of absorption or evolution of gases by small organisms, during respiration. The apparatus consists of two stoppered boiling tube connected by three-way taps to either limb of graduated manometer. One tube holds the organisms and has syringe for altering the level of liquid in the manometer during setting up. The other tube acts as a control thermo barometer. CO<sub>2</sub> given off by the respiring organism is absorbed by potassium hydroxide in the experimental chamber resulting in a change in the level of liquid in the manometer tube. Complete with wire baskets for supporting organisms.

ESB51434





**Skin Fold Calliper**

Body fat tester designed to measure the thickness of a fold of skin with its underlying layer of fat. Convenient trigger operation with pistol-grip handle. Direct reading scale measures 0 to 85 mm and is accurate to 0.5 mm. Durable, accurate, and easily used by students. Complete instructions included.

ESB51467



**Aids Virus Model**

An enormously magnified model of the HIV virus, showing the outer lipid membrane with protein structures and the internal RNA. The internal structure is removable. **Size** : 18\*13\*13cm.

ESB51469



**HIV Virus Model**

This model, enlarged many times, shows the structure of the HIV retrovirus, including the outer lipid membrane with protein structures and the internal nucleus containing the viral genome.

ESB51470

**Food Calorimeter**

The food calorimeter allows students to determine the amount of energy released through the burning of food. This easy to use method involves the measuring of the change in temperature of a sample of water from the combustion of a small amount of food. The included experiment introduces concepts in thermodynamics and leads to an understanding of energy and its relation to food consumption.

- Supplied with instruction manual  
 Kit includes:
- 125 ml Erlenmeyer flask
  - Cylindrical metal stand
  - Metal suspension plate
  - Cork and nail food sample holder
  - Rubber stopper



ESB51472



**Dietary Chemical Assessment**

The purpose of this kit is to provide students with the necessary tools for evaluating their own dietary requirements in a very scientific way. Students learn about sources of energy, proteins, vitamins, and minerals; and the functions of these nutrients within their bodies. They record their food intake over a three-day period. By using the food charts provided and internet resources, they determine their average daily caloric intake. Then they determine their basal metabolic rates and average energy expenditures over the three-day period. They also determine the number of calories they should obtain from carbohydrate, lipid, and protein sources to satisfy their energy expenditures based on the percentage of the total energy requirement each nutrient should supply. Finally, students compare their intake of vitamins and minerals to the recommended dietary allowances. From this information, students may identify and correct any dietary imbalances that occur and restructure their food intake. Grades 6-12

ESB51468



**Grip Dynamometer**

Hand Dynamometer Grip Strength Meter!!  
 Handy and reliable!!  
 Handy dynamometer is ideal for routine screening of hand grip strength at home or in school.  
 Dynamometer measures isometric grip force from 0 – 130 Kg  
**Size** : Approx. 10.5cm x 14cm x 2cm / 4.13" x 5.51" x 0.79"  
 Unit : Kg  
 Package includes : 1 x Hand Dynamometer Grip Strength Meter

ESB51471



**Food Calorimeter II**

Open at both ends (205 x 100) mm (height x diameter). A circular metallic disc of diameter 100 mm with a boss head for mounting on a 13 mm retort rod used as the floor of the combustion chamber. The whole assembly is fitted on a (200 x 130) mm rectangular base with a rod of 13 mm diameter.

ESB51473





**Human Anatomy Chart Set**

Set of 11 chart covering different topic of human anatomy includes: Skeleton \* Circulatory System \* Heart \* Nervous System \* Section of Brain \* Muscles \* Digestive System \* Respiratory System \* The Ear \* The Eye \* Human Kidneys each Laminated charts with hanger , size 50x70cm

ESB51523

- ESB51524 Chart the human skeletal system
- ESB51525 Chart the human musculature system
- ESB51526 Chart the human urinary system
- ESB51527 Chart the human nervous system
- ESB51528 Chart the human respiratory system
- ESB51529 Chart the human circulation system
- ESB51530 Chart the human digestive system
- ESB51531 Chart the human skin
- ESB51532 Chart the human ear
- ESB51533 Chart the human eye
- ESB51534 Chart the human brain
- ESB51535 Chart the human heart
- ESB51536 Chart the human teeth
- ESB51537 Chart the human liver
- ESB51538 Chart the human stomach

**Human Anatomy Chart Set**

Set of 11 chart covering different topic of human anatomy includes: Skeleton \* Circulatory System \* Heart \* Nervous System \* Section of Brain \* Muscles \* Digestive System \* Respiratory System \* The Ear \* The Eye \* Human Kidneys each Size 50x70cm

ESB51523





### Photosynthesis I: The Hill Reaction

Using this kit, students carry out a partial process of photosynthesis known as the Hill Reaction, which is the proteolysis of water in isolated chloroplasts. The splitting of water with the evolution of oxygen and the release of hydrogen is measurable in the course of the reaction by the bleaching of the hydrogen acceptor using a spectrophotometer or visual examination. The Hill Reaction is run in the light and in the dark to demonstrate the light dependence of the reaction. Required, but not included: centrifuge, blender, spectrophotometer (optional), a light source, glassware, and fresh spinach or lettuce leaves. Designed for 24 students working in six groups of four.

Grades 9-14

ESB51642



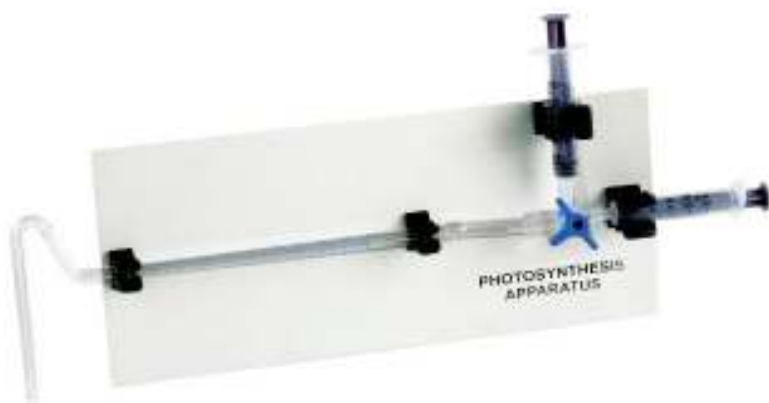
### Photosynthesis II: The Synthesis Of Starch

Photosynthesis II examines the phosphorylation of glucose to produce starch in plant cells.

Students collect phosphorylase in potato extract and use it to catalyse the synthesis of starch. They learn that starch synthesis requires primer starch to which glucose residues can be added and that inorganic phosphate inhibits starch synthesis. Required, but not included: blender, fresh potatoes. Designed for 24 students working in six groups of four.

Grades 9-14

ESB51643



### Photosynthesis Apparatus

For the measurement and collection of gas evolved by aquatic plants during photosynthesis. The gas evolved can be measured by the calibrated capillary tube and drawn off for analysis by the plastic syringes. Mounted on a plastic panel 190 x 150 mm approx.

ESB51644



### Potometer I

deal for laboratory and field use. Allows the students to measure transpiration. The apparatus has only one glass component and is mounted on a strong backing plastic plate. It consists of Capillary tube with millimetre scale connected via three-way tap to syringe.

ESB51646





**Potometer II**

Use for measuring speed of water absorbed by plant.  
 Overall **Size** : 350 x 65 x 150 mm  
 Material : Borosilicate glass  
 Scaling capillary tube 0.9 x 0.01 ml  
 Mounted on metal plate base  
 Dimension : (L) 35.00 x (W) 6.50 x (H) 15.00 cm  
 Weight : 0.350 kg.

ESB51647



**Potometer Ganong's**

Comprises a graduated, narrow bore, horizontal glass measuring tube with a vessel for a plant shoot at one end and having a vertical limb with a stopcock and a funnel fitted by a ground glass joint. Mounted on a plastic stand.

ESB51648



**Porous Pot**

**Size** : 150 x 60mm height x dia.

ESB51650



**Potometer H Type**

Suitable for individual student use, the cut shoot is attached to the side arm with tubing and the wide glass tube acts as the reservoir. Glass tube 160 x 20 mm with side arm 8 mm diameter. Capillary tube length 140 mm with 1 mm Bore..

ESB51649



**Clinostate - Electrical**

For demonstration of heliotropism and geotropism. Germinating seedlings are pinned to the cork table which is rotated by an electric motor at 4 revolutions per hour. The motor is spindle mounted and may be clamped so that the place of the table can be set at any angle between horizontal and vertical. An epoxy resin cover is provided for the cork table to shield the seedlings from droughts. Diameter of cork disc 100 mm

ESB51645





**Mode Transmission Of Seed - PE**

This real different Mode of seed transmissions has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. .Epoxy resin block will not break even if it is accidentally dropped..

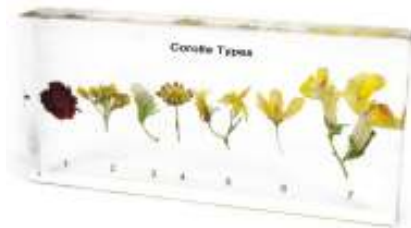
ESB51664



**Specimen Of Inflorescence Types - PE**

This real different type of Inflorescence has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. .Epoxy resin block will not break even if it is accidentally dropped. .

ESB51665



**Specimen Of Corolla Types - PE**

This real different type of Corolla has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. .Epoxy resin block will not break even if it is accidentally dropped. .

ESB51666



**Specimen Of Rhodophyta - PE**

This real Rhodophyta has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. .Epoxy resin block will not break even if it is accidentally dropped. .

ESB51667



**Specimen Of Phaeophyta - PE**

This real Phaeophyta,s has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. .Epoxy resin block will not break even if it is accidentally dropped. .

ESB51668



**Specimen Of Law Of Gene Isolation - PE**

This Corn Gene Isolation has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. .Epoxy resin block will not break even if it is accidentally dropped. .

ESB51669



**Plant Kingdom Set I - PE**

This real different type of plants has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. .Epoxy resin block will not break even if it is accidentally dropped. Set includes 9 pcs .

ESB51661

**Plant Kingdom Set li - PE**

This real different type of plants has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. .Epoxy resin block will not break even if it is accidentally dropped. Set includes 20 pcs

ESB51662





**Different Roots System - PE**

This real different type of plant roots has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. Epoxy resin block will not break even if it is accidentally dropped.

ESB51670



**Specimen Of Roots**

This real different type of Roots has been placed on board for observation and study. Durable, .

ESB51689



**Mechanisms Of Herbicides**

This exercise is designed to demonstrate the effectiveness of different categories of chemical herbicides. Students transplant grasses and weeds into flats or pots and investigate how and why different plants are killed by different chemical herbicides. A simultaneous microbiological proof with inoculated agar plates is run to reinforce the results, further categorize herbicides, and determine possible effects of the herbicides on soil micro-organisms. Each group will choose two natural products and design a simple experiment to compare chemical vs. natural weed killers. A round table discussion including experimental designs, results, comparisons, and possible environmental impact culminates the exercise. Requires five class periods, plus research time. Required, but not included: heat source, flower pots or nursery flats, grass and weeds for transplanting. Designed for 24 students working in four groups of six. Grades 9-14.

ESB51696



**Air Fern**

Did you know that air ferns do not need soil or water to grow? How can such claims be true? Students will experiment, observe, and grow air ferns in six experiments as they develop questions, make predictions, and employ the scientific method to test hypotheses. Students learn to design experiments, use proper controls, limit variables, take proper measurements, and explain the data they collect. They will finally discover that the air fern is not what they have expected and conclude that the air fern is not a plant at all. Stereo microscope recommended. Designed for 24 students working in six groups of four. Grades 5-8.

ESB51697



**Fern Life Cycle Model**

A series of eight models displaying the alternation of generations in the life cycle of the fern. The series is: sori on pinnule; sori after dehiscence; vertical section of sorus; structure of dehiscing sporangium; prothallus with antheridia and archegonia; section through mature archegonium; section through antheridium; gametophyte with young sporophyte. With key card, on base, Size : 40.5\*23.5cm.

ESB51698





**Germination Model Activity Set**

3-D Monocot and dicot plant germination is shown on this markable 60\*45cm model. The included activities support the teaching of seed development. Includes a Teacher's Guide with an overhead transparency black line master, student activities, key and glossary.

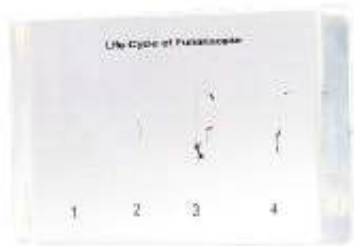
ESB51700



**Germination Model**

This germination model is 5 times enlarged and for 10 times enlarged & showing beans, the rye seeds pushes up from the soil a green shoot, the bean first appears as a two leaved shoot and the shoots of the first appear from the earth first throwing out their star-shaped leaves. Mounted on base. Numbered with English Key Card

ESB51701



**Life Cycle Of Fumariaceae - PE**

This real Fumariaceae life cycle embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. .Epoxy resin block will not break even if it is accidentally dropped.

ESB51709



**Life Cycle Of Fern - PE**

This real Fern life cycle embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. .Epoxy resin block will not break even if it is accidentally dropped.

ESB51710



**Life Cycle Of Pine - PE**

This real Pine life cycle embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. .Epoxy resin block will not break even if it is accidentally dropped.

ESB51711



**Life Cycle Of Cotton - PE**

This real Cotton life cycle embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. .Epoxy resin block will not break even if it is accidentally dropped.

ESB51712



**Specimen Of Bean Germination - PE**

This real Bean Germination embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. .Epoxy resin block will not break even if it is accidentally dropped.

ESB51713



**Specimen Of Corn Germination - PE**

This real Corn Germination embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. .Epoxy resin block will not break even if it is accidentally dropped.

ESB51714





**Peanut Germination - PE**

This real Peanut Germination embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. .Epoxy resin block will not break even if it is accidentally dropped.

ESB51715



**Sorghum Germination - PE**

This real Sorghum Germination embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. .Epoxy resin block will not break even if it is accidentally dropped.

ESB51716



**Paddy Rice Germination - PE**

This real Paddy Rice Germination embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. .Epoxy resin block will not break even if it is accidentally dropped.

ESB51717



**Wheat Germination - PE**

This real Wheat Germination embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. .Epoxy resin block will not break even if it is accidentally dropped.

ESB51718



**Soy bean and Corn Growth Process**

This real of Soy bean and corn growth stages has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. .Epoxy resin block will not break even if it is accidentally dropped.

ESB51719

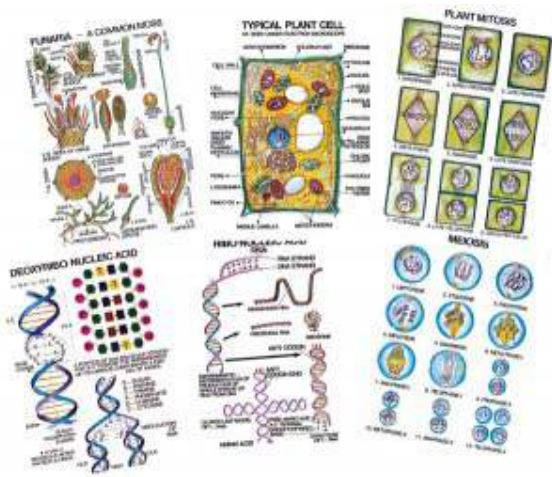


**Plant Germination Set - PE**

This real different type of plants Germination has been embedded in block for observation and study. Durable, clear epoxy resin allows close up viewing from all angles. .Epoxy resin block will not break even if it is accidentally dropped. Set/10

ESB51731





**General Botany Chart I Set**

Set of 8 charts covering different topics General Botany - each Size 50x70cm  
Includes : Typical Plant Cell \* Plant Mitosis \* Meiosis \* D.N.A. \* R.N.A. \* Bacteria \* Spirogyra \* Funaria.

ESB51775

**General Botany Chart Ii Set**

Set of 8 charts covering different topics of General Botany . Size each 50x70cm  
Includes : \* Plant Kingdom \* Germination of Sunflower & Maize \* Germination of Bean & Pea \* Yeast \* Rhizopus & Mucor \* Fern \* Insectivorous Plants

ESB51776

**Individual Botany Charts**

- |          |                                     |                                |
|----------|-------------------------------------|--------------------------------|
| ESB51777 | Chart the plant cell                | Laminated charts size 50x70 cm |
| ESB51778 | Chart the plant mitosis             | Laminated charts size 50x70 cm |
| ESB51779 | Chart the plant meiosis             | Laminated charts size 50x70 cm |
| ESB51780 | Chart the dna                       | Laminated charts size 50x70 cm |
| ESB51781 | Chart the rna                       | Laminated charts size 50x70 cm |
| ESB51782 | Chart the bacteria                  | Laminated charts size 50x70 cm |
| ESB51783 | Chart the spirogyra                 | Laminated charts size 50x70 cm |
| ESB51784 | Chart the funaria                   | Laminated charts size 50x70 cm |
| ESB51785 | Chart the germination of sunflower  | Laminated charts size 50x70 cm |
| ESB51786 | Chart the fern                      | Laminated charts size 50x70 cm |
| ESB51787 | Chart the plant kingdom             | Laminated charts size 50x70 cm |
| ESB51788 | Chart the flower                    | Laminated charts size 50x70 cm |
| ESB51789 | Chart the stem                      | Laminated charts size 50x70 cm |
| ESB51790 | Chart the root                      | Laminated charts size 50x70 cm |
| ESB51791 | Chart the leaf                      | Laminated charts size 50x70 cm |
| ESB51792 | Chart the germination of bean & pea | Laminated charts size 50x70 cm |
| ESB51793 | Chart the yeast                     | Laminated charts size 50x70 cm |
| ESB51794 | Chart the rhizopus & mucor          | Laminated charts size 50x70 cm |



**Living Plants**

**Pond Weed**

- |          |                        |   |
|----------|------------------------|---|
| ESB51853 | Egeria Densa           | Oxygenator. Approx 10 strands - PEr bunch                       |
| ESB51854 | Myriophyllum Scabratum | Oxygenator. Approx 10 strands - PEr bunch                       |
| ESB51855 | Duckweed               | "Lemna. Fast growing & free floating. Over 100 plants per pack" |

**Plants**

- |          |           |  |
|----------|-----------|--|
| ESB51856 | Liverwort | Named species - PEr pack               |
| ESB51857 | Fern      | Fertile fronds - PEr pack              |
| ESB51858 | Moss      | Sexual stage. Named species - PEr pack |
| ESB51859 | Moss      | Ideal for the vivarium , 250g          |

**Carnivorous Plants**

- |          |                |                   |
|----------|----------------|-------------------|
| ESB51860 | Pitcher Plant  | Sarracenia , each |
| ESB51861 | Venus Fly Trap | Dionea , each     |
| ESB51862 | Sundew         | Drosera , each    |







**Leaf Lilac (Stringa Sp) Model**

A vertical section shows epidermis, palisade and spongy mesophyll, stomata and a small vein. A separate underside view of the leaf surface shows stomata. Both models are approx x700. Supplied with key card, mounted on base  
**size** : 27\*21cm.

ESB51928



**Dicotyledon Leaf Model**

A section through a typical leaf, showing epidermis, palisade and spongy mesophyll, vascular bundle and stomata. Supplied with key card.  
**Size** : 15\*10\*6cm.

ESB51929



**Dicot Root Model T.S.**

This model shows a typical dicot root with complete internal details. Mounted on board. Numbered with English Key card.

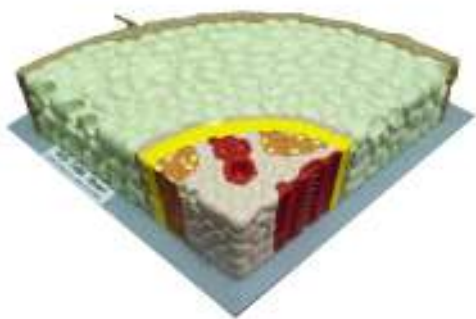
ESB51930



**Monocot Root Model T.S.**

Showing complete internal details of root. Mounted on base. Supplied with English Key Card.

ESB51931



**Dicotyledon Root (Vicia Fabia)**

A section through a typical dicotyledon root in the region of the root hairs. One side shows a longitudinal section through phloem and the other through xylem together with adjacent tissues.  
 Radius of section 17cm, thickness 6 cm.  
 Supplied with a key card.

ESB51932



**Monocot Root (Iris) Model**

A wedge shaped sector through a typical monocotyledon root, giving transverse and longitudinal sections. Longitudinal section of phloem and xylem tissues are shown. Supplied with key card.  
**Size** : 34\*21.5\*5cm.

ESB51933





### Dicotyledon Stem (Helianthus S)

The top surface of the model represents a transverse section of a wedge shaped sector of the stem and includes all the tissues from epidermis to pith. One entire vascular bundle is shown and half an adjacent one. The interfascicular tissues and vascular bundle are shown in longitudinal section. The outer surface represents a view of the epidermis with stomata. Supplied with a key card.

**Size :** 38\*30\*8cm.

ESB51934



### Dicot Stem Anatomy Model T.S. & L.S.

Model shows the transverse and longitudinal section of a dicotyledonous stem in which case the cambium ring has been formed but no secondary growth has yet taken place. Very useful model for study of epidermis, cork layer, cork cambium, cortical parenchyma, starch sheath medullary rays, phloem, sieve plate, sieve tube, phloem parenchyma and inter fascicular cambium, xylem, pitted vessels pith etc. Mounted on base. Numbered With English key card.

ESB51935



### Monocot Stem Anatomy Model T.S. Or L.S.

Exhibits the various tissues and scattered closed and collateral vascular bundles in transverse and longitudinal sections in maize. The large pitted vessels, spiral and annular vessels show the anatomy of monocot stem. On base. Supplied with English Key Card.

ESB51936



### Monocotyledon Stem (Zea Mais)

Transverse and longitudinal sections of all tissues from epidermis to pith are included on this model. Two entire vascular bundles are shown, one entering into the stem from a leaf trace. Another two vascular bundles are shown in section, with longitudinal detail of the cells. Supplied with key card.

**Size :** 40.5\*23\*5cm.

ESB51937



### Pollination And Fertilisation Model

The main model is a vertical section through the stigma, style and ovary, showing the growth of the pollen tubes to the ovules. Separate models show anther, anther dehiscing, and different types of ovary in transverse and longitudinal section. Base

**Size :** 50\*33cm.

ESB51944



### Woody Dicot (Tilia) Model

A sector of a two-year-old stem with transverse, longitudinal and tangential sections. Shows development of annual growth rings. With key card, **Size**

: 35.5\*25\*6cm.

ESB51945





**Flower Model**

A greatly enlarged (10x) model to demonstrate the floral components and reproductive function of the flower. Each of the eight parts of the flower model represents one of the unique structural components such as the petals, sepals, stamens and pistil. Fertilisation is shown, with pollen grains on the stigma; one pollen tube is shown penetrating the micropyle. The anthers are sectioned and the ovary is dissected to show the female gametophyte. The model also depicts the scenario for double fertilisation. Mounted on a base and supplied with key card.

ESB51939



**Dicot Flower Model**

Dicot Flower model Representing a greatly enlarged, complete flower, made of non-breakable vinyl plastic model teaches the reproductive function of flowers, angiosperm pollination and fertilization. Three petals, four sepals and four stamens are detachable. Two anthers are sectioned open to expose pollen grains. The ovary is dissected to reveal the seven-celled female gametophyte. Pollination is demonstrated by pollen grains that have adhered to the stigma. One of them has generated a pollen tube that has penetrated the micropyle. Depicting the condition just prior to fertilization, the tube nucleus, closely followed by the two sperm cells, can be observed near the apex of the pollen tube.

Size : 36\*14\*12cm ,

Net weight : 500g

ESB51938

**Plant Cell Model**

Plant Cell Model

Plant Cell Model (3D- Dimension): The model is durable plastic, shows both microscopic & ultramicroscopic colored details : cell wall, plasma cytoplasm, nucleus, vacuoles, plastids, lysosomes, golgi apparatus, ribosomes, mitochondria, rough & smooth ER. Mounted vertically on a base.

( Catalogue or Hardcover key card of the numbered structures all labeled in Arabic & English printed nicely and pastes on the top surface of the base)

ESB51941



**Plant Cell Model, 20000 Times Enlarged**

This model, enlarged 20,000 times, shows the significant structures of a plant cell, including the wall, nucleus, vacuole, Golgi apparatus, mitochondria, chloroplast, chromoplast, leucoplast, endoplasmic reticulum. Mounted on board.

Size : 42\*30\*10cm,

Net weight : 2100g

ESB51942

**Plant Cell Model**

The two piece plant cell model shows the structures of a typical plant cell with cytoplasm and cell organelles, as viewed by an electron microscope. All important organelles of the plant cell are in raised relief and displayed in colour. Features included are:

Cell wall, Cell membrane, Nucleus, Smooth Endoplasmic Reticulum, Rough Endoplasmic Reticulum, Ribosome's, Chloroplasts, Mitochondria, Dictyosomes/Golgi apparatus,

The plant cell model is magnified 500,000 to 1,000,000 times.

Size : 20\*11.5\*32cm,

ESB51943



**Hydra Model**

A median longitudinal section of a green hydra, showing external and internal structure, budding, testis and ovary.

On base approx 56cm high. Supplied with keycard.

ESB51940





### Plant Cancer

Now cancer can be investigated in the lab, not just discussed in your classroom. Students safely study the various aspects of cancer cell growth with this totally self-contained kit. (A fresh carrot will be required.) Students explore various aspects of cancerous cell growth and learn to explain the differences between a normal cell and a cancer cell, describe similarities and differences between animal and plant cancers, identify cancer cells, identify a plant cancer or gall, and research current theories on the causes of cancer. Students grow their own sunflower plants; then induce crown gall by inoculating plant tissue with *Agrobacterium tumefaciens* (reply card item ships upon request and only in Continental US) which is required for inducing the cancerous growth. Students then do a Koch's Postulates Experiment: Inducing Cancer in Carrot Tissue. Grades 9-12

ESB52046



### Plant Cloning I (Introduction To)

Plant propagation by cloning is becoming increasingly important in food and flower production. Generating a plant by cloning its tissue is an exciting and challenging experience which teaches the importance of sterile laboratory methods. Students will germinate carrot seeds to provide plant material from which to establish a culture, use sterile technique to grow seedlings and establish a callus culture, and induce the development of multiple shoots (plantlets) from the callus tissue. The process takes approximately four months. No hood or incubator required. Includes an instruction manual, assessment questions, and a Power Point presentation with images of plant material at various stages of the experiment. Perishable reply card items ship separately upon request and only in the continental US. Grades 9-12

ESB52047



### Blood Typing Simutype (RH)

Blood typing for Rh factor is a medically important procedure. Rh genetics can be of concern during pregnancy and blood transfusions. Learn why under certain circumstances when the mother is Rh negative and the embryo is Rh positive, the baby can be at risk of attack by the mother's immune system. By determining blood types and taking appropriate medical precautions, the incidence of Rh-induced haemolytic disease of the newborn (erythroblastosis fetalis) fatalities have been substantially reduced in the United States. This kit features the safety of simulated bloods and antisera and the convenience of self-adhesive Hema-Tags. Includes an enhanced instructor's manual with background information, reproducible student worksheets, and comprehensive answer keys. Contains 5mL of anti-Rh and 2mL of each blood sample type. Materials provided are sufficient for up to 50 tests. Meets national standards for grades 9-12.

ESB52148



### Aids Simutest Kit

Students become biotech- technicians while using this AIDS test kit, running eight samples in a simulated ELISA to determine which patient(s) may have contracted the HIV virus. Kit includes simulated patient serums, conjugate, chromagen, and reusable pre-treated ELISA microtiter plates. The kit may be used many times; just add distilled water. The kit is totally safe for student use. It does not contain blood serum or infectious agents. Students experience the world of biotechnology while learning the biology of the HIV virus in a one hour lab investigation. Designed for six groups of four students. This kit is appropriate for college level coursework, college prep, or advanced biology courses. Grades 11-14.

ESB52150





### Plant Cloning Ii

Plant propagation by cloning is common in flower production. Generating a plant by cloning its tissue is an exciting and challenging experience which teaches the importance of sterile laboratory methods. Using this kit, students will establish a shoot multiplication culture using an African violet as a model, use sterile technique to develop African violet cloned cultures and induce the development of multiple shoots (clones) from the leaf tissue. Resulting plantlets may be started in soil. The complete process takes approximately three months. No hood or incubator required. Includes an instruction manual and a Power Point presentation with images of plant material at various stages of the experiment. Perishable reply card items ship separately upon request and only in the continental US. Grades 9-12

ESB52048



### Urinalysis

The analysis of urine is a valuable procedure for evaluating a persons health. Using simulated urine samples, students are introduced to biomedical urinalysis procedures similar to those utilized in medical laboratories to determine the general characteristics of urine, observe sediments found in urine, and test for glucose, albumin, pH, specific gravity, and lead. No real urine or human products are used in this kit. Required, but not included: a Bunsen burner, balance, microscope, lab glassware, urine hydrometers (optional), and a centrifuge (1500 rpm, optional). Designed for 24 students working in six groups of four. Grades 9-12

ESB52131



### Genetics I

Students identify some of their own genetic traits, such as whether or not they are able to taste the bitterness of PTC or roll their tongues. Then they model homologous chromosomes to demonstrate how reproduction results in the inheritance of genetic variation. Punnett Squares are used to apply concepts of statistics and probability to predict the distribution and variation of expressed traits in examples from humans, plants, and animals. Students use a randomized selection process to model the observed occurrence of allele frequency to compare to statistically expected outcomes of crosses. Phenotypes, genotypes, monohybrid and dihybrid crosses, test crosses, dominance, incomplete dominance, codominance, and recessives are discussed. Includes worksheets, data sheets, and complete answer keys. Designed for 24 students working in six groups of four. Grades 6-10

ESB52132



### Genetics Ii

This hands on approach to genetics gives students an opportunity to study the inheritance of multiple alleles, examine karyotypes, and study pedigrees. Students observe the antigen-antibody reaction for ABO blood groups using simulated blood. Then, they identify the blood types of four people and apply the concept of codominance to determine possible genotypes and phenotypes of future generations. Students learn how nondisjunction can cause autosomal and sex chromosome disorders during meiosis while studying karyotypes. They learn to construct pedigree charts and use them to show how genotypes of genetic traits may be followed through a number of generations. Then, students create pedigrees for tongue rolling and ability the ability of their family to taste bitter with PTC paper. Includes all materials for ABO blood typing and karyotyping, PTC paper, worksheets, data sheets, and complete answer keys. Designed for 24 students working in groups of four. Grades 6-10

ESB52133





### Introduction To Chromosomes Kit

EduSciences Introduction to Chromosomes Kit is designed for advanced biology students who are interested in the microscopic examination of chromosomes from peripheral blood leukocytes. The kit uses freshly drawn blood cells and a micro technique which can be adapted for chromosome studies from cells of bone marrow or other tissues. Reply card items include: chromosome media, arresting fluid, rinsing solution, and Hank's Balanced Salt Solution. Required, but not included: centrifuge (800 rpm), oil immersion microscope, water bath or incubator (37°C), alcohol or Bunsen burner, staining jars, xylene, glacial acetic acid, and methanol. Designed for 24 students working in six groups of four. Grades 10-14

ESB52134



### Biotechnology: Electrophoresis

Finally, a safer, much more affordable way to do gel electrophoresis in the classroom! Now anyone can learn the essentials of this classic molecular biology technique which plays such a central role in biotechnology research. Students isolate DNA samples from live organisms and run the samples on agarose gels they pour themselves. Then they stain the DNA with methylene blue to visualize their samples. A wonderful classroom tested option for those who do not own pricey biotechnology equipment. Kit includes all materials, supplies, and instructions for isolating DNA, making running buffers, creating tracking dyes, pouring gels, and running and staining DNA...including the power sources. Materials and supplies for 100s of DNA sample isolations and making up to 50 agarose gels. Designed with six gel running stations. Grades 8-12

ESB52135



### DNA Model Kit (Without Paint)

Students construct this DNA model from six different molecular pieces, collectively depicting sixteen nucleotide pairs worth of DNA (8 AT and 8 GC pairs). The base pairs and the sugar and phosphate units are each manufactured as single plastic units. Because there are only nine molecular parts per nucleotide pair, which snap together by means of a pop-it bead mechanism, the model can be easily assembled. The model may be disassembled and reassembled like a puzzle, enabling extended use. The model is unpainted and individual molecules may be painted by students either prior to or after assembly. Model does not include paint or paint brushes. (EduScience kit 9-102 includes paint.) A laboratory exercise and problem set accompany the model. After completing the building exercise and problem set, students will have a better understanding of the double helical structure and the function and properties of DNA. Contains instruction manual, 144 plastic DNA building pieces, rod, spacers, and wooden base. Building and painting project ideal for six students., Grades 7-14

ESB52136



### Blood Typing Kit (With Red Blood Cells)

This kit provides both the red blood cells and the antisera for demonstrating ABO blood typing agglutination reactions. Students will use the red blood cells provided, eliminating the need to draw blood samples. Includes instructions for two blood typing methods, and both slide and test tube blood typing are performed, compared, and contrasted. Includes enhanced instructor's manual with student worksheets. This kit is drop ship only, and the blood cells included have a life expectancy of at least 20 days after arrival, but should be kept under refrigeration for best shelf life. Allow two weeks for delivery. Materials provided are sufficient for up to 36 students. Meets national standards for Grades 9-12. Also appropriate for college level. Must be Drop shipped from supplier.

ESB52138





### Dna Model Kit (With Paint)

Students construct this DNA model from six different molecular pieces, collectively depicting sixteen nucleotide pairs worth of DNA (8 AT and 8 GC pairs). The base pairs and the sugar and phosphate units are each manufactured as single plastic units. Because there are only nine molecular parts per nucleotide pair, which snap together by means of a pop-it bead mechanism, the model can be easily assembled. The model may be disassembled and reassembled like a puzzle, enabling extended use. The model is unpainted and individual molecules may be painted by students either prior to or after assembly. Model with paint includes six paint colours, paint thinner, and six brushes. A laboratory exercise and problem set accompany the model. After completing the building exercise and problem set, students will have a better understanding of the double helical structure and the function and properties of DNA. Contains instruction manual, 144 plastic DNA building pieces, rod, spacers, and wooden base. Building and painting project ideal for six students. Grades 7-14

ESB52137



### Blood Typing Kit (ABO)

Provide an exciting personal experience? this kit allows students to determine their own blood type, while learning the basics of ABO blood typing. Includes the antisera for demonstrating real ABO blood typing agglutination reactions. The specially designed Hema-Tag on which the blood typing identification is performed is self-adhesive and can be affixed in a student notebook for a permanent record. Includes enhanced instructor's manual with background material and student worksheets complete with answer keys. Antisera are perishable. Refrigerate to prolong shelf life. Materials provided are sufficient for up to 50 tests. Meets national standards for Grades 9-12. Also appropriate for college level.

ESB52139



### Blood Typing Kit (ABO & RH)

Provide an exciting personal experience? this kit allows students to determine their own blood type, while learning the basics of ABO and Rh blood typing. Includes the antisera for demonstrating real ABO and Rh blood typing agglutination reactions. The specially designed Hema-Tags on which the blood typing identification is performed are self-adhesive and can be affixed in a student notebook for a permanent record. Includes an enhanced instructor's manual with background information, reproducible student worksheets, and complete answer keys. Antisera are perishable. Refrigerate to prolong shelf life. Materials provided are sufficient for up to 50 tests. Meets national standards for Grades 9-12. Also appropriate for college use.

ESB52140



### Anti-A, Anti-B Serum Set

These highly specific monoclonal antisera are tested for Hbs Ag and HTLV-III (AIDS). Standard laboratory practices should be used, however, and all biological products should be treated as if capable of transmitting disease. Supplied in dropper vials of 5 mL for approximately 36 tests. Product is perishable and requires special shipping. Refrigerate for prolonged shelf life. Grades 9-14.

ESB52143





### Blood Typing Kit (ABO & RH Lyophilized)

Provide an exciting personal experience. This kit allows students to determine their own blood type, while learning the basics of ABO and Rh blood typing. Includes

Lyophilized antisera for demonstrating real ABO and Rh blood typing agglutination reactions. The specially designed Hema-Tags? on which the blood typing identification is performed are self-adhesive and can be affixed in a student notebook for a permanent record. Includes an enhanced instructor's manual with background material, student worksheets, and complete answer keys. Lyophilized antisera provides the product with an extremely long and stable shelf life. Refrigerate antisera after reconstituting to prolong shelf life. Materials provided are sufficient for up to 50 tests. Meets national standards for Grades 9-12. Also appropriate for college use.

ESB52141

### ABO/RH Synthetic Blood Typing Kit

The ability to type blood is imperative in medicine and criminology. In this kit students test four synthetic blood samples to identify their ABO and Rh blood types. For 30 students.

ESB52162

### ABO/RH Synthetic Blood Typing Refill Kit

The ability to type blood is imperative in medicine and criminology. In this kit students test four synthetic blood samples to identify their ABO and Rh blood types. For 30 students..

ESB52163



### Blood Typing Kit (Saliva)

Provide a truly unique and exciting personal experience this kit allows students to determine their own blood type without drawing blood. Students use their own saliva, from which secretors (80% of students) will be able to determine their ABO blood type. This kit provides real antisera for demonstrating true ABO blood typing agglutination reactions. Ideal for students in advanced biology, physiology, or biochemistry. Includes an enhanced instructor's manual with background information, reproducible student worksheets, and complete answer keys. Antisera and Blood Cells are perishable. Refrigeration prolongs shelf life. Reply card included for blood cells and lectin; materials must ship 2nd day air on ice in summer months. Reply card items are only shipped within the continental United States. Cells must be refrigerated and used within 20 days. Materials provided are sufficient for up to 50 tests. Requires a centrifuge or prolonged settling. Meets national standards for Grades 9-12. Also appropriate for college level.

ESB52142



### Anti-RH Serum

This highly specific monoclonal antiserum to Rh factor is tested for HbsAg and HTLV-III (AIDS). Standard laboratory practices should be used, however, and all biological

Products should be treated as if capable of transmitting disease. Supplied in dropper vials of 5 mL for approximately 36 tests. Product is perishable and requires special shipping. Refrigerate to prolong shelf life.

Grades 9-14

ESB52144



### Nucleic Acids Kit

This nucleic acids kit provides students with the opportunity to demonstrate differences between DNA and RNA in terms of chemical composition and internucleotide bonding. Experiments include: (1) reacting DNA, RNA, and nucleosides in the Bial's test for penthouses and the Dische diphenylamine test for deoxyribose; (2) the acid and alkaline hydrolysis of DNA and RNA. Required, but not included: fume hood, concentrated hydrochloric acid, concentrated sulfuric acid, and glacial acetic acid. Designed for 24 students working in six groups of four.

Grades 10-14

ESB52151







### Anti-A, Anti-B Lyophilized Serum Set

Lyophilized sera allow prolonged, stable storage and shelf life. Each set reconstitutes to 5 ml Anti-A serum and 5 ml Anti-B serum with addition of sterile or distilled water.

Sera are tested for HbsAg and HTLV-III (AIDS), however, standard laboratory practices should be used when handling and all biological products should be treated as if capable of transmitting disease. Refrigerate after reconstituting to extend shelf life.

ESB52145



### Anti-RH Lyophilized Serum

Lyophilized sera allow prolonged, stable storage and shelf life. Each vial reconstitutes to 5 ml Anti-Rh serum with addition of sterile or distilled water. Sera are tested for

Hbs Ag and HTLV-III (AIDS), however, standard laboratory practices should be used when handling and all biological products should be treated as if capable of transmitting disease. Refrigerate after reconstituting to extend shelf life. Grades 9-14

ESB52146



### Simutype (ABO)

These four orphans are trying to find their blood brothers or sisters from whom they were separated while very young. Is it possible that they are related? Learn the genetics, immunology, and medical implications of blood typing in the context of this fun and totally safe simulated blood typing activity. Includes complete 16 page instructor's manual, 72 reusable glass microscope slides, 50 Hema-tags for adhering results to lab books, mixing sticks, and 15 ml bottles simulated antisera and blood regents. Meets national standards for grades 9-12.

ESB52147



### Tallquist Haemoglobin Scale

The Tallquist Haemoglobin scale allows a quick assessment of a patient's haemoglobin levels. Allow blood to absorb into one of the test papers and compare the blood to the

Colour scale to determine the concentration of haemoglobin in blood under normal and anaemic conditions. Includes a color chart and 150 test papers. Grades 9-14

ESB52149



### Electrophoresis Apparatus

is a durable and seamless injection- moulded horizontal agarose electrophoresis unit designed for ease of use and safety. It balances hands-on student participation with economy. Included with the unit are a six-tooth comb and a double 8/10-tooth comb. The 7 cm x 10 cm gel casting tray has an embossing gel ruler and includes rubber end caps which seal the tray. Both the electrophoresis chamber and the gel casting trays are UV transparent.

ESB52155



### Electrophoresis Power Supply

Our most popular electrophoresis power supply and runs gels quickly - in only 20-30 minutes at 150V!

Features:

- Max Voltage: 150 Volts
- Voltage Steps: 75 or 150 Volts
- Max Current: 300 Milliamps
- Output Type: Constant Voltage
- Lead Inputs: 2 Sets, Recessed, Color Coded
- Fuse: 1.0 Amp 250V Glass Fuse

ESB52156



### Micro Pipette

Robust, accurate, easy to use, color coded, fun & cost effective micropipettes which use standard micropipette tips. No need to calibrate and impossible to measure the wrong volume! , Fixed Volume 5 or 10 or 20 or 24 or 30  $\mu$ l (please select your suitable size )

ESB52157

### Dual Gel Electrophoresis Complete Kit

The latest in versatile electrophoresis design! Our newly Complete™ Electrophoresis Package supports up to two groups of students in two standard length gel trays for experiments that require less separation, or one long gel tray for experiments that require more. Produces excellent results in 30-40 minutes and includes a lifetime warranty.

New Features:

- Sleek New Design Speeds Electrophoresis
- Versatile Electrophoresis Accessories Included
- Contoured Lid for Enhanced Gel Visualization
- Large Color Coded Push Tabs for Easy Lid Insertion & Removal
- Pour Spout for Buffer Disposal
- Improved Ventilation Reduces Lid Condensation
- User Replaceable Electrodes

Electrophoresis Package Includes:

- (2) 7 x 7 cm Gel Trays
- (1) 7 x 14 cm Gel Tray
- (2) 6 Tooth Combs
- (2) 8/10 Tooth Combs
- (4) Rubber End Caps

ESB52154



### Orbit Preview DNA Model

A great whole-class DNA project.

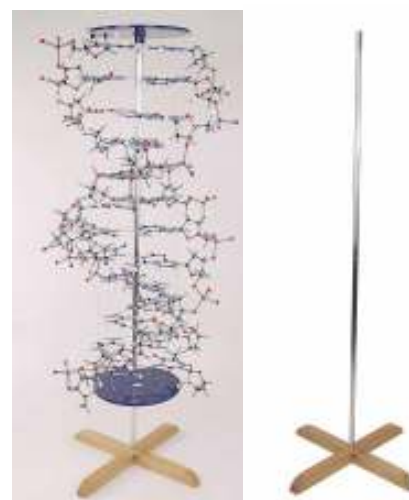
This detailed and large-scale 3d model helps pupils to understand the chemistry and structure of DNA.

Building the double helix model engages and educates students. Pupils work together to make up the sub assemblies – the Thymine-Adenine and Cytosine-Guanine base pairs, sugar rings and phosphate groups – which are joined together to make an impressive display and teaching resource. 12 base pairs show more than one turn of the double helix and the major and minor grooves of the protein lysozyme. Each atom is shown and coloured bonds indicate covalent or hydrogen bonding. The finished model is 85cm high and 40cm wide and can set on a suitable stand (eg 90cm laboratory stand) or hung from a hook.

The kit contains 750 atoms and 850 bonding straws from the Orbit molecular modelling system, a set of wooden plates for hanging the model plus assembly instructions and a worksheet examining the structure of DNA and process of transcription.

Part and fully assembled versions are also available. Please note the kit version comes with unpainted wooden plates and does not include a display stand and this can be purchased separately

ESB52152



### Stand For Orbit Preview DNA Model

A purpose-built display stand for the Orbit Preview DNA model with a wooden base and metal central support. The stand comes supplied in three sections for easy self-assembly and provides an elegant solution for displaying the completed model.

ESB52153



### DNA & RNA Kit

The small DNA-RNA model shows the double helix and how the molecules split at the centre of the base pairs.

The DNA-RNA Model includes:

- 30 coloured tubes (Guanine red, Cytosine green, Thymine blue, Adenine gray, Uracil white)
- 12 white two prong centre, which represents the hydrogen bond between the base pairs
- 28 black trigonal atom centres which represent sugar
- 25 red two prong atom centres, which represent phosphate groups
- 50 yellow tubes that link the phosphate groups to the sugar rings
- Wooden base with support rod are included in the kit, Height 50 cm.

ESB52158



### Mini DNA 22 Layers

These Mini DNA Molecular Kits provide an easy to understand introduction to DNA structure. Comprises abstract shaped, colour coded parts to represent the nitrogenous bases - Pentagonal sugar and pyramidal phosphate component parts present in the DNA double helix.

Each component is designed so that it can only be attached in its correct position, e.g. Thymine will only pair Adenine. Can be constructed on the stand or without the separators provided. The model can also be uncoiled and 'unzipped' to produce two strands.

Scale 1cm = 2 angstroms. Each kit contains all the necessary components, including stand, support rod and easy to follow instructions. Available as an 12 layer or 22 layer model kit.

ESB52160



### Mini DNA 12 Layers

These Mini DNA Molecular Kits provide an easy to understand introduction to DNA structure. Comprises abstract shaped, colour coded parts to represent the nitrogenous bases - Pentagonal sugar and pyramidal phosphate component parts present in the DNA double helix.

Each component is designed so that it can only be attached in its correct position, e.g. Thymine will only pair Adenine. Can be constructed on the stand or without the separators provided. The model can also be uncoiled and 'unzipped' to produce two strands.

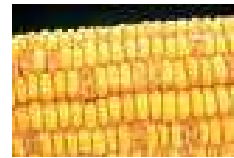
Scale 1cm = 2 angstroms. Each kit contains all the necessary components, including stand, support rod and easy to follow instructions. Available as an 12 layer or 22 layer model kit.

ESB52161

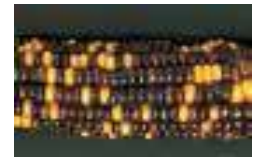




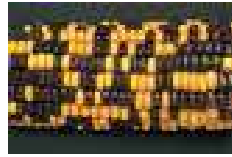
ESB52194



ESB52195



ESB52198



ESB52193



ESB52196



ESB52197

**ESB52189** Soy-bean Seeds

"Green: Yellow Green:

Yellow (1:2:1), F2 seeds giving a 1:2:1, seedling ratio, showing incomplete dominance. These seeds will produce, seedlings in which the heterozygous plants show a clear phenotypic difference from homozygous green and yellow. pk/100"

**Genetic Corn Ears**

Corn ears are an excellent choice for studying Mendelian inheritance. The crosses have been done for you and a selection of F2 corn ears are available. There are numerous contrasting phenotypes expressed in corn seed. These phenotypes are easy to recognize and score. The corn ears are lacquer treated to improve appearance and increase their durability.

**ESB52190** Purple starchy**ESB52191** Yellow starchy**ESB52192** Yellow sweet**Segregating Corn Ears**

The corn ears are used to demonstrate several patterns of Mendelian genetics. Despatched with an explanatory guide.

**ESB52193** R Colour Alleles 1:1

Purple:Yellow. The result of test crossing the F1 hybrid with the recessive parent (R/r x r/r)

**ESB52194** Wax Endosperm Alleles 3:1

Starchy : Waxy. Demonstrates segregation of the recessive endosperm character, waxy. Iodine solution is used to distinguish the phenotypes.

**ESB52195** Su Endosperm Alleles 3:1

Starchy : Sweet. An F2 ear from a cross between a starchy (Su/Su) and a sweet (su/su) parent. The sweet seeds are wrinkled and the starchy seeds are smooth

**ESB52196** R and Su Alleles 1:1:1:1

Purple Starchy:Purple

Sweet:Yellow Starchy:Yellow

Sweet. The result of test crossing the F1 hybrid with the recessive parent. (R/r Su/su x r/r su/su)

**ESB52197** R and Su Alleles 9:3:3:1

For studying dihybrid inheritance. This corn ear allows you to show students organisms that differ their inheritance patterns in 2 traits: Purple Starchy: Purple Sweet: Yellow Starchy :Yellow Sweet. An F2 ear resulting from a P1 generation having the genotypes. (R/R Su/Su and r/r su/su)

**ESB52198** R Colour Alleles 3:1

Shows the relationship between genotypes and phenotypes. Perfect for demonstrations. What's the fastest way to explain the relationship between genotypes and phenotypes? Use this one ear of corn. Purple: Yellow. An F2 ear resulting from a P1 generation having the genotypes R/R and r/r.

**ESB52199** Mendelian Genetics of Corn Kit

"Kit contains:

8 Segregating ears (Purple : Yellow) 8 Corn Parental Cross Cards A 8 Segregating ears (Starchy: Sweet) 16 Transparency markers 8 Segregating ears (Purple: Yellow :Starchy:Sweet) 8 Corn parental cross cards B Storage Box, Teachers manual For 32 students working in groups of 4. Topics include segregation and the independent assortment of alleles, dominance, genotype and phenotype. Expected ratios, mono-hybrid and dihybrid crosses and chi-square."



**Seeds & Accessories**

<b>ESB52209</b>	Barley Seeds	250g
<b>ESB52210</b>	Broad Beans	Quick growing , 250g
<b>ESB52211</b>	Clover Seeds	25g
<b>ESB52212</b>	Grass Seeds	25g
<b>ESB52213</b>	Sunflower Seeds	250g
<b>ESB52214</b>	Cress Seeds	100g
<b>ESB52215</b>	Potting Compost	2kg
<b>ESB52216</b>	Peat seeds	2kg
<b>ESB52217</b>	Lettuce Seeds	Grand rapids light sensitive Approx 10,000 per pack ,10g
<b>ESB52218</b>	Mustard Seeds	White , 250g
<b>ESB52219</b>	Lettuce Seeds	Approx 10,000 per pack ,10g
<b>ESB52220</b>	Oat Seeds	250g
<b>ESB52221</b>	Tomato Seeds	1g
<b>ESB52222</b>	Mung Beans seeds	250g
<b>ESB52223</b>	Pea Seeds	250g
<b>ESB52224</b>	Wheat Seeds	250g
<b>ESB52225</b>	Wild Type Brassica Seeds	pack of 200
<b>ESB52226</b>	Radish Seeds	50g



ESB52255

**Liquid Fertiliser 1ltr****Plant Grow Lighting System Propagation Lighting**

The PL4 propagation light has a 2 metre lead and hanging locations with rope supplied. The unit comes with four double 55 watt white lights for 'fast plant' growing and four Sylvania 55 watt colour 86 daylight bulbs for a maximum blue output. These bulbs are useful when growing a multitude of seeds/plants. The unit measures 60cmx32cmx10cm.

ESB52256

**Replacement bulbs for lighting unit White**

ESB52257

**Replacement bulbs for lighting unit Blue/Colour**

ESB52258





## Kits

**Osmosis & Diffusion Kit**

Osmosis and diffusion are essential concepts in understanding how cells survive. The exchange between water and solutes is visually observed in this three part lab that takes no more than two class periods to complete. Students will utilize starch and glucose solutions with dialysis tubing to model the cell membrane and observe the processes of osmosis & diffusion. This laboratory activity is ideal for high school biology classes of all levels. Designed for 24 students working in six groups of four. Grades 9-12

ESB52287

**Coliform Test Kit**

A dramatic way to demonstrate the presence of coliform in water samples to students with a limited laboratory background. Eliminates the need for expensive laboratory equipment for teaching bacteriology, and includes all necessary materials alleviating extensive lab preparation. Great for leading into discussions about water pollution or environmental contamination. May be used in a multitude of science applications. Kit includes instructor's manual with background information, and enough materials for 24 students working individually, in pairs, or in groups. Includes 25 tubes for testing water for presence of *Escherichia coli* indicative of the presence of animal waste. Requires incubator (37C). Meets national standards for Grades 8-12.

ESB52288

**Mechanisms Of Herbicides**

This exercise is designed to demonstrate the effectiveness of different categories of chemical herbicides. Students transplant grasses and weeds into flats or pots and investigate how and why different plants are killed by different chemical herbicides. A simultaneous microbiological proof with inoculated agar plates is run to reinforce the results, further categorize herbicides, and determine possible effects of the herbicides on soil micro-organisms. Each group will choose two natural products and design a simple experiment to compare chemical vs. natural weed killers. A round table discussion including experimental designs, results, comparisons, and possible environmental impact culminates the exercise. Requires five class periods, plus research time. Required, but not included: heat source, flower pots or nursery flats, grass and weeds for transplanting. Designed for 24 students working in four groups of six. Grades 9-14

ESB52289

**Introduction Microbiology Kit**

Introductory Microbiology Kit

This kit is designed to give an introduction to Microbiology Studies. A workbook is included. The kit allows for 10 groups of students working individually or in groups.

Activities included are: Making broth cultures, effects of temperature, Making plate cultures, Antibiotics and their effects on cultures, Staining, Pasteurisation, Living bacteria study, Study of fungi, Life cycle of *Mucor* and many other activities and applications. The kit has been developed to give a thorough understanding of all the practical Activities that would be conducted in a 'real life' microbiology laboratory thus introducing students to the importance of this critical field of study.

ESB52290



**Cultures**

Our cultures are supplied on agar slopes in screw top vials. Each one is identified as gram + or -.

- ESB52305** Agrobacterium tumefaciens - Nutrient Agar
- ESB52306** Bacillus megaterium + Nutrient Agar
- ESB52307** Bacillus stearothermophilus + Nutrient Agar
- ESB52308** Bacillus subtilis + Nutrient Agar
- ESB52309** Erwinia carotovora - Nutrient Agar
- ESB52310** Escherichia coli K 12 Strain - Nutrient Agar
- ESB52311** Escherichia coli B Strain - Nutrient Agar. Susceptible to T4 Bacteriophage
- ESB52312** Lactobacillus bulgaricus + G.Y.L.A
- ESB52313** Lactobacillus casei + G.Y.L.A
- ESB52314** Micrococcus luteus + Nutrient Agar
- ESB52315** "Pseudomonas fluorescens - Nutrient Agar"
- ESB52316** Staphylococcus albus + Nutrient Agar
- ESB52317** "Streptococcus lactis + Lactococcus lactus. G.Y.L.A"
- ESB52318** Aspergillus oryzae Potato dextrose agar
- ESB52319** Fusarium solani Potato dextrose agar
- ESB52320** Mucor hiemalis + Ve Strain Malt extract agar
- ESB52321** Penicillium chrysogenum Malt extract agar
- ESB52322** Penicillium expansum Malt extract agar
- ESB52323** Penicillium roqueforti Malt extract agar
- ESB52324** Rhizopus stolonifer Potato dextrose agar
- ESB52325** Saccharomyces cerevisiae Normal, diploid strain. Malt extract agar
- ESB52326** Sordaria fimicola Black Spored Sordaria agar
- ESB52327** Sordaria fimicola White Spored Sordaria agar

**Counter**

Hand held mechanical counter. Single lever action counts 0 to 9,999.

**ESB52344****Inoculating Loop Holder**

Metal handles with chuck to take inoculating wires and loops, lockable by a screw collar. Length: 150mm.

Pack of 5.

**ESB52342****Inoculating Loop St. Steel**

Nichrome wire with 2mm diameter loop formed at one end. For use with the Inoculating Loop Holder. Length: 50mm. Pack of 5.

**ESB52341****Inoculating Loop Disposable**

10µl loop at one end with a needle for stab culture or picking off colonies at the other. Sterile.

Pack of 20.

**ESB52343**



**Colony Counter**

Four digital displays  
 4 digit display offers convenience of showing the present and previous three count values.  
 Multi-counting average : can make average count from multiple counting.  
 Exclusive BACK button : The BACK button offers the convenience of deducting data when over counting.  
 Suitable for Petri-dishes in various diameters : adjustable dish holder can accept most Petri-dishes in a wide range of diameters from 90 to 150 mm or 60 mm.  
 Pressure sensor design : Pressure sensor design can allow user to operate with any marking pens. No worry about sample spoiled or contaminated.

ESB52345

**Colony Counter With Software**

Four digital displays : 4 digit display offers convenience of showing the present and previous three count values.  
 Multi-counting average : can make average count from multiple counting.  
 Exclusive BACK button : The BACK button offers the convenience of deducting data when over counting.  
 Suitable for Petri-dishes in various diameters : adjustable dish holder can accept most Petri-dishes in a wide range of diameters from 90 to 150 mm or 60 mm.  
 Pressure sensor design : Pressure sensor design can allow user to operate with any marking pens. No worry about sample spoiled or contaminated.

ESB52346

**Colony Counter Marking Pen**

Marking pen for colony counter

ESB52347

**Colony Counter Background Plate**

Background plate for colony counting

ESB52348



**Nichrome Wire Inoculating Loop**

Pack of 5

ESB52352



**Gram Stain Kit**

Gram Stain Kit is for qualitative procedures to differentiate gram-positive from gram-negative micro-organism.

Include 4 x 250 mL bottles : Crystal Violet; Decolonize; Iodine; Safranin

ESB52351



**Bacteria Spreader**

Stainless steel rod bent to facilitate spreading bacterial dispersions evenly over an agar plate

ESB52354







**Glass Vials**

30ml tubular glass vial with fitted polypropylene cap pack of 30

ESB52355



**Petri Dishes**

9 cm plastic triple vent pack of 20

ESB52356

- ESB52404 Anti Human Ig A Serum Two millilitres
- ESB52405 Antibiotic Assay Discs - Box of 100 Pack of one hundred
- ESB52406 Antibiotic Assay Discs - Box of 1000 Pack of one thousand
- ESB52407 Penicillin G Sensitivity Discs - 1.5 units, Pack of 250
- ESB52408 Penicillin G Sensitivity Discs - 1.5 units, Pack of 50 Pack of fifty
- ESB52409 Penicillin G Sensitivity Discs - 10 units, Pack of 250
- ESB52410 Penicillin G Sensitivity Discs - 10 units, Pack of 50 Pack of fifty
- ESB52411 Penicillin G Sensitivity Discs - 5 units, Pack of 250
- ESB52412 Penicillin G Sensitivity Discs - 5 units, Pack of 50 Pack of fifty



**Living Culture**

- ESB52463 Paramecium caudatum
- ESB52464 Amoeba
- ESB52465 Aquaspirillum serpens
- ESB52466 Bacillus megaterium
- ESB52467 - Bacillus subtilis
- ESB52468 Chlamydomonas pulsatilla
- ESB52469 Chlorella Medium Millilitre
- ESB52470 Chlorella pyrenoidosa
- ESB52471 Escherichia B strain
- ESB52472 Escherichia coli K12 strain
- ESB52473 Euglena spirogyra
- ESB52474 Immunodiffusion (Buffered Agar) Medium
- ESB52475 L shaped spreaders Pack of twenty five

- ESB52476 Lactobacillus casei
- ESB52477 Pseudomonas fluorescens
- ESB52478 Rhizobium leguminarosum
- ESB52479 Spyrogira varians
- ESB52480 Staphylococcus epidermidis
- ESB52481 Streptococcus Faecalis
- ESB52482 Streptomycin Sensitivity Discs - 25g, Pack of 250
- ESB52483 Streptomycin Sensitivity Discs - 25g, Pack of 50 Pack
- ESB52484 Vibrio natriegens





**EduScience UK**



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# MICROSCOPIES

- Monocular
- Binocular
- Digital
- Stereo
- Slides





**Microscope Biological Monocular HM-1**

H-1 Series microscopes are economic, practical and easy to operate. These microscopes adopt LED illumination, which save energy and have long working life. It is also very comfortable for observation. These microscopes are widely used in educational, academic, and agricultural & study field. H-1 series microscopes are ideally suited for school biological education and medical analyses area to observe all kinds of slides. They can be widely used in clinics, hospitals, schools, academic labs and scientific research department.

- Monocular Head, Inclined at 30°, 360° Rotatable
- Wide Field Eyepiece WE 1 OX/1R
- Achromatic Objective 4X, 10X, 40X, 100X
- Quadruple Nose-piece
- Double Layers Mechanical Stage 125 X125min/60x40min
- NA 1.25 Abbé Condenser with Iris Diaphragm
- Coaxial Coarse and Fine Adjustment, Fine Division 0.002mm, Coarse Stroke 37.7mm per Rotation, Fine Stroke 0.2mm per Rotation, Moving Range 14mm
- 1W LED Illumination, Brightness Adjustment
- Blue Filter / Green Filter / Yellow Filter

ESB52672

**Microscope Student Monocular HM-Basic**

HM-Basic is our most popular elementary student microscopes! This microscope is slightly smaller in size for young scientists without sacrificing high quality glass optics. The student elementary microscope includes Up and Down LED illumination, rugged metal components and has been built with student proofing features to eliminate damage to microscope and loss of parts.

- Monocular
- Head, Inclined at 45°
- Wide Field Eyepiece WF10XJ16
- Wide Field Eyepiece WF25
- Achromatic Objective : 4X, 10X, 40X
- Triple Nose-piece
- Plain Stage with Slide Clip 95X95mm
- NA 0.65 Condenser with Iris Diaphragm
- Coaxial Coarse and fine adjustment
- Up and Down LED II
- Illumination, Brightness Adjustment for down illumination



ESB52673



**Microscope Monocular HM-2**

HM-2 microscopes are economic, practical and easy to operate. These microscopes adopt LED illumination, which save energy and have long working life. It is also very comfortable for observation. These microscopes are widely used in educational, academic, and agricultural & study field. These microscopes are ideally suited for school biological education and medical analyses area to observe all kinds of slides. They can be widely used in clinics, hospitals, schools, academic labs and scientific research department-

- Viewing Head: Monocular Head
- Eyepiece : Wide Field Eyepiece WF10X/18 2
- Objective : Achromatic Objective 4X, 10X, 40X
- Nose-piece : Quadruple Nose-piece
- Stage : Double Layers Mechanical Stage 132X142min/75x40mm
- Condense r: NA 1.20 Abbé Condenser with Iris Diaphragm and filter
- Focusing System Coaxial Coarse and Fine Adjustment, Fine Division 0.004mm, Coarse Stroke, 32.7mm per Rotation, Fine Stroke 0.4mm per Rotation, Moving Range 24mm
- Illumination : S-LED Illumination, Brightness Adjustment

ESB52674



**Microscope Monocular HM-3**

HM-3 microscopes are economic, practical and easy to operate. These microscopes adopt LED illumination, which save energy and have long working life. It is also very comfortable for observation. These microscopes are widely used in educational, academic, and agricultural & study field. These microscopes are ideally suited for school biological education and medical analyses area to observe all kinds of slides. They can be widely used in clinics, hospitals, schools, academic labs and scientific research department-

Viewing Head: Monocular Head

Eyepiece: Wide Field Eyepiece WF10X/18 2

Objective : Achromatic Objective 4X, 10X, 40X; Achromatic Objective 100X

Nose-piece : Quadruple Nose-piece

Stage :Double Layers Mechanical Stage 132X142mm/75x40mm

Condenser : NA 1.20 Abbé Condenser with Iris Diaphragm and filter

Focusing System Coaxial Coarse and Fine Adjustment, Fine Division 0.004mm, Coarse Stroke, 32.7mm per Rotation, Fine Stroke 0.4mm per Rotation, Moving Range 24mm

Illumination : S-LED Illumination, Brightness Adjustment

ESB52675



**Microscope Monocular Advance**

Viewing head: Monocular Head

Eyepiece : 2x Wide Field Eyepiece WF 10X/18

Objective : Achromatic Objective 4X, 10X, 40X, 100X

Nose-piece : Quadruple Nose-piece

Stage : double Layers Mechanical Stage 140X140mm/75x50mm

Condenser : NA 1.25 Abbé Condenser with his Diaphragm

Focusing System : Coaxial Coarse and Fine Adjustment. Fine Division 0.002mm, Coarse Stroke 37.7mm per Rotation, Fine Stroke 0.2mm per Rotation, Moving Range 20mm

Illumination : Single LED Illumination, Brightness Adjustment

Filter: Blue Filter, Green Filter

ESB52676

**Microscope Monocular Digital**

Monocular head, Inclined at 45°, 360° rotatable , 1280x1024(1.3M Pixel) , USB2.0 output mode.

Objective : Achromatic Objective (DIN) 4X,10X,40X,100X

Eyepiece : WF10X/ 18

Stage : Double Layers Mechanical Stage 115X125mm/70X20mm

Operation system: WINDOWS 2000/XP/VISTA 32 Bit or 64 Bit

Illumination : 1W Powerful LED Illumination, brightness adjustable

Focusing: Coaxial coarse and fine adjustment

ESB52720





### Microscope Biological, Binocular Digital HB-2D

HB-2 series microscopes are economic, practical and easy to operate. These microscopes adopt LED illumination, which save energy and have long working life, it is also very comfortable for observation. These microscopes are widely used in educational, academic, agricultural and study field. With a microscope adaptor, a digital camera (or digital eyepiece) can be plug into the trinocular tube or the eyepiece tube. Built-in rechargeable battery is optional for outdoors operation or places that power supply is not stable.

#### Description

New machining facility and advanced alignment technology

Complete functions and outfit of binocular microscope

Comfortable operation with updated and ergonomic design

Specimen images are taken with HB-2

Achromatic objective supply the sharp image after adjusting Iris diaphragm. You can get high resolution and contrast ratio image at low or high magnification. 3W Single LED illumination supplies bright background. According to different demands. It also can install 6V/20W halogen bulb, then the lighting effect is the same

High-powered single LED cold light illumination

It maintains constant colour temperature and closes to sun light. It can apply bright white back-ground without filter that is the best choice of observation for bright-field and photography by CCD. The illumination supplies stable brightness and temperature difference never occurred even long time worked. Comparing with halogen lamp, LED has lower power dissipation. Brightness is adjustable freely by the rotatable key at lower right side.

Siedentopf Binocular Head, Inclined at 30°, Inter popularise distance is adjustable from 55mm to 75mm. The left eyepiece tube is 7.5 dioptre adjustable.

Double Layers Mechanical Stage 140X140mm/75x50mm

Coaxial Coarse & Fine Adjustment, Moving Range 24mm, Fine Division 0.004mm

With quadruple nose-piece, it is equipped with Achromatic Objectives:4X,10X,40X(S),100X(S, Oil) (Plan Achromatic Objectives 4X, 10X, 40X, 100X are optional). NA 1.20 (NA 1.25 is optional) Abbé Condenser with Iris Diaphragm is able to acquire light brighter.

Viewing Head: Compensation Free Trinocular Head, Inclined at 45°, Inter popularise Distance 55-75mm

Eyepiece : 2X WF10?/18

Objective : chromatic Objective 4X-10X-40X-100X

Backward Quadruple Nose-piece

Double Layer Mechanical Stage 132-142mm/ 75x40mm

Coaxial Coarse & Fine Adjustment, Moving Range 24mm, Fine Division 0.004mm

Abbé NA 1.20 with Iris Diaphragm & Filter

S-LED, Brightness Adjustable

ESB52719



### Microscope Digital With Built In Screen 2.4 Inch

This LCD HDMI microscope integrating LCD/HDMI/TV/USB functions is highly useful for students, teachers, collectors, hobbyists, and testers etc. to explore the microscopic world. Display: 2.4-inch LCD

Magnification Ratio: 10x to 220x

Image sensor: 3 Mega Pixels

Photo size: 3M, 5M, 8M, 12M

Video size: 1080P, 720P, VGA

Video output : HDMI/TV/USB

Focus Range : Manual focus from 10mm to 50mm

Storage : Micro-SD card, up to 32G

Measurement : Yes, when working as a USB microscope

Light source : 6 LED (adjustable by control wheel)

Power source : Built-in Li-ion Battery or 5V DC-in

Size : 110mm (H) x 80mm (L) x 55mm (W)

ESB52742



### Microscope Digital With Built In Screen 3.5 Inch

3.5-inch Standalone 1200x 5M LCD Digital Microscope with Photo/Video Measurement

- \* 3.5" LCD Display
- \* 5M pixels image sensor
- \* Professional microscopic lens
- \* 300x magnification, up to 1200x by digital
- \* 8 LEDs with brightness adjustable
- \* Battery powered, Portable and Standalone
- \* Measurement function
- \* TV-out to any monitor with TV-in
- \* Image Sensor : 5 Mega Pixels (true resolution)
- \* LCD Panel : 3.5inches
- \* Still capture resolution : 12M, 9M, 5M, 3M, 1.3M, VGA
- \* Video capture resolution : 12M, 9M, 5M, 3M, 1.3M, VGA
- \* Focus Range : Manual focus from 10mm to 50mm
- \* Frame Rate : Max 30f/s under 600 Lux Brightness
- \* Magnification Ratio : up to 1200x
- \* TV output : Available (to any monitor with TV in)
- \* Card Slot : Support Micro-SD Card slot up to 32GB SDHC
- \* Light source : 8 LED (adjustable by control wheel)
- \* Battery : Rechargeable lithium battery (recharged by adaptor or USB)
- \* Measurement : By software (Portable Capture with OSD language: English, German, Spanish, French, Russian)
- \* OSD language : English, German, Spanish, French, Russian
- \* Bundle software : Portable Capture with measurement
- \* Product Size : L149 \* W104 \* H227 mm
- \* Weight : 1100g
- \* Certificates : With CE, FCC approval, ROHS compliance

ESB52743



### Microscope USB Digital 200X With 8 LED

USB Digital Microscope is a high-tech while easy to use Digital Microscope. 8 LEDs with brightness adjustable are good for any inspection environment.

It is applicable in many fields such as visual inspection on electronic components, and materials in a full range of uses, beauty shop and education.

Its 2M image sensor presents vivid and sharp amazing image. The measurement software can help you to measure tiny objects easily and precisely (as small as 0.001mm). With this unit you may see a unique & "bigger" world. Image sensor : 2 Mega Pixels

- \* Focus Range: Manual focus from 10mm to 500mm
- \* Frame Rate: Max 30f/s under 600 Lux Brightness
- \* Magnification Ratio : 10x to 200x
- \* Light source : 8 LED (adjustable by control wheel)
- \* Still capture resolution : 1920x1080, 1280x720, 640x480
- \* Video capture resolution : 1920x1080, 1280x720, 640x480
- \* Frame Rate : Max 30f/s under 600 Lux Brightness
- \* Video format : AVI
- \* Photo format : JPEG or BMP
- \* PC interface : USB2.0
- \* Power source : 5V DC from USB port
- \* Operation system : Windows 7/8/10, Mac OS X 10.10 or above
- \* OSD language : English, German, Spanish, Korean, French, Russian
- \* Bundle software : Micro Capture with measurement & calibration function
- \* Working temperature: -20°C ~ +60°C
- \* Size: 110mm (L) x 33mm (R)

ESB52744





### Microscope USB Digital 400X With 8 LED

The 400 X digital microscope is a high-tech while easy to use USB Digital Microscope. It is applicable in many fields such as visual inspection on electronic components, and materials in a full range of uses, beauty shop and education. 400x magnification bring you with tremendous details. With this unit you may see a unique & "bigger" world. Its 1.3M image sensor presents vivid and sharp amazing image. 8 LEDs with brightness adjustable are good for any inspection environment.

The measurement software can help you to measure tiny objects easily and precisely (as small as 0.001mm).

All the excellent features make it a good aid for your daily inspection on tiny objects.\* Image sensor: 1.3 Mega Pixels

\* Focus Range: Manual focus from 10mm to 500mm

\* Frame Rate: Max 30f/s under 600 Lux Brightness

\* Magnification Ratio: 10x to 400x

\* Light source : 8 LED (adjustable by control wheel)

\* Still capture resolution : 1280x960, 1280x720, 640x480

\* Video capture resolution : 1280x960, 1280x720, 640x480

\* Frame Rate : Max 30f/s under 600 Lux Brightness

\* Video format : AVI

\* Photo format : JPEG or BMP

\* PC interface : USB2.0

\* Power source : 5V DC from USB port

\* Operation system : Windows2000/XP/Vista/Win7/Win8, Mac OS X 10.6 or above

\* OSD language : English, German, Spanish, Korean, French, Russian

\* Bundle software : Micro Capture with measurement & calibration function

\* Working temperature : -20 $\text{^{\circ}}$ C ~ +60 $\text{^{\circ}}$ C

\* Size : 130mm (L) x 33mm (R)

ESB52745

### Microscope USB Digital With HDMI Output

This high-tech while easy to use microscope provides video crystal output directly. It adopts top quality image sensor and corresponding glass microscopic lens, ensuring the best image quality in the digital microscope field. User can share full HD image with others easily, especially useful for school teachers to share microscopic image with students.

It support photo capture; Micro-SD card storage. Image sensor: 3 Mega Pixels

\* Video output: 1080P

\* Video format: HDMI-H.264; USB-MJPEG

\* Photo format: JPEG

\* Photo resolution: 14M, 8M, 5M, 3M, 2M, WVGA

\* Focus Range : Manual focus from 10mm to 500mm

\* Frame Rate : Max 30f/s under 600 Lux Brightness

\* Magnification Ratio: 10x to 220x

\* Video-output Interface : HDMI

\* Storage : Micro-SD card, up to 32G

\* Light source : 6 LED (adjustable by control wheel)

\* Operation Temperature : 0-55 degree

\* Power source : 5V DC

\* Size : 185mm (L) x 33mm (R)

ESB52747

### Microscope USB Digital

USB Digital Microscope

Image sensor : 5 Mega Pixels (true resolution)

Still capture resolution : 5M, 3M, 1.3M, VGA, QVGA

Video capture resolution : 5M, 3M, 1.3M, VGA, QVGA

Focus range : Manual focus from 10mm to 500mm

Frame rate : Max 30f/s under 600 Lux Brightness

Magnification ratio : 20x and 300x

Light source : 8 LED (adjustable by control wheel)

PC interface : USB2.0

Operation system : Windows XP/Vista/Win7, Mac OS X 10.6 or above

Product size : 110mm (L) x 33mm (R), Weight : 90g

ESB52746





**Microscope Biological Binocular HB-2**

New machining facility and advanced alignment technology  
Complete functions and outfit of binocular microscope  
Comfortable operation with updated and ergonomic design  
Specimen images are taken with HB-2

Achromatic objective supply the sharp image after adjusting Iris diaphragm. You can get high resolution and contrast ratio image at low or high magnification. 3W Single LED illumination supplies bright background. According to different demands. it also can install 6V/20W halogen bulb, then the lighting effect is the same

High-powered single LED cold light illumination

It maintains constant colour temperature and closes to sun light. It can apply bright white background without filter that is the best choice of observation for bright-field and photography by CCD. The illumination supplies stable brightness and temperature difference never occurred even long time worked. Comparing with halogen lamp, LED has lower power dissipation. Brightness is adjustable freely by the rotatable key at lower right side.

Siedentopf Binocular Head, Inclined at 30°, Interpupillary distance is adjustable from 55mm to 75mm. The left eyepiece tube is 5 dioptre adjustable.

Double Layers Mechanical Stage 140X140mm/75x50mm

Coaxial Coarse & Fine Adjustment, Moving Range 24mm, Fine Division 0.004mm

With quadruple nose-piece, it is equipped with Achromatic Objectives : 4X,10X,40X(S),100X(S, Oil) (Plan Achromatic Objectives 4X, 10X, 40X, 100X are optional). NA 1.20 (NA 1.25 is optional) Abbé Condenser with Iris Diaphragm is able to acquire light brighter.

Viewing Head: Compensation Free Binocular Head, Inclined at 45°, Interpupillary Distance 48-75mm  
Eyepiece : 2 X WF10X/18

Achromatic Objective : 4X-10X-40X-100X

Backward Quadruple Nose-piece, Double Layer Mechanical Stage 132X142mm/ 75X40mm

Coaxial Coarse & Fine Adjustment, Moving Range 24mm, Fine Division 0.004mm, Abbé NA 1.20 with Iris Diaphragm & Filter  
S-LED, Brightness Adjustable



ESB52780

**Microscope Biological Binocular HB-1**

Siedentopf Binocular Head, Inclined at 30°, Interpupillary 55-75mm

Wide Field Eyepiece WF 10X/18

Achromatic Objective 4X, 10X, 40X, 100X

Quadruple Nose-piece

Double Layers Mechanical Stage 125 X125mm/60x40mm

NA 1.25 Abbé Condenser with Iris Diaphragm

Coaxial Coarse and Fine Adjustment, Fine Division 0.002mm, Coarse Stroke 37.7mm per Rotation, Fine Stroke 0.2mm per Rotation, Moving Range 14mm

1W LED Illumination, Brightness Adjustment

Blue Filter | Green Filter | Yellow Filter

ESB52781

**Microscope Biological Binocular HB-ADV**

Viewing head: Siedentopf Trinocular Head, Inclined at 30°, Interpupillary 55-75mm

Eyepiece: 2x Wide Field Eyepiece WF 10X/18

Objective: Achromatic Objective 4X, 10X, 40X, 100X

Nose-piece: Quadruple Nose-piece

Stage : double Layers Mechanical Stage 140X140mm/75x50mm

Condenser : NA 1.25 Abbé Condenser with his Diaphragm

Focusing System : Coaxial Coarse and Fine Adjustment. Fine Division 0.002mm, Coarse Stroke 37.7mm per Rotation, Fine Stroke 0.2mm per Rotation, Moving Range 20mm

Illumination : Single LED Illumination, Brightness Adjustment

Filter : Blue Filter, Green Filter

ESB52782



## Microscope Biological Binocular

EB2900 Series Biological Microscope features the same infinity corrected optical system used in EduScience research microscopes.

The microscope is a built-to-last, top-quality biological microscope ideal for diagnostic analysis of medical purpose, basic laboratory use or as a student microscope

for educational purposes. It meets all lab needs of today's student. With the newly developed LED illumination system, these microscopes produce brighter, Sharper, clearer images for a noticeably enhanced view. The advanced ergonomics and durable design ensure years of comfortable and stable use.

Best of all, EB2900 maintains the same operational ease and rigidity common to all EduScience microscopes and is compatible with many accessories for higher-grade EB2900 series microscopes. Newly designed accessories for phase contrast, dark field and simple polarization are available.

Optical System : Finite Optical System

Viewing head : Siedentopf Trinocular Head, Inclined at 30°, Interpupillary 46-75mm

Eyeiece : High Eye point Eyeiece PL10x/23mm, Dioptre Adjustment i5, Tube Diameter 30mm

Nose-piece : Backward Quadruple Nose-piece

Objectives : Plan Achromatic Objective 4X, 10X, 40X, 100X

Stage: New-Designed large graphite coating double layer mechanical stage: 216X150mm, travel range: 55X76mm, verniers for X/Y coordinate, precision 0.1mm, damped double slide clamp

Condenser : NA 1.25 Abbé Condenser with Iris Diaphragm

Focusing System: Coaxial Coarse and Fine Adjustment Knob, Fine Division 0.002mm, Coarse Stroke 37.7mm per Rotation, Fine Stroke 0.1mm per Rotation, Fine Focus Graduation of 1µm. Focus Range 16mm

Illumination : 3W LED Illumination with Kohler illumination system, Brightness Adjustment

Filter: Blue Filter, Green Filter

**ESB52783**



## Microscope Biological Binocular Infinity Lenses

EB2900 Series Biological Microscope features the same infinity corrected optical system used in EduScience research microscopes.

The microscope is a built-to-last, top-quality biological microscope ideal for diagnostic analysis of medical purpose, basic laboratory use or as a student microscope

For educational purposes. It meets all lab needs of today's student. With the newly developed LED illumination system, these microscopes produce brighter, Sharper, clearer images for a noticeably enhanced view. The advanced ergonomics and durable design ensure years of comfortable and stable use.

Best of all, EB2900 maintains the same operational ease and rigidity common to all EduScience microscopes and is compatible with many accessories for higher-grade EB2900 series microscopes. Newly designed accessories for phase contrast, dark field and simple polarization are available.

Optical System : Infinity corrected optical system

Viewing head : Siedentopf Binocular Head, Inclined at 30°, 360° Rotatable, Interpupillary 48-75mm

Eyeiece : High Eye point Eyeiece PL10x/23mm, Dioptre Adjustment i5, Tube Diameter 30mm

Nose-piece : Backward Quadruple Nose-piece

Objectives : Infinity Plan Achromatic Objective 4X, 10X, 40X, 100X

Stage: New-Designed large graphite coating double layer mechanical stage: 216X150mm, travel range: 55X76mm, verniers for X/Y coordinate, precision 0.1mm, damped double slide clamp

Condenser : NA 1.25 Abbé Condenser with Iris Diaphragm

Focusing System: Coaxial Coarse and Fine Adjustment Knob, Fine Division 0.002mm, Coarse Stroke 37.7mm per Rotation, Fine Stroke 0.1mm per Rotation, Fine Focus Graduation of 1µm. Focus Range 16mm

Illumination : 3W LED Illumination with Kohler illumination system, Brightness Adjustment

Filter : Blue Filter, Green Filter

**ESB52784**





ESB52817



ESB52821



ESB52825



ESB52828



ESB52829

Basic Series includes a wide selection of stereomicroscopes designed to satisfy every need in both teaching and amateur fields. The whole range is assembled according to the best technical standards. The optical system, thanks to its transparency, quality and depth, is at the top of its category. The series is composed of 15 models, each one designed to satisfy multiple needs.

### Features

1. interpupillary distance: 55-75mm
2. One tube with diopter adjustment:  $\pm 5$  Dio
3. Illumination: 110V or 220V/12V 10W, CE approval
4. Optional accessories:
  - (1). Inserted Objective 1X, 3X, 4X, 8X
  - (2). Rotated Objective 1X&2X, 1X&3X
  - (3). Eyepiece WF5X, WF15X, WF20X

Model	Illumination	Head and Body	Objective	W.D.	Eyepiece
ESB52817	No Light	Straight Viewing	2X	80MM	WF10X/20
ESB52818	Incident Light				
ESB52819	Incident/Transmitted Light				
ESB52820	No Light	Inclined Viewing Un-rotatable Body	Inserted	57MM	
ESB52821	Incident Light				
ESB52822	Incident Transmitted Light				
ESB52823	No Light	Inclined Viewing Body 360° rotatable	2X&4X	76MM	
ESB52824	Incident Light				
ESB52825	Incident Transmitted Light				
ESB52826	No Light	Inclined Viewing Body 360° rotatable	90° Rotated	76MM	
ESB52827	Incident Light				
ESB52828	Incident Transmitted Light				
ESB52829	Incident Transmitted Light				





ESB52830



ESB52831

Specifications		ESB52830	ESB52831
Eyepiece	WF10X / $\Phi$ 20	<input type="checkbox"/>	<input type="checkbox"/>
	WF5X, WF15X, WF20X	Optional	
Working Distance/Objective	2X & 4X/ 72mm	<input type="checkbox"/>	<input type="checkbox"/>
	1X & 2X/72mm , 1X & 3X/72mm	Optional	
Auxiliary Objective	0.5X, 0.75X, 1.5X, 2X	Optional	
Illumination	No Light	<input type="checkbox"/>	
	Transmitted and Incident Light 110V or 220V/6V12W T-H Lamp		<input type="checkbox"/>

Long Working Distance Stereo Microscope



ESB52832

Specification

1. Long Arm for Microscope Body
2. Inclined Binocular Head Interpupillary Distance 65-75mm, Diopter Adjustment on Left Tube  $\pm$ 5 Dio
3. Eyepiece WF 10X
4. Inserted Objective 1X
5. Working Distance of Objective 230mm
6. Illumination 110V or 220V/12V 10W Incandescent Lamp
7. Optional Accessories:
  - (1) Objective 0.5X, Working Distance 250mm
  - (2) Eyepiece WF 5X/ $\Phi$ 22, WF15X/ $\Phi$ 15, WF20X/ $\Phi$ 10



## SUPERIOR STERIOSCOPIC MICROSCOPES

### Features

- High quality, high function and excellent cost performance
- Best choose with ergonomic design, sharp image display and wide viewing field
- Providing a wide viewing field of  $\Phi 20\text{mm}$  with the zoom ratio of 1:4.5
- Ideal instrument in academic, medical and industrial field



Diopter adjustable



Zoom objective 0.7X-3X/ 1X-4.5X,  
Zoom ratio 1:4.3/ 1:4.5



High resolution, Wide viewing field,  
Long working distance



Binocular head inclined at 45°  
Interpupillary 55-75mm

Model		ESB52841	
Viewing Head	Binocular head, inclined at 45°	1	
	Trinocular head, inclined at 45°		
	Binocular head, inclined at 60°		
Eyepiece	Wide field eyepiece 10x/ $\Phi 20$	2	
	15x/16		
	20x/12		
	10x Eyepiece with cross hair		
Objective	Zoom objective	0.7~3x	
		1~4.5x	1
	Auxiliary Objective	2x, 0.75x, 0.63x, 0.5x	
Zoom Ratio	1:4.3		
	1:4.5		1
Working Distance	97mm		1
Illumination	LED Reflection Illumination		1
	LED transmission Illumination		1
Photo Attachment			
Video Attachment			





**Vernier Microscope - Travelling**

Horizontal and vertical scales of stainless steel. The cast iron base is fitted with levelling screws with the top duly machined over which slides a metal carriage. Slide can be clamped at any position by means of clamping screw. Fine adjustment for final reading is with a micrometer screw. A vertical slide operating in a similar way is fitted on the horizontal carriage. The microscope with rack and pinion is fitted on this vertical carriage and can be clamped in a vertical or horizontal position. Stage for placing objects for measurement is fitted with Perspex plate. Achromatic lenses have been used.

Slides travel 165mm horizontally and 140mm vertically. Scales are accurately divided. Vernier reading 0.02 or 0.01mm. The unit packed in wooden polished case.

ESB52860



**Microscopic Slide , 76/26 , Plain, (Pk/50)**

Microscopic slides , 76/26 , plain, (pack of 50)

ESB52871



**Microscopic Cover Slip 18 X 18 Mm**

ESB52872 Size: 18 X 18 MM come in PK/100

ESB52873 Size: 20 X 20 MM come in PK/100



**Haemocytometer Set**

Complete set including double chamber, 2 cover glass, each one red and white diluting pipette with tubing and mouth piece

ESB52874



**Haemometer Set**

Haemometers are used for the determination of blood's content of haemoglobin's. our haemometer according to Sahli is supplied as complete set consisting of:

- polystyrene support with 2 coloured rods and opal glass plate
- comparator tube
- haemoglobin's pipette 20 µl acc. to Sahli
- silicone tubing of approx. 16 cm length
- white mouthpiece
- dropping pipette with rubber teat
- stirring rod
- acid vial
- cleaning brush

ESB52875



**Slide Box Plastic**

This polystyrene slide box is durable, compact and provides protection to 75mm x 25mm slides. The heavy walls will not warp, splinter or crack under normal use.

ESB52876





- ESB52878** MICROSLIDE ADAPTATION
- ESB52879** MICROSLIDE Air Pollution & Human Health
- ESB52880** MICROSLIDE Air Pollution and Plant Health
- ESB52881** MICROSLIDE Amphibians
- ESB52882** MICROSLIDE Animal Mitosis
- ESB52883** MICROSLIDE Aurelia-The Life Cycle
- ESB52884** MICROSLIDE Basic Human Histology
- ESB52885** MICROSLIDE Body Defenses Against Infection
- ESB52886** MICROSLIDE Cell Of Plants
- ESB52887** MICROSLIDE Cell Structure
- ESB52888** MICROSLIDE Cells Of Plants and Animals
- ESB52889** MICROSLIDE Cells Of Your Body
- ESB52890** MICROSLIDE Chromosomes and Genes In Action
- ESB52891** MICROSLIDE Comparative Circulatory Systems
- ESB52892** MICROSLIDE Comparative Digestive Systems
- ESB52893** MICROSLIDE Comparative Nervous Systems
- ESB52894** MICROSLIDE Comparative Respiratory Systems
- ESB52895** MICROSLIDE Dissection Set - Cat
- ESB52896** MICROSLIDE Dissection Set - Earthworm
- ESB52897** MICROSLIDE Dissection Set - Frog
- ESB52898** MICROSLIDE Drug Abuse
- ESB52899** MICROSLIDE Ecology Under The Microscope
- ESB52900** MICROSLIDE Egg To Tadpole To Frog
- ESB52901** MICROSLIDE Fighting Infections
- ESB52902** MICROSLIDE Fossils
- ESB52903** MICROSLIDE Fossils and Evolution
- ESB52904** MICROSLIDE From Flower To Fruit
- ESB52905** MICROSLIDE Fur, Feathers, Skin & Scales
- ESB52906** MICROSLIDE Galaxies and Nebulae
- ESB52907** MICROSLIDE Harmful and Helpful Bacteria
- ESB52908** MICROSLIDE Harmful Bacteria
- ESB52881** MICROSLIDE Amphibians
- ESB52882** MICROSLIDE Animal Mitosis
- ESB52883** MICROSLIDE Aurelia-The Life Cycle
- ESB52884** MICROSLIDE Basic Human Histology
- ESB52885** MICROSLIDE Body Defenses Against Infection
- ESB52886** MICROSLIDE Cell Of Plants
- ESB52887** MICROSLIDE Cell Structure
- ESB52888** MICROSLIDE Cells Of Plants and Animals
- ESB52889** MICROSLIDE Cells Of Your Body
- ESB52890** MICROSLIDE Chromosomes and Genes In Action
- ESB52891** MICROSLIDE Comparative Circulatory Systems
- ESB52892** MICROSLIDE Comparative Digestive Systems
- ESB52893** MICROSLIDE Comparative Nervous Systems
- ESB52894** MICROSLIDE Comparative Respiratory Systems
- ESB52895** MICROSLIDE Dissection Set - Cat
- ESB52896** MICROSLIDE Dissection Set - Earthworm
- ESB52897** MICROSLIDE Dissection Set - Frog
- ESB52898** MICROSLIDE Drug Abuse
- ESB52899** MICROSLIDE Ecology Under The Microscope
- ESB52900** MICROSLIDE Egg To Tadpole To Frog
- ESB52901** MICROSLIDE Fighting Infections
- ESB52902** MICROSLIDE Fossils
- ESB52903** MICROSLIDE Fossils and Evolution
- ESB52904** MICROSLIDE From Flower To Fruit
- ESB52905** MICROSLIDE Fur, Feathers, Skin & Scales
- ESB52906** MICROSLIDE Galaxies and Nebulae
- ESB52907** MICROSLIDE Harmful and Helpful Bacteria
- ESB52908** MICROSLIDE Harmful Bacteria



## Slides

## Microslides

# Microscopes

<b>ESB52909</b>	MICROSLIDE Helpful Bacteria	<b>ESB52934</b>	MICROSLIDE Measuring The Big Bang
<b>ESB52910</b>	MICROSLIDE Heterotrophic Nutrition	<b>ESB52935</b>	MICROSLIDE Mechanisms For Survival
<b>ESB52911</b>	MICROSLIDE Honey Bee	<b>ESB52936</b>	MICROSLIDE Your Body
<b>ESB52912</b>	MICROSLIDE How A One-Celled Animal Divides	<b>ESB52937</b>	MICROSLIDE Algae
<b>ESB52913</b>	MICROSLIDE How Living Things Breathe	<b>ESB52938</b>	MICROSLIDE Monocots & Diocots
<b>ESB52914</b>	MICROSLIDE How Rocks Are Formed	<b>ESB52939</b>	MICROSLIDE Moss-The Life Cycle
<b>ESB52915</b>	MICROSLIDE How Things Breathe	<b>ESB52940</b>	MICROSLIDE Nerve and Muscle Action
<b>ESB52916</b>	MICROSLIDE How We Begin	<b>ESB52941</b>	MICROSLIDE Nutrition
<b>ESB52917</b>	MICROSLIDE Human Blood	<b>ESB52942</b>	MICROSLIDE Obelia-The Life Cycle
<b>ESB52918</b>	MICROSLIDE Human Diseases	<b>ESB52943</b>	MICROSLIDE Omnivores
<b>ESB52919</b>	MICROSLIDE Immunity	<b>ESB52944</b>	MICROSLIDE Parts Of An Insect
<b>ESB52920</b>	MICROSLIDE Ingestion (Amoeba)	<b>ESB52945</b>	MICROSLIDE Plants That are not Green
<b>ESB52921</b>	MICROSLIDE Insect Parts	<b>ESB52946</b>	MICROSLIDE Plants Without Flowers
<b>ESB52922</b>	MICROSLIDE Life Functions (Paramecia)	<b>ESB52947</b>	MICROSLIDE Porifera (Sponges)
<b>ESB52923</b>	MICROSLIDE Life In The Boreal Forest	<b>ESB52948</b>	MICROSLIDE Predators
<b>ESB52924</b>	MICROSLIDE Life In The Desert	<b>ESB52949</b>	MICROSLIDE Probing The Sun's Secrets
<b>ESB52925</b>	MICROSLIDE Life In The Grasslands	<b>ESB52950</b>	MICROSLIDE Protozoa
<b>ESB52926</b>	MICROSLIDE Life In The Rain Forest	<b>ESB52951</b>	MICROSLIDE Spectroscopy In The Sky
<b>ESB52927</b>	MICROSLIDE Life In The Soil	<b>ESB52952</b>	MICROSLIDE Survival By Camouflage (Hide and Seek)
<b>ESB52903</b>	MICROSLIDE Fossils and Evolution	<b>ESB52953</b>	MICROSLIDE Taxonomy
<b>ESB52904</b>	MICROSLIDE From Flower To Fruit	<b>ESB52954</b>	MICROSLIDE Teeth and Gums
<b>ESB52905</b>	MICROSLIDE Fur, Feathers, Skin & Scales	<b>ESB52955</b>	MICROSLIDE The Animal Kingdom
<b>ESB52906</b>	MICROSLIDE Galaxies and Nebulae	<b>ESB52956</b>	MICROSLIDE The Arachnids
<b>ESB52907</b>	MICROSLIDE Harmful and Helpful Bacteria	<b>ESB52957</b>	MICROSLIDE The Bee
<b>ESB52908</b>	MICROSLIDE Harmful Bacteria	<b>ESB52958</b>	MICROSLIDE The Birth and Death Of Stars
<b>ESB52909</b>	MICROSLIDE Helpful Bacteria	<b>ESB52959</b>	MICROSLIDE The Cytoplasm
<b>ESB52910</b>	MICROSLIDE Heterotrophic Nutrition	<b>ESB52960</b>	MICROSLIDE The Drosophila
<b>ESB52911</b>	MICROSLIDE Honey Bee	<b>ESB52961</b>	MICROSLIDE The Five Kingdoms Of Life
<b>ESB52912</b>	MICROSLIDE How A One-Celled Animal Divides	<b>ESB52962</b>	MICROSLIDE The Flower Of A Flowering Plant
<b>ESB52913</b>	MICROSLIDE How Living Things Breathe	<b>ESB52963</b>	MICROSLIDE The Frog
<b>ESB52914</b>	MICROSLIDE How Rocks Are Formed	<b>ESB52964</b>	MICROSLIDE The Human Brain (1994)
<b>ESB52915</b>	MICROSLIDE How Things Breathe	<b>ESB52965</b>	MICROSLIDE The Hydra
<b>ESB52916</b>	MICROSLIDE How We Begin	<b>ESB52966</b>	MICROSLIDE The Kingdom Fungi (1982)
<b>ESB52917</b>	MICROSLIDE Human Blood	<b>ESB52967</b>	MICROSLIDE The Kingdom Monera
<b>ESB52918</b>	MICROSLIDE Human Diseases	<b>ESB52968</b>	MICROSLIDE The Kingdom Protista
<b>ESB52919</b>	MICROSLIDE Immunity	<b>ESB52969</b>	MICROSLIDE The Leaf Of A Flowering Plant
<b>ESB52920</b>	MICROSLIDE Ingestion (Amoeba)	<b>ESB52970</b>	MICROSLIDE The Life Cycle Of Malaria
<b>ESB52921</b>	MICROSLIDE Insect Parts	<b>ESB52971</b>	MICROSLIDE The Microscope-A Tool For Learning
<b>ESB52922</b>	MICROSLIDE Life Functions (Paramecia)	<b>ESB52972</b>	MICROSLIDE The Monarch Butterfly
<b>ESB52923</b>	MICROSLIDE Life In The Boreal Forest	<b>ESB52973</b>	MICROSLIDE The Plant Kingdom
<b>ESB52924</b>	MICROSLIDE Life In The Desert	<b>ESB52974</b>	MICROSLIDE The Root Of A Flowering Plant
<b>ESB52925</b>	MICROSLIDE Life In The Grasslands	<b>ESB52975</b>	MICROSLIDE The Stem Of A Flowering Plant
<b>ESB52926</b>	MICROSLIDE Life In The Rain Forest	<b>ESB52976</b>	MICROSLIDE The Tidepool
<b>ESB52927</b>	MICROSLIDE Life In The Soil	<b>ESB52977</b>	MICROSLIDE Vegetative Propagation
<b>ESB52928</b>	MICROSLIDE Life On The Tundra	<b>ESB52978</b>	MICROSLIDE Your Brain
<b>ESB52929</b>	MICROSLIDE Locomotion	<b>ESB52979</b>	MICROSLIDE Your Life and Breath
<b>ESB52930</b>	MICROSLIDE Mapping The Stars	<b>ESB52980</b>	MICROSLIDE Your Teeth and Gums
<b>ESB52931</b>	MICROSLIDE Marchantia - The Life Cycle (1969)	<b>ESB52981</b>	MICROSLIDE Yours Glands
<b>ESB52932</b>	MICROSLIDE Marine Biology		
<b>ESB52933</b>	MICROSLIDE Marine Plankton		





**Prepared Slide Set Basic Biology**

Set of 25 different slides covers the major requirements for a basic course in biology. Selected slides from the zoology, histology and botany sections make up this useful set. Supplied in Box.

Paramecium, E Paramecium, conjugation, E Hydra, TS Hydra, with testis, TS Hydra, with ovary, TS Taenia (tapeworm), scolex, LS Taenia, proglottid, E Compact bone, TS Striated muscle, LS Cardiac muscle, LS Spinal cord, TS Nerve cells, smear Skin, VS Kidney, VS Lycopodium strobilus, LS Spirogyra, conjugation, Yeast, E Liliium (lily), anther, TS Dryopteris, pinnule with sori, TS Stigma with pollen tube Liliium (lily), anther, TS Dryopteris, pinnule with sori, TS Stigma with pollen tube Cucurbita (marrow), stem, TS Liliium, ovary, TS

Tilia (lima), young and old stem, TS Lumbricus (earthworm), TS, typhlosole Helianthus, stem, secondary thickening, TS.

ESB52983

**Prepared Silde Set Basic Botany**

Set of 25 different slides covers the major requirements for a basic botanical specimens representing the major plant groups. Supplied in Box. Chlamydomonas, E, Spirogyra, vegetative filaments, E Spirogyra, conjugation, E Fucus, dioecious, antheridial and oogonial Mucor, conjugation Conceptacles on one slide, V S Saccharomyces (yeast), budding, E Penicillium, mycelium and conidia, E Marchantia (liverwort), thallus, antheridia, V S Marchantia thallus, archegonia, V S Mnium (moss), antheridial head, V S Marchantia developing sporogonium, V S Mnium, archegonial head, V S Dryopteris (fern), prothallus with antheridia, Dryopteris, pinnule with sori, TS and archegonia, E Pinus (pine), leaf, TS, Allium (onion), root apex, mitosis, LS Zea, (maize), leaf, TS, Helianthus (sunflower), young root, TS Zea, stem, TS, Helianthus, stem, TS Cucurbita (marrow), stem LS for sieve tubes Tilia (lime), young and old stem, T S Ranunculus (buttercup), flower bud, LS Prunus (cherry), leaf, T S Pollen grains, wind and insect distribution, E

ESB52984

**Prepared Silde Set Bacteria Set/12**

Set of 12 different slides of bacteria supplied in plastic box includes: Mixed bacteria, bacilli, cocci and spirillum Mycobacterium tuberculosis, in tissue Cocci, Gram positive and negative Rhizobium, in root nodule Bacilli, Gram positive and negative, Vibrio Escherichia coil, Spirillum, Bacillus subtilis Staphylococcus epidermidis, Bacillus megaterium Streptococcus lactis

ESB52985

**Prepared Silde Set General**

Set of 50 Slides Bacteria-3 types-SMR, Hydra-WM Amoeba-WM, Obelia colony-WM Paramecium-WM, Dugesia (Planaria)-WM Euglena-WM, Fluke (Clonorchis)-WM Volvox-WM, Hookworm, Spirogyra-WM Earthworm-CS, Bread mold Sexual-WM Insect Spiracle-WM, Penicillium-WM Fly wing and leg-WM, Mushroom gill-CS Honeybee sting-WM, Moss antheridia-CS Grasshopper testis-CS, Moss archegonia-CS Ascaris female gonads-CS, Fern prothallia-WM Frog egg-CS, Fern rhizome-CS, Frog egg blastula-CS Polypodium sori-CS Mammal skin-CS, Onion root tip-LS, Frog blood-SMR Dicot root-CS, Mammal intestine-CS Monocot/dicot stem-CS, Amphiuma liver-CS Woody stem-CS, Chick-33-hour-WM Dicot leaf-CS, Chick-96-hour-CS Columnar epithelium, Onion epidermis-WM Squamous epithelium-SMR, Lily bud-CS Corn seed embryo-CS, Bone-CS Mixed pollen-WM, Mammal ovary-CS Spongy tissue-CS grantia, Mammal Testis-CS Spongy tissue-CS Spongy tissue-SMR.

ESB52986

**Prepared Silde Set Human Histology**

Set of 25. Supplied in Box. Cerebellum, Section Ileum, section Spinal cord, TS, Duodenum, TS Nerve, TS and LS, Appendix, TS Artery and vein, TS, Colon, V S Cardiac muscle, section, Pancreas, section Lymph node, section Liver, section Spleen, section Kidney, section Scalp, VS, Ovary, section Skin, heavily pigmented, section Uterus, section Striated muscle, section Cervix, section Mammary gland, section Testis, section Oesophagus, section Thyroid gland, section Stomach, fundic portion, section

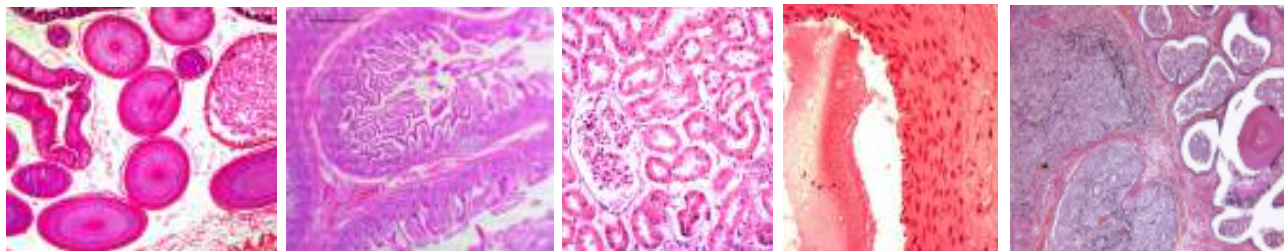
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**Biological Science Set Of 50 Kit**

Biological Science Set of 50 KIT

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Human Scalp and Hair Microscope Slides Pack of twelve

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Meiosis and Mitosis Slide Set Pack

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**Mitosis And Meiosis Set 2**

Mitosis and Meiosis Set 2 Pack of five

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**Prokaryotes Slide Set**

Prokaryotes Slide Set Pack

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Respiratory and Circulatory System Microscope Slides Pack of ten

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**Textile Fibres And Fabric Set**

Textile Fibres and Fabric Microscope Slides Pack of twenty five

ESB53002



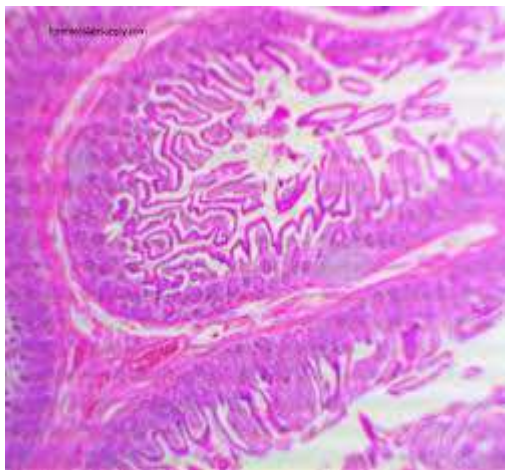
## Zooology Slides

- ESB53003** Adipose tissue, sec.
- ESB53004** Adrenal gland T.S.
- ESB53005** Cortex and medulla
- ESB53006** Aorta
- ESB53007** Vein, T.S.
- ESB53008** Areolar connective tissue
- ESB53009** Artery and vein, thin sec.
- ESB53010** Vein, thin sec.
- ESB53011** Bed bug (*cimex lectarius*) w.m.
- ESB53012** Bronchus T.S. (plastic embedded)
- ESB53013** Cardiac muscle L.S.. intercalated discs.
- ESB53014** Cardiac stomach T.S.
- ESB53015** Catshark (*scyliorhinus*) h.s. gill arch of late embryo
- ESB53016** Ciliated epithelium T.S. oviduct (plastic embedded)
- ESB53017** Cockroach (*periplaneta*), head entire.
- ESB53018** Colon T.S. large intestine
- ESB53019** Compact bone L.S.
- ESB53020** Compact bone T.S.
- ESB53021** Compact bone T.S. decalcified femur
- ESB53022** cuboidal epithelium sec.
- ESB53023** Kidney tubules
- ESB53024** Earthworm (*lumbricus*) T.S. Intestinal region
- ESB53025** Earthworm (*lumbricus*) T.S. Intestinal region (for insertion of chaetae)
- ESB53026** Effector nerve endings (intercostal muscle)
- ESB53027** Frog blood smear
- ESB53028** Fruit fly (*drosophila melanogaster*) salivary gland
- ESB53029** fundic stomach T.S.
- ESB53030** Housefly (*musca domestica imago*) head and proboscis entire
- ESB53031** Human blood smear, giemsa stained
- ESB53032** Human cardiac muscle, sec.
- ESB53033** Human molar or canine tooth I.S.
- ESB53034** Human pacinian corpuscle V.S. (skin or pancreas)
- ESB53035** Human plantar skin V.S. (triple stain)
- ESB53036** Human scalp V.S. (triple stain)
- ESB53037** Human thyroid, sec.
- ESB53038** Hydra I.s. general structure
- ESB53039** Hydra t.s. for endoderm and ectoderm structure
- ESB53040** Hydra w.m. budding
- ESB53041** Hydra w.m. carefully extended and stained.
- ESB53042** Insect trachea (cockroach or locust)
- ESB53043** Liver (human) V.S.
- ESB53044** Liver (pig) V.S.
- ESB53045** Liver fluke (*fasciola hepatica*) w.m. carefully extended specimen
- ESB53046** Liver, injected, sec.
- ESB53047** Locust embryo squash (acetic orcein and feulgen stain)
- ESB53048** Locust, v.s. Head and eye (triple stain)
- ESB53049** Lung t.s. Stained for elastic and collagen fibres of alveolar walls.
- ESB53050** Lung, injected, thick sec.
- ESB53051** Lung, t.s. thin sec. (plastic embedded)
- ESB53052** Lymph node t.s. cortex and medulla (plastic embedded)
- ESB53053** Mammal duodenum, sec. (brunners glands)
- ESB53054** Mammal hyaline cartilage, sec.
- ESB53055** Mammal ileum, sec.
- ESB53056** Mammal small intestine t.s.
- ESB53057** Mammal yellow elastic cartilage, sec.
- ESB53058** Medulla oblongata t.s.
- ESB53059** Mites w.m.
- ESB53060** Mosquito (*anopheles*) w.m. female adult, mouthparts
- ESB53061** Nematode (*trichinella spiralis*) encysted larvae in muscle sec.
- ESB53062** Nerve cells (spinal cord smear)
- ESB53063** Non-striated (smooth) muscle, intestinal wall
- ESB53064** Pancreas for islets of langerhans
- ESB53065** Peripheral nerve I.s.
- ESB53066** Peripheral nerve t.s.
- ESB53067** Peripheral nerve t.s. (plastic embedded)
- ESB53068** Pituitary v.I.s.
- ESB53069** Planarian worm t.s. (triple stain)
- ESB53070** Polychaete worm (*nereis*) w.m. parapodium.
- ESB53071** Pseudostratified ciliated columnar epithelium t.s. trachea/bronchus
- ESB53072** Rabbit oesophagus t.s.
- ESB53073** Rat cerebellum sec.
- ESB53074** Rat cerebral cortex, sec.
- ESB53075** Red bone marrow smear
- ESB53076** Respiratory system
- ESB53077** Scabies mite (*sarcoptes*) w.m. isolated adults
- ESB53078** Simple columnar epithelium of intestine
- ESB53079** Simple squamous epithelium - pavement tissue (frog skin)
- ESB53080** Small intestine I.s.
- ESB53081** Small mammal entire heart, I.s.
- ESB53082** Small intestine
- ESB53083** Snail (*helix*) w.m. radula
- ESB53084** Spinal cord c.s.
- ESB53085** Squamous epithelium - buccal smear
- ESB53086** Stomach for mucous, parietal and chief cells
- ESB53087** Stratified squamous epithelium t.s. oesophagus
- ESB53088** Striated muscle t.s. selected for muscle spindles
- ESB53089** Striated muscle, cardiac L.S.
- ESB53090** Striated muscle, skeletal, sec.
- ESB53091** Taenia pisiformis w.m. scolex
- ESB53092** Tapeworm (*echinococcus granulosus*) w.m. Complete
- ESB53093** Tapeworm (*taenia pisiformis*) ova in faeces
- ESB53094** Tapeworm (*taenia pisiformis*) W.M. cysticercus, scolex
- ESB53095** Tapeworm (*taenia*) T.S. proglottid (triple stain)



**Zoology Slides**

- ESB53096** Tendon L.S. white fibrous connective tissue
- ESB53097** Thyroid gland, sec.
- ESB53098** Thyroid and parathyroid T.S.
- ESB53099** Tongue V.S.
- ESB53100** Trachea (triple stain)
- ESB53101** Trachea T.S. thin sec. (h & e stain, plastic embedded)
- ESB53102** Transitional epithelium sec. bladder sec.
- ESB53103** Vertebral column (entire) T.S.
- ESB53104** White fibro-cartilage l.s. intervertebral disc.
- ESB53105** Yellow elastic connective tissue l.s.



**Bacteria Slides**

- ESB53106** Anabaena w.M. Filaments
- ESB53107** Bacillus cereus W.M.
- ESB53108** Bacillus megatherium W.M.
- ESB53109** Bacillus,
- ESB53110** Coccus and
- ESB53111** Spirillum W.M. (Gram stain)
- ESB53112** Escherichia coli W.M.
- ESB53113** Gram +VE and -VE bacilli W.M..
- ESB53114** Mycobacterium tuberculosis in sputum smear
- ESB53115** Nostoc filament
- ESB53116** Oscillatoria W.M.
- ESB53117** Rhizobium leguminosarum sec.
- ESB53118** Streptococcus lactic - microscope slide



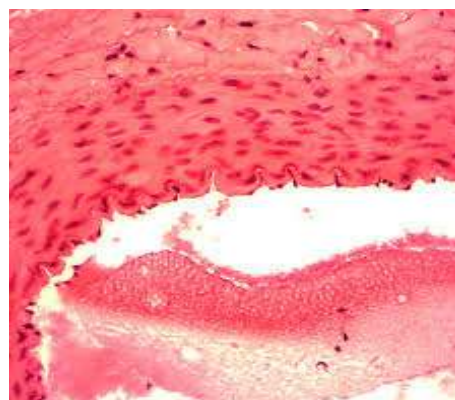
**Plant Slides**

- ESB53119** Allium root tip
- ESB53120** Allium root tip
- ESB53121** Beech (fagus) sun shade leaf sec.
- ESB53122** Broad bean (vicia) L.S. root tip
- ESB53123** Broad bean (vicia) T.S. young root hair region
- ESB53124** Buttercup (ranunculus repens) T.S. stem
- ESB53125** Buttercup (ranunculus) L.S. flower
- ESB53126** Buttercup (ranunculus) T.S. mature root
- ESB53127** Buttercup (ranunculus) T.S. root
- ESB53128** Buttercup (ranunculus) T.S. root, young (protoxylem only)
- ESB53129** Buxus (or alt. dicot) W.M. lower epidermis with stomata
- ESB53130** C3 and C4 leaf T.S.
- ESB53131** Capsella L.S. ovule - cotyledon stage
- ESB53132** Capsella L.S. ovule - early embryo, short serial
- ESB53133** Cherry laurel (prunus lauro-cerasus) T.S. leaf
- ESB53134** Club moss (mniun) L.S. archegonial head
- ESB53135** Club moss (mniun) L.S. capsule
- ESB53136** Crassulacean acid metabolism T.S. leaf
- ESB53137** Crowberry (empetrum nigrum) t.s. xerophytic leaf
- ESB53138** Cucurbita L.S. stem, sieve tubes
- ESB53139** Cucurbita T.S. stem, sieve tubes
- ESB53140** Cucurbita T.S. and l.s. stem
- ESB53141** Deadnettle (lamium) T.S. stem
- ESB53142** Drosera, sundew - microscope slide
- ESB53143** Elderberry (sambucus) t.s bark with lenticel
- ESB53144** Fern (dryopteris filix-mas) t.s. pinnule with sori.
- ESB53145** Fern w.m. prothallus (developing sporophyte, first leaf emerged)
- ESB53146** Fern W.M. prothallus (developing sporophyte, young stage)
- ESB53147** Fern w.m. prothallus (immature, archegonia only)
- ESB53148** Fig (ficus) T.S. leaf - multiple epidermis with sunken stomata cystoliths
- ESB53149** french bean (phaseolus) T.S. leaf
- ESB53150** Heather (erica) T.S. xerophytic leaf
- ESB53151** helianthus L.S. stem
- ESB53152** helianthus T.S. and L.S. stem
- ESB53153** Impatiens T.S. and h.L.S.leaf
- ESB53154** Lily (lilium regale)T.S. anthers - first meiotic division, early prophase
- ESB53155** Lily (lilium regale) T.S. anthers - first meiotic division, late prophase
- ESB53156** Lily (lilium regale) t.s. anthers - first meiotic division, metaphase
- ESB53157** Lily (lilium regale) T.S. anthers - second meiotic division
- ESB53158** Lily (lilium) germinating pollen



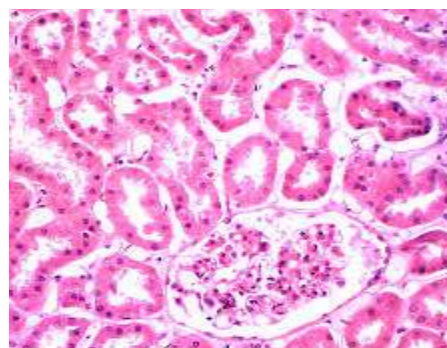
## Plant Slides

- ESB53159** Lily (lilium) mature embryo sac  
**ESB53160** Lily (lilium) T.S. young flower bud.  
**ESB53161** Lime (tilia) T.S. old stem  
**ESB53162** Lycopodium T.S. stem.  
**ESB53163** Maize (zea mays) T.S. leaf  
**ESB53164** Maize (zea mays) T.S. root  
**ESB53165** Maize (zea) T.S. and L.S. stem  
**ESB53166** marchantia polymorpha v.s. antheriophore  
**ESB53167** with antheridia  
**ESB53168** Marchantia polymorpha v.s. sporogonium  
**ESB53169** Marram grass (ammophila arenaria) t.s. xerophyte  
**ESB53170** Mesophytic, hydrophytic and xerophytic leaf.  
**ESB53171** Monocot leaf T.S.  
**ESB53172** Dicot leaf T.S.  
**ESB53173** Monocot and dicot root C.S. comparison  
**ESB53174** Monocot stem T.S.  
**ESB53175** Dicot stem T.S.  
**ESB53176** Moss L.S. of antheridial head  
**ESB53177** Moss leaf W.M.  
**ESB53178** Nettle (urtica dioica) T.S. stem for stinging cells  
**ESB53179** Onion (allium) L.S. root tip (stained for mitosis, all stages) - set of 5  
**ESB53180** Onion (allium) root tip squash (feulgen acetic-orcein stain)  
**ESB53181** Onion (allium) root tip squash (stained for mitosis, metaphase)  
**ESB53182** Onion (allium) W.M. epidermis with stomata  
**ESB53183** Pine (pinus) T.S.. leaf  
**ESB53184** Pine (pinus) T.S. older stem plus annual rings  
**ESB53185** Pine (pinus) T.S. young root  
**ESB53186** Pine (pinus) w.m. stem to show xylem tubes.  
**ESB53187** Pinus l.s. whole female cone (1st year)  
**ESB53188** Pinus w.m. pollen  
**ESB53189** Pondweed (potamogeton) T.S. stem, hydrophyte  
**ESB53190** Potato (solanum) T.S. stem, tuber for starch  
**ESB53191** Privet (ligustrum) T.S. leaf  
**ESB53192** Privet (ligustrum) T.S. leaf  
**ESB53193** Rice T.S. root  
**ESB53194** Sorghum T.S. leaf  
**ESB53195** Sunflower (helianthus) T.S. root, young  
**ESB53196** Sunflower (helianthus) T.S. leaf  
**ESB53197** Sunflower (helianthus) T.S. root, old  
**ESB53198** Sunflower (helianthus) T.S. stem, old (secondary thickening)  
**ESB53199** Sunflower (helianthus) T.S. stem, old primary  
**ESB53200** Sunflower (helianthus) T.S. stem, young  
**ESB53201** Sunflower (helianthus) T.S. stem, young primary (pericycle fibres unthickened)  
**ESB53202** Sunflower (helianthus) T.S. stem, interfascicular cambium  
**ESB53203** Water lily (nymphaea) T.S. floating leaf



## Extra

- ESB53204** Agaricus campestris V.S. Pileus, grills with basidiospores  
**ESB53205** Amoeba proteus w.M. Selected specimens  
**ESB53206** Aspergillus on substrate with conidiospores  
**ESB53207** Chlamydomonas W.M. Vegetative stages  
**ESB53208** Chlorella W.M.  
**ESB53209** Ectotrophic mycorrhiza W.M.  
**ESB53210** Endotrophic mycorrhiza C.S.  
**ESB53211** Euglena viridis (careful differential haematoxylin staining)  
**ESB53212** Lycopodium L.S. Strobilus  
**ESB53213** Mixed marine diatoms W.M. Protoplasts stained  
**ESB53214** Mixed protozoa W.M.. Common forms  
**ESB53215** Paramecium caudatum W.M. in conjunction  
**ESB53216** Paramecium caudatum W.M. (Careful differential staining)  
**ESB53217** Penicillium on diosubstrate with hyphae and conidiospores.  
**ESB53218** Plasmodium falciparum smear  
**ESB53219** Puccinia (wheat rusts) T.S. Host with uredospores  
**ESB53220** Rhizopus stolonifer W.M. With sporangia  
**ESB53221** Rhizopus stolonifer W.M. With zygospores  
**ESB53222** Saccharomyces cerevisiae W.M. Budding cells  
**ESB53223** Sordaria fimicola W.M.  
**ESB53224** Spirogyra vegetative filaments  
**ESB53225** Trypanosoma brucei in rat blood smear (giemsa stain)  
**ESB53226** Volvox W.M. Daughter colonies, sexual stages, zygotes





**EduScience UK**



# FORENSICS SCIENCE



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# FORENSIC SCIENCE





### Analysis Of Hair

The Hair Analysis Kit provides students with the opportunity to use scientific methods and basic laboratory skills to study the morphology of hair samples from various species. Includes a discussion of hair used as evidence in forensic science, directions for mounting hair samples and visualizing scale patterns, and illustrated descriptions of hair structures. Students conduct two forensic examinations using the standard procedures used by forensic examiners. Includes instructional manuals and student worksheets. Required, but not included: microscopes, hair brushes, forceps, and plastic sandwich bags. Designed for 24 students working in six groups of four. Meets national standards for grade levels 9-12.

#### Kit Contains:

Instructor Manual, Student Manual, MSDS, Student Diagram Charts, #1 Examination Worksheets, #2 Examination Worksheets, Microscope Slides, Cover Slips, CD, Hair Sample A, Hair Sample B, Hair Sample C, Mounting Media, Fingernail Polish

ESF53502



### Analysis Of Documents

Analysis of Documents includes a series of lab investigations in which types of paper, ink, pencil marks, typewriting, and handwriting are analysed using microscopic observation, UV light, chromatography, replicating techniques, and wet chemistry to determine forgery of checks and alteration of notes and messages. Culminates in the analysis of secret messages. Includes instructional manuals and reproducible student worksheets. Required, but not included: Microscope, UV light, hot plate (or heat lamp or oven), lemon juice or milk, erasers, cotton balls, clear tape, small jars, watch glasses or beakers. Designed for 24 students working in six groups of four. Meets national standards for grade levels 6-12.

#### Kit Contains:

Instructor Manual, Student Manual, MSDS, Chromatography Paper, Jars w/ Lids, Black Felt Tipped Pens, Pencils, Blue Pens, Typed Notes, Crime Scene Note, Magnifying Lenses, Brushes, Clay, Disposable Gloves, Shell Vials, Forceps, Different Types of Paper, Ethanol, Acetone, Butanol, Sodium Hydroxide Solution, Phenolphthalein Solution, Iron Sulphate Solution, Potassium Ferro-cyanide Solution, Ink Eradicator, Iodine, Fluorescent Ink

ESF53503



### Analysis Of Drugs & Poisons

Students are introduced to qualitative analysis in the intriguing context of criminal investigation. Chemical analytical techniques are used to identify over-the-counter drugs, test for controlled substances using simulated drugs, simulate presumptive drug testing, and detect evidence of heavy metal poisoning through the analysis of amino acids in urine. Includes materials for six groups (24 students) and an instructors manual with reproducible student instructions, data sheets, and complete answer keys. Meets national standards for grade level 9-12. Required but not included: UV light, microscope, oven, lamp, or hot plate, scale, glassware and lab supplies.

#### Kit Contains:

Instructor I453s Manual w/ Reproducible Student Data Sheet, MSDS, Simulated Urine Alanine, Simulated Urine Glycine, Simulated Urine Unknown, Crime Scene Unknown, Unknown A, Unknown B, Unknown Powder X, Unknown Powder Y, Aspirin, Tylenol, Alka-Seltzer, Butanol, Simulated LSD, Simulated Marijuana, Acetic Acid, Acidified Ferric Nitrate Solution, Acetone, Sodium Bicarbonate, Hydrochloric Acid, Ninhydrin (powder), Empty Plastic Bottles W/Dropper Caps, Universal Indicator and pH Colour Chart, Chromatography Paper, Capillary Tubes, Depression Plates, Pipettes, Q-tips, Toothpicks, Scott Reagent, Unknown Drug Sample, Quinine Monohydrochloride, Glass Sample Vials, Pasture Pipets

ESF53504





**Analysis Of Fingerprints Class-pack (For 24 Students)**

This kit provides students with the opportunity to learn standard techniques for dusting for fingerprints using a variety of powders and for developing latent fingerprints from a variety of surfaces. Students lift fingerprints from slides, develop prints on paper using both the Ninhydrin method and the Lugol Iodine method, use the cyanoacrylate fuming method to visualize a fingerprint on a metal spoon, and learn to identify direct prints. Each investigative group prepares fingerprint evidence for another class group to analyse and with the aid of Modus Operandi sheets, the group identifies the fingerprints of the suspects with the aid of fingerprint standards developed by the FBI. Includes instructional manuals and student worksheets. Required, but not included: fume hood, (6) one-quart jars or one -litre beakers. Designed for 24 students working in six groups of four. Meets national standards for grade levels 10-12.

**Kit Contains:**

Instructor Manual, Student Data Sheets, MSDS, "FBI" Fingerprint Classification Sheets, Bond Paper, Filter Paper, Gloves, Pipette, Fingerprint Brushes, Magnifying Glasses, Forceps, Jars w/ Caps, Metal Spoons, Aluminium Foil, Super-glue, Ink Pads, Scotch Tape

String, Microscope Slides, Index Cards, Modus Operandi Sheets, Aluminium Powder, Carbon Black, Ninhydrin, Acetone, Iodine

ESF53505

**Analysis Of Finger prints Mini Kit (Ideal For 1 To 4 Students)**

This kit provides students with the opportunity to learn standard techniques for dusting for fingerprints using a variety of powders and for developing latent fingerprints from a variety of surfaces. Students lift fingerprints from slides, develop prints on paper using both the Ninhydrin method and the Lugol Iodine method, use the cyanoacrylate fuming method to visualize a fingerprint on a metal spoon, and learn to identify direct prints. Each investigative group prepares fingerprint evidence for another class group to analyse and with the aid of Modus Operandi sheets, the group identifies the fingerprints of the suspects with the aid of fingerprint standards developed by the FBI. Includes instructional manuals and student worksheets. Required, but not included: fume hood, (6) one-quart jars or one -litre beakers. Designed for 24 students working in six groups of four. Meets national standards for grade levels 10-12.

**Kit Contains:**

Instructor Manual, Student Data Sheets, MSDS, "FBI" Fingerprint Classification Sheets, Bond Paper, Filter Paper, Gloves, Pipette, Fingerprint Brushes, Magnifying Glasses, Forceps, Jars w/ Caps, Metal Spoons, Aluminium Foil, Super-glue, Ink Pads, Scotch Tape

String, Microscope Slides, Index Cards, Modus Operandi Sheets, Aluminium Powder, Carbon Black, Ninhydrin, Acetone, Iodine

ESF53506

**Dusting For Finger prints Class Kit**

Students learn to prepare fingerprint evidence and to stabilize, dust, and lift latent fingerprints, then identify the prints by comparison to the minutia of inked prints. Includes advanced techniques using carbon, aluminium, magnetic, and fluorescent powders, magnetic applicators, fibreglass brushes, and camel fingerprinting brushes. Students apply their new expertise to determine the best methodologies for collecting prints from unusual surfaces and analyse print evidence to solve a crime at the Museum of the Modern Detective. Includes supplies for 24 students working in teams, complete instruction manual, reproducible student procedures, and assessment materials. Hood, UV light source, and goggles required. Requires special permit for international sales.

**Kit Contains:**

Instructor Manual, Student Manuals, MSDS, Tape, Ink Pad, Super Glue, Brushes, Aluminium Foil Sheet, Spoons, Charcoal, Aluminium Powder, Index Cards, Magnifying Glasses, Plastic Containers, Powder, Magnetic, Black, Powder, Magnetic, Fluoresc Pink, Magnetic Applicator, w/ 2 Sleeves, Vinyl Flooring Piece, Hardwood Flooring Sample

ESF53509





### Dustless Fingerprints

Investigate alternate methods for lifting fingerprints while practicing the scientific method. Students gather data using fingerprint evidence as they observe, compare, contrast, and hypothesize their way through four different experimental procedures. They will learn how to make impressions in clay and pour a mould, lift fingerprints from soda cans using super glue fuming, and use both iodine and ninhydrin fuming to lift fingerprints from paper. The activity includes an instructor's manual, and student data sheets. Note: This lab should be performed in a chemical fume hood. Designed for 24 students working in six groups of four. Meets national standards for grade levels 5-10.

#### Kit Contains:

Instructor Manual, Student Manuals, MSDS, Fingerprint Identification Sheets, Scotch Tape, Super Glue, Petri Dishes, Forceps, Tongue Depressors, Paint Brushes, Empty Jars w/ Caps, Paper Cups, Modelling Clay, Plastic Gloves, Magnifying Glasses, Aluminium Foil, White Paper, Plaster of Paris, Iodine, Products

ESF53514



### Analysis Of Minerals & Soils

Analysis of Minerals & Soils kit now extends the students experience to not only investigate the physical and chemical properties of trace evidence from a crime scene, but to learn to characterize soil texture. Ideal for Forensic Science, Agriculture, and Environmental Science Courses. Experiments include: Characterizing Soil Appearance, Acidity of Soil, Soil Comparison by Particle Size Analysis, Forensic Density Distribution of Soil Particles, Chemical Reactions of Substances in Soil, and Analysis of Glass Samples. Now includes Hands-On Soil Classification Extension Activities for Determining Soil Texture by Sedimentation and by Using the Feel Method with instructions at differentiated learning levels.

Required not included: fume hood, UV light, balance, microscope, oven/lamp or hot plate, glassware, and general lab supplies.

Contains lead nitrate. Meets national standards for grades 9-12. Note: Soil sample A contains lead nitrate; avoid direct contact with this soil and wash hands after handling.

#### Kit Contains:

Instructor Manual  
Student Data Sheets  
Soil Sample A  
Soil Sample B

Soil Sample C  
Soil Sample D  
Soil Sample "Crime Scene"  
Suspect A (Glass Beads)  
Suspect B (Glass Beads)  
Crime Scene (Glass Beads)  
Density Gradient Tubes  
Medicine Droppers  
Microscope Slides  
Polarizing Film  
Magnifying Glasses  
Plastic Forceps  
Plastic Spoons  
Aluminum Pans  
Sets of Sieves  
Universal Indicator Chart  
Labels  
Bromoform  
Bromobenzene  
Universal Indicator  
Hydrochloric Acid Solution T

ESF53507





### Art Forgery

Add excitement to art, chemistry, or general science classrooms. Students use scientific observation and reasoning as they master the techniques used to distinguish original paintings from forgeries. They are presented with "real" and (forged) Paintings in the styles of Monet, Van Gogh, and Pollack and asked to determine which are original. To determine this, they test for lead in the paint, check for fluorescence under UV light, and analyse paint colours to determine if they are mixed or layered. Required, but not included: UV lamp, 30 small test tubes with stoppers, distilled water, spatulas and match books. Contains lead nitrate and potassium chromate. Designed for 24 students working in six groups of four. Meets national standards for grades 6-12.

#### Kit Contains:

Instructor Manual, Student Data Sheets, MSDS, Single Edge Razor Blades, Magnifying Lenses, Paraffin Cubes, Pipets, 6 Pairs of Paintings, Empty Dropper Bottles w/ Caps, Lead Nitrate Solution, Potassium Chromate Solution

ESF53508



### Criminalization Kit

This murder mystery provides inquiry based learning with an intriguing twist. Students apply many CSI techniques including blood typing, fingerprinting (dusting with carbon powder, dusting with aluminium powder, cyanoacrylate, iodine fuming, and ninhydrin), hair analysis, and analysing and identifying drugs, poisons and other chemicals. Using microscopes, measurement, chemical analysis, observation, and deductive reasoning, students examine the clues necessary to solve the murder of Mr. Paul Dudden. Includes Searching for Clues Forensics Manual, Murder Mystery CD, Analysis of Hair Identification Unit, Analysis of Fingerprinting Unit, and Analysing Drugs and Poisons Unit. Required, but not included: microscope, UV light, beakers, three test tubes with corks or stoppers, large jar, nails, scissors, distilled water, newspaper, pencils, and scrap paper. Designed for 24 students working in six groups of four. Meets national standards for Grades 7-12.

#### Kit Contains:

Instructor Manual, Student Manual, MSDS, MO Sheets, "Searching for Clues" Book, CD, Evidence Collection (A, B, C, D), Microscope Slides, Cover slips, Gloves, Forceps, Magnifying Glasses, Spoons, Index Cards, Filter Paper, Scrap Paper, Tape, Paint Brushes, Ink Pads  
Pipettes, Depression Plates, Super Glue, String, Toothpicks, Empty Jars w/ Lids, Foil, Acetone, "Unknown" Heavy Metal, Carbon Powder  
Aluminium Powder, Ninhydrin, Iodine, Clear Nail Polish, Hair Samples (A, B, C), Mounting Media, Universal Indicator & Chart, Hydrochloric Acid, Dille-Koppanyi A Reagent, Dille-Koppanyi B Reagent, Scott Reagent, Van Urk's Reagent, Drug "Unknown A"  
Drug "Unknown B", Drug "Unknown Z", Simulated Marijuana, Simulated LSD, Acidified Ferric Nitrate, Mercury Compound, Lead Compound, Potassium Chromate, Aspirin, Tylenol, Alka Seltzer

ESF53510





### Crime Scene

This kit takes students through six exercises using reasoning, common sense, math skills, biology, and chemistry to identify a crime scene: Scene Mapping, Hair Analysis, Soil Analysis, Rope Analysis, Analysis of Crime Scene Trash, and Interpretation of Police Evidence. When suspects and victims enter and/or leave a crime scene they bring with them and carry away useful pieces of evidence. Students learn to conduct a proper search, like real crime scene technicians, to avoid destroying evidence. They also learn to properly gather and document evidence and make factual interpretations of a crime scene. Required, but not included: microscopes, graduated cylinders, test tubes, rulers, markers, notebook paper, white paper, and water. Designed for 24 students working in six groups of four. Meets national standards for grades 5-8.

#### Kit Contains:

Instructor Manual, Student Investigation Packets, MSDS, Graph Paper, Glass Slides, Cover Slips, Mounting Media, Universal Indicator Solution, Sifting Screen, Soil Samples, Hair Samples, Rope Samples, Moulding Clay, Trash Evidence (including 9 trace evidence samples), Plastic Spoons, Magnifying Glasses

**ESF53511**



### Blood Spatter Detective

The Blood Spatter Analysis Kit includes in depth experiments which help students become aware of how physics plays a role in criminal investigation. Students learn how gravity, distance, and angles affect a blood stain pattern. Includes the use of a build it yourself blood spatter chamber. Experiments include Distance Effect on Blood Spatter, Identifying Distance and Angle of Travel with Blood Spatter, and Investigating Blood Spatter with Luminol. Experimentation uses totally safe synthetic blood. Teaches students the sixteen general rules of blood spatter interpretation and extensive investigative technology. Now includes directions and student worksheets for calculating angle of impact, area of convergence, and point of origin from blood spatter patterns. Cross-curricular use of science and writing skills are applied in creating a crime scene scenario. Includes materials for 24 students working in six groups. Meets national standards for grade 9-12. Also appropriate for college level. Black Light required, but not included.

#### Kit Contains:

Instruction manual, Reproducible Student Worksheets, Simulated Blood, Simulated Haemoglobin, Luminol, Sodium Perborate, Sodium Carbonate, Spray Bottles, Complete Blood Spatter Chamber with Platform and Hammer, Paper for Spatter Chamber Protractors, Retractable Measuring Tape, Filter Paper, Pipette, Rulers, Paper Clips, Clip Boards.

**ESF53512**



### Designing Investigations In Blood Spatter

Guide students through the investigative process of a blood spatter detective using this inquiry based activity. Just like the detective, they will design and conduct a simple experiment to model how blood reacts and how blood spatter patterns change in response to variables. They may choose to investigate the effects of angle, force, distance, surface texture, rate of movement, velocity at impact, number of blows, or location of the victim. They may investigate the difference in spatter due to cast-off, blunt force trauma or projectile trauma. They might compare patterns due to impact spatter, passive spatter, transfer spatter, or projected spatter. Just like the detective, students will analyse and present their results as evidence to support their case. This kit includes an instructor's manual with reproducible student pages, simulated blood, butcher paper, claw hammer, two screwdrivers, scissors, plastic knives, protractors, measuring tapes, and plastic pipettes. The kit may be used independently or as an introduction or companion to the analysis activities provided in EduScience Blood Spatter Kit # ESF53516.

#### Kit Contains:

Instructors Manual, Simulated Blood, Butcher Paper, Roll, Claw Hammer, Screwdrivers, Retractable Tape Measures, Protractors, Scissors, Plastic Knives, Plastic Pipette

**ESF53516**





### Master Forensics

EduScience Master Forensics Kit presents the ultimate Crime Scene Investigation problem solving and deductive reasoning activity. This kit includes our slightly modified Fingerprint Analysis, Soil and Mineral Analysis, Hair Analysis, Document Analysis, and Analysis of Drugs and Poisons kits. Following training, your CSI investigators watch the included CD setting the scene for the crime and collect the clues to solve one of the four case scenarios. Includes all materials for training activities, a faculty cast list, and materials for preparing the evidence box. Complete with an updated, bound instructor's Manual, CDs, reproducible student instructions, and reproducible worksheets. Allow the equivalent of 12-14 one-hour lab periods. Not included: Microscopes, Chemical Splash Goggles, UV light, Oven or Heat Lamp, balance, (36) large test tubes, (6) graduated cylinders, 10 ml, (6) evaporating dishes, gloves and lab aprons. Designed for 24 students working in groups of four.

#### Kit Contains:

Instructor Manual, Student Manual, MSDS, CD	
Components of Fingerprint Analysis Kit	(ESF53505)
Components of Soil and Mineral Analysis Kit	(ESF53507)
Components of Hair Analysis Kit	(ESF53502)
Components of Document Analysis Kit	(ESF53503)
Components of Analysis of Drugs and Poisons Kit	(ESF53504)

ESF53513



### Toxicology

This kit simulates authentic drug screening. Students extract drugs from simulated urine using columns, elute the drugs, run them on chromatographic gels, and use visualization techniques to identify the drugs. The lab may be done in four standard lab periods or two three hour lab periods and is easily separated into drug isolation and chromatography sections. Approximately fifty minutes is required for completing the thin layer chromatography and visualization process, which must be done all at one time. Required, but not included: fume hood, water bath 65-70C, hair dryer, UV light (356 nm; black light, strong sunlight, plant lights, or a goggle cabinet), UV light short wave (254 nm), and ring stands. Designed for 24 students working in six groups of four. Meets national standards for grade levels 10-12.

#### Kit Contains:

Instructor Manual, Student Manual, MSDS, Note on Phenylpropanolamine, Rf Value Cards Large, Rf Value Cards Small, Tox Elute Columns, Dropper Bottles, Silica Plates, Capillary Tubes, Pipette, Acetone, Methanol, Simulated Urine, Eluent, Ethyl Acetate, Ammonium Hydroxide, Potassium Iodide Solution, Methanol, Chloroplastic Solution, Ninhydrin, Diphenylcarbozone, Mercuric Oxide, Contac (Mucinex), Sudafed, Caffeine, Dexatrim, Quinine, Sulphuric Acid Solution

ESF53515





**Forensic Impressions**

Footprints, shoe prints, tire tracks, and other impressions embedded in soft material, if properly identified, preserved, and evaluated, may provide the crime scene investigator with valuable class evidence. Students become the CSI detectives and learn to properly collect, record, and avoid destroying crime scene evidence as they photograph and cast six types of impressions using various methods in this investigation. Includes writing impressions, plastic prints, rope and binding impressions, key impressions, tire impressions and shoe impressions using carbon powder, plaster, clay, and ink. Materials provided for 24 students working in groups of two or four, depending upon the activity. Required, but not included: an old tire, an old gym shoe, mixing containers, a spray bottle, and newspaper. Meets national standards for grades 8-12.

**Kit Contains:**

Instructor's Manual, Students Manual, MSDS, Carbon Powder, Paint Brushes, Plain Paper, Modelling Clay, Plaster of Paris, Spoons  
5 Different Rope Samples, Magnifying Glass, Tongue Depressors, Tire Impressions Pictures, Ink Roller, Ink, Cups, Soil, Sifting Screen  
Tooth Brushes, Pans, Petri Dishes

ESF53518



**Odontology- One Bite Out Of Crime Class-pack (For 24 Students)**

Dental records, like fingerprints, offer a form of positive identification. Not only do they differ in detail from person to person, but they last longer than other physical evidence and may be the only identifiable body characteristic following catastrophic accidents, explosions, burning, or decomposition. Changes in dental records are minor as a person ages, so records compiled years earlier may provide positive identification. Kit includes seven experiments: Making a Patient Dental Chart, Identifying a Body with Dental Charts, Casting Teeth, Evidence Analysis of Bite Mark Injury, Collecting Evidence (Bite Marks in Wax Moulds), Identifying Suspects from Bite Marks, and Identifying Suspects (Matching Teeth Cast to Wax Bite Planes). Designed for 24 students working in six groups of four. Meets national standards for grades 9-12.

**Kit Contains:**

Instructor's Manual, Experiment #1, Student Data Sheet (SDS) Patient Chart, Dentist Worksheet (SDS), Experiment #1, Student Data Sheet, Assistants Worksheet, Experiment #2, Identifying a Body with Dental Charts, Experiment #3, SDS, Working Teeth Model  
Experiment #4, SDS, Metric Analysis of Bite Mark, Experiment #5, SDS, Making Bite Mark Evidence In Wax, Experiment # 6, SDS, Identifying bite Marks in Wax , Experiment # 7, SDS, Identifying Suspect by Matching Teeth Cast to Teeth Bite Tray (Small & Medium)  
Tooth Development Diagram SDS, Figure 1, Tooth Eruption at 5 Years SDS, Figure 2, Gloves, Magic Marker, Mould Material, Plaster Paris, Tongue Depressors, Plastic Cups, Measuring Cups, Seal-able Bags, Metric Rulers, Wax Bite Plates, Wax Bite Plane, Products  
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ESF53517





### Odontology- One Bite Out Of Crime Mini Kit (Ideal For 1 To 4 Students)

Dental records, like fingerprints, offer a form of positive identification. Not only do they differ in detail from person to person, but they last longer than other physical evidence and may be the only identifiable body characteristic following catastrophic accidents, explosions, burning, or decomposition. Changes in dental records are minor as a person ages, so records compiled years earlier may provide positive identification. Kit includes seven experiments: Making a Patient Dental Chart, Identifying a Body with Dental Charts, Casting Teeth, Evidence Analysis of Bite Mark Injury, Collecting Evidence (Bite Marks in Wax Moulds), Identifying Suspects from Bite Marks, and Identifying Suspects (Matching Teeth Cast to Wax Bite Planes). Designed for 24 students working in six groups of four. Meets national standards for grades 9-12.

#### Kit Contains:

Instructor's Manual,  
 Experiment #1, Student Data Sheet (SDS) Patient Chart, Dentist Worksheet (SDS)  
 Experiment #1, Student Data Sheet, Assistants Worksheet  
 Experiment #2, Identifying a Body with Dental Charts  
 Experiment #3, SDS, Working Teeth Model  
 Experiment #4, SDS, Metric Analysis of Bite Mark  
 Experiment #5, SDS, Making Bite Mark Evidence In Wax  
 Experiment #6, SDS, Identifying bite Marks in Wax  
 Experiment #7, SDS, Identifying Suspect by Matching Teeth Cast to, Teeth Bite Tray (Small & Medium), Tooth Development Diagram SDS, Figure 1, Tooth Eruption at 5 Years SDS, Figure 2, Gloves Magic Marker, Mould Material, Plaster Paris, Tongue Depressors, Plastic Cups, Measuring Cups, Seal-able Bags, Metric Rulers, Wax Bite Plates, Wax Bite Plane

ESF53519



### Fabrics and Fibre Kit

Students perform four experiments analysing fabric and fibre types to learn to characterize them. First, students determine if each sample is animal, vegetable, mineral, or synthetic in origin by subjecting fibres to a burn test and evaluating fibres for protein and for the presence of sulphur. Then, students observe fibre samples to identify general microscopic characteristics and subject them to chemical solubility and stress and strain tests. After learning techniques for proper collection of fibre evidence, students test three unknowns to determine their identity. Includes instructional manuals and student worksheets. Required, but not included: microscopes, alcohol or Bunsen burners, matches, test tubes, 1-hole stopper, test tube clamp, and distilled water. Designed for 24 students working in groups of four. Meets national standards for grade levels 10-12.

#### Kit Contains:

Instructor's Manual, Student Manual, MSDS, Cotton Sample, Wool Sample, Carpet Sample, Glass Wool Sample, Nylon Sample, Rayon Sample, Acetate Sample, Unknown Sample #1, Unknown Sample #2, Unknown Sample #3, Wax Pencils, Metal Forceps  
 Plastic Forceps, Slides, Cover Slips, Toothpicks, Empty Dropper Bottles, Red Litmus Paper, Lead Acetate Paper, Hydrochloric Acid  
 Sodium Hydroxide, Sodium Hypochlorite, Dry-Cleaning Solution, Acetone, Mounting Media

ESF53520





**Paper Trail**

Introduce middle school students to the excitement of forensics with this age appropriate crime scene related document analysis kit. Students perform physical and chemical analyses of a variety of papers and inks using a number of techniques including chromatography, microscopy, and an alignment tool to analyse documents and handwriting. Students produce and retrieve hidden messages, and prepare forged and authenticated documents. Requires four to five class periods. Required, but not included: microscopes, 100 Watt desk lamps and/or hot plates, fresh lemon juice, spray starch, newspaper, scissors, water, white paper, and paper-clips. Designed for 24 students working in six groups of four. Meets national standards for grades 5-8.

**Kit Contains:**

Instructor Manual, Student Manual, MSDS, Alignment Tools, Paper Samples, Magnifying Glasses, Cotton Swabs, Chromatography Tubes, Chromatography Paper, Spray Bottles, Pencils, Pens, Ethanol Solution, Iodine Solution

ESF53521



**Science Detective**

This kit is designed to help younger students understand the scientific method through investigation, and to develop observation, interpretation, and organizational skills. Includes instructor's manual, transparencies, student data sheets, card game, "what's different" activity, and bread mould and plant growth project materials for a class of 24 students. Required, but not included: scented candle, scented spray, spray bottle, candy, ribbon, soil, bread, marker, masking tape, and paper. Extension activities provided in the Instructor's Manual. Meets national standards for grades 2-6.

Instructor Manual, Student Data Sheets, Lima Bean Seeds, Plastic Cups, Plastic Bags, Plant Fertilizer, Sodium Chloride, Washing Powder #1, Vinegar, Graph Paper

ESF53523







### Robbery At Any Town Mall

Various types of trace evidence allow students to solve the crime presented in this hands-on CSI activity.

Using observation, experimentation, and interpretation, students will employ the scientific method to analyse hair, fibre, fabric, blood, fingerprints, and handwriting.

Both evidence and personal profiles intermingle to enable students to crack the case using deductive reasoning.

Includes instructional manual and reproducible student worksheets.

Required, but not included: microscopes, water bath, and glass test tubes with stoppers or caps.

Designed for 24 students working in six groups of four. Meets national standards for grade levels 7-11.

#### Kit Contains:

Instructor Manual, Student Manuals, MSDS, Silk Sample, Cotton Sample, Linen Sample, Polyester Sample, Wool Sample, Cat Hair

Human Hair, Dog Hair, Police Envelope, Suspect Envelope Randy, Suspect Envelope Martha, Suspect Envelope Paul, Suspect Envelope John, Signature Cards, Hand Lens, Cover Slips, Microscope Slides, Wooden Sticks, Red Litmus Paper, Tweezers, Toothpicks

Hema-Tag Label A&B, Hema-Tag Label Rh, Mounting Media, Anti A Serum, Simulated, Anti B Serum, Simulated, Anti Rh Serum, Simulated, Simulated Blood, Type A, Simulated Blood, Type B, Simulated Blood, Type O, Simulated Blood, Type AB

ESF53522



### Ballistics : The Sacco & Vanzetti Case

Can your aspiring ballistics experts determine once and for all whether Sacco and Vanzetti committed this crime? Students reconstruct the shootings of the infamous Sacco and Vanzetti case and calculate projectile trajectories using a map of the gunshot evidence, ballistics blocks, and trajectory rods. Then, they recreate the crime scene using string and laser techniques. Using inactive dummy cartridges, fired bullets and casings, students learn to characterize ammunition. They use gunshot residue analysis to determine which suspects fired guns during the crime. Finally, each scenario is presented with evidence for students to argue their unique case in court. Includes complete instructor's manual, reproducible ballistics training handbook, reproducible lab experiments, instructions and documents for holding a mock trial, and six additional extension activities addressing the social and political issues surrounding the case. Designed for 24 students working in small groups. Recommended: stereo-microscope and a balance. Warning: Danger, kit contains lasers, avoid eye exposure. Product intentionally contains lead bullets and lead nitrate. Grades 7-12

ESF53524





**EduScience UK**



# CHEMISTRY



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# CHEMISTRY

- **Data Logging & Sensors**
- **Materials & Its properties**
- **AP Chemistry**
- **Chromatography**
- **Microchemistry**
- **Molecular Models**
- **Periodic table and resources**
- **Gas Preparation Analysis**
- **Jointed Glassware64**

## CMES Data Logger

is a modern advanced graphic data-logger. It is a handheld Linux device equipped with two processors and 8 GB memory. Works standalone and with Windows and MAC computers.

Display: 5" high-resolution capacitive colour touch screen

Resolution: 12-bit

Maximum sampling rate: 1 MHz

Sensor inputs: Four analogue BT inputs, two digital BT inputs

Built-in: Sound sensor, 3-axis

Accelerometer (2g, 4g, 8 g)

Wireless connectivity: Wi-Fi and Blue-tooth®

Computer connection: USB mini port

USB port: Full USB for USB peripherals

Power: Rechargeable battery, charging via USB from computer or via power adapter

Software on board: Coach Linux

Software on computer: Coach (Windows and MAC)

Includes: Power adapter, USB cable and User's Guide.

The dedicated desktop applications, installed on CMES, offer tools for collecting data, managing user files, setting up the device and its wireless connection, browsing the web, watching video files, playing audio files, etc. All applications can be easily updated via the CMES Update server available via a Wi-Fi connection.

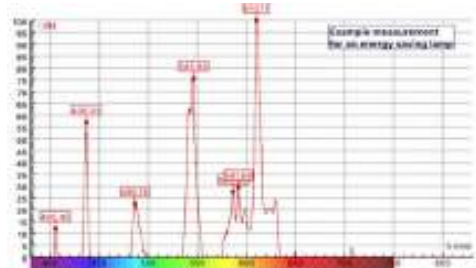
The powerful Coach Application, installed on CMES, offers live sensor data displays, real-time graphing, tools for data processing and possibilities to create new or open ready-to-go student activities, enriched with texts, images and web-pages. Coach 7 and Coach 7 Lite support measurements with CMES.

During such measurement CMES is connected to the computer via a USB port or communicates via a Wi-Fi connection, and is controlled by Coach running on the computer. The collected data are transferred in real-time to the computer and the measurement

can be followed directly on the computer screen. By using wireless connectivity and the VNC protocol the CMES screen can be remotely viewed and controlled from any computer or mobile device connected to the same network.



ESD50000



## Coach 7 Desktop

Our Coach software is the most versatile and complete software for STEM Education.

Coach integrates ICT tools, which resemble technologies used by professional scientists and facilitate an inquiry-based approach to education. By collecting high-quality, real-time data, constructing and using models, using simulations and visualizations, comparing results from experiments and models, students can be actively involved in authentic learning activities.

Coach 7 is the successor of Coach 6 and offers new features and enhancements of our unique and powerful environment.

5-years Single User License

ESD50013



## Colorimeter Sensor

The Colorimeter BT29i measures the amount of light transmitted through a sample solution. It has four LED light sources emitting light of different wavelengths:

Violet 430 nm, blue 470 nm, green 565 nm and red 635 nm.

Range: 90 .. 10 %T Resolution (12-bit): 0.025 %T Includes: 10 plastic cuvette with caps.

Can be used to:

- Investigate application of Beer's law e.g.-crystal violet or Copper Sulphate,
- Determine unknown concentrations,
- Measure reaction rate, reaction
- Order or reaction equilibrium,
- Determine biological molecules e.g. sugars, protein, vitamins..

ESD50078





### Conductivity Sensor

The Conductivity sensor BT27i measures the ability of a solution to conduct an electric current between two electrodes. The Conductivity sensor consists of a conductivity electrode and an amplifier. The sensor has three measurement ranges, which can be selected using a switch.

Ranges: 0 .. 200  $\mu$ S, 0 .. 2000  $\mu$ S, 0 .. 20000  $\mu$ S Resolution (12-bit): 0.082 $\mu$ S, 0.82 $\mu$ S, 8.2  $\mu$ S

Can be used to:

- Monitor the rate of reaction in chemical reactions,
- Monitor changes in conductivity in aquatic systems,
- Perform conductivity titration,
- Find the rate at which ionic species diffuse through membranes..

ESD50079



### Light Sensor \*

The Light sensor 0142i measures light intensities in the range between 0 and 200 lux. It consists of a photo-transistor, which receives light through a glass fibre. Because of its range the sensor is suitable for measurements in normal indoor situations. The sensor can also be used as a light gate.

Range: 0 .. 200 lux Resolution (12-bit): 0.05 lux

Can be used to:

- Verify inverse square law,
- Monitor changes in light caused by a chemical reaction,
- Investigate light reflection and absorption,
- Investigate light interference patterns..

ESD50080



### Light Sensor \*

The low-cost Light sensor 0513 measures light intensity and is sensitive to the visible light spectrum and also infrared. Because

of its range the sensor is suitable for measurements in normal indoor situations. Range: 0.1 .. 10 W/ m<sup>2</sup>

Can be used to:

- Verify inverse square law,
- Monitor change in light caused by a chemical reaction,
- Measure the rapid changes of the light intensity.

ESD50081



### Light Sensor with three ranges

The Light sensor BT50i measures light intensity and has three measurement ranges, which can be selected using a switch. Because of its ranges the sensor is suitable as well for indoor as for outdoor measurements. Full sun illumination is within the range of the sensor. The spectral response of the sensor approximates the response of the human eye.

Ranges: 0 .. 1500 lux, 0 .. 15000 lux, and 0 .. 150000 lux

Resolution (12-bit): 0.37 lux, 3.7 lux, 37 lux

Can be used to:

- Verify inverse square law,
- Investigate light reflection and absorption,
- Study solar energy,
- Monitor monitoring sunrise and sunset times.

ESD50082



### ORP Sensor

The ORP sensor BT57i measures the ability of a solution to act as an oxidizing or reducing agent. The sensor consists of an ORP electrode and an amplifier.

Range: -450 mV .. 1100 mV

Resolution (12-bit): 0.5 mV

ORB electrode: sealed, gel-filled, epoxy body,

Ag/AgCl reference

Temperature range: 0 - 600C

Can be used to:

- Measure the oxidizing ability of chlorine in swimming pools,
- Investigate red-ox titration to determine the equivalence point in an oxidation reduction reactions.

ESD50083

NOTE : all \* Marked sensors need a sensor cable (IEEE1394-BT)ESP50250, which has to be purchased separate.





### Thermocouple \*

The Thermocouple sensor 0135i measures temperatures in two ranges, which can be selected using the switch. The sensor uses a thermocouple type K, which consists of Chromega and Alomega wires that are welded together to form a measuring junction.

Range: -200.. 1300 °C , -20 .. 110 °C

Resolution (12-bit): 0.39 °C, 0.035 °C

Can be used to:

- Measure the temperature inside a Bunsen burner flame or candles,
- Determine the melting point of copper, bismuth, or other solids,
- Measure temperature in specific heat experiments.

ESD50039



### Temperature Sensor \*

This Temperature sensor BT01 is a low-cost, general-purpose temperature sensor that can be used to measure temperature in the range of -40°C to 140°C, in liquids (water, mild acidic solutions) and air. The sensing element of the sensor is an NTC thermistor, which is positioned in a stainless steel tube. The thermistor is a variable resistor whose resistance decreases non-linearly with increasing temperature.

Range: -20 °C .. 140 °C

Accuracy: 2°C at -40°C, 0.6 at 30°C, 1.8°C at 140°C

Can be used to:

- Monitor indoor and outdoor temperatures,
- Monitor freezing and boiling water,
- Investigate the temperature during endothermic and exothermic reactions,
- Investigate evaporation

ESD50036



### Temperature Sensor

The Temperature sensor BT84i measures temperature and temperature differences in the range between -18 °C to 110 °C. This sensor uses the solid-state temperature transducer, whose output is linearly proportional to the temperature. The transducer is positioned in the point of a stainless steel tube. In liquids the response of the temperature sensor is quite fast (in between 1.3 and 2.0 s).

Range: -20 °C to 110 °C

Resolution (12-bit): 0.07 °C

Can be used to:

- Monitor indoor and outdoor temperatures,
- Monitor freezing and boiling water,
- Investigate the temperature during endothermic and exothermic reactions,
- Investigate evaporation.

ESD50086



### Salinity Sensor

The Salinity sensor BT78i measures the salinity of a solution, which indicates the amount of all the salts dissolved in water. The sensor consists of a Salinity electrode and an amplifier.

Range: 0 .. 50 ppt

Resolution (12-bit): 0.02 ppt

Can be used to:

- Measure of salinity of water sources,
- Measure the change in salinity of salt-water as the water evaporates,
- Monitor the rate of reaction in a chemical reaction.

ESD50089



### Turbidity sensor

The Turbidity sensor BT88i measures the turbidity of water samples in the range between 0 ... 200 NTU. Range: 0 .. 200 NTU

Resolution (12-bit): 0.2 NTU

Includes: one empty cuvette and one cuvette containing 100 NTU Stabl Cal Formalin Standard, which is used to calibrate the sensor.

Can be used to:

- Measure turbidity of a water sample from various locations,
- Determine the rate of settling of a sample,
- Measure the formation of a precipitate.

ESD50090

NOTE : all \* Marked sensors need a sensor cable (IEEE1394-BT)ESP50250, which has to be purchased separate.





### PH sensor

The pH sensor BT61i is a general-purpose pH measurement system that allows measuring the degree of acidity/pH value. The sensor consists of a pH amplifier and pH electrode. The pH Electrode is not delivered with the pH sensor and has to be purchased separately (Order Code 031).

Range: 0.. 14 pH

Resolution (12-bit): 0.005 pH

Can be used to:

- Measure pH values of different acids and bases,
- Monitor pH in acid-base titration experiments,
- Monitor pH during chemical reactions,
- Investigate of water quality in streams and lakes.

ESD50038



### Pressure Sensor

The Pressure sensor BT66i is designed to measure absolute gas pressure. The pressure is measured via a pressure valve, which is located on the side of the box. The sensor has two measurement ranges, which can be selected using a switch.

Range: 0 .. 700 k Pa, 0 .. 130 k Pa

Resolution (12-bit): 0.2 k Pa, 0.04 k Pa Includes: a plastic 20-ml syringe with Lu-er lock, two plastic tubes (5 cm and 45 cm long), a three-way valve with Lu er-lock connectors, two Lu er-lock connectors.

Can be used to:

- Measure pressure changes in gas-law experiments, Boyle's and Gay-Lussac's laws,
- Measure vapour pressure of liquids,
- Measure air pressure for weather studies.

ESD50088



### Photo-gate

The Photo-gate BT63i is a traditional photo-gate, which consists of a light gate allowing detecting objects passing between the photo-gate arms. In this light gate, a narrow infrared beam is directed to a fast infrared detector, which produces very accurate signals for timing. The external (laser) gate mode allows detecting objects passing outside the photo gate arms. Includes: a pulley attachment and a steel support rod.

The EduScience Drop counter can be attached to the photo gate for titration experiments (not supplied has to be purchased separately Order Code 0662drop). Up to five photo gates can be chained in a daisy-chain configuration and connected to a single interface input (IEEE1394 cable not supplied, this cable has to be ordered separately Order Code 07662).

Can be used to:

- Count events,
- Measure the speed of a moving (rolling) object (with the pulley attachment),
- Measure volume in titration experiments (with the drop counter attachment),
- Study pendulum periods,
- Measure the acceleration due to gravity (e.g. by using a picket fence).

ESD50091



### Drop Counter Attachment for photo-gate

Drop Counter can be attached to photo-gates 0662i, BT63i and ML54f and can be used to record volume (counting drops) in titration experiments. Includes: a drop dispenser, two valves and a tip.

ESD50092



### Angle Sensor \*

The Angle sensor 013i is a potentiometer, which has a pulley to attach a string to. The sensor is suitable for detecting angle changes and (small) displacements.

Range: 270° (turn), 140 mm (displacement) Resolution (12-bit): 0.07°, 0.03 mm

Can be used to:

- Study a pendulum period,
- Measure small displacements,
- Investigate harmonic motion.

ESD50077

NOTE : all \* Marked sensors need a sensor cable (IEEE1394-BT)ESP50250, which has to be purchased separate.





**Basic Chemistry Sensors Bundle Kit**

- Angle (position) Sensor 013i
- Conductivity Sensor BT27i
- Light Sensor BT50i
- pH Sensor BT61i and Electrode 031
- Photo-gate BT63i with Drop Counter 0662drop or Step-motor Burette 061 (suitable only for CoachLab II+)
- Pressure Sensor BT66i
- Salinity Sensor BT78i
- 2 x Temperature Sensor BT01
- 4 Sensor Cables BTsc\_4

ESD50093



**Chemistry Sensors Extension Bundle Kit**

- Colorimeter BT29i
- ORP sensor BT57i
- Thermocouple 0135i
- Turbidity sensor BT88i

ESD50094

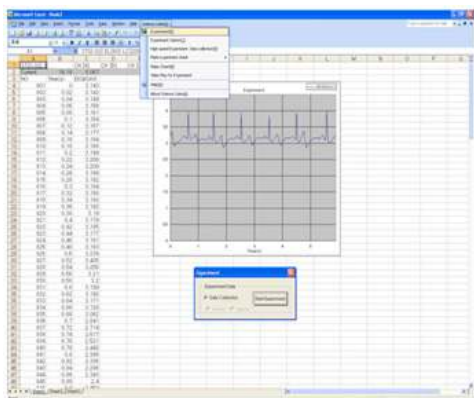




### Xlogger system introduction

Xlogger is an innovative new data logging system using direct USB sensors & Excel\* for data capture and analysis. Our sensors plug straight into USB ports on any Windows computer. No dedicated software program just Microsoft Excel\*

Data is logged directly into Excel\* and graphed automatically  
 Simple toolbar commands control everything  
 Completely intuitive - start logging straight away  
 Students work in the familiar Excel\* environment  
 All the power of Excel\* for analysing data is immediately available  
 All the standard sensors with new ones being developed  
 Simply plug them in and start logging (no calibration needed)  
 Robust construction and encapsulated leads



### ES Data-logging Software

Xlogger software is a specially designed Add-In to Excel\* that recognises the sensors you have plugged in, understands the data being transmitted and allows you to manage the data entering the computer. Once it has been captured the data is 'standard' Excel\* data and can be analysed as required.

For full computer software and hardware requirements please visit [www.xlogger.com](http://www.xlogger.com)  
 Please 'add' this item to your basket and once you checkout and we receive the order you will be emailed a copy of the software.

N.B. Purchase of new or existing Xlogger products is required.

£80.00 Free with XL Logger Sensors.

ESD50014



### USB Light Sensor

USB Light Sensor, Measuring Range: 0 - 15,000 Lux

ESD50186



### USB PH Sensor

Xlogger PH sensor with probe

ESD50194



### USB Oxygen Sensor

Xlogger Oxygen Sensor.  
 Range: 0 - 100% Oxygen

ESD50184



### USB Turbidity Sensor

Xlogger Turbidity Sensor.  
 Range: 0-200 NTU  
 Accuracy:  $\pm 2$ NTU under 25NTU,  $\pm 5\%$  over 25NTU

ESD50189





**USB Barometer Sensor**

Xlogger Barometer.  
Range: 0 to +2068 hPa (Mbar)  
Resolution: 0.6 hPa

ESD50188



**USB Temperature Sensor**

USB Temperature Sensor

ESD50185



**PH electrode**

The pH electrode 031 is a gel-filled Ag-AgCl combination-electrode in a plastic tube. It has a coax cable, with a BNC connector. It is supplied in a bottle filled with a protective solution. The electrode cannot be refilled.

ESD50242



**BT-BT Extension cable (analogue)**

A 5-m long cable for extending the length of analogue BT sensor cables.

ESD50247



**Adapter 4mm - BT**

For connecting sensors with 4-mm plugs to interfaces with BT inputs such as CMES,

ESD50248



**Data-Logger stand**

Plastic stand for the CMES data-logger.

ESD50249



**BT - IEEE1394 cable**

The BT - IEEE1394 sensor cable (1.5 m length) is used for BT sensors, which are equipped with the IEEE1394 socket. These sensor cables are sold per piece (BTsc\_1) and in packages of four (BTsc\_4).

ESD50250





### Actuator Set

The Actuator Set 062 can be used to introduce the students to the basics of control technology. The set consists of the following elements: 3 red and 3 black 4-mm wires, 12-V switch, lamp holder with 3 coloured 12-V bulbs, 12-V buzzer, 12-V direct current motor, and propeller to connect to motor. All elements make use of the 4-mm buses.

ESD50258



### Switch Module

The Switch Module 063 is a solid-state-relay (SSR) that allows you to control 110 – 230 V devices by a voltage of 3 V DC or more up to 25 V). The relay is connected to the mains (110 V up to 230 V) via a Euro-connector at the rear of the module. The relay can supply devices up to 1150 W.

ESD50259



### Heating Coil

The Heating Coil 018 can be used as an actuator in control systems. The coil has 4 mm plugs for easy connection. The Heating Coil has to be supplied with 24 volt or less.

ESD50260



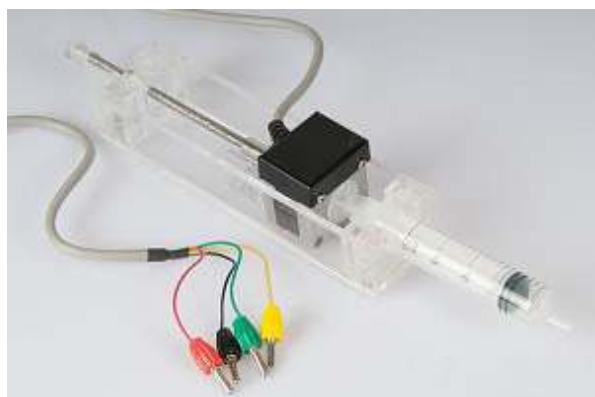
### Cuvette for Colorimeter BT29i

ESD50261



### Cuvette holder for Colorimeter BT29i

ESD50262



### Titrator - Step - Motor Burette

ESD50263



**Matter And Its Changes Kit 1**

Consist of :

1. Watch Glass Ø 80 mm 1 pc
2. Glass Funnel 75 mm 1 pc
3. Stirring Rod Ø 5 x 150 mm, Glass 2 pcs
4. Measuring Pipette 10 ml 1 pc
5. Measuring Cylinder 10 ml, Glass 1 pc
6. Measuring Cylinder 25 ml, Glass 1 pc
7. Beaker 100 ml 3 pcs
8. Beaker 250 ml 1 pc
9. Volumetric Flask 100 ml 2 pcs
10. Test Tube Ø 25 x 150 mm 1 pc
11. Test Tube Ø 25 x 150 mm with Side Pipe 1 pc
12. Mortar and Pestle, OD Ø 80 1 set
13. Wire Gauze 14 x 14 cm without Ceramic 1 pc
14. Tripod Stand Ø 100 x 80 mm 1 pc
15. Spirit Burner 60 ml, Stainless 1 pc
16. Universal Clamp Ø 70 mm 1 pc
17. Boss head Clamp 1 pc
18. Stand Base with 3 Clamps 1 pc
19. Stand Foot 1 pc
20. Stand Rod Ø10 x 250 mm 1 pc
21. Stand Rod Ø10 x 500 mm 1 pc
22. Alcohol Thermometer -10°C - 110°C 1 pc
23. Analogue Stopwatch 1 pc
24. Dropping Pipette 10.5 cm 2 pcs
25. Pipette Filler 1 pc
26. Rubber Stopper with One Hole, Ø 21/27 mm 2 pcs
27. Wash Bottle 250 ml 1 pc
28. Spatula, Stainless Steel 1 pc
29. Experiment Manual Book 1 exp

Complete with 2 tool holder tray and packed in a firm plastic box

Support Tools (sold separately) :

Balance 311 g 1 set

**Dimension :** (L) 61.00 x (W) 26.00 x (H) 17.00 cm**Weight :** 3.820 kg

ESC54137

**Matter And Its Changes Kit 3**

Consist of :

1. Watch Glass Ø 80 mm 1 pc
2. Glass Funnel Ø 75 mm 1 pc
3. Glass Stirring Rod Ø 5 x 150 mm 2 pcs
4. Measuring Pipette 10 ml 1 pc
5. Beaker 100 ml 4 pcs
6. Glass Measuring Cylinder 10 ml 1 pc
7. Glass Measuring Cylinder 25 ml 1 pc
8. Volumetric Flask 100 ml 2 pcs
9. Test Tube Ø 16 x 150 mm 6 pcs
10. Mortar and Pestle 1 set
11. Evaporating Basin 75 ml 1 pc
12. Spot Plate 1 pc
13. Wire Gauze 14 x 14 cm without Ceramic 1 pc
14. Tripod Stand, Circular 1 pc
15. Spirit Burner 60 ml, Stainless 1 pc
16. Thermometer Alcohol -10°C - 110°C 1 pc
17. Analogue Stopwatch 1 pc
18. Dropping Pipette 10.5 cm 2 pcs
19. Pipette Filler 1 pc
20. Wash Bottle 250 ml 1 pc
21. Spatula, Stainless Steel 1 pc
22. Test Tube Holder 1 pc
23. Test Tube Brush ? 24 mm 1 pc
24. Test Tube Rack, Plastic 1 pc
25. Experiment Manual Book 1 exp

Complete with 2 tool holder tray and packed in a firm plastic box, Additional tool (sold separately) : Balance 311 g (KNE 23)

**Dimension :** (L) 61.00 x (W) 26.00 x (H) 17.00 cm**Weight :** 3.180 kg

ESC54139

**Matter And Its Changes Kit 2**

Consist of :

- 1 Watch Glass Ø 80 mm 1 pc
- 2 Glass Funnel Ø 75 mm 1 pc
- 3 Glass Stirring Rod Ø 5 x 150 mm 2 pcs
- 4 Measuring Pipette 10 ml 1 pc
- 5 Beaker 100 ml 3 pcs
- 6 Glass Measuring Cylinder 10 ml 1 pc
- 7 Glass Measuring Cylinder 25 ml 1 pc
- 8 Volumetric Flask 100 ml 2 pcs
- 9 Evaporating Basin 75 ml 2 pcs
- 10 Wire Gauze 14 x 14 cm without Ceramic 1 pc
- 11 Tripod Stand, Circular 1 pc
- 12 Spirit Burner 60 ml, Stainless 1 pc
- 13 Universal Clamp Ø 70 mm 1 pc
- 14 Boss-head Clamp 1 pc
- 15 Ring with Stem, Ø 65 mm 1 pc
- 16 Stand Base with 3 Clamps 1 pc
- 17 Stand Foot 1 pc
- 18 Stand Rod Ø 10 x 250 mm 1 pc
- 19 Stand Rod Ø 10 x 500 mm 1 pc
- 20 Thermometer Alcohol -10 °C - 110 °C 1 pc
- 21 Dropping Pipette 10.5 cm 2 pcs
- 22 Pipette Filler 1 pc
- 23 Wash Bottle 250 ml 1 pc
- 24 Spatula, Stainless Steel 1 pc
- 25 Crucible Tong 250 mm 1 pc
- 26 Magnet Bar 1 pc
- 27 Iron Metal 1 pc
- 28 Copper Metal 1 pc
- 29 Zinc Metal 1 pc
- 30 Ion Compounds Nomenclature Card 1 pack
- 31 Nylon Thread 1 pc
- 32 Experiment Manual Book 1 exp

Complete with 2 tool holder tray and packed in a firm plastic box  
Support Tools (sold separately) :

1. Balance 311 g 1 set

2. Periodic System of Elements, 111 Elements 1 pc

3. Distillation Kit 1 set

4. Water Filter Apparatus, Simple 1 set

**Dimension :** (L) 61.00 x (W) 26.00 x (H) 17.00 cm**Weight :** 3.780 kg

ESC54138





### Physical Properties Kit

This kit introduces students to the physical properties of a variety of substances, including solid chemicals and solutions. In experiment one, students observe the colour, state of matter, odour, texture, and pH of substances. In experiment two, students determine the solubility and density of the same substances. Includes all required chemicals and substances, vocabulary and symbols worksheets, experiment worksheets, and reproducible laboratory procedures. Chemical symbols for elements and chemical formulas for compounds are introduced. Required, but not included: balance and general laboratory supplies. Designed for 24 students working in six groups of four. Grades 6-11

ESC54140



### Characteristics Of Matter

Ten experiments exploring the Characteristics of Matter include: Properties of Matter, States of Matter, Physical Properties of Solids, Physical Properties of Liquids, Melting Point, Boiling Point, Solubility of Solids, Density, Chemical Properties, and Identification of Unknown Solutions. Includes reproducible student labs, reproducible assessment materials for each lab, vocabulary, and complete answer keys. Required, not included: balance, ice, (24) small test tubes, test tube racks, 10 ml graduated cylinders, (6) beakers or clear cups, chemical splash goggles. Allow three one hour lab periods. Designed for 24 students working in groups of four. Meets national standards for grades 5-9.

ESC54136



### Chemical Properties Kit

Students test the chemical properties of seven different solutions by mixing them in each possible combination and observing their reactions. Evidence of chemical reactions observed include gas production, colour changes, and formation of precipitates. After becoming familiar with the chemical properties of the solutions, students use this information to identify any of the four unknown solutions. The kit includes all required chemicals, reaction plates, additional bottles for making student group chemical sets, reproducible student procedures, reproducible worksheets, and complete answer keys. Designed for 24 students working in six groups of four. Meets national standards for grades 9-12.

ESC54141

### Chemical Properties Refill

ESC54142



### Physical And Chemical Properties Kit

This very extensive kit includes chemicals and micro well plates for examining physical properties including the density and specific gravity of solids and liquids, the melting points of solids, the boiling points of liquids, and the colligative properties of mixtures as well as chemical properties including the percent composition of various compounds and properties of transition elements on a micro scale. This kit is all you will need for a complete lab experience on matter; physical and chemical properties for your students. Includes two lab quizzes. Kit contains lead shot. Required, but not included: balance, Bunsen burner, water bath, and standard laboratory supplies. Designed for 24 students working in six groups of four. Grades 9-12

ESC54143





### Chemical Equations I Kit

Introduce students to chemical equations as they perform and observe two different single replacement reactions and two different double replacement reactions. Colour changes, precipitate formation, and gas production are observed. The kit includes all required chemicals, a vocabulary exercise, and reproducible worksheets and laboratory procedures. Worksheets give students practice with chemical symbols, naming compounds, valence, and chemical formulas for compounds and radicals (polyatomic ions). Written laboratory exercises give students practice in identifying properties and completing and balancing single replacement and double replacement reactions. All chemicals included, additional laboratory supplies required. Designed for 24 students working in six groups of four. Addresses national standards for grade levels 8-12.

ESC54144



### Chemical Equations II Kit

Introduce students to chemical equations as they perform and observe decomposition and synthesis reactions. Changes in chemical and physical properties are observed and the concept that some reactions require heat to proceed is introduced. The kit includes all required chemicals, reproducible procedures, a vocabulary exercise, and reproducible worksheets emphasizing balancing equations, valence, writing chemical formulas, and identifying reactants and products. Required, but not included: Bunsen burner (optional) and general laboratory supplies. Designed for 24 students working in six groups of four. Grades 8-12

ESC54145



### Chemical Formulas I Kit

Students experiment to determine the correct chemical formulas for compounds by combining chemicals in various ratios, and observing the combination that produces the greatest amount of precipitate. Using the ratio of the combination, they determine the chemical formulas for the newly formed substances. Includes all required chemicals, vocabulary and chemical formula writing and naming worksheets, data sheets, reproducible procedures, and answer keys. Designed for 24 students working in six groups of four. Grades 7-12

ESC54146

### Chemical Formulas I Refill

ESC54147



### Chemical Formulas II Kit

Students experimentally determine the correct chemical formulas for compounds by combining chemicals in various ratios and observing the combination that produces the greatest amount of precipitate. Using the ratio of the combination, students determine the chemical formula for the newly formed substances. Includes more challenging stoichiometry than Chemical Formulas I and contains inquiry components. Includes all required chemicals, vocabulary, chemical formula writing and naming worksheets, data sheets, reproducible procedures, and answer keys. Designed for 24 students working in six groups of four. Grades 9-12

ESC54148



**Ionic Interaction Kit**

This kit provides an introduction to ionic interactions. It gives students exposure to a large number of reactions, allowing maximal observation for a limited amount of time and effort. Includes precipitate forming, gas forming, and non-ionized product forming reactions. The investigation may be extended to teach students a number of additional basic chemical principles: including writing ionic formulas for the products formed; writing ionic interaction equations; relating placement of elements in the periodic table to their reactivity; and developing solubility principles from empirical evidence. Ideal for high school chemistry or physical sciences courses. Follow-up activities are suggested at the end of the instruction manual. Designed for 24 students working in groups of four. Contains cadmium nitrate and lead nitrate. Grade level 9-12.

ESC54149

**Ionic Interaction Refill**

ESC54150

**Water Test (Qualitative Ion) Kit**

Learn to test for chloride, nitrate, phosphate, mercury, magnesium, chromate, lead, and carbonate ions, which are indicators of water pollution. The kit includes test solutions containing each of the ions for establishing controls and Universal Indicator solution and a Universal Indicator pH Chart, which may be used for determining water pH. This kit may be used for detecting the presence of polluting ions in any fresh water supply. Required, but not included: sulphuric acid, deionized water, and glassware. Contains lead nitrates. Designed for 24 students working in six groups of four. Grades 9-14

ESC54151

**Fluorescent Dye Kit**

Here is an attention grabbing method for introducing discussions about the electromagnetic spectrum and light. The set contains blue, green, orange and red fluorescent dyes suitable for colouring water for demonstrations, particularly those performed under black light (ultraviolet radiation of wavelength 320-400nm). The observed colour of conventional pigments and dyes results from their selective absorption and reflection of various wavelengths of light in the visible portion of the spectrum. The appearance of colour is absent when no light source is present. Certain materials have the property of absorbing radiant energy of wavelengths not visible to the human eye (usually 320 to 400 nm), converting them into energy of longer wavelengths, and emitting them as visible light. Materials possessing this property are said to be luminescent. Grades 8-12

ESC54152

**Molarity I Kit**

Students determine Molarity experimentally using a simple titration method with an indicator solution. This kit includes two experiments, one in which students determine different molarities of an acid and one in which students determine different molarities of a base. Includes reproducible student worksheets for learning to write chemical formulas and to calculate formula mass, concentration, molarity, and molar mass. Kit includes all required chemicals, reproducible procedures for laboratory experiments, worksheets, assessment, and answer keys. Required but not included: goggles, evaporating dishes, and stirring rods. Designed for 24 students working in groups of four.

ESC54153

**Molarity I Refill**

ESC54154





### Reaction Rate Factors I Kit

Four experiments expose students to factors which affect the rate of chemical reactions; heat, concentration, catalysts, and surface area. Using a variety of reactions, including neutralization reactions, and acid base indicators, students are able to time the chemical reactions by observing specific colour changes. The indicators used in these kits provide colourful results which are user friendly for students. The included worksheets focus on factors which affect reaction rates and their commercial significance. Includes all required chemicals, worksheets, reproducible laboratory procedures, and answer keys. Required, but not included: hot water bath, ice bath, and common laboratory supplies. Designed for 24 students working in six groups of four. Grades 9-12

ESC54155



### Acids And Bases I Kit

Students are introduced to acids, bases, and the pH scale through lab experiments using indicator solutions and papers commonly used in acid base titration's. In the first experiment, students compare eight test substances using red litmus paper, blue litmus paper, phenolphthalein, methyl orange, bromothymol blue, and phenol red. Then they compare the pH of common substances using Universal indicator solution, Universal indicator paper, and wide range pH paper. Students are asked to compare and contrast the results of these methods. Students observe the relationship between pH, ion concentrations, and the strengths of acids and bases. Students may continue to investigate by testing additional substances with the indicators. Lab activities are written in easy-to-understand, step-by-step format, and include worksheets, assessment materials, and answer keys. Includes small bottles for setting up group stations, and all required chemicals and supplies except goggles, gloves, and distilled water. Designed for 24 students working in groups of four. Meets national standards for grades 7-12.

ESC54156







### Ice Melting Kit

This elegantly simple kit challenges student's preconceived notions on concepts of heat and thermodynamics. The melting plates display quizzical properties when an ice cube melts on each plate. The aluminium plate that is cold to the touch melts the ice faster than the plastic foam plate, even though both have equivalent temperatures. A great demonstration for conductivity and heat transfer.

Supplied with instruction manual.

Kit includes:

- 1 aluminium plate (9x9x1 cm)
- 1 plastic foam plate (9x9x1 cm)

ESC54159



### Smoke Cell - Whitley Bay

For observation of 'Brownian Motion' in smoke particles. Consists of box with plastic lid as well as flanges that allow easy attachment to standard microscopes. The box contains a smoke cell, cylindrical condensing lens and a 12 volts 3W festoon bulb. Apparatus pre-set to focus the light at correct height. The set is supplied with detailed instructions and a squeeze bottle type smoke generator. Dimensions 90 x 46 x 20 mm

ESC54161



### Heat Absorption Radiation Comparator

This apparatus allows demonstration for comparing heat absorption & radiation between dull and black bodies. Comprises of 12 V bulb which acts as a heat source and 2 parabolic metal bodies one finished in black and one in shiny metal. These bodies have 2 thermometer holders attached for temperature readings. Instructions included.

ESC54162



### Solids Materials Kit- In Gragnell Storage Tray

It comprises two each of seventeen blocks of different materials.

A variety of materials in the form of rectangular blocks, intended to familiarize students with appearance, 'feel', texture, hardness and density of a range of common substances. Kit comprises two each of seventeen blocks as detailed below.

Blocks, 50 x 40 x 30 mm. Softwood, hardwood, paraffin wax, aluminium, Iron, foamed polystyrene.

Blocks, 20 x 20 x 100 mm. Perspex, glass, slate, aluminium, softwood, Marble

Blocks other sizes: Lead 50 x 50 x 20 mm

Aluminium 50 x 50 x 80 mm

Hardwood 50 x 50 x 200 mm

Brass 20 x 20 x 50 mm

Iron 40 x 40 x 20 mm

ESC54160



### Charls Law Apparatus Single

A clear simple way of demonstrating that the volume of a fixed mass of gas is proportional to its absolute temperature. It comprises a Jolly's apparatus on an anodised stand. A scale is marked in mm. Spring clips secure an air reservoir and adjustment is made using a vertical clamping rod. Comes complete with a mercury levelling tube and Jolly air thermometer. The whole is supplied in a strong polished wooden storage box.

Our Charles Law apparatus does not use mercury as this is now deemed as a highly dangerous substance. Supplied with oil bead and ready to use.

0-5N x 0.1, 0-10N x 1 & 200g x 1g

Height 33.5cm x Width 40cm x Depth 1.5cm

Capillary tube 0-20cm reading

Thermometer -10 - 100 degrees centigrade

ESC54158

### Charls Law Apparatus Pk Of 10

ESC54157





### Statistics: Precision and Accuracy

Use a variety of basic volumetric measuring techniques to distinguish between precision and accuracy, while identifying an unknown liquid by its density. Students work as analytical chemistry to learn the importance of measurement reproducibility. Lessons include statistical analysis calculations of mean, standard deviation, and relative error. Students address the Inquiry Question: How is a physical constant used to verify the precision of a measuring tool Ideal for AP Chemistry, Chemistry I or II, or Honours Chemistry. Glassware is included in the Enhanced Kit (16-101B). Kit designed to exceed 2013 AP Next Generation National Standards. State of the Art instructor's Manual features background material, easy to follow stepwise protocols, assessment questions, sample data, modelled calculations, and an answer key. Recommended: analytical balance; not included. Meets AP Science Practice 2. Designed to accommodate 24 students working in groups of two. Grades 10-14

ESC54235



### Statistics: Precision and Accuracy With Glass Ware

Use a variety of basic volumetric measuring techniques to distinguish between precision and accuracy, while identifying an unknown liquid by its density. Students work as (analytical chemists) to learn the importance of measurement reproducibility. Lessons include statistical analysis calculations of mean, standard deviation, and relative error. Students address the Inquiry Question: How is a physical constant used to verify the precision of a measuring tool Ideal for AP Chemistry, Chemistry I or II, or Honours Chemistry. Glassware is included in the Enhanced Kit (16-101B). Kit designed to exceed 2013 AP Next Generation National Standards. State of the Art instructor's manual features background material, easy to follow stepwise protocols, assessment questions, sample data, modelled calculations, and an answer key. Recommended: analytical balance; not included. Meets AP Science Practice 2. Designed to accommodate 24 students working in groups of two. Grades 10-14

ESC54236



### Spectrophotometric analysis Of Copper: Beers Law

Explore the interaction of light with copper ions in solution using photons from the visible portion of the electromagnetic spectrum. Students examine the relationship between transmittance, absorbency and solution concentration using Beers Law ( $A = \epsilon b \cdot C$ ) after determining Max. Fulfil the AP chemistry requirement for using a Spectrophotometer and learn to perform serial dilutions. Includes an inquiry based extension for determining the amount of copper in a penny (nitric acid not included). Experiments are adjustable to fit your lab period; minimal prep time. Ideal for AP or Honours Chemistry. Kit designed to exceed 2013 AP Next Generation National Standards. State of the Art instructor's manual features background material, easy to follow stepwise protocols, assessment questions, sample data, modelled calculations, and an answer key. Requires additional equipment: spectrophotometers, 10mL volumetric flasks, 1mL pipettes. Meets AP Science Practices: 2, 3 & 5. Designed to accommodate 24 students working in groups of two. Grades 10-14

ESC54237



### Synthesis and Gravimetric Analysis Of Cobalt Oxalate Hydrate

Students will enjoy this lab as they experience multiple techniques required for AP chemistry; synthesizing cobalt oxalate hydrate by precipitation, gravimetric analysis by dehydration, and oxidation-reduction (red-ox) titration on a unique compound. Experiments are well delineated and can be easily adjusted to fit your lab period: minimal prep time. State of the Art instructors manual features background material, easy to follow stepwise protocols, assessment questions, sample data, modelled calculations, and an answer key. Additional equipment required: analytical balance, burette, Bunsen burners, standard laboratory glassware. Meets AP Science Practices 2 & 7. Designed to accommodate 24 students working in groups of two. Grades 10-14

ESC54238





### Acid Base Titration: an Inquiry Investigation

Students standardize a sodium hydroxide titrant with a primary standard, KHP; then find the concentration of an unknown acid solution. Ideal for fulfilling the AP

Chemistry Inquiry requirements as students investigate: What is the mass percent of citric acid in a piece of candy such as a Sour Patch Kid, Warhead, Smartee, Or Sweet Tart Minimal prep time and easily adapted to shorter lab periods. Ideal for AP or Honours Chemistry. State of the Art instructor's manual features background material, easy to follow stepwise protocols, assessment questions, sample data, modelled calculations, and an answer key. Additional equipment required: stir plates, burette, 250 & 500mL volumetric flasks, 1mL pipette, pH meter (optional). Meets AP Science Practices 2 & 3. Designed to accommodate 24 students working in groups of two. Grades 10-14

ESC54239



### Separating Substances by Adsorption Chromatography

Students learn the fundamentals of thin-layer chromatography (TLC), polarity, and intermolecular forces as they separate dyes on silica gels using predetermined solvent mixtures. In an inquiry exercise, students analyse their experimental results and propose unique solvent proportions to improve the chromatography system. After each lab group runs a newly designed experiment, all results are shared and analysed to determine the best solvent mixture for dye separation. Ideal for AP Chemistry, Chemistry I, Chemistry II, or Honours Chemistry courses. State of the Art Instructor's Manual features background material, easy to follow stepwise protocols, assessment questions, sample data, modelled calculations and an answer key. Additional equipment required: standard laboratory supplies. Meets AP Science Practices 1 & 5. Grades 10-14

ESC54240



### Stoichiometry: Reactions With Copper Compounds

Perform four quantitatively different reactions utilizing copper compounds. Identify reaction type, determine mole ratios experimentally, identify limiting reactants, and determine percent yield. The reaction series provides experience synthesizing ionic compounds, a coordination complex, and elemental copper. Ideal for AP Chemistry or Honours Chemistry. State of the Art instructor's manual features background material, easy to follow stepwise protocols, assessment questions, sample data, modelled calculations, and an answer key. Additional equipment required: fume hood, vacuum filtration (recommended), hot plates, balances and basic laboratory supplies. Meets AP Science Practices 2 & 6. Designed to accommodate 24 students working in groups of two. Grades 10-14

ESC54241



### Stoichiometry: Mole Ratio Of An Unknown

This unique, hands-on lab shows students how to treat heat as a quantitative product, using continuous variation (Jobs method). The reagent combination used provides reliable results far superior to competitor kits. State of the Art instructor's manual features background material, easy to follow stepwise protocols, assessment questions, sample data, modelled calculations, and an answer key. Minimal prep time; easily adapted to shorter lab periods. Suitable for Honors and AP chemistry. Additional equipment required: glassware, thermometers, and Styrofoam cups. Meets AP Science Practices 2, 3 & 5. Designed to accommodate 24 students working in groups of two. Grades 10-14

ESC54242





### Using Colligative Properties To Determine The Molar Mass Of An Unknown

Students investigate all aspects of freezing point depression including: solvent freezing constant, Vant Hoff factor, and molar mass. Fulfill the AP required inquiry component while determining important applications of freezing point depression in everyday life. Direct students to design an experiment to resolve: What is the lowest temperature at which road treatment containing calcium chloride would be effective, Includes multiple solvents and solutes, both ionic and molecular. State of the Art instructor's manual features background material, easy to follow stepwise protocols, assessment questions, sample data, modelled calculations, and an answer key. Additional equipment required: hot plates, analytical balances, thermometers, and basic lab supplies. Meets AP Science Practices 2, 3 & 5. Designed to accommodate 24 students working in groups of two. Grades 10-14

ESC54243



### Determining Molar Mass Using The Ideal Gas Equation

This unique hands-on method of exploring gases allows students to compare properties of real and ideal gases (based on KMT assumptions) as they determine the molar mass of a volatile solvent. Students manipulate volume, temperature and pressure while using the ideal gas equation to compute moles of gas. Ideal for Honours or AP Chemistry. State of the Art instructor's manual features background material, easy to follow stepwise protocols, assessment questions, sample data, modelled calculations, and an answer key. Additional equipment required: hot plates, balances, ring stands, glassware, and basic lab supplies. Meets AP Science Practices 1, 2 & 5. Designed to accommodate 24 students working in groups of two. Grades 10-14

ESC54244



### Reaction Rate And Order

Using this superior reagent system, students are able to generate highly reproducible results from an iodine clock reaction. Students determine factors that affect reaction

rates as they vary reactant concentrations, measure rates, calculate reaction orders, and calculate reaction rate constants. Activation Energy is also determined utilizing the logarithmic form of the Arrhenius equation by plotting temperature and reaction rate. State of the Art instructor's Manual features background material, easy to follow stepwise protocols, assessment questions, sample data, modelled calculations, and an answer key. Additional equipment required: stop watch, pipette, lab glassware. Meets AP Science Practices 1, 2 & 4. Designed to accommodate 24 students working in groups of two. Grades 10-14

ESC54245



### Determining Molar Enthalpy Using Hess's Law

This calorimetry lab uses reliable reactions as students measure temperature changes, determine the calorimeter constant and ultimately calculate the molar enthalpy of formation for magnesium oxide using Hess's Law. Students compare lab results to standard values. Ideal for Honours or AP Chemistry. State of the Art instructor's Manual features background material, easy to follow stepwise protocols, assessment questions, sample data, modelled calculations, and an answer key. Procedures can easily be divided or used as collaborative lessons. Additional equipment required: thermometers, balances, basic lab supplies, and Styrofoam cups. Meets AP Science Practices 2 & 7. Designed to accommodate 24 students working in groups of two.

Grades 10-14

ESC54246





### Le Chateliers Principle

Students create and analyse four different equilibrium systems, allowing manipulation of a variety of stresses to show how systems respond by shifting in the direction that reduces stress. Students vary temperature, alter the pH of a weak acid indicator, use silver ions to draw chloride from a complex ion by precipitation, and design a set of conditions for optimum yield. Students make predictions and test their hypotheses. State of the Art instructor's Manual features background material, easy to follow stepwise protocols, assessment questions, sample data, and an answer key. Ideal for AP Chemistry, Chemistry II, or Honors Chemistry. Standard lab equipment and fume hood required. Experiments are readily adjustable to fit your lab periods. Meets AP Science Practices 6 & 7. Designed to accommodate 24 students working in groups of two.

ESC54247



### Identifying Weak Acids By PKA

Students perform titration on weak acids while measuring pH, perform qualitative analysis by determining PKA values of acids, perform quantitative analysis by calculating molar masses, confirm the identities of weak acids, and derive and use the Henderson-Hasselbalch equation. Features four different weak acid solids; three monoprotic, one diprotic. Ideal for two 45 minute lab periods. State of the Art Instructors manual features background material, easy to follow stepwise protocols, assessment questions, sample data, modelled calculations, and an answer key. Additional equipment required: pH meter, Burette, pipettes, and volumetric flasks. Meets AP Chemistry Science Practices 2, 5, and 6. Designed to accommodate 24 students working in groups of two. Grades 10-14

ESC54248



### Preparing Buffer Solutions And Determining Their Properties

Students utilize the Henderson-Hasselbalch equation in analysing buffers. After being assigned one of the three buffer systems, pH, and component acids, bases or conjugates, students construct a buffer and test it based on their own calculations. Students compare the pH changes of their buffer to those of distilled water and other solutions. Minimal prep time required. State of the Art instructor's Manual features background material, easy to follow stepwise protocols, assessment questions, sample data, modelled calculations, and an answer key. Additional equipment required: pH meter, glassware. Meets AP Science Practices 4 & 7. Designed to accommodate 24 students working in groups of two. Grades 10-14

ESC54249



### Determining The Equilibrium Constant (and Temperatures Effect) Withbeers Law

Loaded with important concepts and techniques for the AP chemistry student; determine the equilibrium constant using Le Chatelier's Principle and Beer's Law (using spectrophotometry) to determine equilibrium concentrations of reactants and products. Addresses the inquiry question: What is the effect of temperature on the equilibrium constant? Minimal prep time; easily adapted to three shorter lab periods. State of the Art instructor's manual features background material, easy to follow stepwise protocols, assessment questions, sample data, modelled calculations, and an answer key. Additional equipment required: spectrophotometers, glassware, and thermometers. Meets AP Science Practices 2 & 7. Designed to accommodate 24 students working in groups of two. Grades 10-14

ESC54250





### Electrochemical Cells Voltaic And Electrolytic

Analyse oxidation-reduction (red-ox) reactions and become familiar with the activity series of metals and its importance in predicting the products of replacement reactions. Students test both Voltaic and Electrolytic cells, and predict and measure cell voltages. Lessons include learning to separate oxidation-reduction (red-ox) reactions into half reactions, as well as identifying both anode and cathode activity. Minimal prep time required. State of the Art instructor's manual features background material, easy to follow stepwise protocols, assessment questions, sample data, modelled calculations, and an answer key. Additional equipment required: a DC VOLTMETER, glassware. Meets AP Science Practices 3 & 7. Designed to accommodate 24 students working in groups of two. Grades 10-14

ESC54251



### Ap Chemistry Series (Includes Kit ESC54235)

The EduScience AP Chemistry Series includes 16 labs designed to meet the essential laboratory requirements of an AP Chemistry course. As a series, these labs address the 2013 Essential Knowledge, Science Practices, and Learning Objectives established by the AP College Board. Six labs incorporate specific Inquiry components and all labs contain instructions for optional inquiry adaptations. For planning purposes, each manual contains a complete breakdown of the AP Framework correlations for each of the 16 lab experiments. Grades 10-14

ESC54252



### Ap Chemistry Series (Includes Kit ESC54236)

The EduScience AP Chemistry Series includes 16 labs designed to meet the essential laboratory requirements of an AP Chemistry course. As a series, these labs address the 2013 Essential Knowledge, Science Practices, and Learning Objectives established by the AP College Board. Six labs incorporate specific Inquiry components and all labs contain instructions for optional inquiry adaptations. For planning purposes, each manual contains a complete breakdown of the AP Framework correlations for each of the 16 lab experiments. Grades 10-14

ESC54253





**Ge Filtration: Plant Pigments**

This gel filtration technique allows students to take advantage of differences in molecular size and structure to separate plant pigments using chromatographic columns. Students pack their own Sephadex G-25 chromatographic columns. They observe the separation of anthocyanin, carotene, chlorophyll and xanthophyll from a mixture of these pigments. This separation is due to differences in size as well as the presence of aromatic and cyclic compounds. The greater the number of rings in the pigments, the greater the affinity of the pigments for the gel granules. Columns may be re-used. Required, but not included: beet, spinach, and coleus leaves, balance, lab glassware and supplies. Designed for 24 students working in six groups of four. Grades 10-14

ESC54310



**Chromatography Paper Roll G N 1**

High-quality paper suitable for general analytical separations, electrophoresis, or chromatography requirements for educational use.

- 10 mm ESC54311
- 20 mm ESC54312
- 50 mm ESC54313
- 100 mm ESC54314
- 150 mm ESC54315



**Chromatography Paper Sheet G N 1**

No. 1, Chromatography Filter Paper sheet, Pack of 100.

- Size 25x25cm ESC54316
- Size 10x30cm ESC54317
- Size 20x20cm ESC54318
- Size 46x57cm ESC54319



**Chromatography Tank With Lid**

Transparent rectangular jars Size 22.5x20x20 cm. For chromatography purpose use. Supplied with glass lid

ESC54324



**Simple Chromatography Kit**

This exceptional introduction to paper chromatography, students learn how chromatography can identify the makeup of organic and inorganic substances. Students perform experiments to compare the effects of different solvents on the separation of chlorophyll extract and dyes into their constituent components.

ESC54325





### Drop Neutralization Kit

A great way to teach the principles of acid base titration to students with a limited laboratory background. Eliminates the need for expensive laboratory equipment for teaching titration, and includes all necessary materials alleviating extensive lab preparation. Ideal for leading into discussions about titration, acids, bases, pH, buffers, or environmental or physiological buffering systems in a range of science applications from Biology to Environmental Sciences to Physiology. Kit includes instructor's manual with background information, assessment materials, an answer key, and enough materials for 24 students working in six groups of four. Meets national standards for Grades 8-12.

ESC54359



### Stoichiometry Kit

Explore the types of chemical reactions, mole ratios, and stoichiometric equivalents which are central to all chemical calculations. Students perform a series of experiments including an electro-chemistry decomposition reaction, single replacement reactions, and double replacement reactions. Students are encouraged to predict possible products, as well as write and balance equations representing the reactions. Students will discover the quantitative nature of chemical equations and the experimental basis of numerically balancing coefficients. Includes a lab quiz. Kit includes all required chemicals and supplies for performing experiments on a micro-scale. Kit contains lead nitrate. Required, but not included: 9V batteries with clips and leads. Designed for 24 students working in six groups of four. Grades 9-12

ESC54360

### Stoichiometry Refill

ESC54361



### Acids , Bases And Salt , Micro-chem Kit

Students engage in three experiments to investigate the properties of acids, bases, and salts. First students use five solution indicators to explore the pH of acids and bases. Then they experience a micro-titration procedure for reacting acids and bases to form salts and learn the difference between strong and weak acids and bases. They also learn how a titration curve shows the endpoint or neutralization point for indicators. Finally, students apply the techniques they've learned to determine the concentration of acetic acid in household vinegar by titrating the weak acid with a strong base and using a phenolphthalein indicator. Includes all necessary chemicals and micro supplies for investigations. Required, but not included: distilled water. Designed for 24 students working in six groups of four. Grades 9-12

ESC54362

### Acids , Bases And Salt , Micro-chem Refil

ESC54363



### Basic Microchemistry, Single Kit

Basic Microchemistry includes all laboratory supplies required to perform the following five experiments chemistry labs in micro-scale: Mole Ratios, Catalysts, Rates of Reaction, Equilibrium, and Titration's. These sets provide an economical solution for increasing lab hour requirements with inexpensive, reusable supplies, reduced chemical costs, and easy clean up. You will need to supply small amounts of standard laboratory chemicals. Each single kit is ideal for two students. Class sets supply 24 students working in pairs. Student manuals feature stepwise protocols, clear instructional diagrams, and questions for assessment. Instructor's manuals are complete with answer keys.

ESC54364







### Basic Microchemistry, Class Pack Kit

Basic Microchemistry includes all laboratory supplies required to perform the following five experiments chemistry labs in micro scale: Mole Ratios, Catalysts, Rates of Reaction, Equilibrium, and Titrations. These sets provide an economical solution for increasing lab hour requirements with inexpensive, reusable supplies, reduced chemical costs, and easy clean up. You will need to supply small amounts of standard laboratory chemicals. Each single kit is ideal for two students. Class sets supply 24 students working in pairs. Student manuals feature stepwise protocols, clear instructional diagrams, and questions for assessment. Instructor's manuals are complete with answer keys.

ESC54365



### Advanced Microchemistry, Single Kit

Advanced Microchemistry includes all laboratory supplies required to perform the following ten experiments chemistry labs in micro-scale; Mole Ratios, Catalysts, Rates of Reaction, Equilibrium, Titration, Acids & Bases, Reduction of Hydrogen Sulphide, Reduction of Copper Oxide, Electrochemical Cell, and Decomposition of Water by Electrolysis. These sets provide an economical solution for increasing lab hour requirements with inexpensive, reusable supplies, reduced chemical costs, and easy clean-up. You will need to supply small amounts of standard laboratory chemicals. Each single kit is ideal for two students. Class sets supply 24 students working in pairs. Student manuals feature stepwise protocols, clear instructional diagrams, and questions for assessment. Instructor's manuals are complete with answer keys. Grades 9-12

ESC54366



### Advanced Microchemistry, Class-pack

Advanced Microchemistry includes all laboratory supplies required to perform the following ten experiments chemistry labs in micro-scale; Mole Ratios, Catalysts, Rates of Reaction, Equilibrium, Titration, Acids & Bases, Reduction of Hydrogen Sulphide, Reduction of Copper Oxide, Electrochemical Cell, and Decomposition of Water by Electrolysis. These sets provide an economical solution for increasing lab hour requirements with inexpensive, reusable supplies, reduced chemical costs, and easy clean up. You will need to supply small amounts of standard laboratory chemicals. Each single kit is ideal for two students. Class sets supply 24 students working in pairs. Student manuals feature stepwise protocols, clear instructional diagrams, and questions for assessment. Instructor's manuals are complete with answer keys. Grades 9-12

ESC54367





### Molecular Model

Can be used to explain elementary organic and inorganic compound structures.

Overall size : 23 x 17 x 3.5 cm, Material : Plastic

Showing different bonding types It contains different colour balls indicating different atoms, All of the parts fit neatly into plastic storage box Complete with manual instruction

#### Consist of :

1. Carbon Black 13 pcs
2. Hydrogen White 26 pcs
3. Sulphur Yellow 1 pc
4. Nitrogen Blue 3 pcs
5. Oxygen Red 13 pcs
6. Halogen Green 6 pcs
7. Medium connector Grey 26 pcs
8. Long flexible connector Grey 12 pcs
9. Short connector White 34 pcs

**Dimension :** (L) 23.00 x (W) 17.00 x (H) 3.50 cm

**Weight :** 0.500 kg

ESC54388



### Molecular Model Diamond

Ideal for demonstrate diamond molecular structure.

Material : Plastic.

Consist of 30 plastic balls with 4 holes and 40 medium connectors, represents as carbon atoms and bonds.

All parts are packed in a plastic box for storage while not in use.

Complete with manual instruction

Dimension :(L) 23.50 x (W) 17.50 x (H) 3.50 cm

Weight :0.445 kg

ESC54389



### Molecular Model, Graphite

Ideal for demonstrate diamond molecular structure.

Material : Plastic

Consist of 57 plastic balls with 5 holes, 69 medium connectors (grey), and 14 long connectors (purple) represents as carbon atoms and bonds , All parts are packed in a plastic box for storage while not in use

Complete with manual instruction

Dimension :(L) 23.20 x (W) 17.00 x (H) 3.50 cm

Weight :0.480 kg

ESC54391



### Molecular Model, Fullerene C-60

Ideal for demonstrate fullerene (C-60) molecular structure.

Material : plastic.

Consist of 60 plastic balls with 4 holes and 90 medium connectors, represents as carbon atoms and bonds.

All parts are packed in a plastic box for storage while not in use.

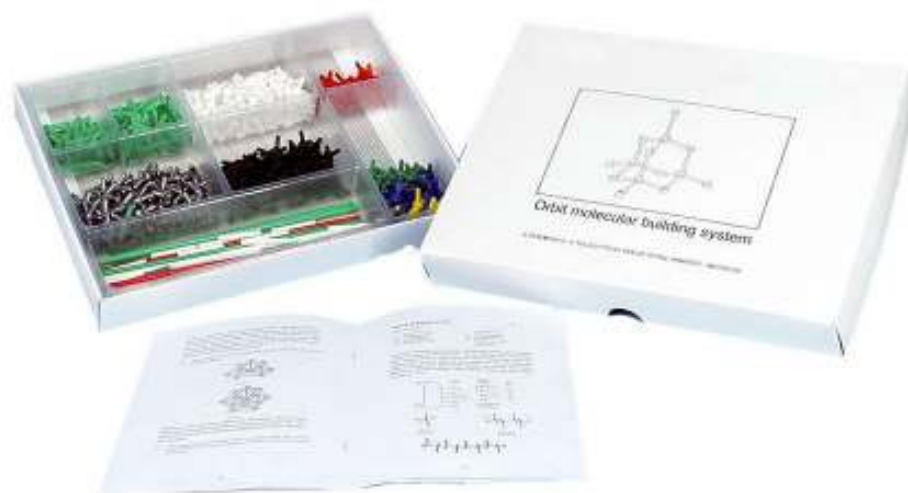
Complete with manual instruction.

Dimension :(L) 23.50 x (W) 17.00 x (H) 7.00 cm

Weight :0.700 kg

ESC54390





### Molecular Model Orbit System, Basic

Showing different bonding types. Can be used to explain organic and inorganic compound structures, including crystal structures. It contains different colour balls with different quantity of legs, indicating different atoms.

Material : plastic.

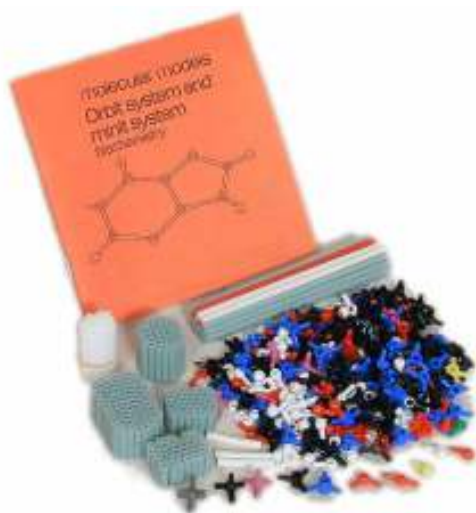
All of the parts fit neatly into compartmentalized box.

Complete with manual instruction.

Set of Molecular Model Orbit System, consist of :

- |  |  |
|--|--|
| 1 Oxygen Type a Red 15pcs Legs 1pc                 | 16 Metal Type q3 Grey 80pcs Legs 3pcs          |
| 2 Halogen Type a Green 15pcs Legs 1pc              | 17 Bonding pegs x Translucent 10pcs Legs 1pc   |
| 3 Hydrogen Type a White 120pcs Legs 1pc            | 18 Plastic straw 4 x 210 mm Grey 3             |
| 4 Hydrogen Type b White 50pcs Legs 2pc             | 19 Plastic straw 4 x 210 mm Green 5            |
| 5 Sulphur Type c Yellow 25pcs Legs 2pc             | 20 Plastic straw 4 x 210 mm Red 3              |
| 6 Oxygen Type d Red 30pcs Legs 2                   | 21 Plastic straw 4 x 210 mm White 5            |
| 7 Carbon Type j Black 50pcs Legs 3pcs              | 22 Plastic straw 4 x 120 mm Clear 3            |
| 8 Nitrogen Type j Blue 15pcs Legs 3pcs             | 23 Plastic straw 4 x 35 mm Green 350           |
| 9 Carbon Type k Black 78pcs Legs 4pcs              | 24 Plastic straw 4 x 20 mm Green 140           |
| 10 Nitrogen Type k Blue 5pcs Legs 4pcs             | 25 Plastic straw 4 x 35 mm White 45            |
| 11 Oxygen Type k Red 21pcs Legs 4pcs               | 26 Plastic straw 4 x 50 mm White 30            |
| 12 Sulphur Type k Yellow 5pcs Legs 4pcs            | Dimension :(L) 31.00 x (W) 22.50 x (H) 4.50 cm |
| 13 Halogen Type l Green 30pcs Legs 6pcs            | Weight :0.600 kg                               |
| 14 Metal Type l Grey 30pcs Legs 6pcs               |  |
| 15 Metal Type q6 Grey 40pcs Legs 6pcs (reel shape) |  |

ESC54392



### Biochemistry Student Kit

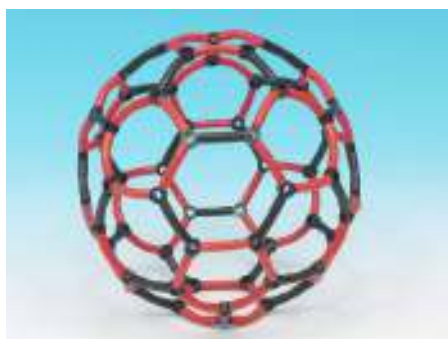
Learn about amino acids; monosaccharides, glycerol, fatty acids, steroids, purines and pyrimidines, peptides, disaccharides, lipids, nucleosides, nucleotides, proteins, polysaccharides, nucleic acids.

Advanced student set in pocket-sized plastic container.

255 atoms, 220 bonds, 44 page booklet covers the above structures.

ESC54401





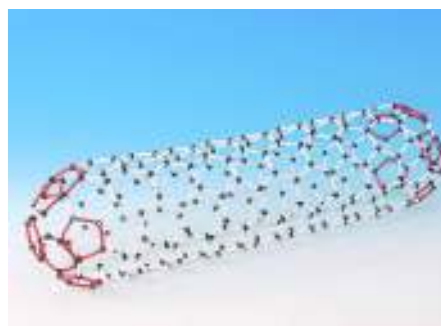
### Carbon 60 Model

Carbon 60 is the nearly spherical football-shaped molecule consisting of 60 carbon atoms. It is also known as the Buckyball and is the most stable example of the fullerene.

This Colour-wave model kit shows the highly symmetrical structure of Carbon 60. It is composed of 12 pentagons and 20 hexagons with alternating double and single bonds illustrated by different colour tubes in the model.

Part of the Orbit Colour-wave series, the model is easy to assemble and robust with sufficient atoms to see the relationships between structure and physical properties. Different coloured tubes illustrate the different types of bonding

ESC54393



### Carbon Nano-tube Model

Carbon nano-tubes are currently one of the most intensively studied nano-materials with their unique molecular structure resulting in several potential exciting applications in current day nano-science.

Using this kit you can make a graphite sheet, carbon nano-tube, carbon 60 (buckyball) and related structures with up to 260 carbon atoms.

Instructions show how the carbon atoms can be arranged to illustrate the different symmetries of carbon rings in the nano-tube to create the chair, zigzag and chiral structures.

The kit uses the Minit molecular building system and contains 260 atoms to make a nano-tube model 50cm long.

ESC54394



### Copper Model Kit

Robust model containing sufficient atoms to see the relationships between structure and physical properties. Easy-to-build, low-cost kits, students learn as they follow the building instructions and model description.

Shape: Irregular | Height: 17cm | 38 copper atoms

ESC54395



### Diamond Model Kit

Robust model containing sufficient atoms to see the relationships between structure and physical properties. Easy-to-build, low-cost kits, students learn as they follow the building instructions and model description.

Shape Octahedron | Height 22cm | 84 carbon atoms

ESC54396

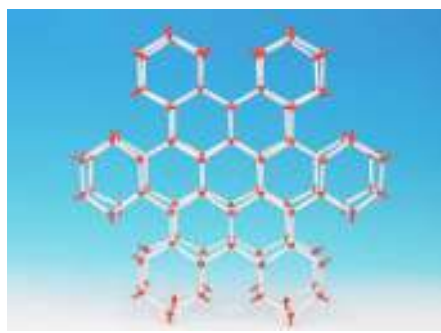


### Graphite Model Kit

Robust model containing sufficient atoms to see the relationships between structure and physical properties. Easy-to-build, low-cost kits, students learn as they follow the building instructions and model description.

Shape Three layers | Height 16cm; Width 22cm | 94 carbon atoms

ESC54397



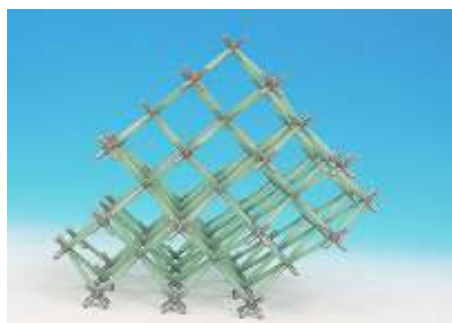
### ICE Model Kit

Robust model containing sufficient atoms to see the relationships between structure and physical properties. Easy-to-build, low-cost kits, students learn as they follow the building instructions and model description.

Shape: Snowflake | Diameter: 36cm | 96 oxygen atoms

ESC54398





### IRON Model Kit

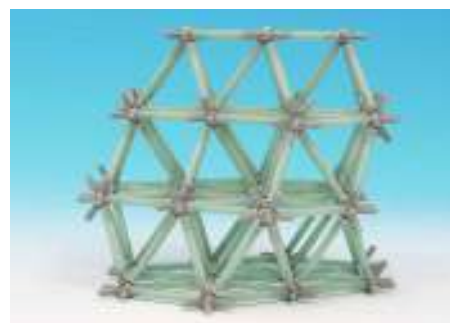
Robust model containing sufficient atoms to see the relationships between structure and physical properties. As easy-to-build, low-cost kits, students learn as they follow the building instructions and model description.

Shape: Irregular

Height: 20cm

71 iron atoms

ESC54399



### Magnesium Model Kit

Robust model containing sufficient atoms to see the relationships between structure and physical properties. Easy-to-build, low-cost kits, students learn as they follow the building instructions and model description.

Shape: Irregular | Height: 14cm | 38 magnesium atoms

ESC54400



### Inorganic Organic Student Kit

14 hydrogen (I), 6 carbon (IV), 7 oxygen (II, IV), 3 nitrogen (III, IV), 2 sulphur (II, VI), 2 phosphorus (III, V), 6 halogen (I), 8 metal (I, II, III, IV, VI), 4 brown (III, IV, V, VI), 3 lone pair 2D paddles (beige) Links: 20 medium (grey), 5 medium (purple), 12 long flexible (grey)

ESC54402



### Vibrating Atom Kit

This vibrating atom model formally demonstrates how atoms making up a solid (e.g. a crystal) are held together by spring-like forces.

Hold the model at arm's length and shake lightly, and pupils will see the individual atoms vibrate and move independently due to the springs holding them together. They will also notice that they remain in the same formation within the model, as they do in a solid.

Best used for demonstration purposes due to the ease with which the springs can be bent or misplaced.

Comprises 9 white ball atoms arranged in a 3 x 3 x 3 lattice, connected by 54 springs. Dimensions: 185 x 185 x 185 mm

ESC54408



### Organic Student Kit

20 hydrogen (I), 12 carbon (IV), 6 oxygen (II), 4 nitrogen (III, IV), 2 sulphur (IV, VI), 1 phosphorus (IV), 4 halogen (I), 1 metal (I) Links: 26 medium (grey), 12 long flexible (grey), 26 short (white), 1 short link remover tool

ESC54404



### Advance Chemistry Kit

18 hydrogen (I), 8 carbon (IV), 7 oxygen (II, IV), 4 nitrogen (III, IV), 6 chlorine (I), 6 fluorine (I), 3 sulphur (II, IV, VI), 2 boron (III, IV), 4 phosphorus (III, IV, V, VI), 6 metal (II, III, IV, VI), 3 lone pair 3D lobes (beige) Links: 26 medium (grey), 5 medium (purple), 12 long flexible (grey)

ESC54406





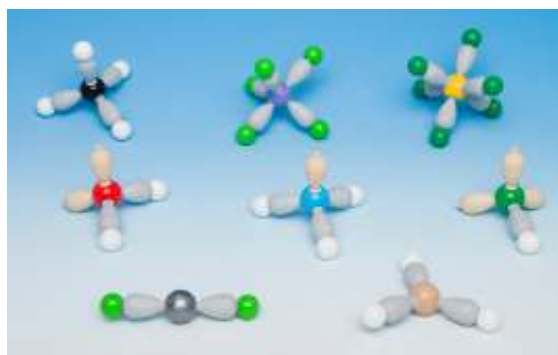
### Inorganic Organic Teacher Kit

Designed to make a wide range of open type models, such as amines, inorganic acids, metal oxides and simple organic structures.

Spheres: 4 metal (1 hole), 3 metal (2 holes), 2 metal (3 holes), 4 metal (4 holes), 1 metal (6 holes), 14 carbon (4 holes), 6 carbon (5 holes), 12 hydrogen (1 holes), 2 hydrogen (2 holes), 6 nitrogen (4 holes), 4 nitrogen (3 holes), 13 oxygen (2 holes), 4 oxygen (4 holes), 5 oxygen (1 holes), 8 sulphur (2 holes), 4 sulphur (4 holes), 1 sulphur (6 holes), 4 phosphorus (4 holes), 1 phosphorus (5 holes), 2 phosphorus (3 holes) and 8 halogen (1 holes).

Links: 38 grey medium, 12 purple medium, 36 long flexible. Atomic orbitals: 6 pink unhybridised p-lobes, 6 purple unhybridised p-lobes, and 6 lone pair of electrons lobes.

ESC54403



### Shapes Of Molecules Electron Repulsion Theory

This set contains sufficient parts to make eight atomic models. Each model is an example of the different orientations of the bonds and cover coordination numbers 1 to 6. Lone pairs are represented by brown spheres or brown pear shaped parts. The latter is useful as protonated models of  $\text{NH}_4^+$  and  $\text{H}_3\text{O}^+$  may be built thus demonstrating Acid/Base theory.

Spheres: 1 carbon (4 holes), 1 oxygen (4 holes), 1 nitrogen (4 holes), 1 sulphur (6 holes), 1 phosphorous (5 holes), 1 chlorine (4 holes), 1 boron (3 holes), 1 metal (beryllium) (2 holes), 7 chlorine (1 holes), 9 fluorine (1 holes), 13 hydrogen, 6 circular lone pair orbitals, 6 pear shaped lone pair orbitals. Links: 26 grey pear shaped sigma bonds, 6 short links (to be used with circular lone pairs).

ESC54407



### Sodium Chloride Model Kit

Self-assembly kit

ESC54409



### Organic Teacher Kit

The TEACHER organic set can be used to make any number of simple molecules and is designed for those needing to make many models, such as teachers and lecturers.

The atom parts are made of solid plastic spheres and are available with from 1 - 6 holes in the usual angular orientations.

The contents are contained within a sturdy plastic storage box.

The contents of the organic teacher set include;

Atoms:

- 24 carbon atoms (black, 4 hole, tetrahedral)
- 6 carbon atoms (black, 5 hole, trigonal bipyramidal)
- 2 carbon atoms (black, 2 hole, linear)
- 6 carbon atoms (black, 3 hole, trigonal)
- 12 oxygen atoms (red, 2 hole, angular)
- 40 hydrogen atoms (white, 1 hole)
- 4 nitrogen atoms (blue, 4 hole, tetrahedral)
- 1 sulphur atom (yellow, 4 holes, tetrahedral)
- 1 sulphur atom (yellow, 2 holes, angular)
- 4 phosphorus atoms (purple, 4 hole, tetrahedral)
- 8 halogen atoms (green, 1 hole)
- 2 metal atoms (grey, 1 hole)
- 1 metal atom (grey, 2 holes, angular)

Bonds:

- 55 medium links (grey, single bonds)
- 25 long flexible links (grey, double/triple bonds)
- 60 short links (white, all bond types)
- 6 pink unhybridised p-lobes, 6 purple unhybridised p-lobes and 6 lone pair of electrons lobes.

Tool:

- 1 tool (used for disassembling models containing short link bonds)

ESC54405



### Zinc Sulphide Model Kit

45 atom self-assembly kit

ESC54410





### Families Of Elements I Kit

Students are introduced to families (groups) within the periodic table that have the same number of electrons in their outer energy orbitals. Tests are conducted to determine if those elements have similar chemical activity. This kit includes two experiments, one in which students determine the reactivity of the non-metals in the halogen family and one in which they observe the properties of oxygen. Worksheets focus on identifying characteristics of elements within the halogen, oxygen and nitrogen families, separation methods, and the observed chemical reactions. Kit includes all required chemicals, reproducible procedures for laboratory experiments, a test, and answer keys. Required, but not included: chemical ventilation hood, general lab supplies. Includes nitric acid. Designed for 24 students working in six groups of four. Grades 9-12

ESC54446



### Elements, Compounds & Mixtures I Kit

In the laboratory, students identify that a mixture can be separated using one of a variety of methods such as evaporation, distillation, filtration, or crystallization when differences in solubility exist. Experiment one is designed to separate a mixture of an element and a compound using solubility and filtration. Experiment two is designed to separate a mixture of two compounds using solubility and filtration. Experiment three is designed to separate a mixture using chromatography. Experiment four is designed to separate a mixture by evaporation. Includes all required chemicals, vocabulary exercise, and reproducible laboratory procedures and worksheets. Required, but not included: balance and laboratory supplies. Designed for 24 students working in groups of four. Meets national standards for grades 7-10.

ESC54447

### Elements, Compounds & Mixtures I Kit

ESC54448



### Elements, Compounds & Mixtures I I

This kit illustrates the concepts of elements, compounds, and mixtures with special emphasis on creating new compounds in chemical reactions. Students witness evidence of chemical changes identified by the formation of precipitates, colour changes, odours, or the production of gas. The kit includes enough materials to repeat the experiment twice, with vocabulary and activity worksheets focused on chemical symbols, chemical formulas, chemical names, components of common compounds, and distinguishing between chemical and physical changes. Answer keys included. Required, but not included: balance and laboratory supplies. Designed for 24 students working in six groups of four.

ESC54449

### Elements, Compounds & Mixtures II Kit Refill

ESC54450





### Hoffman Electrolysis Apparatus

Made of Borosilicate glass, graduated. For study of composition of water by volume and E.C.E. of hydrogen by electrolysis. H-shaped glass unit has two connected limbs, with stopcocks at the top and electrodes at the bottom. Limbs are connected to central tube and bulb reservoir at apex of outer tubes and inner tubes respectively. Outer limbs graduated 0-50 x 0.2ml.

Stable retort stand and clamps included. Includes one pair each of platinum and carbon electrodes. Supplied with Instructions.

ESC54493



### Absorption Tube With Side Arm

Absorption tubes, calcium chloride, U-form with side arms and strong walls, borosilicate glass.

Height	Diameter	NO
100mm	13mm	ESC54496
150mm	15mm	ESC54497



### Beehive Shelf

This porcelain Beehive Shelf is glazed inside and out. It is for use in pneumatic troughs for gas collection.

Diameter: 100mm.

ESC54498

### Gas Syringe

Graduated glass syringe Gas tight Heat resistant.

Size: Outlet tube external diameter: 7mm.

Capacity: 100cm<sup>3</sup> x 1cm<sup>3</sup>.



ESC54502



### Spare Carbon Electrodes In Rubber Stoppers

Spare Carbon Electrodes in rubber stoppers, Overall length 8cm

ESC54495



### Spare Platinum Electrodes In Rubber Stoppers

Spare Platinum Electrodes in rubber stoppers, Overall length 8cm

ESC54494



### Gas Jar Cylindrical Boro

Borosilicate glass with heavy foot and grounded flange. Lid not included.

Height 20 cm, Diameter 5 cm

ESC54499

Height 25 cm, Diameter 5 cm

ESC54500



### Gas Jar Cover Dia 6 Cm

6CM Circulars sheet glass, ground one side.

ESC54501







**Kinetic Theory Model**

To study the motion and behaviour of gas molecule, works on 9 to 12V DC, vibrates a small platform inside a transparent tube, which further vibrates steel balls inside the tube. Includes steel balls and two floats.

ESC54503



**Simple Gas Preparation Kit**

Simple gas preparation kit use for producing gasses which can be collected over water, e.g. Oxygen, hydrogen and carbon dioxide. Comprises with plastic tank with lid, test tube stand, five test tube 150x24mm and stopper, special gas chimney shelf, delivery tube and tubing connector. The tank and lid form a storage box for all components.

ESC54504



**Salt Bridge**

For use in experiments involving the measurement of cell EMF under conditions of forward, zero and reverse current flow. The bridge comprises an inverted "U" tube with its ends closed by sintered discs. This apparatus provides a more effective method of making reversible cells than the wet filter paper or agar gel methods. Dia. of arms 13 mm, overall width 80 mm, overall height 100 mm

ESC54510



**Plate For Simple Cell Lead**

Plate size 125 x 50 mm and fitted with 4 mm socket terminals.

ESC54505

**Plate For Simple Cell Carbon**

Plate size 125 x 50 mm and fitted with 4 mm socket terminals.

ESC54506

**Plate For Simple Cell Zinc**

Plate size 125 x 50 mm and fitted with 4 mm socket terminals.

ESC54507

**Plate For Simple Cell Copper**

Plate size 125 x 50 mm and fitted with 4 mm socket terminals.

ESC54508



**Trough Pneumatic, Soda Glass**

Made of soda glass. Dia 30 cm, height 12.5cm

ESC54511

**Trough Pneumatic, Soda Glass**

Made of soda glass. Dia 25cm, height 12.5cm

ESC54512

**Trough Pneumatic, Soda Glass**

Made of soda glass. Dia 20cm, height 12.5cm

ESC54513



**Trough Pneumatic, Polypropylene, Dia 18cm, Height 6cm**

Dia 18cm, height 6cm, Polypropylene, autoclavable, can be used for storage, sterilizing and drying lab-ware.

ESC54509





### Electrolysis Cell

For quick demonstration of electrolysis. Comprises open-ended glass tube fitted with two carbon electrodes by means of a rubber stopper. Connections made by crocodile clips and an insulating strip of plastic in the bung prevents the clips being shorted accidentally. Consists of glass tubes of dia 74 x 24mm, and collecting tubes of dia 75 x 10mm.

ESC54514



### Carbon Rod

With terminal, length 140 mm and dia. 15 mm

ESC54515



### Organic Quick fit Set - 27BU/M - 14/23 Joints

27 BU ORGANIC CHEMISTRY SET 27 ITEMS AS DESCRIBE.

INCLUDES :

For preparative chemistry up to advanced level. This set enables a number of preparations to be carried out on the 30g scale. **Contents:** Pear shaped flask, 50cm, Still head, Liebig condenser, Screw-cap adaptor, Receiver adaptor, Thermometer, 0 - 360 C x 2 C, Dropping funnel, 50cm with Rotaflo tap , Stopper, Air leak/steam inlet tube.

ESC54576



### Organic Chemistry Glassware Kit 9Pcs

This starter set is designed for organic chemistry labs and is suitable for small-scale procedures up to 30g. All of the ground glass components in this set have a joint size of 14/23. Includes a sturdy storage box with foam insert.

**Contents:**

Dropping Funnel (50ml with Rotoflo Stopcock) 1, Receiver Delivery Adapter, Long Stem 1, Stopper for Dropping Funnel 1, Screw Cap Adapter 1, Air Leak / Steam Inlet Tube 1, Thermometer 1, Boiling Flask (50ml) 1, Still Head 1, Liebig Condenser 1

ESC54577

### Organic Chemistry Glassware Kit 16Pcs

This deluxe set is designed for organic chemistry labs and is suitable for preparations up to 150g. All glassware is jointed (joint sizes available upon request). Includes a sturdy storage box with foam insert.

**Contents:**

Still Head, (socket size 14/23, cone size 19/26) 1, Dropping Funnel (100ml) (socket size 19/26, cone size 19/26) 1, Thermometer Pocket (cone size 14/23) 1, Air Leak / Steam Inlet Tube (cone size 19/26) 1, Round Bottom Flask (250ml) (socket size 24/29) 1, Erlenmeyer Flask (250ml) (socket size 24/29) 1, Reducing Adapter (socket size 19/26, cone size 24/29) 1, Round Bottom Flask (100ml) (socket size 24/29) 1, Receiver Adapter with Vent (socket size 19/26, cone size 24/29) 1, Multiple Adapter (socket size 19/26, cone size 24/29) 1, Round Bottom Flask (50ml) (socket size 24/29) 1, Stopper, (cone size 19/26) 1, Stopper, (cone size 19/26) 1, Stopper, (cone size 24/29) 1, Receiver Delivery Adapter, Long Stem (socket size 19/26) 1.

ESC54578





**A Quick-fit Joint Clips Conical Joints**

Conical joint clips Keck pom 14/23 yellow  
 Conical joint clips keck pom 19/26 blue  
 Conical joint clips keck pom 24/29 green

ESC54582

ESC54583

ESC54584



**B Quick-fit Reduction Adaptors**

Hollow stopper  
 14/23 flat bottom  
 19/26 flat bottom

ESC54587

ESC54588



**C Quick-fit Reduction Adaptors**

Reduction adaptor socket  
 14/23 cone 19/26  
 14/23 cone 24/29  
 19/26 cone 24/29

ESC54591

ESC54592

ESC54593



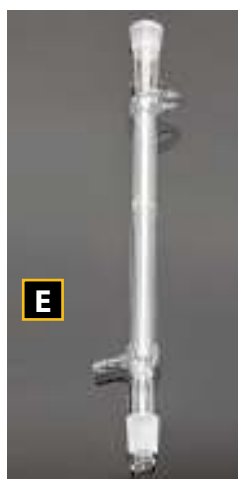
**D Quick-fit Expansion Adaptor**

Expansion adaptor socket  
 19/26 cone 14/23  
 24/29 cone 14/23  
 24/29 cone 19/26

ESC54597

ESC54598

ESC54599



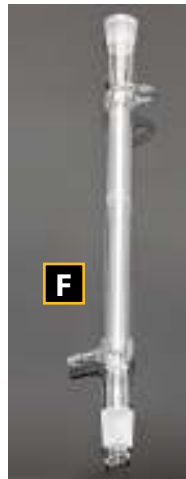
**E Quick-fit Condenser Liebig With Screw-thread**

Liebig condenser with screw thread  
 160mm socket 14/23 cone 14/23  
 160mm socket 19/26 cone 19/26  
 400mm socket 24/29 cone 24/29

ESC54603

ESC54604

ESC54605



**F Quick-fit Condenser Liebig**

Liebig condenser with glass connector  
 160mm socket 14/23 cone 14/23  
 400mm socket 24/29 cone 24/29

ESC54609

ESC54610



**V Quick-fit Multiple Adapter With 2 Necks**

Multiple adapter 2 neck one joint at 45 degree socket  
 19/26 cone 19/26

ESC54614



**G Quick-fit Receiver Adaptor**

Receiver delivery adaptor short stem socket  
 14/23 65mm  
 19/26 65mm

ESC54618

ESC54619





**H**



**I**

**H Quick-fit Receiver Adaptor**

Receiver delivery adaptor long stem socket

14/23 190mm

ESC54622

19/26 200mm

ESC54623

**I Quick-fit Receiver With Vented Bend**

Receiver adaptor bend with vent socket

14/23 cone 14/23

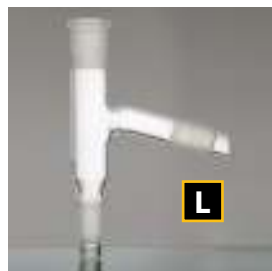
ESC54626

9/26 cone 19/26

ESC54627



**J**



**L**

**J Quick-fit Recovery Bend Sloping Adaptor**

Recovery bend sloping cone size to fit flask

14/23 cone size to fit condenser 14/23

ESC54630

**L Quick-fit Still Head**

Still head plain socket 14/23 cone size to fit flask

14/23 cone size to fit condenser 14/23

ESC54634

14/23 cone size to fit flask 19/26

ESC54635



**K**



**M**

**K Quick-fit Thermometer Pocket**

Thermometer pocket stem length 45mm cone 14/23

ESC54638

**M Quick-fit Air Leak Tube Gas Inlet Tube**

Air leak tube gas inlet tube cone 14/23

ESC54641



**P**



**Q**

**P Quick-fit Flask Pear Shaped**

Pear shape flask single neck din

50ml socket 14/23

ESC54663

100ml socket 14/23

ESC54664

**Q Quick-fit Flask Pear Shaped With Two Necks**

Pear shape flask two neck din 50ml centre socket

14/23 side socket 14/23

ESC54669

**R Quick-fit Flask Conical**

Conical flask din 250ml socket 19/26

ESC54673



**R**



**S**

**S Quick-fit Separating Funnel Conical Squibb Shape**

Separating funnel PTFE key stopcock clear glass din Squibb without graduation pp stopper

50ml 19/26

ESC54648

100ml 19/26

ESC54649

250ml 29/32

ESC54650

500ml 29/32

ESC54651

1000ml 29/32

ESC54652





**N**

**N Quick-fit Cone- Screw-thread Adaptor**

Simple glands with cap 6 mm cone 14/23

ESC54645



**O**

**O Quick-fit Flask Round Bottom, Short Neck**

Round bottom flask single neck din

25ml socket 14/23

ESC54648

50ml socket 14/23

ESC54649

100ml socket 14/23

ESC54650

100ml socket 19/26

ESC54651

100ml socket 24/29

ESC54652

250ml socket 14/23

ESC54653

250ml socket 19/26

ESC54654

250ml socket 24/29

ESC54655

1000ml socket 24/29

ESC54656



**T**

**T Quick-fit Dropping Funnel Stem With Cone**

Separating funnel PTFE key stopcock clear glass pear shape stem inside cone without graduation pp stopper 50ml socket

19/26 cone 19/26

ESC54687

100ml socket 14/23 cone 14/23

ESC54688



**U**

**U Quick-fit Dropping Funnel, Open**

Separating funnel (cylindrical) PTFE needle valve stopcock without graduation pp stopper

50ml socket 14/23 cone 14/23

ESC54692

100ml socket 14/23 cone 14/23

ESC54693





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**Safety Spectacle ES130**

Safety Spectacle with enhanced side protection Clear Lens CE Certified

- ESG58742**      Each
- ESG58743**      PK/10



**Safety Spectacle ES660**

Safety Spectacle, Clear Lens Impact Resistant, UV380No Metal Parts Including,Ventilation Glasses Temples CE, ANSI & AS/ NZS Certified

- ESG58745**      Each
- ESG58746**      PK/10



**Safety Spectacle ES661**

Frame-less Safety Spectacle ANSI Certified

- ESG58747**      Each
- ESG58748**      PK/10



**Safety Spectacle ES802**

Safety Spectacle Clear Lens, Impact Resistant, UV380Frameless Wraparound CE, ANSI, AS / NZS Certified

- ESG58749**      Each
- ESG58750**      PK/10



**Safety Spectacle ES9008**

Safety Spectacle Frame-less Wraparound Adjustable Temples CE Certified

- ESG58751**      Each
- ESG58752**      PK/10



**Safety Spectacle ESX6**

Safety Spectacle/ Clear Lens Slim Style Light Weight.,CE, ANSI, AS/ NZS Certified

- ESG58754**      Each
- ESG58755**      PK/10







**Safety Goggle Sporty ES01**

Safety Goggle Sporty Style Safety Goggles-lightweight clear or blue PVC body to fit most face shapes Indirect Ventilation system Adjustable elastic strap,CE & ANSI Certified

- ESG58757** Each
- ESG58758** PK/10



**Safety Goggle ES07**

Safety Goggle Indirect Ventilation, Adjustable Elastic Strap,CE, ANSI, AS / NZS Certified

- ESG58759** Each
- ESG58760** PK/10



**Safety Goggle ES07**

Safety Goggle Direct Ventilation ,CE, ANSI, AS/ NZS Certified

- ESG58761** Each
- ESG58762** PK/20



**Face Shield**

- ESG58763** ES03 Face Shield PC Clear Visor, Light Weight CE, ANSI Certified
- ESG58764** ES03A Face Shield Clear PC 8"X12" Polycarbonate CE, ANSI Certified
- ESG58765** ES06 Face Shield PC Clear Visor, Double Bracket CE, ANSI Certified



**Safety Spectacle Hanger**

Can be mounted on wall, made of strong fabric hanger with pockets for up to 20 pairs of safety spectacles.

**ESG58767**

**Lens Cleaner Spray**

Capacity of 250ml,Anti-bacterial, anti-static, anti-reflective cleaning spray.

**ESG58766**



**Ultraviolet Sterilization Goggle Cabinet - 30-Goggle Model**

Designed for use in schools where reuse of laboratory safety goggles and earphones presents a health hazard. It provides dry sterilization using ultraviolet radiation. When the doors are closed and locked, the interior can be flooded with ultraviolet light. All bacteria or micro-organisms within the cabinet are killed. The door has a key lock safety closure, and the ultraviolet lamp is automatically shut off when the doors are opened. A built-in 15-minute automatic timer controls the sanitizing period desired. 24-gauge steel cabinet. Operates on a 220V AC with a 3-wire grounded cord. Special aluminium reflective interior surface available upon request to insure complete sterilization of cabinet and goggles. Dimensions: 60 x 780 x 23 cm. Supplied with a rack to hold 30 pairs of goggles. Goggles not included. White, baked enamel

ESG58773



**Protective Screen**

Made of clear perspex material dimensions : 750 x 600 x 3mm. Need channel base to mount on the table

ESG58768



**Fixed Safety Screen**

Made of clear perspex material dimensions high 600 mm with 3 fixed angles

ESG58770

**Channel Base for protection screen**

To use with protective screen

ESG58769



**Folding Safety Screen**

Made of clear perspex material ,dimensions : high 600 mm with 3adjustables angles

ESG58771





**Gloves, Leather Pair**

Made of leather used to protect hand against heat

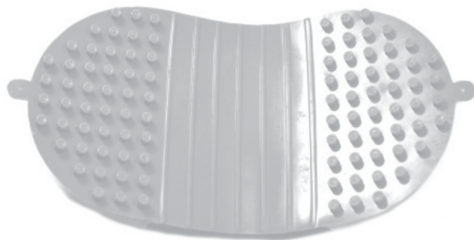
**ESG58774**



**Hand Protectors - Silicon Superior**

Heat and cold resistant silicon rubber glove, with the help of this, one can easily handle heated up material like flask, bottles beakers etc. Studded surface is used for positive grip of material with a temp. of 250°C. Pockets for fingers thumb fit every hand size.

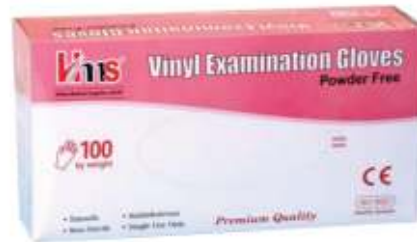
**ESG58778**



**Hand Protectors - Silicon**

Heat and cold resistant silicon rubber glove, with the help of this, one can easily handle heated up material like flask, bottles ,beakers etc. Studded surface is used for positive grip of material with a temp. of 250 ° C. Pockets for fingers thumb fit every hand size.

**ESG58779**



**Gloves Disposable Blue Powder Free - Pk/ 100 .**

Blue ,Vinyl made of 100% DINP material ,DINP is high quality , environment friendly and low toxicity plasticizers ,for sensitive skin contain low protein allergens , meet EN45 /ASTM D5250, CE approved , gloves 100% DEHP free ,Ambidextrous, non-sterile, single use ,PK/100 Pcs

- ESG58781** Small
- ESG58782** Medium
- ESG58783** Large
- ESG58784** X Larg



**Gloves Disposable Clear Powder Free - Pk/ 100 .**

Clear natural rubber latex gloves for sensitive skin contain low protein allergens , meet ASTM D 3578 , CE standard ,beaded cuff, textured surface for improved grip, ambidextrous ,non- sterile, single use ,PK/100 Pcs

- ESG58785** Small
- ESG58786** Medium
- ESG58787** Large
- ESG58788** X Large



**Gloves Disposable Clear Powdered - Pk/ 100 .**

Clear ,Vinyl ,powdered with absorb-able corn starch, made of 100% DINP material ,DINP is high quality , environment friendly and low toxicity plasticizers , meet EN455 /ASTM D5250, CE approved , gloves 100% DEHP free ,Ambidextrous ,non-sterile, single use ,PK/100 Pcs

- ESG58789** SMALL
- ESG58790** MEDIUM
- ESG58791** LARGE
- ESG58792** X LARGE



## Protective Gloves



### Gloves Disposable White Powdered - Pk/ 100 .

White, natural rubber latex gloves for sensitive skin contain low protein allergens, meet ASTM D 3578, CE standard, beaded cuff, textured surface for improved grip, ambidextrous, non-sterile, single use, PK/100 Pcs

<b>ESG58793</b>	Small
<b>ESG58794</b>	Medium
<b>ESG58795</b>	Large
<b>ESG58796</b>	X Large



### Gloves Polythene

PE gloves, embossed for better grip, ambidextrous, non-sterile, single use ,PK/100 Pcs

<b>ESG58806</b>	Small
<b>ESG58807</b>	Medium
<b>ESG58808</b>	Large



### Gloves Neoprene

High quality natural rubber, Chloroprene coated natural rubber latex gloves with textured palm and fingers to increase grip. Cotton flock lined for increased comfort and reduced perspiration. Protection against some detergents alkalis and acids. Extra Long cuff for better arm protection. Chloroprene coated for fat and oil protection at palm. Improved abrasion resistance, Contains natural rubber latex which may cause allergic reactions including anaphylactic response.

<b>ESG58801</b>	Small
<b>ESG58802</b>	Medium
<b>ESG58803</b>	Large
<b>ESG58804</b>	X Large



### Gloves General Purpose - Pair

Medium weight gloves with raised surface pattern for excellent wet grip, Medium weight, coloured rubber household gloves with a cotton flock lined interior ,Contains latex, Multi-purpose rubber gloves. Per Pair

<b>ESG58797</b>	Small
<b>ESG58798</b>	Medium
<b>ESG58799</b>	Large
<b>ESG58800</b>	X Large

## Protective Clothing



### Apron Disposable White Universal Size PK/100

Disposable apron ,Polythene, Size: 66 x 107cm, White pack of 100

**ESG58810**



### Apron Disposable Blue Universal Size Pk/100

Disposable apron ,Polythene, Size: 66 x 107cm, Blue pack of 100

**ESG58809**





**Lab Coat Blue Poly-cotton Men Small**

Coat made of poly-cotton with 3 patch pockets, Centre back vent, longer to provide protection , blue colour

- ESG58835** Small
- ESG58836** Medium
- ESG58837** Large
- ESG58838** X Large



**Lab Coat White Poly-cotton Men**

Men lab coat made of poly-cotton with 3 patch pockets, Centre back vent, White

- ESG58816** Small
- ESG58817** Medium
- ESG58818** Large
- ESG58819** X Large



**Mask Paper Play**

Surgical disposable face mask, high breath-ability, nose adapter for correct and comfort face adjustments, high filter action (BEF APP 95%), Ear loop type, 2 play,PK/50 Pcs

**ESG58843**



**Mask With Valve Pk/10**

General purpose use including fine toxic particles ,nose adapter for correct and comfort face adjustments

**ESG58842**



**Surgical Face Mask Ear Loop**

Surgical disposable face mask, high breath-ability, nose adapter for correct and comfort face adjustments, high filter action (BEF APP 95%), Ear loop type, PK/50 Pcs

**ESG58844**



**Face Mask For Dust**

Provide comfortable fit, easy breathing, light weight, clear vision, latex and fibre free, Multi-purpose use.

**ESG58848**





**Sharps Containers**

Multi purpose sharp container , provide safe way to dispose contaminated and sharp instruments like blade, needle, scalpel...etc.

- ESG58853** Small Capacity 2.2 Litre
- ESG58854** Medium Capacity 6.2 Litre
- ESG58855** Large Capacity 10 Litre
- ESG58856** X Large Capacity 15 Litre



**Eyewash Bottle**

Eyewash is ideal for irrigating eyes and general wound washing applications• 500ml bottle• Each

**ESG58864**



**Fixed Eyewash Station**

Eyewash station comes complete with 2 x 500mL bottles of eyewash, Includes quick release wall hanging brackets

**ESG58866**



**Fire Blanket**

Hinged lid for easy extraction

- ESG58880** Size: 1.2 X 1.2M
- ESG58881** Size: 1.2 X 1.8M



**Eye Emergency Signs**

- ESG58857** Size : 150 x 150mm, s/a Board made of self adhesive vinyl size:150 x 150mm
- ESG58858** Size : 200 x 150mm, PVC Board made of PVC size: 200 x 150mm
- ESG58859** Size : 200 x 150mm, s/a Board made of self adhesive vinyl size: 200 x 150mm



**Eyewash Pod Station**

Wall mounted eyewash pod station contents : Single use, just snap off top Size H250 x W325 x D25mm• Each

**ESG58865**



**Emergency Burns Kit**

Kit consist of Burn shield dressing 200 x 200mm , 2 x burn shield dressing 100 x 100mm , 2 x burn dressings DIN specification 60 x 80mm, 8 x burn blot sachets, 1 x 7.5cm x 4cm conforming bandage, 1 x waterjel burn dressing, Safety pins, 1 pair of tufkut scissors, 2 pairs of vinyl disposable glove

**ESG58877**



**First Aid Kit Small**

Made of strong ABS plastic which is shiny, smooth and easy to clean. The kit contains a neoprene seal which makes the kit dust-proof. The wall bracket is able to secure the kit on a common house wall. The internal crystal partitions permit a more flexible and scientific item arrangement. Additionally, two swivel catches are set for closing security. Recommended use: business companies, small factories, workshops, labs, and etc.

**Contents:**

- 01 Adhesive Tape 1 roll
- 02 Elastic Bandage 5 x 450cm 2 rolls
- 03 Elastic Bandage 7.5 x 450cm 2 rolls
- 04 Adhesive Plasters 25 pcs
- 05 Sterile Gauze (7.5 x 7.5cm) 5 pcs



- 06 Sterile Gauze (5 x 5cm) 5 pcs
- 07 Soap Sachet 3 pcs
- 08 Cleansing Wipe 3 pcs
- 09 Alcohol Wipe 4 pcs
- 10 Antiseptic Wipe 3 pcs
- 11 Safety Pins 10 pcs
- 12 Gloves 2 pairs
- 13 Scissors 1 pair
- 14 Sterile Tweezers 1 pair
- 15 Cotton Wool Pack 4 pkts
- 16 Adhesive Dressing, 10 x 6 cm 1 pkt
- 17 Haemostatic Lancet 2 pcs
- 18 Triangular Bandage 1 pc
- 19 Compress Bandage 8 x 10cm 1 roll
- 20 ABS Box 1 pc

ESG58870

**First Aid Kit Medium Size**

Made of strong ABS plastic which is shiny, smooth and easy to clean. The kit contains a neoprene seal which makes the kit dust-proof. The wall bracket is able to secure the kit on a common laboratory wall. The internal crystal partitions permit a more flexible and scientific item arrangement. Additionally, two swivel catches are set for closing security. Recommended use: small factories, labs, and etc.

**Content List:**

- 01 Soap Sachets 10pcs
- 02 Alcohol Pad 20pcs
- 03 Adhesive Plaster 100pcs
- 04 Boston 1pc
- 05 Conforming Bandage 5cm 3pcs
- 06 Conforming Bandage 7.5cm 2pcs
- 07 Elastic Bandage 2pcs
- 08 Sterile Eye Pad 5pcs
- 09 Sterile Gauze Pad 20pcs
- 10 Cotton Ball 5pkts
- 11 Safety Pin 10pcs



- 12 Triangular Bandages TNT 4pcs
- 13 Antiseptic Wipes 7pcs
- 14 Scissors 1pair
- 15 Tweezers 2pairs
- 16 Sterile Scalpel 1pc
- 17 Lancet 1pc
- 18 Syringe 1pc
- 19 Latex Gloves 6pairs
- 20 Plastic Kidney Dish 1pc
- 21 Eco Splints 22cm 1pc
- 22 Blanket 2pcs
- 23 Wound Dressing 1pc
- 24 Strap Tourniquets 1pc
- 25 Burn Sheet 2pcs
- 26 ABD Pad 2pcs
- 27 Ice Bag 1pc
- 28 CRP Mask 1pc
- 29 Adhesive Tape 3pcs
- 30 Plaster 1pc
- 31 First Aid booklet 1pc
- 32 ABS Box 1pc

ESG58871

**First Aid Kit Class Room**

The kit is plastic case, with handle and wall mounted , for up to 50 persons and the first aid guide. The kit includes the following :

- (1) Extra large plastic case
- (125) Adhesive plastic bandages
- (6) Fingertip fabric bandages
- (6) Knuckle fabric bandages
- (10) Elbow & knee plastic bandages
- (8)Gauze dressing pads, (4) 2-pks
- (3) Trauma pads
- (8) Non stick pads
- (3) 2" Conforming gauze roll bandages
- (2) 3" Conforming gauze roll bandages
- (1) 40" Triangular sling/bandage, w/2 safety pins
- (30) BZK antiseptic towelettes

- (1) First aid/burn cream, 0.9 gm. Packs, 10/box
- (2) Latex free elastic bandage
- (1) 1/2"x10 yd. First aid tape roll
- (2) 4"x5" Instant cold compress
- (1) 6"x9" Instant cold compress, 1/box
- (4) Sterile eye pads
- (2) Eye wash, 1/2 oz.
- (2) Exam quality vinyl gloves, 1 pair
- (1) Scissors
- (1) 4" Tweezers, plastic
- (2) Finger splints
- (1) One-way CPR face shield, 2 exam quality vinyl gloves, 3 BZK antiseptic towelettes, 1set /box

ESG58872

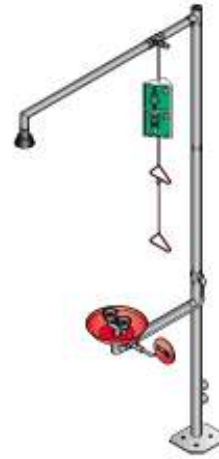




**Emergency Shower Wall Mounted**

Body showers are indispensable where acids, steam, dust or other harmful substances are being handled. Wall mounted straight Body shower, wall mounted with Self-draining shower head. In brass with chemical resistant Poly-coat. Min. Working pressure: 1 BA

ESG58886



**Emergency Shower With Eye Face Shower**

Body and eye/face showers in one installation. Body and eye shower, Body shower with eye/face shower and bowl, modular. In brass and SS with Chemical resistant red Poly-coat with self-draining shower head. Eye wash with built-in FLOWFIX for regulation of water flow (26 l/Min). Bowl in Stainless Steel with integrated outlet. Min. Working pressure: 1.5 bar

ESG58887



**Eye Wash Shower Double Wall Mounted**

Reliable and efficient showers for eyes and face. Which Comply to EN15154-2 and ANSI Z358.1 norms and which Provide the following IMPROVED features:

**SAFETY**

- Improved trigger lock
- Improved activation of the shower

**OPERATION**

- Stay-open dust cap
- Light weight
- Well-balanced construction
- Better spray pattern

**RELIABILITY**

- Easy-to-clean spray head
- Anti-lime scale design and material choice
- Improved functionality
- Longer lifetime

ESG58890

**Eye Wash Shower Double Table Mounted**

Reliable and efficient showers for eyes and face. Which comply to EN15154-2 and ANSI Z358.1 norms and which Provide the following IMPROVED features:

**SAFETY**

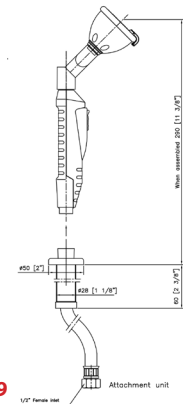
- Improved trigger lock
- Improved activation of the shower

**OPERATION**

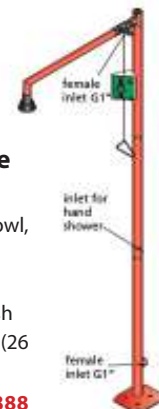
- Stay-open dust cap
- Light weight
- Well-balanced construction
- Better spray pattern

**RELIABILITY**

- Easy-to-clean spray head
- Anti-lime scale design and material choice
- Improved functionality
- Longer lifetime



ESG58889



**Emergency Shower Without Eye Face Shower**

Body shower with eye/face shower and bowl, modular. In brass and SS with chemical resistant red Poly-coat with self-draining shower head. Eye wash with built-in FLOWFIX for regulation of water flow (26 l/Min). Min. Working pressure: 1.5 bar.

ESG58888







**Hazard tape :**

Hazard warning tape. 66 meters long and 25mm wide

- ESG58899** Corrosive Agents Tape
- ESG58900** Environment Tape
- ESG58901** Explosives Tape
- ESG58902** Flammable Tape
- ESG58903** Oxidising Tape
- ESG58904** Toxicity Tape CAT 1-3
- ESG58905** Toxicity Tape CAT 4
- ESG58906** Gases Tape
- ESG58907** Carcinogenic
- ESG58908** Caution Radioactive Material Tape



Everything you need to deal with everyday spills quickly and easily. The dispenser contains 4 identical spill kits, each capable of absorbing up to 1.5L

Design allows safer clean-up – less risk of injury

Fully disposable kits for hygienic and safe disposal

Kits supplied in a dispenser that can be positioned in areas where spills are likely to occur

Each Kit contains:

2 pieces of (chemical multi-format) Protective gloves

1 disposable dustpan and brush

1 disposal bag

1 hazardous waste disposal label

1 bag tie

**ESG58915**



**Biohazard Bags Pack of one hundred**

Non Sterile Disposable PP Bags and Disposable PE bags for a wide variety of uses throughout the laboratory

**ESG58909**



**Mercury Collector**

Spilled mercury is collected by pressing the foam pad in the screw top closure against the mercury. The mercury is drawn into and encapsulated in the pad by releasing the pressure and can then be released by screwing the closure on to the jar.

**ESG58912**



**Gauze Swab Non Sterile**

Soft and breathable, folded edges, 19x15 mesh, 8 Plies, PK/100.

- ESG58917** Size : 5 x 5 cm
- ESG58918** Size : 7.5 X 7.5Cm
- ESG58919** Size : 10 x 10 cm



**Cotton Wool Absorbent**

100% cotton wool, hygienic purity with high absorbent capacity

**ESG58916**





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# CHEMICALS



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# CHEMICALS



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- Clear & compliant labeling

**CLP**

On 20th January 2009 the CLP element of REACH, European Regulation (EC) No 1272/2008 came into force concerning Classification, Labelling and Packaging (CLP) of chemical substances. It is based upon the UN Globally Harmonized System of Classification and Labelling of Chemicals (GHS) and ensures worldwide uniformity.

What does this mean?

As of 1st December 2010 all substances supplied with the E.U. are now classified and labelled in accordance with the new regulations. The familiar orange hazard symbols have been replaced with the GHS Pictograms shown opposite. Risk and Safety phrases were also replaced, with Hazard and Precautionary statements, as shown on pages 423 and 424.

**ADR & LQ**

European Agreement concerning the international carriage of Dangerous goods by Road (ADR). If a substance is classified as hazardous for transport it will be assigned a UN number, this dictates the regulations that have to be applied when the substance is transported. Each UN number is assigned a "Limited Quantity" (LQ) which indicates the maximum pack size of a substance that can be transported without special restrictions. If the LQ is zero, or the pack size exceeds the LQ, then the substance must be transported by a specially trained and licensed courier.

**What does this mean for you...?**

If over the limited quantity (LQ) there is a £14.95 surcharge per order.

The cost to us can be as much as £30.00 and as such we are absorbing a large proportion of this cost. In recognition of those customers placing larger orders we will absorb the whole cost, so there is no surcharge on orders over £300.00

Chemicals are clearly marked if a surcharge is applicable. Our next day delivery service is not available when shipping ADR chemicals.

**What's New?**

From June 2015 the restrictions on some chemicals have changed, namely the flammable substances, e.g. IMS & Acetone. Consequently, where possible, we have changed our pack sizes to comply with the new LQ restriction of 1L to avoid the need for specialist transport and thus the £14.95 surcharge.

**Permits**

A permit is required by law to purchase certain chemicals. Denatured Alcohol (IDA) aka Methylated Spirit is one such chemical. You only require a permit if purchasing more than 5 litres per annum. However as part of our licencing compliance we require a declaration that no more than 5L will be purchased.

**MSDS**

Material Safety Data Sheets (MSDS) provide information on chemicals that help the users of those chemicals to make a risk assessment. They describe the hazards the chemical presents, and give information on handling, storage and emergency measures in case of accident.

Here at Breckland Scientific we take our responsibility very seriously so have invested in an automated system which will provide you with up-to-date Safety Data Sheets via e-mail when despatched. They are also available on our website.

<b>POTASSIUM METAL IN LIQUID PARAFFIN (Potass m)</b>			
1	K = 39.1g/mol		2
3	UN Class: 4.3/UN2257 PG-1		4
6	Cas No.: 7440-09-7	10	EC No.: 231-119-8
7	Hazard: H260 H314 EUH014		5
8	Precaution: P223 P231+P232 P280 P305+P351+P338		12
9	Cat No.	Type	Info.
	CHE291535	98%	<b>SURCHARGE</b>

**1 Product Name**

**2 Alternative Name(s)**

**3 Chemical Formula**

**4 GHS Pictograms**

These are located on the chemical bottle.

**5 Flash Point**

The flash point, where available, is here. The flash point of a volatile liquid is the lowest temperature at which its vapours form an ignitable mixture in air.

**6 UN Class / UN Number / Packing Group**

Dangerous goods are divided into 9 UN Classes and several sub-divisions UN numbers are the 4 digits that identify the substance. Packing Group refers to the degree of danger: PG-1 = High Danger PG-2 = Medium Danger PG-3 = Low Danger

- |                                     |                                   |
|-------------------------------------|-----------------------------------|
| Class 1 Explosive                   | Class 5.1 Oxidising Agent         |
| Class 2 Gases                       | Class 5.2 Organic Peroxides       |
| Class 3 Flammable Liquids           | Class 6.1 Poisonous               |
| Class 4.1 Flammable Solids          | Class 7 Radioactive               |
| Class 4.2 Spontaneously Combustible | Class 8 Corrosive                 |
| Class 4.3 Dangerous when Wet        | Class 9 Misc. Dangerous Substance |

**7 Cas No.**

Chemical identifier as defined by the American Chemical Society

**8 Hazard & Precautionary Statement Numbers**

Health & safety statements for the specific chemical. Absence of any statements does NOT always mean the substance is harmless. See pages ix and x for definitions of the Hazard & Precautionary Statement numbers.

**9 Molecular Weight**

**10 EC No.**

Chemical identifier as defined by the European Chemicals Agency (ECHA)

**11 Index No.**

Is the identification code given to the substance in Part 3 of Annex VI of the Classification, Labelling and Packaging of Substances and Mixtures (CLP) Regulation (EC) No 1272/2008

**12 Signal Word**

If the chemical has a more severe hazard, the label includes the signal word 'Danger'; in case of less severe hazards, the signal word is 'Warning'

**13 Catalogue No.**

**14 Type**


















































**15 Assay**







































The Assay is the quality or purity of a product. This is often linked to the type of the chemical (above).

**16 Info**

If a delivery surcharge is applicable it is clearly marked.



BOX LABEL		UN CLASS	DESCRIPTION OF DANGER	CATEGORY	GHS PICTOGRAM (On Bottle)
ADR	LQ (Limited Quantity)				
no transport allowed		1	Unstable explosives		
		1	Explosives of Divisions 1.1, 1.2, 1.3, 1.4		
		1	Self reactive substances and mixtures	A, B	
		1	Organic Peroxide	A, B	
		2	Flammable gases	1	
		2	Flammable aerosols categories	1, 2	
		2	Gases under pressure		
		3	Flammable liquids	1, 2, 3	
		3	Pyrophoric liquids	1	
		4.1	Flammable solids	1, 2	
		4.1	Self-reactive substances and mixtures	B,C,D,E,F	
		4.2	Pyrophoric solids	1	
		4.2	Self-heating substances and mixtures	1, 2	
		4.3	Substances and mixtures which in contact with water emit flammable gases	1,2,3	
		5.1	Oxidising gases	1	
		5.1	Oxidising liquids	1,2,3	
		5.1	Oxidising solids	1,2,3	

BOX LABEL		UN CLASS	DESCRIPTION OF DANGER	CATEGORY	GHS PICTOGRAM (On Bottle)
ADR	LQ (Limited Quantity)				
		5.2	Organic peroxides	B,C,D,E,F	
		6.1	Acute toxicity (oral, dermal, inhalation)	1, 2, 3	
		6.1	Acute toxicity (oral, dermal, inhalation)	4	
		6.1	Skin irritation	2	
		8	Corrosive to metals	1	
		8	Skin corrosion	1A, 1B, 1C	
		8	Serious eye damage	1	
		n/a	Eye irritation	2	
		n/a	Skin sensation	1	
		n/a	Specific Target Organ Toxicity - Single exposure	3	
		n/a	Respiratory sensitisation	1	
		n/a	Germ cell mutagenicity	1A, 1B, 2	
		n/a	Carcinogenicity	1A, 1B, 2	
		n/a	Reproductive toxicity	1A, 1B, 2	
		n/a	Specific Target Organ Toxicity - Single exposure	1, 2	
		n/a	Aspiration hazard	1	
		n/a	Environmentally hazardous	1, 2, 3	



**HAZARD STATEMENTS - Physical Hazards**

H200	Unstable explosives.
H201	Explosive; mass explosion hazard.
H202	Explosive, severe projection hazard.
H203	Explosive; fire, blast or projection hazard.
H204	Fire or projection hazard.
H205	May mass explode in fire.
H220	Extremely flammable gas.
H221	Flammable gas.
H222	Extremely flammable aerosol.
H223	Flammable aerosol.
H224	Extremely flammable liquid and vapour.
H225	Highly flammable liquid and vapour.
H226	Flammable liquid and vapour.
H228	Flammable solid.
H240	Heating may cause an explosion.
H241	Heating may cause a fire or explosion.
H242	Heating may cause a fire.
H250	Catches fire spontaneously if exposed to air.
H251	Self-heating; may catch fire.
H252	Self-heating in large quantities; may catch fire.
H260	In contact with water releases flammable gases which may ignite spontaneously.
H261	In contact with water releases flammable gases.
H270	May cause or intensify fire; oxidiser.
H271	May cause fire or explosion; strong oxidiser.
H272	May intensify fire; oxidiser.
H280	Contains gas under pressure; may explode if heated.
H281	Contains refrigerated gas; may cause cryogenic burns or injury.
H290	May be corrosive to metals.

**HAZARD STATEMENTS - Health Hazards**

H300	Fatal if swallowed.
H301	Toxic if swallowed.
H302	Harmful if swallowed.
H304	May be fatal if swallowed and enters airways.
H310	Fatal in contact with skin.
H311	Toxic in contact with skin.
H312	Harmful in contact with skin.
H314	Causes severe skin burns and eye damage.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H318	Causes serious eye damage.
H319	Causes serious eye irritation.
H330	Fatal if inhaled.
H331	Toxic if inhaled.
H332	Harmful if inhaled.
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H335	May cause respiratory irritation.
H336	May cause drowsiness or dizziness.
H340	May cause genetic defects.
H341	Suspected of causing genetic defects.
H350	May cause cancer.
H351	Suspected of causing cancer.
H360	May damage fertility or the unborn child <state specific effect if known.
H361	Suspected of damaging fertility or the unborn child.
H362	May cause harm to breast-fed children.
H370	Causes damage to organs.
H371	May cause damage to organs.
H372	Causes damage to organs.
H373	May cause damage to organs through prolonged or repeated exposure.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
H411	Toxic to aquatic life with long lasting effects.
H412	Harmful to aquatic life with long lasting effects.
H413	May cause long lasting harmful effects to aquatic life.

**Additional EU Hazard Classes**

EUH001	Explosive when dry.
EUH006	Explosive with or without contact with air.
EUH014	Reacts violently with water.
EUH018	In use may form flammable/explosive vapour-air mixture.
EUH019	May form explosive peroxides.
EUH029	Contact with water liberates toxic gas.
EUH031	Contact with acids liberates toxic gas.
EUH032	Contact with acids liberates very toxic gas.
EUH044	Risk of explosion if heated under confinement.
EUH059	Hazardous to the ozone layer.
EUH066	Repeated exposure may cause skin dryness or cracking.
EUH070	Toxic by eye contact.
EUH071	Corrosive to the respiratory tract.
EUH201	Contains lead. Should not be used on surfaces liable to be chewed or sucked by children.
EUH201A	Warning! Contains lead.
EUH202	Cyanoacrylate. Danger. Bonds skin and eyes in seconds. Keep out of the reach of children.
EUH203	Contains chromium (VI). May produce an allergic reaction.
EUH204	Contains isocyanates. May produce an allergic reaction.
EUH205	Contains epoxy constituents. May produce an allergic reaction.
EUH206	Warning! Do not use together with other products. May release dangerous gases (chlorine).
EUH207	Warning! Contains cadmium. Dangerous fumes are formed during use. See information supplied by the manufacturer. Comply with the safety instructions.
EUH208	Contains <name of sensitising substance>. May produce an allergic reaction.
EUH209	Can become highly flammable in use.
EUH209A	Can become flammable in use.
EUH210	Safety data sheet available on request.
EUH401	To avoid risks to human health and the environment, comply with the instructions for use.

**PRECAUTIONARY STATEMENTS - General**

P101	If medical advice is needed, have product container or label at hand.
P102	Keep out of reach of children.

**PRECAUTIONARY STATEMENTS - Prevention**

P103	Read label before use.
P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P210	Keep away from heat/sparks/open flames/hot surfaces. – No smoking.
P211	Do not spray on an open flame or other ignition source.
P220	Keep/Store away from clothing/.../combustible materials.
P221	Take any precaution to avoid mixing with combustibles...
P222	Do not allow contact with air.
P223	Keep away from any possible contact with water, because of violent reaction and possible flash fire.
P230	Keep wetted with...
P231	Handle under inert gas.
P231+P232	Handle under inert gas. Protect from moisture.
P232	Protect from moisture.
P233	Keep container tightly closed.
P234	Keep only in original container.
P235	Keep cool.
P235+P410	Keep cool. Protect from sunlight.
P240	Ground/bond container and receiving equipment.
P241	Use explosion-proof electrical/ventilating/lighting/.../equipment.
P242	Use only non-sparking tools.
P243	Take precautionary measures against static discharge.
P244	Keep reduction valves free from grease and oil.
P250	Do not subject to grinding/shock/.../friction.
P251	Pressurized container: Do not pierce or burn, even after use.
P260	Do not breathe dust/fume/gas/mist/vapours/spray.





PRECAUTIONARY STATEMENTS - Prevention	
P261	Avoid breathing dust/fume/gas/mist/vapours/spray.
P262	Do not get in eyes, on skin, or on clothing.
P263	Avoid contact during pregnancy/while nursing.
P264	Wash ... thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P271	Use only outdoors or in a well-ventilated area.
P272	Contaminated work clothing should not be allowed out of the workplace.
P273	Avoid release to the environment.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P281	Use personal protective equipment as required.
P282	Wear cold insulating gloves/face shield/eye protection.
P283	Wear fire/flammable resistant/retardant clothing.
P284	Wear respiratory protection.
P285	In case of inadequate ventilation wear respiratory protection.





PRECAUTIONARY STATEMENTS - Response	
P301	IF SWALLOWED:
P301+P310	IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
P301+P312	IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
P301+ IF	SWALLOWED: rinse mouth. Do NOT induce vomiting.
P330+P331	
P302	IF ON SKIN:
P302+P334	IF ON SKIN: Immerse in cool water/wrap in wet bandages.
P302+P350	IF ON SKIN: Gently wash with plenty of soap and water.
P302+P352	IF ON SKIN: Wash with plenty of soap and water.
P303	IF ON SKIN (or hair):
P303+	IF ON SKIN (or hair): Remove/Take off immediately all
P361+P353	contaminated clothing. Rinse skin with water/shower.
P304	IF INHALED:
P304+P340	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P304+P341	IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing.
P305	IF IN EYES:
P305+	
P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P306	IF ON CLOTHING:
P306+P360	IF ON CLOTHING: rinse immediately contaminated clothing and skin with plenty of water before removing clothes.
P307	IF exposed:
P307+P311	IF exposed: Call a POISON CENTER or doctor/physician.
P308	IF exposed or concerned:
P308+P313	IF exposed or concerned: Get medical advice/attention.
P309	IF exposed or if you feel unwell:
P309+P311	IF exposed or if you feel unwell: Call a POISON CENTER or doctor/physician.
P310	Immediately call a POISON CENTER or doctor/physician.
P311	Call a POISON CENTER or doctor/physician.
P312	Call a POISON CENTER or doctor/physician if you feel unwell.
P313	Get medical advice/attention.
P314	Get medical advice/attention if you feel unwell.
P315	Get immediate medical advice/attention.
P320	Specific treatment is urgent (see ... on this label).
P321	Specific treatment (see ... on this label).
P322	Specific measures (see ... on this label).
P330	Rinse mouth.
P331	Do NOT induce vomiting.
P332	If skin irritation occurs:
P332+P313	If skin irritation occurs: Get medical advice/attention.
P333	If skin irritation or rash occurs:
P333+P313	If skin irritation or rash occurs: Get medical advice/attention.
P334	Immerse in cool water/wrap in wet bandages.
P335	Brush off loose particles from skin.



PRECAUTIONARY STATEMENTS - Response	
P335+P334	Brush off loose particles from skin. Immerse in cool water/wrap in wet bandages.
P336	Thaw frosted parts with lukewarm water. Do not rub affected area.
P337	If eye irritation persists:
P337+P313	If eye irritation persists: Get medical advice/attention.
P338	Remove contact lenses, if present and easy to do. Continue rinsing.
P340	Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P341	If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing.
P342	If experiencing respiratory symptoms:
P342+P311	If experiencing respiratory symptoms: Call a POISON CENTER or doctor/physician.
P350	Gently wash with plenty of soap and water.
P351	Rinse cautiously with water for several minutes.
P352	Wash with plenty of soap and water.
P353	Rinse skin with water/shower.
P360	Rinse immediately contaminated clothing and skin with plenty of water before removing clothes.
P361	Remove/Take off immediately all contaminated clothing.
P362	Take off contaminated clothing and wash before reuse.
P363	Wash contaminated clothing before reuse.
P370	In case of fire:
P370+P376	In case of fire: Stop leak if safe to do so.
P370+P378	In case of fire: Use ... for extinction.
P370+P380	In case of fire: Evacuate area.
P370+	In case of fire: Evacuate area. Fight fire remotely due to the
P380+P375	risk of explosion.
P371	In case of major fire and large quantities:
P371+	In case of major fire and large quantities: Evacuate area.
P380+P375	Fight fire remotely due to the risk of explosion.
P372	Explosion risk in case of fire.
P373	DO NOT fight fire when fire reaches explosives.
P374	Fight fire with normal precautions from a reasonable distance.
P375	Fight fire remotely due to the risk of explosion.
P376	Stop leak if safe to do so.
P377	Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
P378	Use ... for extinction.
P380	Evacuate area.
P381	Eliminate all ignition sources if safe to do so.
P390	Absorb spillage to prevent material damage.
P391	Collect spillage.



PRECAUTIONARY STATEMENTS - Storage	
P401	Store ...
P402	Store in a dry place.
P402+P404	Store in a dry place. Store in a closed container.
P403	Store in a well-ventilated place.
P403+P233	Store in a well-ventilated place. Keep container tightly closed.
P403+P235	Store in a well-ventilated place. Keep cool.
P404	Store in a closed container.
P405	Store locked up.
P406	Store in corrosive resistant/... container with a resistant inner liner.
P407	Maintain air gap between stacks/pallets.
P410	Protect from sunlight.
P410+P403	Protect from sunlight. Store in a well-ventilated place.
P410+P412	Protect from sunlight. Do not expose to temperatures exceeding 50°C/ 122°F.
P411	Store at temperatures not exceeding ...°C/...°F.
P411+P235	Store at temperatures not exceeding ...°C/...°F. Keep cool.
P412	Do not expose to temperatures exceeding 50°C/ 122°F.
P413	Store bulk masses greater than ... kg/... lbs at temperatures not exceeding ...°C/...°F.
P420	Store away from other materials.
P422	Store contents under ...
P501	Dispose of contents/container to ...







ACACIA POWDER (GUM ARABIC)					
N/A 					
UN Class: N/A		EC No.: 232-519-5		Danger	
Cas No.: 9000-01-5		Index No.: Not listed			
Hazard: H318 Precaution: P280 P305+P351+P338					
Cat No.	Grade	Assay	Info.	Per	
ESC54794		99%		100g	





ACETALDEHYDE (ETHANAL)					
CH <sub>3</sub> CHO = 44.05g/mol   					
UN Class: 3 /UN1089 PG-I		EC No.: 200-836-8		Danger	
Cas No.: 75-07-0		Index No.: 605-003-00-6			
Hazard: H224 H319 H335 H351 Precaution: P210 P261 P281 P305+P351+P338					
Cat No.	Grade	Assay	Info.	Per	
ESC54795		98%	SURCHARGE	500 ml	




ACETAMIDE (ETHANAMIDE)					
CH <sub>3</sub> . CO . NH <sub>2</sub> = 59.07g/mol 					
UN Class: N/A		EC No.: 200-473-5		Warning	
Cas No.: 60-35-5		Index No.: 616-022-004			
Hazard: H351 Precaution: P281					
Cat No.	Grade	Assay	Info.	Per	
ESC54798		97%		100g	




ACETANILIDE (N-PHENYLACETAMIDE)					
C <sub>6</sub> H <sub>5</sub> . NH . CO . CH <sub>3</sub> = 135.17g/mol 					
UN Class: N/A		EC No.: 203-150-7		Warning	
Cas No.: 103-84-4		Index No.: Not listed			
Hazard: H315 H319 Precaution: P305+P351+P338 P301+P312 P280					
Cat No.	Grade	Assay	Info.	Per	
ESC54801		98%		100g	




ACETIC ACID GLACIAL (ETHANOIC ACID)					
CH <sub>3</sub> COOH = 60.05g/mol  					
UN Class: 8(3) /UN2789 PG-II		EC No.: 200-580-7		Danger	
Cas No.: 64-19-7		Index No.: 607-002-00-6			
Hazard: H226 H314 Precaution: P280 P305+P351+P338 P310					
Cat No.	Grade	Assay	Info.	Per	
ESC54804		99.5%		1L	

ACETIC ACID 1.0M (1.0N) (ETHANOIC ACID)					
UN Class: N/A					
EC No.: 200-580-7		Danger			
Cas No.: 64-19-7		Index No.: 607-002-00-6			
Hazard: Not considered hazardous Precaution: No additional precautions required					
Cat No.	Grade	Assay	Info.	Per	
ESC54805		98%	Std solution	2.5L	

ACETIC ANHYDRIDE (ETHANOIC ANHYDRIDE)					
(CH <sub>3</sub> CO) <sub>2</sub> O = 102.09g/mol    49°C					
UN Class: 8(3) /UN1715 PG-II		EC No.: 203-564-8		Danger	
Cas No.: 108-24-7		Index No.: 607-008-00-9			
Hazard: H314 H314 H226 H302 H332 Precaution: P280 P305+P351+P338 P261 P304+P340+P310 P303+P361+P353 P370+P378					
Cat No.	Grade	Assay	Info.	Per	
ESC54806		97%		500ml	



ACETONE (PROPANONE)					
(CH <sub>3</sub> ) <sub>2</sub> CO = 58.08g/mol   -18°C					
UN Class: 3 /UN1090 PG-II		EC No.: 200-662-2		Danger	
Cas No.: 67-64-1		Index No.: 606-001-00-8			
Hazard: H225 H319 H336 Precaution: P210 P305+P351+P338 P261					
Cat No.	Grade	Assay	Info.	Per	
ESC54807		99%		2.5L	


ACETONITRILE (CYANOMETHANE)					
CH <sub>3</sub> CN = 41.05g/mol   -2°C					
UN Class: 3 /UN1648 PG-II		EC No.: 200-835-2		Danger	
Cas No.: 75-05-8		Index No.: 608-001-00-3			
Hazard: H225 H319 H302 H312 H332 Precaution: P210 P280 P305+P351+P338 P309+P310					
Cat No.	Grade	Assay	Info.	Per	
ESC54810		98%		2.5L	



ACETYL CHLORIDE (ETHANOYL CHLORIDE)					
CH <sub>3</sub> COCl = 78.5g/mol   -4°C					
UN Class: 3(8) /UN1717 PG-II		EC No.: 200-865-6		Danger	
Cas No.: 75-36-5		Index No.: 607-011-00-5			
Hazard: H225 H314 EUH014 Precaution: P210 P280 P305+P351+P338 P310					
Cat No.	Grade	Assay	Info.	Per	
ESC54813		98%		500ml	









O-ACETYSALICYLIC ACID (2-(ACETOXY)-BENZOIC ACID)				
$C_9H_8O_4 = 180.16g/mol$				
				
<b>UN Class:</b> N/A		<b>EC No.:</b> 200-064-1		Warning
<b>Cas No.:</b> 50-78-2		<b>Index No.:</b> Not listed		
<b>Hazard:</b> H302 H315 H319 H335				
<b>Precaution:</b> P261 P305+P351+P338				
Cat No.	Grade	Assay	Info.	Per
ESC54814		99.5%		100g


ADENOSINE-5-TRIPHOSPHORIC ACID (A.T.P.)				
$C_{10}H_{14}N_5Na_2O_{13}P_3 \cdot 3H_2O = 605.19g/mol$				
<b>UN Class:</b> N/A		<b>EC No.:</b> 213-579-1		
<b>Cas No.:</b> 34369-07-8		<b>Index No.:</b> Not listed		
<b>Hazard:</b> Not considered hazardous				
<b>Precaution:</b> No additional precautions required				
Cat No.	Grade	Assay	Info.	Per
ESC54815		98%		5g



ADIPIIC ACID (HEXANEDIOIC ACID)				
$HOOC(CH_2)_4COOH = 146.14g/mol$				
				
<b>UN Class:</b> N/A		<b>EC No.:</b> 204-673-3		Warning
<b>Cas No.:</b> 124-04-9		<b>Index No.:</b> 607-144-00-9		
<b>Hazard:</b> H319				
<b>Precaution:</b> P305+P351+P338				
Cat No.	Grade	Assay	Info.	Per
ESC54816		99%		250g


AGAR POWDER				
<b>UN Class:</b> N/A		<b>EC No.:</b> 232-658-1		
<b>Cas No.:</b> 9002-18-0		<b>Index No.:</b> Not listed		
<b>Hazard:</b> Not considered hazardous				
<b>Precaution:</b> No additional precautions required				
Cat No.	Grade	Assay	Info.	Per
ESC54818		> 97%		100g
ESC54819		> 97%		250g




DL-ALANINE ((±)-2-AMINOPROPIONIC ACID)				
$CH_3CH(NH_2)COOH = 89.09g/mol$				
<b>UN Class:</b> N/A		<b>EC No.:</b> 206-126-4		
<b>Cas No.:</b> 302-72-7		<b>Index No.:</b> Not listed		
<b>Hazard:</b> Not considered hazardous				
<b>Precaution:</b> No additional precautions required				
Cat No.	Grade	Assay	Info.	Per
ESC55260		97%		25g

L-ALANINE ((S)-2-AMINOPROPIONIC ACID)				
$CH_3CH(NH_2)COOH = 89.09g/mol$				
<b>UN Class:</b> N/A		<b>EC No.:</b> 200-273-8		
<b>Cas No.:</b> 56-41-7		<b>Index No.:</b> Not listed		
<b>Hazard:</b> Not considered hazardous				
<b>Precaution:</b> No additional precautions required				
Cat No.	Grade	Assay	Info.	Per
ESC55464		98%		25g

ALBUMEN EGG POWDER (EGG WHITE)				
<b>UN Class:</b> N/A		<b>EC No.:</b> 292-692-7		
<b>Cas No.:</b> 9006-59-1		<b>Index No.:</b> Not listed		
<b>Hazard:</b> Not considered hazardous				
<b>Precaution:</b> No additional precautions required				
Cat No.	Grade	Assay	Info.	Per
ESC54822		Protein > 80%		250g

ALIZARIN RED S C.I.58005 (1,2-DIHYDROXYANTHRAQUINONE)				
$C_{14}H_7NaO_7S = 342.3g/mol$				
				
<b>UN Class:</b> N/A		<b>EC No.:</b> 204-981-8		Warning
<b>Cas No.:</b> 130-22-3		<b>Index No.:</b> Not listed		
<b>Hazard:</b> H315 H319 H335				
<b>Precaution:</b> P261 P305+P351+P338 P280 P302+P352 P304+P340				
<b>Notes:</b> Yellow to orange red				
Cat No.	Grade	Assay	Info.	Per
ESC54823		> 98%	pH 4.0-6.0	100g

ALUMINIUM METAL - FOIL 0.1MM				
$Al = 26.98g/mol$				
<b>UN Class:</b> N/A		<b>EC No.:</b> 231-072-3		
<b>Cas No.:</b> 7429-90-5		<b>Index No.:</b> Not listed		
<b>Hazard:</b> Not considered hazardous				
<b>Precaution:</b> No additional precautions required				
Cat No.	Grade	Assay	Info.	Per
ESC54834		N/A	0.1mm	250g

ALUMINIUM METAL - POWDER				
$Al = 26.98g/mol$				
				
<b>UN Class:</b> 4.3 /UN1396 PG-II		<b>EC No.:</b> 231-072-3		Danger
<b>Cas No.:</b> 7429-90-5		<b>Index No.:</b> 013-002-00-1		
<b>Hazard:</b> H261 H228				
<b>Precaution:</b> P280 P210+P240+P241				
Cat No.	Grade	Assay	Info.	Per
ESC54835		98%	Fine	250g
ESC54836		98%	Fine	500g



**ALUMINIUM AMMONIUM SULPHATE (AMMONIUM ALUM)** $\text{AlNH}_4(\text{SO}_4)_2 \cdot 12\text{H}_2\text{O} = 453.33\text{g/mol}$ 

**UN Class:** N/A **EC No.:** 232-055-3 **Warning**  
**Cas No.:** 7784-26-1 **Index No.:** Not listed  
**Hazard:** H315 H319 H335  
**Precaution:** P261 P305+P351+P338

Cat No.	Grade	Assay	Info.	Per
ESC54825		98%		500g

**ALUMINIUM CHLORIDE ANHYDROUS (TRICHLOROALUMINIUM)** $\text{AlCl}_3 = 133.34\text{g/mol}$ 

**UN Class:** 8 /UN1726 PG-II **EC No.:** 231-208-1 **Danger**  
**Cas No.:** 7446-70-0 **Index No.:** 013-003-00-7  
**Hazard:** H314 H372+H378  
**Precaution:** P260 P280 P305+P351+P338 P302+P352

Cat No.	Grade	Assay	Info.	Per
ESC54831		98%		500g

**ALUMINIUM CHLORIDE 6-WATER (TRICHLOROALUMANE)** $\text{AlCl}_3 \cdot 6\text{H}_2\text{O} = 241.43\text{g/mol}$ 

**UN Class:** 8 /UN3260 PG-III **EC No.:** 231-208-1 **Danger**  
**Cas No.:** 7784-13-6 **Index No.:** Not listed  
**Hazard:** H314 H315 H319 H335 H412  
**Precaution:** P273 P305+P351+P338 P261

Cat No.	Grade	Assay	Info.	Per
ESC54828		95%		100g

**ALUMINIUM HYDROXIDE (ALUMINIC ACID)** $\text{Al}(\text{OH})_3 = 78\text{g/mol}$ 

**UN Class:** N/A **EC No.:** 244-492-7 **Warning**  
**Cas No.:** 21645-51-2 **Index No.:** Not listed  
**Hazard:** H319  
**Precaution:** P305+P351+P338

Cat No.	Grade	Assay	Info.	Per
ESC54833		95%		500g

**ALUMINIUM NITRATE 9-WATER** $\text{Al}(\text{NO}_3)_3 \cdot 9\text{H}_2\text{O} = 375.13\text{g/mol}$ 

**UN Class:** 5.1 /UN1438 PG-III **EC No.:** 236-751-8 **Warning**  
**Cas No.:** 7784-27-2 **Index No.:** Not listed  
**Hazard:** H272 H315 H319  
**Precaution:** P220 P305+P351+P338

Cat No.	Grade	Assay	Info.	Per
ESC54837		95%		500g

**ALUMINIUM OXIDE CALCINED (ALUMINA)** $\text{Al}_2\text{O}_3 = 101.96\text{g/mol}$ 

**UN Class:** N/A **EC No.:** 215-691-6  
**Cas No.:** 1344-28-1 **Index No.:** Not listed  
**Hazard:** Not considered hazardous  
**Precaution:** Not considered hazardous

Cat No.	Grade	Assay	Info.	Per
ESC54839		97%		500g

**ALUMINIUM POTASSIUM SULPHATE 12-WATER (POTASH ALUM)** $\text{AlK}(\text{SO}_4)_2 \cdot 12\text{H}_2\text{O} = 474.39\text{g/mol}$ 

**UN Class:** N/A **EC No.:** 233-141-3  
**Cas No.:** 7784-24-9 **Index No.:** Not listed  
**Hazard:** Not considered hazardous  
**Precaution:** No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC54840		99%		500g

**ALUMINIUM SULPHATE 16-WATER (ALUNOGENITE)** $\text{Al}_2(\text{SO}_4)_3 \cdot 16\text{H}_2\text{O} = 630.4\text{g/mol}$ 

**UN Class:** N/A **EC No.:** 233-135-0 **Danger**  
**Cas No.:** 16828-11-8 **Index No.:** Not listed  
**Hazard:** H318  
**Precaution:** P280 P305+P351+P338

Cat No.	Grade	Assay	Info.	Per
ESC54843		98%		500g

**AMINO ACID SET**

L-Alanine, L-Aginine, L-Asparagine, L-Cystine, L-Glutamic Acid, Glycine, L-Histidine, L-Leucine, L-Lysine, DL-Methionine, DL-Phenylalanine, L-Proline, L-Serine, L-Threonine, L-Tryptophan, L-Tyrosine, L-Valine - 1g of each included in set

**UN Class:** N/A **EC No.:** N/A  
**Cas No.:** N/A **Index No.:** Not listed  
**Hazard:** Not considered hazardous  
**Precaution:** No additional precautions required


Cat No.	Grade	Assay	Info.	Per
ESC54845		N/A	17 Amino acids	SET



**AMMONIA SOLUTION** $\text{NH}_4\text{OH} = 35.05\text{g/mol}$ 



**UN Class:** 8 /UN2672 PG-III **EC No.:** 215-647-6 **Danger**  
**Cas No.:** 1336-21-6 **Index No.:** 007-001-01-2  
**Hazard:** H314 H400  
**Precaution:** P273 P280 P305+P351+P338 P310



Cat No.	Grade	Assay	Info.	Per
ESC54847		33-35 $\text{NH}_3$		1L
ESC54848		33-35 $\text{NH}_3$		2.5L











AMMONIUM ACETATE (AMMONIUM ETHANOATE)				
$\text{CH}_3\text{COONH}_4 = 77.08\text{g/mol}$				
UN Class: N/A		EC No.: 211-162-9		
Cas No.: 7664-93-9		Index No.: Not listed		
Hazard: Not considered hazardous				
Precaution: Not considered hazardous				
Notes: pH of solution 6.5-7.5				
Cat No.	Grade	Assay	Info.	Per
ESC54851		96%		500g



AMMONIUM BROMIDE (HYDROBROMIC ACID MONOAMMONIATE)				
$\text{NH}_4\text{Br} = 97.94\text{g/mol}$ 				
UN Class: N/A		EC No.: 235-183-8		
Cas No.: 12124-97-9		Index No.: Not listed		
Hazard: H319 H315				
Precaution: P305+P351+P338 P332+P313 P337+P313				
Cat No.	Grade	Assay	Info.	Per
ESC54854		99%		500g



AMMONIUM CARBONATE				
$(\text{NH}_4)_2\text{CO}_3 = 96.09\text{g/mol}$ 				
UN Class: N/A		EC No.: 208-058-0		
Cas No.: 506-87-6		Index No.: Not listed		
Hazard: H302				
Precaution: P301+P312				
Cat No.	Grade	Assay	Info.	Per
ESC54857		98%		500g



AMMONIUM CHLORIDE (SAL AMMONIAC)				
$\text{NH}_4\text{Cl} = 53.49\text{g/mol}$ 				
UN Class: N/A		EC No.: 235-186-4		
Cas No.: 12125-02-9		Index No.: Not listed		
Hazard: H302 H319				
Precaution: P305+P351+P338				
Cat No.	Grade	Assay	Info.	Per
ESC54860		99%		500g


AMMONIUM DICHROMATE				
$(\text{NH}_4)_2\text{Cr}_2\text{O}_7 = 252.06\text{g/mol}$     				
UN Class: 5.1 / UN1439 PG-II		EC No.: 232-143-1		
Cas No.: 7789-09-5		Index No.: 024-003-00-1		
Hazard: H272 H350 H340 H360 H330 H301 H372 H312 H314 H334 H317 H410				
Precaution: P201 P220 P260 P273 P280 P284				
Cat No.	Grade	Assay	Info.	Per
ESC54863		33-35 $\text{NH}_3$		500g

AMMONIUM HYDROGEN CARBONATE (AMMONIUM BICARBONATE)				
$\text{NH}_4\text{HCO}_3 = 79.06\text{g/mol}$ 				
UN Class: N/A		EC No.: 213-911-5		
Cas No.: 1066-33-7		Index No.: Not listed		
Hazard: H302				
Precaution: P301+P312				
Cat No.	Grade	Assay	Info.	Per
ESC54866		98.5%		500g

DI-AMMONIUM HYDROGEN PHOSPHATE				
$(\text{NH}_4)_2\text{HPO}_4 = 132.06\text{g/mol}$ 				
UN Class: N/A		EC No.: 231-987-8		
Cas No.: 7783-28-0		Index No.: Not listed		
Hazard: H315 H319 H335				
Precaution: P261 P305+P351+P338				
Cat No.	Grade	Assay	Info.	Per
ESC55236		98%		500g

AMMONIUM IRON (II) SULPHATE 6-WATER				
$(\text{NH}_4)_2\text{Fe}(\text{SO}_4)_2 \cdot 6\text{H}_2\text{O} = 392.14\text{g/mol}$ 				
UN Class: N/A		EC No.: 233-151-8		
Cas No.: 7783-85-9		Index No.: Not listed		
Hazard: H315 H319 H335				
Precaution: P261 P305+P351+P338				
Cat No.	Grade	Assay	Info.	Per
ESC54869		98%		500g

AMMONIUM IRON (III) CITRATE (AMMONIUM FERRIC CITRATE)					
$\text{C}_6\text{H}_8\text{O}_7 \cdot x\text{Fe}_3 \cdot y\text{NH}_3$ 					
UN Class: N/A		EC No.: 214-686-6			
Cas No.: 1185-57-5		Index No.: Not listed			
Hazard: Not considered hazardous					
Precaution: No additional precautions required					
Cat No.	Grade	Assay	Info.	Price	Per
ESC54872		98%	Brown	15.95	100g

AMMONIUM IRON (III) CITRATE - GREEN				
$\text{C}_6\text{H}_8\text{O}_7 \cdot x\text{Fe}_3 \cdot y\text{NH}_3$				
UN Class: N/A		EC No.: 214-686-6		
Cas No.: 1185-57-5		Index No.: Not listed		
Hazard: Not considered hazardous				
Precaution: No additional precautions required				
Cat No.	Grade	Assay	Info.	Per
ESC54875		98%	Green	100g



**AMMONIUM IRON (III) SULPHATE 12-WATER** $\text{NH}_4\text{Fe}(\text{SO}_4)_2 \cdot 12\text{H}_2\text{O} = 482.19\text{g/mol}$ 

**UN Class:** N/A **EC No.:** 233-382-4 **Warning**  
**Cas No.:** 7783-83-7 **Index No.:** Not listed  
**Hazard:** H315 H319  
**Precaution:** P305+P351+P338

Cat No.	Grade	Assay	Info.	Per
ESC54878		98%		500g

**ISO-AMYL ACETATE (ISO-PENTYL ACETATE)** $\text{CH}_3\text{COOC}_5\text{H}_{11} = 130.18\text{g/mol}$ 

24°C

**UN Class:** 3 /UN1104 PG-III **EC No.:** 211-047-3 **Warning**  
**Cas No.:** 628-63-7 **Index No.:** 607-130-00-2  
**Hazard:** H226 EUH066  
**Precaution:** P210 P243 P280

Cat No.	Grade	Assay	Info.	Per
ESC54894		95%		500ml

**AMMONIUM METAVANADATE (AMMONIUM TRIOXOVANADATE)** $\text{NH}_4\text{VO}_3 = 116.98\text{g/mol}$ 

**UN Class:** 6.1 /UN2859 PG-II **EC No.:** 232-261-3 **Danger**  
**Cas No.:** 7803-55-6 **Index No.:** Not listed  
**Hazard:** H301 H315 H319 H330 H335  
**Precaution:** P260 P284 P301+P310 P305+P351+P338 P310

Cat No.	Grade	Assay	Info.	Price	Per
ESC54880		98%		15.95	50g

**AMMONIUM PEROXODISULPHATE (AMMONIUM PERSULPHATE)** $(\text{NH}_4)_2\text{S}_2\text{O}_8 = 228.2\text{g/mol}$ 

**UN Class:** 5.1 /UN1444 PG-III **EC No.:** 231-786-5 **Danger**  
**Cas No.:** 7727-54-0 **Index No.:** 016-060-00-6  
**Hazard:** H272 H302 H315 H317 H319 H334 H335  
**Precaution:** P280 P305+P351+P338 P210 P302+P352 P304+P340 P309+P311

Cat No.	Grade	Assay	Info.	Per
ESC54888		98%		500g

**AMMONIUM MOLYBDATE (VI) 4-WATER** $(\text{NH}_4)_6\text{Mo}_7\text{O}_{24} \cdot 4\text{H}_2\text{O} = 1235.86\text{g/mol}$ 

**UN Class:** N/A **EC No.:** 234-722-4 **Warning**  
**Cas No.:** 12054-85-2 **Index No.:** Not listed  
**Hazard:** H315 H319 H335  
**Precaution:** P261 P305+P351+P338

Cat No.	Grade	Assay	Info.	Per
ESC54881		98%		500g

**AMMONIUM SULPHATE** $(\text{NH}_4)_2\text{SO}_4 = 132.14\text{g/mol}$ 

**UN Class:** N/A **EC No.:** 231-984-1 **Danger**  
**Cas No.:** 7783-20-2 **Index No.:** Not listed  
**Hazard:** Not considered hazardous  
**Precaution:** No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC54889		98.5%		500g

**AMMONIUM NICKEL (II) SULPHATE 6-WATER (NICKEL AMMONIUM SULPHATE)** $(\text{NH}_4)_2\text{Ni}(\text{SO}_4)_2 \cdot 6\text{H}_2\text{O} = 394.99\text{g/mol}$ 

**UN Class:** N/A **EC No.:** 239-793-5 **Danger**  
**Cas No.:** 7785-20-8 **Index No.:** Not listed  
**Hazard:** H302 H317 H332 H334 H341 H350 H360 H372 H410  
**Precaution:** P201 P261 P273 P280 P308+P313 P501

Cat No.	Grade	Assay	Info.	Per
ESC54884		98%		500g

**AMMONIUM THIOCYANATE** $\text{NH}_4\text{SCN} = 76.12\text{g/mol}$ 

**UN Class:** N/A **EC No.:** 217-175-6 **Warning**  
**Cas No.:** 1762-95-4 **Index No.:** 615-030-00-5  
**Hazard:** H302 H312 H332 H410  
**Precaution:** P273 P280 P501

Cat No.	Grade	Assay	Info.	Per
ESC54892		96%		500g

**AMMONIUM NITRATE** $\text{NH}_4\text{NO}_3 = 80.04\text{g/mol}$ 

**UN Class:** 5.1 /UN2067 PG-III **EC No.:** 229-347-8 **Warning**  
**Cas No.:** 6484-52-2 **Index No.:** Not listed  
**Hazard:** H272 H319 H315  
**Precaution:** P220 P261 P305+P351+P338



Cat No.	Grade	Assay	Info.	Per
ESC54885		98%		500g



**AMMONIUM OXALATE 1-WATER (OXALIC ACID DIAMMONIUM SALT)** $(\text{COONH}_4)_2 \cdot \text{H}_2\text{O} = 142.11\text{g/mol}$ 



**UN Class:** 6.1 /UN2811 PG-III **EC No.:** 214-202-3 **Warning**  
**Cas No.:** 6009-70-7 **Index No.:** 607-007-00-3  
**Hazard:** H312 H302  
**Precaution:** P261 P302+P352 P304+P340+P312


Cat No.	Grade	Assay	Info.	Per
ESC54886		99%		100g






ISO-AMYL ALCOHOL (3-METHYL BUTAN-1-OL)				
$C_5H_{11}OH = 88.15g/mol$ 				
<b>UN Class:</b> 3 /UN1105 PG-III		<b>EC No.:</b> 204-633-5		Warning
<b>Cas No.:</b> 123-51-3		<b>Index No.:</b> 603-006-00-7		
<b>Hazard:</b> H226 H315 H319 H332 H335				
<b>Precaution:</b> P210 P261 P280 P337+P313 P304+P340+P312				
Cat No.	Grade	Assay	Info.	Per
ESC55448		96%		2.5L



AQUADAG (CARBON COLLOIDAL)				
N/A 				
<b>UN Class:</b> N/A		<b>EC No.:</b> 231-955-3		Warning
<b>Cas No.:</b> 7782-42-5		<b>Index No.:</b> Not listed		
<b>Hazard:</b> H319 H335				
<b>Precaution:</b> P261 P305+P351+P338				
<b>Notes:</b> 20% suspension of colloidal in graphite				
Cat No.	Grade	Assay	Info.	Per
ESC54899		N/A		100g


ANILINE (PHENYLAMINE)				
$C_6H_5NH_2 = 93.13g/mol$ 				
<b>UN Class:</b> 6.1 /UN1547 PG-II		<b>EC No.:</b> 200-539-3		Danger
<b>Cas No.:</b> 62-53-3		<b>Index No.:</b> 612-008-00-7		
<b>Hazard:</b> H301 H311 H317 H318 H331 H341 H351 H372 H410				
<b>Precaution:</b> P261 P273 P280 P301+P310 P305+P351+P338 P311				
<b>Notes:</b> Distillation range 182-186°C				
Cat No.	Grade	Assay	Info.	Per
ESC54895		98%		1L


L-ARGININE ((S)-2-AMINO-5-GUANIDINOPENTANOIC ACID)				
$H_2NC(=NH)NH(CH_2)_3CH(NH_2CO_2H) = 174.2g/mol$				
<b>UN Class:</b> N/A		<b>EC No.:</b> 200-811-1		
<b>Cas No.:</b> 74-79-3		<b>Index No.:</b> Not listed		
<b>Hazard:</b> Not considered hazardous				
<b>Precaution:</b> No additional precautions required				
Cat No.	Grade	Assay	Info.	Per
ESC54900		98%		100g


ANILINE HYDROCHLORIDE (PHENYLAMMONIUM CHLORIDE)				
$C_6H_5NH_2 \cdot HCl = 129.59g/mol$ 				
<b>UN Class:</b> 6.1 /UN1548 PG-III		<b>EC No.:</b> 205-519-8		Danger
<b>Cas No.:</b> 142-04-1		<b>Index No.:</b> 612-009-00-2		
<b>Hazard:</b> H301 H311 H317 H318 H331 H341 H351 H372 H400				
<b>Precaution:</b> P261 P273 P280 P301+P310 P305+P351+P338 P311				
Cat No.	Grade	Assay	Info.	Per
ESC54896		98%		100g

L-ASCORBIC ACID (VITAMIN C)				
$C_6H_8O_6 = 176.13g/mol$				
<b>UN Class:</b> N/A		<b>EC No.:</b> 200-066-2		
<b>Cas No.:</b> 50-81-7		<b>Index No.:</b> Not listed		
<b>Hazard:</b> Not considered hazardous				
<b>Precaution:</b> No additional precautions required				
Cat No.	Grade	Assay	Info.	Per
ESC55468		99%		500g

ANTHRANILIC ACID (2-AMINO BENZOIC ACID)				
$2-(H_2N)C_6H_4CO_2H = 137.14g/mol$ 				
<b>UN Class:</b> N/A		<b>EC No.:</b> 204-287-5		Warning
<b>Cas No.:</b> 118-92-3		<b>Index No.:</b> Not listed		
<b>Hazard:</b> H319				
<b>Precaution:</b> P305+P351+P338 P280				
Cat No.	Grade	Assay	Info.	Per
ESC54897		97%		100g

DL - ASPARTIC ACID ((2S)-2-AMINO BUTANEDIOIC ACID)				
$HOOCCH_2CH(NH_2)COOH = 133.1g/mol$				
<b>UN Class:</b> N/A		<b>EC No.:</b> 210-513-3		
<b>Cas No.:</b> 617-45-8		<b>Index No.:</b> Not listed		
<b>Hazard:</b> Not considered hazardous				
<b>Precaution:</b> No additional precautions required				
Cat No.	Grade	Assay	Info.	Per
ESC55469		97%		25g

ANTI-BUMPING GRANULES (REFINED ALUMINIUM OXIDE)				
$Al_2O_3 = 101.96g/mol$				
<b>UN Class:</b> N/A		<b>EC No.:</b> 215-691-6		
<b>Cas No.:</b> 1344-28-1		<b>Index No.:</b> Not listed		
<b>Hazard:</b> Not considered hazardous				
<b>Precaution:</b> No additional precautions required				
<b>Notes:</b> To prevent boiling liquids from bumping				
Cat No.	Grade	Assay	Info.	Per
ESC54898		97%		250g

L-ASPARTIC ACID ((S)-AMINO BUTANEDIOIC ACID)					
$NH_2CH(COOH) \cdot CH_2 \cdot COOH = 133.1g/mol$					
<b>UN Class:</b> N/A		<b>EC No.:</b> 200-291-6			
<b>Cas No.:</b> 56-84-8		<b>Index No.:</b> Not listed			
<b>Hazard:</b> Not considered hazardous					
<b>Precaution:</b> No additional precautions required					
Cat No.	Grade	Assay	Info.	Price	Per
ESC55470		99%		15.95	25g



**BARFOED'S REAGENT**NH<sub>2</sub>CH(COOH) . CH<sub>2</sub> . COOH = 133.1g/mol

**UN Class:** N/A      **EC No.:** N/A      **Warning**  
**Cas No.:** N/A      **Index No.:** Not listed  
**Hazard:** H411  
**Precaution:** P273  
**Notes:** Reagent testing for the presence of monosaccharide

Cat No.	Grade	Assay	Info.	Per
ESC54901		N/A		500ml

**BARIUM METAL IN LIQUID PARAFFIN**

Ba = 137.34g/mol



**UN Class:** 4.3 /UN1400 PG-II      **EC No.:** 231-149-1      **Danger**  
**Cas No.:** 7440-39-3      **Index No.:** Not listed  
**Hazard:** H261 H315 H319 H335  
**Precaution:** P231+P232 P261 P305+P351+P338

Cat No.	Grade	Assay	Info.	Per
ESC54903		98%		10g

**BARIUM CARBONATE**BaCO<sub>2</sub> = 197.34g/mol

**UN Class:** 6.1 /UN1564 PG-III      **EC No.:** 208-167-3      **Warning**  
**Cas No.:** 513-77-9      **Index No.:** 056-003-00-2  
**Hazard:** H302  
**Precaution:** P301+P312

Cat No.	Grade	Assay	Info.	Per
ESC54904		99%		500g

**BARIUM CHLORIDE 2-WATER**BaCl<sub>2</sub> . 2H<sub>2</sub>O = 244.26g/mol

**UN Class:** 6.1 /UN1564 PG-III      **EC No.:** 233-788-1      **Warning**  
**Cas No.:** 10326-27-9      **Index No.:** 056-004-00-8  
**Hazard:** H301 H332  
**Precaution:** P261 P301+P330+P331 P310

Cat No.	Grade	Assay	Info.	Per
ESC54907		99%		250g
ESC54908		99%		500g

**BARIUM HYDROXIDE 8-WATER**Ba(OH)<sub>2</sub> . 8H<sub>2</sub>O = 315.46g/mol

**UN Class:** 8 /UN3262 PG-II      **EC No.:** 241-234-5      **Danger**  
**Cas No.:** 12230-71-6      **Index No.:** Not listed  
**Hazard:** H302 H314 H332  
**Precaution:** P280 P305+P351+P338 P310

Cat No.	Grade	Assay	Info.	Per
ESC54911		96%		500g

**BARIUM PEROXIDE**BaO<sub>2</sub> = 169.34g/mol

**UN Class:** 5.1(6.1) /UN1449 PG-II      **EC No.:** 215-128-4      **Danger**  
**Cas No.:** 1304-29-6      **Index No.:** 056-001-00-1  
**Hazard:** H272 H302 H332  
**Precaution:** P220

Cat No.	Grade	Assay	Info.	Per
ESC54916		85-90%		100g

**BARIUM NITRATE**Ba(NO<sub>3</sub>)<sub>2</sub> = 261.34g/mol

**UN Class:** 5.1(6.1) /UN1446 PG-II      **EC No.:** 233-020-5      **Danger**  
**Cas No.:** 10022-31-8      **Index No.:** 056-002-00-7  
**Hazard:** H302 H332 H272  
**Precaution:** P210 P280 P304+P340 P309+P310

Cat No.	Grade	Assay	Info.	Per
ESC54914		98%		250g

**BARIUM OXIDE**

BaO = 153.33g/mol



**UN Class:** 6.1 /UN1884 PG-III      **EC No.:** 215-127-9      **Danger**  
**Cas No.:** 1304-28-5      **Index No.:** Not listed  
**Hazard:** H301 H314 H332  
**Precaution:** P280 P301+P310 P305+P351+P338

Cat No.	Grade	Assay	Info.	Per
ESC54915		97%		50g

**BARIUM SULPHATE PRECIPITATED**BaSO<sub>4</sub> = 233.39g/mol

**UN Class:** N/A      **EC No.:** 231-784-4  
**Cas No.:** 7727-43-7      **Index No.:** Not listed  
**Hazard:** Not considered hazardous  
**Precaution:** No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC54917		97%		500g



**BEEWAX (WHITE)**



**UN Class:** N/A      **EC No.:** 232-383-7  
**Cas No.:** 8012-89-3      **Index No.:** Not listed



**Hazard:** Not considered hazardous  
**Precaution:** No additional precautions required



Cat No.	Grade	Assay	Info.	Per
ESC54920		> 97%		500g







BENZOPHENONE (DIPHENYL KETONE)				
$C_{15}H_{12}O$ = 182.22g/mol 				
UN Class: N/A		EC No.: 204-337-6		Warning
Cas No.: 119-61-9		Index No.: Not listed		
Hazard: H410 Precaution: P273				
Cat No.	Grade	Assay	Info.	Per
ESC54931		99%		250ml

BENZOIC ACID (BENZENECARBOXYLIC ACID)				
$C_6H_5COOH$ = 122.12g/mol 				
UN Class: N/A		EC No.: 200-618-2		Warning
Cas No.: 65-85-0		Index No.: Not listed		
Hazard: H302 H319 Precaution: P301+P312 P305+P351+P338				
Cat No.	Grade	Assay	Info.	Per
ESC54930		98.5%		500g



BENEDICT'S SOLUTION QUALITATIVE				
N/A 				
UN Class: 9 /UN3082 PG-III		EC No.: N/A		Warning
Cas No.: N/A		Index No.: Not listed		
Hazard: H412 Precaution: P273 Notes: For determination of reducing sugars				
Cat No.	Grade	Assay	Info.	Per
ESC54923		N/A		500ml



BENZOYL CHLORIDE				
$C_6H_5COCl$ = 140.57g/mol 				
UN Class: 8 /UN1736 PG-II		EC No.: 202-710-8		Danger
Cas No.: 98-88-4		Index No.: 607-012-00-0		
Hazard: H314 H302 H312 H332 Precaution: P280 P305+P351+P338 P310				
Cat No.	Grade	Assay	Info.	Per
ESC54933		99%		1L


BENZALDEHYDE				
$C_6H_5 \cdot CHO$ = 106.12g/mol 				
UN Class: 9 /UN1990 PG-III		EC No.: 202-860-4		Warning
Cas No.: 100-52-7		Index No.: 605-012-00-5		
Hazard: H302 Precaution: P301+P312 Notes: Distillation range 175-183°C				
Cat No.	Grade	Assay	Info.	Per
ESC54926		98%		500ml

BENZYL ALCOHOL (BENZENEMETHANOL)				
$C_6H_5CH_2OH$ = 108.14g/mol 				
UN Class: 9 /UN3334 PG-III		EC No.: 202-859-9		Warning
Cas No.: 100-51-6		Index No.: 603-057-00-5		
Hazard: H302 H332 Precaution: P301+P312				
Cat No.	Grade	Assay	Info.	Per
ESC54936		99%		1L

BENZENE-1,2-DICARBOXYLIC ACID SEE PHTHALIC ACID	
BENZENE-1,2-DICARBOXYLIC ANHYDRIDE	SEE PHTHALIC ANHYDRIDE
BENZENE-1,2-DIOL	SEE CATECHOL
BENZENE-1,3-DIOL	SEE RESORCINOL
BENZENE-1,4-DIOL	SEE HYDROQUINONE
BENZENE-1,2,3-TRIOL	SEE PYROGALLOL
BENZENE-1,2,5-TRIOL	SEE PHLOROGLUCINOL

BENZYL CHLORIDE (A-CHLOROTOLUENE)				
$C_6H_5CH_2Cl$ = 126.58g/mol 				
UN Class: 6.1 /UN1738 PG-II		EC No.: 202-853-6		Danger
Cas No.: 100-44-7		Index No.: 602-037-00-3		
Hazard: H350 H331 H302 H373 H335 H315 H318 Precaution: P201 P261 P280 P305+P351+P338 P308+P313 Notes: Distillation range 175-180°C				
Cat No.	Grade	Assay	Info.	Per
ESC54939		98%	SURCHARGE	500ml

BENZIL (1,2-DIPHENYLETHANE-1,2-DIONE)				
$C_{14}H_{10}O_2$ = 210.23g/mol 				
UN Class: N/A		EC No.: 205-157-0		Warning
Cas No.: 134-81-6		Index No.: Not listed		
Hazard: H315 H319 H335 Precaution: P261 P305+P351+P338 P302+P352				
Cat No.	Grade	Assay	Info.	Per
ESC54928		98%		25g


BICARBONATE INDICATOR				
UN Class: N/A		EC No.: N/A		
Cas No.: N/A		Index No.: Not listed		
Hazard: Not considered hazardous Precaution: No additional precautions required Notes: Distillation range 175-180°C				
Cat No.	Grade	Assay	Info.	Per
ESC54943		N/A		500ml




**BILE SALTS (SODIUM TAUROGLYCOCHOLATE)**

UN Class: N/A EC No.: 234-243-0  
 Cas No.: 11006-55-6 Index No.: Not listed

Hazard: Not considered hazardous  
 Precaution: No additional precautions required  
 Notes: Distillation range 175-180°C


Cat No.	Grade	Assay	Info.	Per
ESC54944		>65%		25g

**BISMUTH (III) CHLORIDE (BISMUTH TRICHLORIDE)**



BiCl<sub>3</sub> = 315.34g/mol 

UN Class: N/A EC No.: 232-123-2 Warning  
 Cas No.: 7787-60-2 Index No.: Not listed

Hazard: H315 H319  
 Precaution: P305+P351+P338 P302+P352


Cat No.	Grade	Assay	Info.	Per
ESC54945		98%		10g

**BISMUTH NITRATE 5-WATER**

Bi(NO<sub>3</sub>)<sub>3</sub> · 5H<sub>2</sub>O = 485.07g/mol  

UN Class: 5.1 /UN1477 PG-II EC No.: 233-791-8 Danger  
 Cas No.: 10035-06-0 Index No.: Not listed

Hazard: H272 H315 H319 H335  
 Precaution: P220 P261 P305+P351+P338


Cat No.	Grade	Assay	Info.	Per
ESC54946		98%		25g

**BIURET REAGENT**

N/A  

UN Class: N/A EC No.: N/A Warning  
 Cas No.: N/A Index No.: Not listed


Hazard: H315 H319  
 Precaution: P280 P305+P351+P338  
 Notes: Working solution to test for proteins

Cat No.	Grade	Assay	Info.	Per
ESC54947		N/A		1L

**BLEACHING POWDER SEE CALCIUM HYPOCHLORITE**


**BORAX SEE DISODIUM TETRABORATE**

**BORIC ACID CRYSTALS (TRIOXYBORIC (III) ACID)**


H<sub>3</sub>BO<sub>3</sub> = 61.83g/mol 

UN Class: N/A EC No.: 233-139-2 Danger  
 Cas No.: 10043-35-3 Index No.: 005-007-00-2

Hazard: H360FD  
 Precaution: P201 P308+P313


Cat No.	Grade	Assay	Info.	Per
ESC54950		99.5%		500g

**BORIC ACID POWDER (TRIOXYBORIC (III) ACID)**




H<sub>3</sub>BO<sub>3</sub> = 61.83g/mol 

UN Class: N/A EC No.: 233-139-2 Danger  
 Cas No.: 10043-35-3 Index No.: 005-007-00-2

Hazard: H360FD  
 Precaution: P201 P308+P313


Cat No.	Grade	Assay	Info.	Per
ESC54951		99.5%		500g

**BROMINE**

Br<sub>2</sub> = 159.81g/mol   

UN Class: 8(6.1) /UN1744 PG-I EC No.: 231-778-1 Danger  
 Cas No.: 7726-95-6 Index No.: 035-001-00-5

Hazard: H314 H330 H400  
 Precaution: P260 P273 P280 P284 P305+P351+P338 P310


Cat No.	Grade	Assay	Info.	Per
ESC54953		98%	SURCHARGE	1L

**BROMINE WATER 0.2M**




N/A   

UN Class: 8(6.1) /UN1744 PG-I EC No.: 231-778-1 Danger  
 Cas No.: 7726-95-6 Index No.: Not listed

Hazard: H314 H330 H400  
 Precaution: P273 P280 P305+P351+P338 P310


Cat No.	Grade	Assay	Info.	Per
ESC54954		0.2M	SURCHARGE	1L

**BROMOBENZENE**

C<sub>6</sub>H<sub>5</sub> · Br = 157.01g/mol   

UN Class: 3 /UN2514 PG-III EC No.: 203-623-8 Warning  
 Cas No.: 108-86-1 Index No.: 602-060-00-9

Hazard: H226 H315 H411  
 Precaution: P210 P273

Cat No.	Grade	Assay	Info.	Per
ESC54960		95%		100ml





**1-BROMOBUTANE (N-BUTYL BROMIDE)** $\text{CH}_3 \cdot \text{CH}_2 \cdot \text{CH}_2 \cdot \text{CH}_2 \cdot \text{BR} = 137.02\text{g/mol}$ 

10°C

**UN Class:** 3 /UN1126 PG-II      **EC No.:** 203-691-9      **Danger**  
**Cas No.:** 109-65-9      **Index No.:** Not listed  
**Hazard:** H225 H315 H319 H335 H411  
**Precaution:** P210 P261 P273 P280 P337+P313 P391 P403+P235

Cat No.	Grade	Assay	Info.	Per
ESC54760		>97%		1L

**2-BROMO-2-METHYLPROPANE (TERT-BUTYL BROMIDE)** $(\text{CH}_3)_3\text{CBr} = 137.02\text{g/mol}$ 

16°C

**UN Class:** 3 /UN2342 PG-II      **EC No.:** 208-065-9      **Danger**  
**Cas No.:** 507-19-7      **Index No.:** Not listed  
**Hazard:** H225  
**Precaution:** P210

Cat No.	Grade	Assay	Info.	Per
ESC54784		>97%		25ml

**2-BROMOBUTANE (SEC-BUTYL BROMIDE)** $\text{CH}_3 \cdot \text{CHBR} \cdot \text{CH}_2 \cdot \text{CH}_3 = 137.02\text{g/mol}$ 

21°C

**UN Class:** 3 /UN2339 PG-II      **EC No.:** 201-140-7      **Danger**  
**Cas No.:** 78-76-2      **Index No.:** Not listed  
**Hazard:** H226 H412  
**Precaution:** P210 P243 P273 P280

Cat No.	Grade	Assay	Info.	Per
ESC54782		>97%		100ml

**BROMO PHENOL BLUE** $\text{C}_{19}\text{H}_{10}\text{Br}_4\text{O}_5\text{S} = 669.96\text{g/mol}$ 

**UN Class:** N/A      **EC No.:** 204-086-2      **Warning**  
**Cas No.:** 115-39-9      **Index No.:** Not listed

**Hazard:** H332 H312 H319  
**Precaution:** P261 P280 P305+P351+P338 P264  
**Notes:** pH 2.8-4.6

Cat No.	Grade	Assay	Info.	Per
ESC54957		>97%	Powder	25g

**BROMOCRESOL GREEN** $\text{C}_{21}\text{H}_{14}\text{Br}_4\text{O}_5\text{S} = 698.01\text{g/mol}$ 

**UN Class:** N/A      **EC No.:** 200-972-8  
**Cas No.:** 76-60-8      **Index No.:** Not listed  
**Hazard:** Not considered hazardous  
**Precaution:** No additional precautions required  
**Notes:** pH 3.6-5.2

Cat No.	Grade	Assay	Info.	Per
ESC54964		>97%	Powder	25g

**BROMOTHYMOL BLUE** $\text{C}_{27}\text{H}_{28}\text{Br}_2\text{O}_5\text{S} = 624.38\text{g/mol}$ 

**UN Class:** N/A      **EC No.:** 200-971-2  
**Cas No.:** 76-59-5      **Index No.:** Not listed

**Hazard:** Not considered hazardous  
**Precaution:** No additional precautions required  
**Notes:** pH 6.0-7.6

Cat No.	Grade	Assay	Info.	Per
ESC54970		>97%	Powder	25g

**BROMOCRESOL PURPLE** $\text{C}_{21}\text{H}_{16}\text{Br}_2\text{O}_5\text{S} = 540.22\text{g/mol}$ 

**UN Class:** N/A      **EC No.:** 204-087-8      **Warning**  
**Cas No.:** 115-40-2      **Index No.:** Not listed  
**Hazard:** H315 H319 H335  
**Precaution:** P261 P305+P351+P338

Cat No.	Grade	Assay	Info.	Per
ESC54967		>97%	pH 5.2-6.8	25g

**1-BROMOETHANE (ETHYL BROMIDE)** $\text{C}_2\text{H}_5\text{Br} = 108.97\text{g/mol}$ 

-20°C

**UN Class:** 6.1 /UN1891 PG-II      **EC No.:** 200-825-8      **Danger**  
**Cas No.:** 74-96-4      **Index No.:** 602-055-00-1  
**Hazard:** H225 H351 H332 H302  
**Precaution:** P201 P210 P281 P301+P312 P304+P340 P309+P311

Cat No.	Grade	Assay	Info.	Per
ESC54763		>97%		500ml

**BUFFER SOLUTION**

**UN Class:** N/A      **EC No.:** N/A  
**Cas No.:** N/A      **Index No.:** Not listed

**Hazard:** Not considered hazardous  
**Precaution:** No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC54978			pH2 (Citrate)	500ml
ESC54982			pH4 (Phthalate)	500ml
ESC54985			pH6 (Acetate)	500ml
ESC54988			pH7 (Phthalate)	500ml
ESC54991			pH9.2 (Phthalate)	500ml
ESC54974			pH10 (Phthalate)	500ml




**COLOURED BUFFER SOLUTION**

UN Class: N/A  
Cas No.: N/A

EC No.: N/A  
Index No.: Not listed

Hazard: Not considered hazardous  
Precaution: No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC54998			pH4 Red	500ml
			pH7 Green	500ml
			pH10 Blue	500ml



**BUTANAL (N-BUTYRALDEHYDE)**

$\text{CH}_3\text{CH}_2\text{CH}_2\text{CHO} = 72.11\text{g/mol}$



UN Class: 3 / UN1129 PG-II      EC No.: 204-646-6      Danger  
Cas No.: 123-72-8      Index No.: 605-006-00-2

Hazard: H225  
Precaution: P210

Cat No.	Grade	Assay	Info.	Per
ESC55000		98%		100ml
ESC55001		98%		500ml

**BUTANEDIOIC ACID SEE SUCCINIC ACID**


**BUTANOIC ACID (N-BUTYRIC ACID)**

$\text{CH}_3\text{CH}_2\text{CH}_2\text{COOH} = 88.11\text{g/mol}$



UN Class: 8 / UN2820 PG-III      EC No.: 203-532-3      Danger  
Cas No.: 107-92-6      Index No.: 607-135-00-X

Hazard: H314  
Precaution: P280 P305+P351+P338 P310

Cat No.	Grade	Assay	Info.	Per
ESC55002		99.5%		100ml



**BUTAN-1-OL (N-BUTYL ALCOHOL)**

$\text{CH}_3(\text{CH}_2)_3\text{OH} = 74.12\text{g/mol}$



UN Class: 3 / UN1120 PG-III      EC No.: 200-751-6      Danger  
Cas No.: 71-36-3      Index No.: 603-004-00-6

Hazard: H226 H302 H335 H315 H318 H336  
Precaution: P210 P280 P301+P330+P331 P304+P340 P312

Cat No.	Grade	Assay	Info.	Per
ESC55003		99.5%		500ml
ESC55004		99.5%		2.5L


**BUTAN-2-OL (SEC-BUTYL ALCOHOL)**

$\text{CH}_3\text{CH}_2\text{CHOHCH}_3 = 74.12\text{g/mol}$



UN Class: 3 / UN1120 PG-III      EC No.: 201-158-5      Warning  
Cas No.: 78-92-2      Index No.: 603-127-00-5

Hazard: H225 H319 H335 H336  
Precaution: P210 P243 P280 P304+P340 P305+P351+P338 P312

Cat No.	Grade	Assay	Info.	Per
ESC55005		99.5%		1L


**BUTANONE (METHYL ETHYL KETONE)**

$\text{C}_2\text{H}_5\text{COCH}_3 = 72.11\text{g/mol}$



UN Class: 3 / UN1193 PG-II      EC No.: 201-159-0      Danger  
Cas No.: 78-93-3      Index No.: Not listed

Hazard: H225 H319 H336  
Precaution: P210 P241 P303+P361+P353 P405 P501

Cat No.	Grade	Assay	Info.	Per
ESC55006		99%		2.5L


**N-BUTYL ACETATE (BUTYL ETHANOATE)**

$\text{CH}_3\text{COO}(\text{CH}_2)_3\text{CH}_3 = 116.16\text{g/mol}$



UN Class: 3 / UN1123 PG-III      EC No.: 204-658-1      Warning  
Cas No.: 123-86-4      Index No.: 607-025-00-1

Hazard: H226 H336 EUH066  
Precaution: P210 P243 P280 P304+P340 P312

Cat No.	Grade	Assay	Info.	Per
ESC55640		98%		1L

**ISO-BUTYL ALCOHOL SEE 2-METHYLPROPAN-1-OL**

**N-BUTYL ALCOHOL SEE BUTAN-1-OL**

**SEC-BUTYL ALCOHOL SEE BUTAN-2-OL**

**TERT-BUTYL ALCOHOL SEE 2-METHYLPROPAN-2-OL**


**N-BUTYLAMINE (1-AMINOBTANE)**

$\text{CH}_3(\text{CH}_2)_3\text{NH}_2 = 73.14\text{g/mol}$



UN Class: 3(8) / UN1125 PG-II      EC No.: 203-699-2      Danger  
Cas No.: 109-73-9      Index No.: 612-005-00-0


Hazard: H225 H332 H312 H302 H314  
Precaution: P210 P243 P280 P301+P330+P331 P302+P352 P304+P340 P309+P311


Cat No.	Grade	Assay	Info.	Per
ESC55644		98%		1L



**N-BUTYL IODIDE SEE 1-IODOBTANE**


**N-BUTYRALDEHYDE SEE BUTANAL**





CAESIUM CHLORIDE				
$\text{CsCl} = 168.32\text{g/mol}$				
<b>UN Class:</b> N/A		<b>EC No.:</b> 231-600-2		Danger
<b>Cas No.:</b> 7647-17-8		<b>Index No.:</b> Not listed		
<b>Hazard:</b> H302 H361 H373				
<b>Precaution:</b> P201 P301+P312+P330 P308-P313				
Cat No.	Grade	Assay	Info.	Per
ESC55007		99%		10g



CAFFEINE (1,3,7-TRIMETHYLXANTHINE)				
$\text{C}_8\text{H}_{10}\text{N}_4\text{O}_2 = 194.19\text{g/mol}$				
<b>UN Class:</b> 6.1 /UN1544 PG-III		<b>EC No.:</b> 200-362-1		Warning
<b>Cas No.:</b> 58-08-2		<b>Index No.:</b> 613-086-00-5		
<b>Hazard:</b> H302				
<b>Precaution:</b> P301+P312				
Cat No.	Grade	Assay	Info.	Per
ESC55008		98%		25g

CALCIUM METAL - GRANULAR				
$\text{Ca} = 40.08\text{g/mol}$				
<b>UN Class:</b> 4.3 /UN1401 PG-II		<b>EC No.:</b> 231-179-5		Danger
<b>Cas No.:</b> 7440-70-2		<b>Index No.:</b> 020-001-00-X		
<b>Hazard:</b> H261				
<b>Precaution:</b> P231+P232 P422				
Cat No.	Grade	Assay	Info.	Per
ESC55041		98%	2-7mm	50g
ESC55042		98%	2-7mm	100g


CALCIUM ACETATE (CALCIUM ETHANOATE)				
$(\text{CH}_3\text{COO})_2\text{Ca} = 158.17\text{g/mol}$				
<b>UN Class:</b> N/A		<b>EC No.:</b> 200-540-9		
<b>Cas No.:</b> 62-54-4		<b>Index No.:</b> Not listed		
<b>Hazard:</b> Not considered hazardous				
<b>Precaution:</b> No additional precautions required				
Cat No.	Grade	Assay	Info.	Per
ESC55011		99%		250g


CALCIUM BROMIDE				
$\text{CaBr}_2 \cdot x\text{H}_2\text{O} = 199.89\text{g/mol}$				
<b>UN Class:</b> N/A		<b>EC No.:</b> 232-164-6		Warning
<b>Cas No.:</b> 71626-99-8		<b>Index No.:</b> Not listed		
<b>Hazard:</b> H315 H319 H355				
<b>Precaution:</b> P261 P302+p352 P305+P351+P338 P405 P501				
Cat No.	Grade	Assay	Info.	Per
ESC55012		97%		250g

CALCIUM CARBIDE				
$\text{CaC}_2 = 64.1\text{g/mol}$				
<b>UN Class:</b> 4.3 /UN1402 PG-II		<b>EC No.:</b> 200-848-3		Danger
<b>Cas No.:</b> 75-20-7		<b>Index No.:</b> 006-004-00-9		
<b>Hazard:</b> H260				
<b>Precaution:</b> P223 P231+P232 P370+P378				
Cat No.	Grade	Assay	Info.	Per
ESC55016		97%		500g

CALCIUM CARBONATE - PRECIPITATED (PRECIPITATED)				
$\text{CaCO}_3 = 100.09\text{g/mol}$				
<b>UN Class:</b> N/A		<b>EC No.:</b> 207-439-9		
<b>Cas No.:</b> 471-34-1		<b>Index No.:</b> Not listed		
<b>Hazard:</b> Not considered hazardous				
<b>Precaution:</b> No additional precautions required				
Cat No.	Grade	Assay	Info.	Per
ESC55020		99%		500g
ESC55021		99%		1kg

## CALCIUM CARBONATE ORE SEE MARBLE CHIPS

CALCIUM CHLORIDE ANHYDROUS - GRANULAR				
$\text{CaCl}_2 = 110.99\text{g/mol}$				
<b>UN Class:</b> N/A		<b>EC No.:</b> 233-140-8		Warning
<b>Cas No.:</b> 10043-52-4		<b>Index No.:</b> 017-013-00-2		
<b>Hazard:</b> H319				
<b>Precaution:</b> P305+P351+P338				
Cat No.	Grade	Assay	Info.	Per
ESC55032		90%		500g

CALCIUM CHLORIDE 2-WATER				
$\text{CaCl}_2 \cdot 2\text{H}_2\text{O} = 147.01\text{g/mol}$				
<b>UN Class:</b> N/A		<b>EC No.:</b> 233-140-8		Warning
<b>Cas No.:</b> 10035-04-8		<b>Index No.:</b> Not listed		
<b>Hazard:</b> H319				
<b>Precaution:</b> P305+P351+P338				
Cat No.	Grade	Assay	Info.	Per
ESC55028		98%		500g



**CALCIUM CHLORIDE 6-WATER**CaCl<sub>2</sub> • 6H<sub>2</sub>O = 219.08g/mol

UN Class: N/A      EC No.: N/A      Warning  
 Cas No.: 7774-34-7      Index No.: Not listed  
 Hazard: H319  
 Precaution: P305+P351+P338 P230 P337+313

Cat No.	Grade	Assay	Info.	Per
ESC55030		98%		500g

**CALCIUM HYDROXIDE**Ca(OH)<sub>2</sub> = 74.09g/mol

UN Class: N/A      EC No.: 215-137-3      Danger  
 Cas No.: 1305-62-0      Index No.: Not listed  
 Hazard: H318  
 Precaution: P280 P305+P351+P338

Cat No.	Grade	Assay	Info.	Per
ESC55036		95%		500g

**CALCIUM HYDROXIDE SOLUTION SEE LIME WATER****CALCIUM ETHANOATE SEE CALCIUM ACETATE****CALCIUM HYPOCHLORITE (BLEACHING POWDER)**Ca(OCl)<sub>2</sub> = 142.98g/mol

UN Class: 5.1 /UN1748 PG-II      EC No.: 231-908-7      Danger  
 Cas No.: 7778-54-3      Index No.: 017-012-00-7  
 Hazard: H272 H302 H314 H400  
 Precaution: P220 P273 P280 P305+P351+P338 P310

Cat No.	Grade	Assay	Info.	Per
ESC55039		96%		500g

**CALCIUM NITRATE 4-WATER**Ca(NO<sub>3</sub>)<sub>2</sub> • 4H<sub>2</sub>O = 236.15g/mol

UN Class: 5.1 /UN1454 PG-III      EC No.: 233-332-1      Warning  
 Cas No.: 13477-34-4      Index No.: Not listed  
 Hazard: H272 H315 H319 H335  
 Precaution: P220+P261 P280 P304+P340 P305+P351+P338

Cat No.	Grade	Assay	Info.	Per
ESC55048		98%		500g

**CALCIUM OXIDE (QUICKLIME)**

CaO = 56.08g/mol



UN Class: 8 /UN1910 PG-III      EC No.: 215-138-9      Danger  
 Cas No.: 1305-78-8      Index No.: Not listed  
 Hazard: H314  
 Precaution: P280 P305+P351+P338 P312

Cat No.	Grade	Assay	Info.	Per
ESC55054		96%		1kg
ESC55053		96%		500g

**CALCIUM SULPHATE 2-WATER - PRECIPITATE**CaSO<sub>4</sub> • 2H<sub>2</sub>O = 172.17g/mol

UN Class: N/A      EC No.: 231-900-3  
 Cas No.: 10101-41-4      Index No.: Not listed  
 Hazard: H225 H319 H335 H336  
 Precaution: P210 P243 P280 P304+P340 P305+P351+P338 P312

Cat No.	Grade	Assay	Info.	Per
ESC55064		99%		500g

**CALCIUM SULPHATE (PLASTER OF PARIS)**CaSO<sub>4</sub> • .H<sub>2</sub>O = 145.15g/mol

UN Class: N/A      EC No.: 231-900-3  
 Cas No.: 10034-76-1      Index No.: Not listed  
 Hazard: Not considered hazardous  
 Precaution: No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC55059		N/A		500g
ESC55060		N/A		1kg

**CALCIUM TETRAHYDROGEN PHOSPHATE (CALCIUM PHOSPHATE MONOBASIC)**Ca(H<sub>2</sub>PO<sub>4</sub>)<sub>2</sub> • H<sub>2</sub>O = 252.07g/mol

UN Class: N/A      EC No.: 231-837-1      Warning  
 Cas No.: 10031-30-8      Index No.: Not listed  
 Hazard: H315 H319 H335  
 Precaution: P261 P305+P351+P338

Cat No.	Grade	Assay	Info.	Per
ESC55068		97%		500g

**DL-CAMPOR - SYNTHETIC (1,7,7-TRIMETHYLBICYCLO[2.2.1]HEPTAN-2-ONE)**C<sub>10</sub>H<sub>16</sub>O = 152.24g/mol

UN Class: 4.1 /UN2717 PG-III      EC No.: 200-945-0      Warning  
 Cas No.: 76-22-2      Index No.: Not listed  
 Hazard: H228 H302 H315 H319 H335  
 Precaution: P210 P261 P305+P351+P338

Cat No.	Grade	Assay	Info.	Per
ESC55070		97%		100g

**CANADA BALSAM IN XYLENE**



N/A



UN Class: 3 /UN1307 PG-III      EC No.: N/A      Warning  
 Cas No.: N/A      Index No.: Not listed  
 Hazard: H226 H332 H312 H315  
 Precaution: P280

Cat No.	Grade	Assay	Info.	Per
ESC55072		97%		25ml




CARMINE ACETIC				
N/A				
<b>UN Class:</b> 8 /UN1760 PG-III		<b>EC No.:</b> N/A		Danger
<b>Cas No.:</b> N/A		<b>Index No.:</b> Not listed		
<b>Hazard:</b> H314				
<b>Precaution:</b> P260 P280 P305+P351+P338				
Cat No.	Grade	Assay	Info.	Per
ESC55076		98%		500ml

CARBAMIDE SEE UREA



CARBOLIC ACID SEE PHENOL



CARBON COLLOIDAL SEE AQUADAG



CARBON POWDER SEE GRAPHITE POWDER


CASEIN POWDER				
<b>UN Class:</b> N/A		<b>EC No.:</b> 234-243-0		
<b>Cas No.:</b> 9000-71-9		<b>Index No.:</b> Not listed		
<b>Hazard:</b> Not considered hazardous				
<b>Precaution:</b> No additional precautions required				
Cat No.	Grade	Assay	Info.	Per
ESC55080		59%		100g



CASTOR OIL SEE OIL, CASTOR



CATECHOL (BENZENE-1,2-DIOL OR PYROCATECHOL)				
$C_6H_4(OH)_2 = 110.11g/mol$				
<b>UN Class:</b> 6.1 /UN2811 PG-III		<b>EC No.:</b> 204-427-5		Warning
<b>Cas No.:</b> 120-80-9		<b>Index No.:</b> 604-016-00-4		
<b>Hazard:</b> H302 H312 H315 H319				
<b>Precaution:</b> P280 P305+P351+P338 P301+P312 P302+P352				
Cat No.	Grade	Assay	Info.	Per
ESC55082		98%		100g



CERIUM (IV) SULPHATE (CERIC SULPHATE)				
$Ce(SO_4)_2 \cdot 4H_2O = 404.3g/mol$				
<b>UN Class:</b> N/A		<b>EC No.:</b> 237-029-5		Warning
<b>Cas No.:</b> 10294-42-5		<b>Index No.:</b> Not listed		
<b>Hazard:</b> H315 H319 H335				
<b>Precaution:</b> P261 P305+P351+P338 P302+P352				
Cat No.	Grade	Assay	Info.	Per
ESC55083		98%		25g



CHARCOAL-ACTIVATED (FOR GAS ABSORPTION 8-24 MESH)				
<b>UN Class:</b> 4.2 /UN1362 PG-III		<b>EC No.:</b> 231-153-3		
<b>Cas No.:</b> 7440-44-0		<b>Index No.:</b> Not listed		
<b>Hazard:</b> Not considered hazardous				
<b>Precaution:</b> No additional precautions required				
<b>Notes:</b> For Gas Absorption 8-24 Mesh				
Cat No.	Grade	Assay	Info.	Per
ESC55086		95%		250g
ESC55087		95%		500g

CHARCOAL WOOD LUMP				
<b>UN Class:</b> N/A		<b>EC No.:</b> 231-153-3		
<b>Cas No.:</b> 7440-44-0		<b>Index No.:</b> Not listed		
<b>Hazard:</b> Not considered hazardous				
<b>Precaution:</b> No additional precautions required				
Cat No.	Grade	Assay	Info.	Per
ESC55089		N/A		1kg

CHLORINE WATER					
					
<b>UN Class:</b> 8(5.1) /UN1791 PG-II		<b>EC No.:</b> 231-668-3		Warning	
<b>Cas No.:</b> 7681-52-9		<b>Index No.:</b> 017-011-00-1			
<b>Hazard:</b> H315 H319					
<b>Precaution:</b> No additional precautions required					
Cat No.	Grade	Assay	Info.	Price	Per
ESC55091		98%		15.95	500ml

CHLOROACETIC ACID				
$ClCH_2COOH = 94.5g/mol$				
				
<b>UN Class:</b> 6.1(8) /UN1751 PG-II		<b>EC No.:</b> 201-178-4		Danger
<b>Cas No.:</b> 79-11-8		<b>Index No.:</b> 607-003-00-1		
<b>Hazard:</b> H331 H311 H301 H314 H400				
<b>Precaution:</b> P261 P273 P280 P301+P310 P501				
Cat No.	Grade	Assay	Info.	Per
ESC55093		99%		100g

CHLOROBENZENE				
$C_6H_5Cl = 112.56g/mol$				
				
<b>UN Class:</b> 3 /UN1134 PG-III		<b>EC No.:</b> 203-628-5		Warning
<b>Cas No.:</b> 108-90-7		<b>Index No.:</b> 602-033-00-1		
<b>Hazard:</b> H226 H332 H411 H302 H315				
<b>Precaution:</b> P273				
Cat No.	Grade	Assay	Info.	Per
ESC55096		99%		2.5L

1-CHLOROBUTANE (BUTYL CHLORIDE)				
$CH_3(CH_2)_3Cl = 92.57g/mol$				
				
<b>UN Class:</b> 3 /UN1127 PG-II		<b>EC No.:</b> 203-696-6		Danger
<b>Cas No.:</b> 109-69-3		<b>Index No.:</b> 602-059-00-3		
<b>Hazard:</b> H225 H304 H412				
<b>Precaution:</b> P210 P273 P301+P310 P331 P403+P235				
Cat No.	Grade	Assay	Info.	Per
ESC54766		98%		1L



**1-CHLOROBUTANE (BUTYL CHLORIDE)** $\text{CH}_3(\text{CH}_2)_3\text{Cl} = 92.57\text{g/mol}$ 

**UN Class:** 3 /UN1127 PG-II      **EC No.:** 203-696-6      **Danger**  
**Cas No.:** 109-69-3      **Index No.:** 602-059-00-3

**Hazard:** H225 H304 H412  
**Precaution:** P210 P273 P301+P310 P331 P403+P235

Cat No.	Grade	Assay	Info.	Per
ESC54767		98%		100mL

**CHROMIUM (III) NITRATE 9-WATER** $\text{Cr}(\text{NO}_3)_3 \cdot 9\text{H}_2\text{O} = 400.15\text{g/mol}$ 

**UN Class:** 5.1 /UN2720 PG-III      **EC No.:** 236-921-1      **Warning**  
**Cas No.:** 7789-02-8      **Index No.:** Not listed

**Hazard:** H272 H315 H319  
**Precaution:** P210 P280 P305+P351+P338 P337+P313

Cat No.	Grade	Assay	Info.	Per
ESC55108		96%		500g

**CHLOROFORM (TRICHLOROMETHANE)** $\text{CHCl}_3 = 119.38\text{g/mol}$ 

**UN Class:** 6.1 /UN1888 PG-III      **EC No.:** 200-663-8      **Warning**  
**Cas No.:** 67-66-3      **Index No.:** 602-006-00-4

**Hazard:** H351 H302 H373 H315  
**Precaution:** P281 P302+P352 P309+P311

Cat No.	Grade	Assay	Info.	Per
ESC55100		99.5%		2.5L

**CHROMIUM (III) OXIDE** $\text{Cr}_2\text{O}_3 = 151.99\text{g/mol}$ 

**UN Class:** N/A      **EC No.:** 215-160-9  
**Cas No.:** 1308-38-9      **Index No.:** Not listed

**Hazard:** Not considered hazardous  
**Precaution:** No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC55112		99%		500g

**2-CHLORO-2-METHYLPROPANE (TERT-BUTYL CHLORIDE)** $(\text{CH}_3)_3\text{CCl} = 92.57\text{g/mol}$ 

**UN Class:** 3 /UN1127 PG-II      **EC No.:** 208-066-4      **Danger**  
**Cas No.:** 507-20-0      **Index No.:** Not listed

**Hazard:** H225  
**Precaution:** P210

Cat No.	Grade	Assay	Info.	Per
ESC55102		98%		100ml

**CHROMIUM (III) POTASSIUM SULPHATE 12-WATER (ALUM CHROME)** $\text{CrK}(\text{SO}_4)_2 \cdot 12\text{H}_2\text{O} = 499.39\text{g/mol}$ 

**UN Class:** N/A      **EC No.:** 233-401-6      **Warning**  
**Cas No.:** 7788-99-0      **Index No.:** Not listed

**Hazard:** H315 H319  
**Precaution:** P280 P302+P352 P305+P351+P338

Cat No.	Grade	Assay	Info.	Per
ESC55116		99%		500g

**CHOLESTEROL** $\text{C}_{27}\text{H}_{46}\text{O} = 386.66\text{g/mol}$ 

**UN Class:** N/A      **EC No.:** 200-353-2  
**Cas No.:** 57-88-5      **Index No.:** Not listed

**Hazard:** Not considered hazardous  
**Precaution:** No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC55103		95%		25g



**CINNAMIC ACID (3-PHENYLACRYLIC ACID)** $\text{C}_6\text{H}_5\text{CH}=\text{CH} \cdot \text{COOH} = 148.16\text{g/mol}$ 





**UN Class:** N/A      **EC No.:** 205-398-1      **Warning**  
**Cas No.:** 140-10-3      **Index No.:** Not listed


**Hazard:** H315 H319 H335  
**Precaution:** P261 P305+P351+P338



Cat No.	Grade	Assay	Info.	Per
ESC55118		99%		100g










CITRIC ACID ANHYDROUS				
$\text{HOC}(\text{COOH})(\text{CH}_2\text{COOH})_2 = 192.13\text{g/mol}$ 				
<b>UN Class:</b> N/A		<b>EC No.:</b> 201-069-1		Warning
<b>Cas No.:</b> 77-92-9		<b>Index No.:</b> Not listed		
<b>Hazard:</b> H319				
<b>Precaution:</b> P305+P351+P338				
Cat No.	Grade	Assay	Info.	Per
ESC55128		99.5%		500g





CITRIC ACID 1-WATER				
$\text{HOC}(\text{COOH})(\text{CH}_2\text{COOH})_2 \cdot \text{H}_2\text{O} = 210.14\text{g/mol}$  				
<b>UN Class:</b> N/A		<b>EC No.:</b> 201-069-1		Danger
<b>Cas No.:</b> 5949-29-1		<b>Index No.:</b> Not listed		
<b>Hazard:</b> H318 H335 H315				
<b>Precaution:</b> P261 P280 P305+P351+P338				
Cat No.	Grade	Assay	Info.	Per
ESC55122		99%		500g
ESC55123		99%		1kg




CLAY POWDER				
<b>UN Class:</b> N/A		<b>EC No.:</b> N/A		
<b>Cas No.:</b> N/A		<b>Index No.:</b> Not listed		
<b>Hazard:</b> Not considered hazardous				
<b>Precaution:</b> No additional precautions required				
Cat No.	Grade	Assay	Info.	Per
ESC55125		N/A		1kg





COBALT METAL - POWDER				
$\text{Co} = 58.93\text{g/mol}$ 				
<b>UN Class:</b> 4.1 / UN3089 PG-II		<b>EC No.:</b> 231-158-0		Danger
<b>Cas No.:</b> 7440-48-4		<b>Index No.:</b> 027-001-00-9		
<b>Hazard:</b> H334 H317 H413				
<b>Precaution:</b> P261 P280 P342+P311				
Cat No.	Grade	Assay	Info.	Per
ESC55130		98%		250g




COBALT (II) CARBONATE BASIC				
$\text{CoCO}_3 \cdot [\text{Co}(\text{OH})_2]_n \cdot \text{H}_2\text{O} = 516.72\text{g/mol}$  				
<b>UN Class:</b> N/A		<b>EC No.:</b> 208-169-4		Danger
<b>Cas No.:</b> 57454-67-8		<b>Index No.:</b> 027-010-00-8		
<b>Hazard:</b> H350i H341 H360F H334 H317 H410				
<b>Precaution:</b> P261 P280 P305+P351+P338				
Cat No.	Grade	Assay	Info.	Per
ESC55132		Co = 45-50%		500g

COBALT (II) CHLORIDE 6-WATER				
$\text{CoCl}_2 \cdot 6\text{H}_2\text{O} = 237.93\text{g/mol}$   				
<b>UN Class:</b> 9 / UN3077 PG-III		<b>EC No.:</b> 231-589-4		Danger
<b>Cas No.:</b> 7791-13-1		<b>Index No.:</b> 027-004-00-5		
<b>Hazard:</b> H350i H341 H360F H302 H334 H317 H410				
<b>Precaution:</b> P201 P261 P273 P280 P302+P352 P308+P313 P501				
Cat No.	Grade	Assay	Info.	Per
ESC55134		98%		250g

COBALT (II) NITRATE 6-WATER				
$\text{Co}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O} = 291.03\text{g/mol}$   				
<b>UN Class:</b> 5.1 / UN1477 PG-II		<b>EC No.:</b> 233-402-1		Danger
<b>Cas No.:</b> 10026-22-9		<b>Index No.:</b> Not listed		
<b>Hazard:</b> H272 H302 H317 H350i H341 H360DF H334				
<b>Precaution:</b> P201 P210 P220 P273 P261 P280 P284 P304+P340				
Cat No.	Grade	Assay	Info.	Per
ESC55136		97%		500g

COBALT (II) OXIDE - BLACK (TRICOBALT TETRAOXIDE)				
$\text{Co}_3\text{O}_4 = 240.8\text{g/mol}$  				
<b>UN Class:</b> N/A		<b>EC No.:</b> 215-157-2		Danger
<b>Cas No.:</b> 1308-06-1		<b>Index No.:</b> Not listed		
<b>Hazard:</b> H334 H350i H412				
<b>Precaution:</b> P201 P261 P273 P284 P304+P340				
Cat No.	Grade	Assay	Info.	Per
ESC55142		97%		100g

COBALT (II) SULPHATE 7-WATER				
$\text{CoSO}_4 \cdot 7\text{H}_2\text{O} = 281.1\text{g/mol}$   				
<b>UN Class:</b> 9 / UN3077 PG-III		<b>EC No.:</b> 233-334-2		Danger
<b>Cas No.:</b> 10026-24-1		<b>Index No.:</b> 027-005-00-0		
<b>Hazard:</b> H350i H341 H360F H302 H334 H317 H410				
<b>Precaution:</b> P201 P273 P281 P285 P302+P352 P304+P341 P309+P311				
Cat No.	Grade	Assay	Info.	Per
ESC55138		97%		100g

COPPER METAL - POWDER - FINE				
$\text{Cu} = 63.55\text{g/mol}$  				
<b>UN Class:</b> 4.1 / UN3089 PG-II		<b>EC No.:</b> 231-159-6		Danger
<b>Cas No.:</b> 7440-50-8		<b>Index No.:</b> 027-005-00-0		
<b>Hazard:</b> H228 H410				
<b>Precaution:</b> P210 P273				
Cat No.	Grade	Assay	Info.	Per
ESC55172		99%		100g





**COPPER METAL**

Cu = 63.55g/mol

UN Class: N/A EC No.: 231-159-6  
 Cas No.: 7440-50-8 Index No.: Not listed

Hazard: Not considered hazardous  
 Precaution: No additional precautions required


Cat No.	Grade	Assay	Info.	Per
ESC55176		98%	Granules	100g
ESC55177		98%	Millings	500g

**COPPER METAL - FOIL 0.25 MM**

Cu = 63.55g/mol

UN Class: N/A EC No.: 231-159-6  
 Cas No.: 7440-50-8 Index No.: Not listed

Hazard: Not considered hazardous  
 Precaution: No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC55180		99%		250g


**COPPER (I) CHLORIDE (CUPROUS CHLORIDE)**

CuCl = 99g/mol



UN Class: 8 / UN2802 PG-III EC No.: 231-842-9 Warning  
 Cas No.: 7758-89-6 Index No.: 029-001-00-4



Hazard: H302 H315 H318 H410  
 Precaution: P273 P280 P305+P351+P338 P501

Cat No.	Grade	Assay	Info.	Per
ESC55146		96%		500g

**COPPER (I) OXIDE (CUPROUS OXIDE)**Cu<sub>2</sub>O = 143.09g/mol

UN Class: 9 / UN3077 PG-III EC No.: 215-270-7 Warning  
 Cas No.: 1317-39-1 Index No.: 029-002-00-X


Hazard: H302 H410  
 Precaution: P273 P501

Cat No.	Grade	Assay	Info.	Per
ESC55163		95%		100g
ESC55165		95%		500g

**CHROMIUM (III) CHLORIDE 6-WATER (CHROMIUM TRICHLORIDE)**CrCl<sub>3</sub> • 6H<sub>2</sub>O = 266.45g/mol

UN Class: N/A EC No.: 233-038-3  
 Cas No.: 10060-12-5 Index No.: Not listed


Hazard: H302  
 Precaution: P301+P312 P310

Cat No.	Grade	Assay	Info.	Per
ESC55104		95%		500g

**COPPER (II) BROMIDE (CUPRIC BROMIDE)**CuBr<sub>2</sub> = 223.35g/mol

UN Class: 8 / UN3260 PG-III EC No.: 232-167-2 Danger  
 Cas No.: 7789-45-9 Index No.: Not listed



Hazard: H302 H314 H400 H410  
 Precaution: P280 P273 P301+P330+P331 P304+P340 P309+P311 P310

Cat No.	Grade	Assay	Info.	Per
ESC55144		98%		100g

**COPPER (II) CARBONATE BASIC (CUPRIC CARBONATE BASIC)**CuCO<sub>3</sub> • Cu(OH)<sub>2</sub> = 221.12g/mol

UN Class: N/A EC No.: 235-113-6 Warning  
 Cas No.: 12069-69-1 Index No.: Not listed


Hazard: H302 H315 H319 H335 H400  
 Precaution: P261 P273 P305+P351+P338

Cat No.	Grade	Assay	Info.	Per
ESC55151		Cu = 54%		250g
ESC55152		Cu = 54%		500g

**COPPER (II) CHLORIDE 2-WATER (CUPRIC CHLORIDE)**CuCl<sub>2</sub> • 2H<sub>2</sub>O = 170.48g/mol

UN Class: 8 / UN2802 PG-III EC No.: 231-210-2 Warning  
 Cas No.: 10125-13-0 Index No.: Not listed


Hazard: H302 H315 H319 H335 H400  
 Precaution: P261 P273 P280 P305+P351+P338 P391

Cat No.	Grade	Assay	Info.	Per
ESC55156		96%		500g

**COPPER (II) NITRATE 3-WATER (CUPRIC NITRATE)**Cu(NO<sub>3</sub>)<sub>2</sub> • 3H<sub>2</sub>O = 241.6g/mol

UN Class: 5.1 / UN1477 PG-II EC No.: 221-838-5 Danger  
 Cas No.: 10031-43-3 Index No.: Not listed

Hazard: H272 H302 H315 H319 H400  
 Precaution: P210 P273 P280 P302+P352 P305+P351+P338 P309+P311

Cat No.	Grade	Assay	Info.	Per
ESC55160		98.5%		500g





COPPER (II) SULPHATE - ANHYDROUS (CUPRIC SULPHATE)				
CuSO <sub>4</sub> = 159.61g/mol				
<b>UN Class:</b> 9 /UN3077 PG-III		<b>EC No.:</b> 231-847-6		Warning
<b>Cas No.:</b> 7758-98-7		<b>Index No.:</b> 029-004-00-0		
<b>Hazard:</b> H302 H319 H315 H410				
<b>Precaution:</b> P273 P305+P351+P338 P501				
Cat No.	Grade	Assay	Info.	Per
ESC55184		97%		500g

COPPER (II) OXIDE (CUPRIC OXIDE)				
CuO = 79.55g/mol				
<b>UN Class:</b> 9 /UN3077 PG-III		<b>EC No.:</b> 215-269-1		Warning
<b>Cas No.:</b> 1317-38-0		<b>Index No.:</b> Not listed		
<b>Hazard:</b> H302 H410				
<b>Precaution:</b> P273 P501				
Cat No.	Grade	Assay	Info.	Per
ESC55167		96%	Black powder	250g
ESC55168		96%	Black powder	500g

COPPER (II) SULPHATE 5-WATER (CUPRIC SULPHATE PENTAHYDRATE)				
CuSO <sub>4</sub> · 5H <sub>2</sub> O = 249.69g/mol				
<b>UN Class:</b> 9 /UN3077 PG-III		<b>EC No.:</b> 231-847-6		Warning
<b>Cas No.:</b> 7758-99-8		<b>Index No.:</b> 029-004-00-0		
<b>Hazard:</b> H302 H319 H315 H410				
<b>Precaution:</b> P273 P305+P351+P338 P501				
Cat No.	Grade	Assay	Info.	Per
ESC55186		98%	Black powder	500g

CRESOL RED INDICATOR (O-CRESOLSULFONPHTHALEIN)				
C <sub>21</sub> H <sub>18</sub> O <sub>5</sub> S = 382.43g/mol				
<b>UN Class:</b> N/A		<b>EC No.:</b> 217-064-2		Warning
<b>Cas No.:</b> 1733-12-6		<b>Index No.:</b> Not listed		
<b>Hazard:</b> H315 H319 H335				
<b>Precaution:</b> P261 P280 P302+P352 P305+P351+P338				
Cat No.	Grade	Assay	Info.	Per
ESC55196		N/A	pH 0.2-1.8, pH 7.2-8.8	25g

CRESOL RED 0.02% AQUEOUS SOLUTION				
<b>UN Class:</b> N/A		<b>EC No.:</b> N/A		
<b>Cas No.:</b> 1733-12-6		<b>Index No.:</b> Not listed		
<b>Hazard:</b> Not considered hazardous				
<b>Precaution:</b> No additional precautions required				
<b>Notes:</b> pH 0.2-1.8 - Red to Yellow; pH 7.2-8.8 - Yellow to Red				
Cat No.	Grade	Assay	Info.	Per
ESC55192		0.02%	Solution	500ml

CRYSTAL VIOLET C.I.42555 (BASIC VIOLET 3, GENTIAN VIOLET)				
C <sub>25</sub> H <sub>30</sub> N <sub>3</sub> Cl = 407.98g/mol				
<b>UN Class:</b> 9 /UN3077 PG-III		<b>EC No.:</b> 208-953-6		Danger
<b>Cas No.:</b> 548-62-9		<b>Index No.:</b> 612-204-00-2		
<b>Hazard:</b> H351 H302 H318 H410				
<b>Precaution:</b> P273 P280 P305+P351+P338				
Cat No.	Grade	Assay	Info.	Per
ESC55200		N/A		50g

CRYSTAL VIOLET AQUEOUS SOLUTION				
C <sub>25</sub> H <sub>30</sub> N <sub>3</sub> Cl = 407.98g/mol				
<b>UN Class:</b> N/A		<b>EC No.:</b> N/A		Warning
<b>Cas No.:</b> N/A		<b>Index No.:</b> Not listed		
<b>Hazard:</b> H319 H351 H411				
<b>Precaution:</b> P273 P281 P305+P351+P338				
Cat No.	Grade	Assay	Info.	Per
ESC55202		1%	Aq. Solution	100ml

CYCLOHEXANE				
C <sub>6</sub> H <sub>12</sub> = 84.16g/mol				
<b>UN Class:</b> 3 /UN1145 PG-II		<b>EC No.:</b> 203-806-2		Danger
<b>Cas No.:</b> 110-82-7		<b>Index No.:</b> 601-017-00-1		
<b>Hazard:</b> H225 H304 H315 H336 H410				
<b>Precaution:</b> P210 P261 P273 P301+P330+P331 P331 P501				
Cat No.	Grade	Assay	Info.	Per
ESC55206		98%	Aq. Solution	500ml

CYCLOHEXANOL				
C <sub>6</sub> H <sub>11</sub> OH = 100.16g/mol				
<b>UN Class:</b> N/A		<b>EC No.:</b> 203-630-6		Warning
<b>Cas No.:</b> 108-93-0		<b>Index No.:</b> 603-009-00-3		
<b>Hazard:</b> H332 H302 H335 H315				
<b>Precaution:</b> P261				
<b>Notes:</b> High M.P.T Solid at Room temperature				
Cat No.	Grade	Assay	Info.	Per
ESC55210		99%		500ml

CYCLOHEXANONE				
CH <sub>3</sub> (CH <sub>2</sub> ) <sub>4</sub> CO = 98.14g/mol				
<b>UN Class:</b> 3 /UN1915 PG-III		<b>EC No.:</b> 203-631-1		Warning
<b>Cas No.:</b> 108-94-1		<b>Index No.:</b> 606-010-00-7		
<b>Hazard:</b> H226 H332				
<b>Precaution:</b> P210 P243 P280 P304+P340 P313				
Cat No.	Grade	Assay	Info.	Per
ESC55213		99%		500ml



**CYCLOHEXENE (TETRAHYDROBENZENE)** $C_6H_{10} = 82.15g/mol$ 

**UN Class:** 3 /UN2256 PG-II **EC No.:** 203-807-8 **Danger**  
**Cas No.:** 110-83-8 **Index No.:** Not listed  
**Hazard:** H225 H302 H311 H304  
**Precaution:** P210 P280 P304 P301+P312 P313

Cat No.	Grade	Assay	Info.	Per
ESC55215		99%		500ml
ESC55216		99%		1L

**DECANE** $CH_3(CH_2)_8CH_3 = 142.28g/mol$ 

**UN Class:** 3 /UN2247 PG-III **EC No.:** 204-686-4 **Danger**  
**Cas No.:** 124-18-5 **Index No.:** Not listed  
**Hazard:** H226 H304  
**Precaution:** P301+P310 P331

Cat No.	Grade	Assay	Info.	Per
ESC55218		99%		25ml

**DECANEDIOYL CHLORIDE SEE SEBACOYL CHLORIDE****1,2-DIAMINOETHANE SEE ETHYLENEDIAMINE****1,6-DIAMINOHEXANE (HEXAMETHYLENEDIAMINE)** $NH_2(CH_2)_6NH_2 = 116.21g/mol$ 

**UN Class:** 8 /UN2280 PG-III **EC No.:** 204-679-6 **Danger**  
**Cas No.:** 124-09-4 **Index No.:** 612-104-00-9  
**Hazard:** H314 H302 H312 H335  
**Precaution:** P261 P280 P304 P305+P351+P338 P312

Cat No.	Grade	Assay	Info.	Per
ESC55219		98%		25g

**1-6-DIAMINOHEXANE 5% AQUEOUS SOLUTION**

N/A



**UN Class:** 8 /UN3267 PG-III **EC No.:** 204-679-6 **Warning**  
**Cas No.:** 124-09-4 **Index No.:** Not listed  
**Hazard:** H315 H319  
**Precaution:** P280 P305+P351+P338

Cat No.	Grade	Assay	Info.	Per
ESC55220		5%	Aq. Solution	250ml

**2,4-DINITROPHENYLHYDRAZINE (DNPH)** $(NO_2)_2C_6H_3NHNH_2 = 198.14g/mol$ 

**UN Class:** 4.1 /UN3380 PG-I **EC No.:** 204-309-3 **Danger**  
**Cas No.:** 119-26-6 **Index No.:** Not listed  
**Hazard:** H228 H302  
**Precaution:** P210 P240 P280 P302 P312

Cat No.	Grade	Assay	Info.	Per
ESC54772		97%	SURCHARGE	50g

**DIBUTYL PHTHALATE (N-BUTYL PHTHALATE)** $C_6H_4-1,2-[CO_2(CH_2)_3CH_3]_2 = 278.35g/mol$ 

**UN Class:** 9 /UN3082 PG-III **EC No.:** 201-557-4 **Danger**  
**Cas No.:** 84-74-2 **Index No.:** 607-318-00-4  
**Hazard:** H360Df H400  
**Precaution:** P201 P273 P308+P313

Cat No.	Grade	Assay	Info.	Per
ESC55221		99%		1L

**DICHLOROACETIC ACID** $Cl_2CHCOOH = 128.94g/mol$ 

**UN Class:** 8 /UN1764 PG-II **EC No.:** 201-207-0 **Danger**  
**Cas No.:** 79-43-6 **Index No.:** 607-066-00-5  
**Hazard:** H314 H400  
**Precaution:** P273 P280 P305+P351+P338 P310

Cat No.	Grade	Assay	Info.	Per
ESC55223		98%		100ml

**1,4-DICHLOROBENZENE (P-DICHLOROBENZENE)** $C_6H_4Cl_2 = 147g/mol$ 

**UN Class:** 9 /UN3077 PG-III **EC No.:** 203-400-5 **Warning**  
**Cas No.:** 106-46-7 **Index No.:** 602-035-00-2  
**Hazard:** H351 H319 H410  
**Precaution:** P201 P273 P281 P305+P351+P338 P308+P313



Cat No.	Grade	Assay	Info.	Per
ESC55225		97%		250g



**DICHLOROMETHANE (METHYLENE CHLORIDE)** $CH_2Cl_2 = 84.93g/mol$ 



**UN Class:** 6.1 /UN1593 PG-III **EC No.:** 200-838-9 **Warning**  
**Cas No.:** 75-09-2 **Index No.:** 602-004-00-3  
**Hazard:** H351  
**Precaution:** P260 P281 P308+P313 P501 P403+P235



Cat No.	Grade	Assay	Info.	Per
ESC55240		98%		2.5L






DIPHENYLAMINE				
$(C_6H_5)_2NH = 169.23g/mol$				
				
<b>UN Class:</b> 9 /UN3077 PG-III		<b>EC No.:</b> 204-539-4		Danger
<b>Cas No.:</b> 122-39-4		<b>Index No.:</b> 612-026-00-5		
<b>Hazard:</b> H331 H311 H301 H373 H410				
<b>Precaution:</b> P273 P280 P302+P352 P304+P340 P309 P311				
Cat No.	Grade	Assay	Info.	Per
ESC55242		99%		100g



EDTA DISODIUM SALT (ETHYLENEDIAMINETETRAACETIC ACID)				
$C_{10}H_{14}N_2Na_2O_8 \cdot 2H_2O = 372.24g/mol$				
				
<b>UN Class:</b> N/A		<b>EC No.:</b> 205-358-3		Warning
<b>Cas No.:</b> 6381-92-6		<b>Index No.:</b> Not listed		
<b>Hazard:</b> H332 H373				
<b>Precaution:</b> P260				
Cat No.	Grade	Assay	Info.	Per
ESC55268		98%		500g



2,6-DICHLOROPHENOLINDOPHENOL (DCPIP)				
<b>UN Class:</b> N/A				
<b>Cas No.:</b> 620-45-1				
<b>Hazard:</b> Not considered hazardous				
<b>Precaution:</b> No additional precautions required				
Cat No.	Grade	Assay	Info.	Per
ESC54778		96%	Powder	1g
ESC54779		96%	Powder	5g


EOSIN C.I.45380 (ACID RED 87)				
N/A				
				
<b>UN Class:</b> N/A		<b>EC No.:</b> 241-409-6		Warning
<b>Cas No.:</b> 17372-87-1		<b>Index No.:</b> Not listed		
<b>Hazard:</b> H319				
<b>Precaution:</b> P305+P351+P338				
Cat No.	Grade	Assay	Info.	Per
ESC55276		N/A	Powder	5g



DIETHYL ETHER (ETHOXYETHANE)				
$(CH_3CH_2)_2O = 74.12g/mol$				
				
<b>UN Class:</b> 3 /UN1155 PG-I		<b>EC No.:</b> 200-467-2		Danger
<b>Cas No.:</b> 60-29-7		<b>Index No.:</b> 603-022-00-4		
<b>Hazard:</b> H224 H302 H336 EUH019 EUH066				
<b>Precaution:</b> P210 P261				
Cat No.	Grade	Assay	Info.	Per
ESC55244		98%	SURCHARGE	1L

EOSIN 5% AQUEOUS SOLUTION				
<b>UN Class:</b> N/A				
<b>Cas No.:</b> N/A				
<b>Hazard:</b> Not considered hazardous				
<b>Precaution:</b> No additional precautions required				
Cat No.	Grade	Assay	Info.	Per
ESC55272		5%	Aq. Solution	100ml

DITHIZONE (1,5-DIPHENYL-3-THIOCARBAZONE)				
$C_6H_5NHNHCSN=NC_6H_5 = 256.32g/mol$				
				
<b>UN Class:</b> N/A		<b>EC No.:</b> 200-454-1		Warning
<b>Cas No.:</b> 60-10-6		<b>Index No.:</b> Not listed		
<b>Hazard:</b> H315 H319 H335				
<b>Precaution:</b> P280 P302+P352 P305+P351+P338				
Cat No.	Grade	Assay	Info.	Per
ESC55246		98%		5g

ERIOCHROME BLACK T C.I.14645				
$C_2O_{12}N_3NaO_7S = 461.38g/mol$				
<b>UN Class:</b> N/A				
<b>Cas No.:</b> 1787-61-7				
<b>Hazard:</b> Not considered hazardous				
<b>Precaution:</b> No additional precautions required				
Cat No.	Grade	Assay	Info.	Per
ESC55280		N/A	6.2 - 11.55	50g
ESC55281		N/A	6.2 - 11.55	100g

DUTCH METAL LEAF				
<b>UN Class:</b> N/A				
<b>Cas No.:</b> N/A				
<b>Hazard:</b> Not considered hazardous				
<b>Precaution:</b> No additional precautions required				
Cat No.	Grade	Assay	Info.	Per
ESC55264		N/A	140 x 150mm	Bk25

ETHANOL (ETHYL ALCOHOL)				
$C_2H_5OH = 46.07g/mol$				
				
<b>UN Class:</b> 3 /UN1170 PG-II		<b>EC No.:</b> 200-578-6		Danger
<b>Cas No.:</b> 64-17-5		<b>Index No.:</b> 603-002-00-5		
<b>Hazard:</b> H225				
<b>Precaution:</b> P210				
Cat No.	Grade	Assay	Info.	Per
ESC55288		99.9%		2.5L



ETHANAL SEE ACETALDEHYDE

ETHANEDIOIC ACID SEE OXALIC ACID

ETHANOIC ACID SEE ACETIC ACID

ETHANOIC ANHYDRIDE SEE ACETIC ANHYDRIDE

ETHOXYETHANE SEE DIETHYL ETHER

**ETHYL ACETATE (ETHYL ETHANOATE)** $\text{CH}_3\text{COOC}_2\text{H}_5 = 88.11\text{g/mol}$ 

-4°C

UN Class: 3 /UN1173 PG-II EC No.: 205-500-4 Danger  
Cas No.: 141-78-6 Index No.: 607-022-00-5Hazard: H225 H319 H336  
Precaution: P210 P261 P305+P351+P338

Cat No.	Grade	Assay	Info.	Per
ESC55284		99%		2.5L

**ETHYLAMINE 70% W/W SOLUTION (70% W/W IN WATER)** $\text{C}_2\text{H}_5\text{NH}_2 = 45.08\text{g/mol}$ 

-20°C

UN Class: 2.1 /UN1036 PG-II EC No.: 200-834-7 Danger  
Cas No.: 75-04-7 Index No.: 612-002-00-4Hazard: H225 H302 H311 H314 H335  
Precaution: P210 P261 P280 P305+P351+P338 P310

Cat No.	Grade	Assay	Info.	Per
ESC55296		70%		1L
ESC55297		70%		2.5L

**ETHYL-4-AMINO BENZOATE (BENZOCAINE)** $\text{NH}_2\text{C}_6\text{H}_4\text{COOC}_2\text{H}_5 = 165.19\text{g/mol}$ UN Class: N/A EC No.: 202-303-5 Warning  
Cas No.: 94-09-7 Index No.: Not listedHazard: H317  
Precaution: P280 P302+P352

Cat No.	Grade	Assay	Info.	Per
ESC55291		99%		50g

**ETHYL BENZOATE** $\text{C}_6\text{H}_5\text{COOC}_2\text{H}_5 = 150.17\text{g/mol}$ UN Class: N/A EC No.: 202-284-3  
Cas No.: 93-89-0 Index No.: Not listedHazard: Not considered hazardous  
Precaution: No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC55292		99%		100ml

**ETHYLENEDIAMINE (1,2-DIAMINOETHANE)** $\text{NH}_2\text{CH}_2\text{CH}_2\text{NH}_2 = 60.1\text{g/mol}$ UN Class: 8(3) /UN1604 PG-II EC No.: 203-468-6  
Cas No.: 107-15-3 Index No.: 612-006-00-6Hazard: H226 H312 H302 H314 H334 H317  
Precaution: P210 P243 P261 P280 P285 P301+P330+P331 P302+P352 P304+P340 P309

Cat No.	Grade	Assay	Info.	Per
ESC55308		97%		1L

**ETHYL FORMATE (FORMIC ACID ETHYL ESTER)** $\text{HCOOC}_2\text{H}_5 = 74.08\text{g/mol}$ 

-20°C

UN Class: 3 /UN1190 PG-II EC No.: 203-721-0 Danger  
Cas No.: 109-94-4 Index No.: 607-015-00-7Hazard: H225 H332 H302 H319 H335  
Precaution: P210 P240 P280 P304+P340 P305+P351+P338 P309

Cat No.	Grade	Assay	Info.	Per
ESC55310		98%		100ml

**ETHYLENE GLYCOL (ETHANE-1,2-DIOL)** $\text{HOCH}_2\text{CH}_2\text{OH} = 62.07\text{g/mol}$ UN Class: N/A EC No.: 203-473-3 Warning  
Cas No.: 107-21-1 Index No.: 603-027-00-1Hazard: H302  
Precaution: P301+P312

Cat No.	Grade	Assay	Info.	Per
ESC55304		99%		2.5L

**EVOLVE CH15 (COLD DEGREASING AGENT)**

N/A

UN Class: 3 /UN3295 PG-III EC No.: N/A Danger  
Cas No.: N/A Index No.: Not listedHazard: H350 H340 H304 EUH066  
Precaution: P201 P281 P301+P310 P308+P313

Cat No.	Grade	Assay	Info.	Per
ESC55306		N/A		500ml



**FEHLING'S SOLUTION NO.1 (COPPER SULPHATE SOLUTION)**



N/A



UN Class: N/A EC No.: N/A Warning  
Cas No.: N/A Index No.: Not listedHazard: H411  
Precaution: P273





Cat No.	Grade	Assay	Info.	Per
ESC55312		N/A		1L






FEHLING'S SOLUTION NO.2 (ALKALINE TARTRATE)				
N/A				
<b>UN Class:</b> 8 /UN1824 PG-II		<b>EC No.:</b> N/A		Danger
<b>Cas No.:</b> N/A		<b>Index No.:</b> Not listed		
<b>Hazard:</b> H314				
<b>Precaution:</b> P260 P280 P301+P330+P331 P309+P311				
Cat No.	Grade	Assay	Info.	Per
ESC55316		N/A		1L


FERROIN INDICATOR SOLUTION (1,10-PHENANTHROLINE IRON(II) SULFATE COMPLEX)				
N/A				
<b>UN Class:</b> N/A		<b>EC No.:</b> N/A		Warning
<b>Cas No.:</b> N/A		<b>Index No.:</b> Not listed		
<b>Hazard:</b> H411				
<b>Precaution:</b> P273				
Cat No.	Grade	Assay	Info.	Per
ESC55318		N/A		100ml



FLUORESCEIN C.I.45350 (ACID YELLOW 73)				
$C_{20}H_{12}O_5 = 332.31g/mol$				
<b>UN Class:</b> N/A		<b>EC No.:</b> 219-031-8		Warning
<b>Cas No.:</b> 2321-07-5		<b>Index No.:</b> Not listed		
<b>Hazard:</b> H319				
<b>Precaution:</b> P305+P351+P338				
Cat No.	Grade	Assay	Info.	Per
ESC55320		N/A		5g




FORMALDEHYDE (METHANAL)				
$HCHO = 30.03g/mol$				  
<b>UN Class:</b> 8 /UN2209 PG-III		<b>EC No.:</b> 200-001-8		Danger
<b>Cas No.:</b> 50-00-0		<b>Index No.:</b> 605-001-00-5		
<b>Hazard:</b> H301 H311 H314 H317 H331 H335 H341 H350 H371				
<b>Precaution:</b> P260 P261 P280 P281 P304+P340 P305+P351+P338 P309+P311				
Cat No.	Grade	Assay	Info.	Per
ESC55322			38-40% w/v	2.5L


FORMIC ACID (METHANOIC ACID)				
$HCOOH = 46.03g/mol$				
<b>UN Class:</b> 8(3) /UN1779 PG-II		<b>EC No.:</b> 200-579-1		Danger
<b>Cas No.:</b> 64-18-6		<b>Index No.:</b> 607-001-00-0		
<b>Hazard:</b> H314				
<b>Precaution:</b> P260 P280 P305+P351+P338 P310				
Cat No.	Grade	Assay	Info.	Per
ESC55324		90%		2.5L

FRENCH CHALK (TALC)				
<b>UN Class:</b> N/A		<b>EC No.:</b> 238-87-9		
<b>Cas No.:</b> 14807-96-6		<b>Index No.:</b> Not listed		
<b>Hazard:</b> H332				
<b>Precaution:</b> No additional precautions required				
Cat No.	Grade	Assay	Info.	Per
ESC55326		N/A		1kg

D (-) FRUCTOSE (D-LEVULOSE)				
$C_6H_{12}O_6 = 180.16g/mol$				
<b>UN Class:</b> N/A		<b>EC No.:</b> 200-333-3		
<b>Cas No.:</b> 57-48-7		<b>Index No.:</b> Not listed		
<b>Hazard:</b> Not considered hazardous				
<b>Precaution:</b> No additional precautions required				
Cat No.	Grade	Assay	Info.	Per
ESC55228		98%		500g

FUCHSIN ACID STAIN C.I.42685 (ACID VIOLET 19)				
$C_{20}H_{17}N_3Na_2O_9S_3 = 585.54g/mol$				
<b>UN Class:</b> N/A		<b>EC No.:</b> 221-816-5		
<b>Cas No.:</b> 3244-88-0		<b>Index No.:</b> Not listed		
<b>Hazard:</b> Not considered hazardous				
<b>Precaution:</b> No additional precautions required				
Cat No.	Grade	Assay	Info.	Per
ESC55328		98%		50g
ESC55329		98%		100g

FUCHSIN BASIC STAIN C.I.42510 (BASIC VIOLET 14)				
N/A				 
<b>UN Class:</b> N/A		<b>EC No.:</b> 211-189-6		Danger
<b>Cas No.:</b> 58969-01-0		<b>Index No.:</b> Not listed		
<b>Hazard:</b> H302 H351				
<b>Precaution:</b> P281				
Cat No.	Grade	Assay	Info.	Per
ESC55330		N/A		5g


D (+) GALACTOSE ANHYDROUS				
$C_6H_{12}O_6 = 180.16g/mol$				
<b>UN Class:</b> N/A		<b>EC No.:</b> 200-416-4		
<b>Cas No.:</b> 59-23-4		<b>Index No.:</b> Not listed		
<b>Hazard:</b> Not considered hazardous				
<b>Precaution:</b> No additional precautions required				
Cat No.	Grade	Assay	Info.	Per
ESC55230		98%		25g



**GELATINE POWDER**

UN Class: N/A EC No.: 232-554-6  
 Cas No.: 9000-70-8 Index No.: Not listed

Hazard: Not considered hazardous  
 Precaution: No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC55333		N/A		500g


**GENTIAN VIOLET SEE CRYSTAL VIOLET****GIBBERELIC ACID**

$C_{19}H_{22}O_6 = 346.37g/mol$



UN Class: N/A EC No.: 201-001-0 Warning  
 Cas No.: 77-06-5 Index No.: Not listed

Hazard: H319  
 Precaution: P305+P351+P338

Cat No.	Grade	Assay	Info.	Per
ESC55334		97%		1g

**GLASS WOOL**

UN Class: N/A EC No.: N/A  
 Cas No.: N/A Index No.: Not listed

Hazard: Not considered hazardous  
 Precaution: No additional precautions required


Cat No.	Grade	Assay	Info.	Per
ESC55335		N/A		500g

**D (+) GLUCOSE 1-WATER (DEXTRROSE MONOHYDRATE)**

$C_6H_{12}O_6 \cdot H_2O = 198.17g/mol$

UN Class: N/A EC No.: 218-914-5  
 Cas No.: 14431-43-7 Index No.: Not listed

Hazard: Not considered hazardous  
 Precaution: No additional precautions required


Cat No.	Grade	Assay	Info.	Per
ESC55234		98%		500g

**GLYCEROL TRIACETATE (TRIACETIN)**

$(CH_3COO)_3C_3H_5 = 218.21g/mol$

UN Class: N/A EC No.: 203-051-9  
 Cas No.: 102-76-1 Index No.: Not listed

Hazard: Not considered hazardous  
 Precaution: No additional precautions required


Cat No.	Grade	Assay	Info.	Per
ESC55342		98%		500ml

**D (+) GLUCOSE ANHYDROUS (DEXTROSE)**

$C_6H_{12}O_6 = 180.16g/mol$

UN Class: N/A EC No.: 200-075-1  
 Cas No.: 50-99-7 Index No.: Not listed

Hazard: Not considered hazardous  
 Precaution: No additional precautions required



Cat No.	Grade	Assay	Info.	Per
ESC55236		98%		250g

**GLUCOSE-1-PHOSPHATE DISODIUM SALT**

$C_6H_{11}O_9PNa_2 \cdot xH_2O = 304.1g/mol$

UN Class: N/A EC No.: 260-154-1  
 Cas No.: 56401-20-8 Index No.: Not listed

Hazard: Not considered hazardous  
 Precaution: No additional precautions required


Cat No.	Grade	Assay	Info.	Per
ESC55336		98%		1g
ESC55337		98%		5g

**L-GLUTAMIC ACID**

$HO_2CCH_2CH_2CH(NH_2)CO_2H = 147.13g/mol$

UN Class: N/A EC No.: 200-293-7  
 Cas No.: 56-86-0 Index No.: Not listed

Hazard: Not considered hazardous  
 Precaution: No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC55339		99%		100g



**GLYCEROL (GLYCERINE OR PROPANE-1,2,3-TRIOL)**

$HOCH_2CH(OH)CH_2OH = 92.09g/mol$



UN Class: N/A EC No.: 200-289-5 Warning  
 Cas No.: 56-81-5 Index No.: Not listed


Hazard: H319  
 Precaution: P305+P351+P338

Cat No.	Grade	Assay	Info.	Per
ESC55340		99%		1L
ESC55341		99%		2.5L




**GLYCINE (AMINOACETIC ACID)** $\text{NH}_2\text{CH}_2\text{COOH} = 75.07\text{g/mol}$ 

**UN Class:** N/A      **EC No.:** 200-272-2  
**Cas No.:** 56-40-6      **Index No.:** Not listed  
**Hazard:** Not considered hazardous  
**Precaution:** No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC55344		98.5%		100g

**GRAM'S IODINE SOLUTION**

**UN Class:** N/A      **EC No.:** N/A  
**Cas No.:** N/A      **Index No.:** Not listed  
**Hazard:** Not considered hazardous  
**Precaution:** No additional precautions required


Cat No.	Grade	Assay	Info.	Per
ESC55350		N/A		1L

**GRAPHITE (CARBON POWDER)**

C = 12.01g/mol




**UN Class:** N/A      **EC No.:** 231-955-3      **Warning**  
**Cas No.:** 7782-42-5      **Index No.:** Not listed  
**Hazard:** H319 H335  
**Precaution:** P261 P305+P351+P338

Cat No.	Grade	Assay	Info.	Per
ESC553348		95%	Powder	1kg

**GUM ARABIC SEE ACACIA POWDER****HEPTANE FRACTION FROM PETROLEUM** $\text{CH}_3(\text{CH}_2)_5 \cdot \text{CH}_3 = 100.21\text{g/mol}$ 

-25°C


**UN Class:** 3 /UN1206 PG-II      **EC No.:** 205-563-8      **Danger**  
**Cas No.:** 142-82-5      **Index No.:** 601-008-00-2  
**Hazard:** H225 H304 H315 H336 H410  
**Precaution:** P210 P241 P301+P310 P303+P361+P353 P405 P501

Cat No.	Grade	Assay	Info.	Per
ESC55648		85%		2.5L

**N-HEXANE** $\text{CH}_3(\text{CH}_2)_4\text{CH}_3 = 86.18\text{g/mol}$ 


-23°C

**UN Class:** 3 /UN1208 PG-II      **EC No.:** 203-777-6      **Danger**  
**Cas No.:** 110-54-3      **Index No.:** 601-037-00-0  
**Hazard:** H225 H361f H304 H373 H315 H336 H411  
**Precaution:** P210 P261 P273 P281 P301+P310 P331

Cat No.	Grade	Assay	Info.	Per
ESC55652		97%		2.5L

**HEPTAN-1-OL (HEPTYL ALCOHOL)** $\text{CH}_3(\text{CH}_2)_6\text{OH} = 116.2\text{g/mol}$ 



**UN Class:** N/A      **EC No.:** 203-897-9      **Warning**  
**Cas No.:** 111-70-6      **Index No.:** Not listed  
**Hazard:** H302 H312 H319  
**Precaution:** P280 P302+P352 P305+P351+P338 P309+P310

Cat No.	Grade	Assay	Info.	Per
ESC55352		>99%		100ml

**HEXANE FRACTION FROM PETROLEUM** $\text{CH}_3(\text{CH}_2)_4\text{CH}_3 = 86.18\text{g/mol}$ 


-23°C

**UN Class:** 3 /UN1208 PG-II      **EC No.:** 203-777-6      **Danger**  
**Cas No.:** 110-54-3      **Index No.:** 601-037-00-0  
**Hazard:** H225 H361f H304 H373 H315 H336 H411  
**Precaution:** P210 P261 P273 P281 P301+P310 P331

Cat No.	Grade	Assay	Info.	Per
ESC55654		85%		500ml
ESC55655		85%		2.5L

**HEXANE-1,6-DIAMINE SEE 1,6-DIAMINOHEXANE****HEXANEDIOIC ACID SEE ADIPIC ACID****HEXANOIC ACID (CAPROIC ACID)** $\text{CH}_3(\text{CH}_2)_4\text{COOH} = 116.16\text{g/mol}$ 


**UN Class:** 8 /UN2829 PG-III      **EC No.:** 205-550-7      **Danger**  
**Cas No.:** 142-62-1      **Index No.:** Not listed  
**Hazard:** H311 H314 H331  
**Precaution:** P261 P280 P305+P351+P338 P310

Cat No.	Grade	Assay	Info.	Per
ESC55656		99%		100ml

**HEXAN-1-OL (HEXYL ALCOHOL)** $\text{CH}_3(\text{CH}_2)_5\text{OH} = 102.17\text{g/mol}$ 

59°C

**UN Class:** 3 /UN2282 PG-III      **EC No.:** 203-852-3      **Warning**  
**Cas No.:** 111-27-3      **Index No.:** 603-059-00-6  
**Hazard:** H302  
**Precaution:** P301+P312

Cat No.	Grade	Assay	Info.	Per
ESC55657		98%		500ml



**HEX-1-ENE**CH<sub>3</sub>(CH<sub>2</sub>)<sub>3</sub>CH=CH<sub>2</sub> = 84.16g/mol

**UN Class:** 3 /UN2370 PG-II **EC No.:** 209-753-1 **Danger**  
**Cas No.:** 592-41-6 **Index No.:** Not listed  
**Hazard:** H225 H304  
**Precaution:** P210 P301+P310 P331

Cat No.	Grade	Assay	Info.	Per
ESC55658		98%		100ml

**HYDROCHLORIC ACID 1.0M (1.0N)**

Hcl = 36.46g/mol



**UN Class:** 8 /UN1789 PG-III **EC No.:** 231-595-7 **Warning**  
**Cas No.:** 7647-01-0 **Index No.:** 017-002-01-X  
**Hazard:** H315  
**Precaution:** P261 P280 P305+P351+P338

Cat No.	Grade	Assay	Info.	Per
ESC55357		1.0M		2.5L

**HYDROCHLORIC ACID - 36-38%**

Hcl = 36.46g/mol



**UN Class:** 8 /UN1789 PG-II **EC No.:** 231-595-7 **Danger**  
**Cas No.:** 7647-01-0 **Index No.:** 017-002-01-X  
**Hazard:** H314 H335 H290  
**Precaution:** P261 P280 P305+P351+P338 P310

Cat No.	Grade	Assay	Info.	Per
ESC55367		37%		1L
ESC55368		36-38%	SURCHARGE	1L
ESC55369		36-38%		2.5L

**HYDROCHLORIC ACID 2M**

Hcl = 36.46g/mol



**UN Class:** 8 /UN1789 PG-III **EC No.:** 231-595-7 **Warning**  
**Cas No.:** 7647-01-0 **Index No.:** 017-002-01-X  
**Hazard:** H314 H315 H335  
**Precaution:** P261 P302+352 P304+340 P305+P351+P338 P309+P311

Cat No.	Grade	Assay	Info.	Per
ESC55360		2.0M	Ampoule	1L

**HYDROCHLORIC ACID 0.1M (0.1N)**

Hcl = 36.46g/mol

**UN Class:** 8 /UN1789 PG-III **EC No.:** 231-595-7  
**Cas No.:** 7647-01-0 **Index No.:** 017-002-01-X  
**Hazard:** Not considered hazardous  
**Precaution:** No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC55355		0.1M		2.5L

**HYDROCHLORIC ACID 4M (4N)**

Hcl = 36.46g/mol



**UN Class:** 8 /UN1789 PG-III **EC No.:** 231-595-7 **Warning**  
**Cas No.:** 7647-01-0 **Index No.:** 017-002-01-X  
**Hazard:** H315 H319 H335  
**Precaution:** P261 P302+P352 P304+P340 P305+P351+P338 P309+P311

Cat No.	Grade	Assay	Info.	Per
ESC55362		4.0M	Ampoule	1L

**HYDROCHLORIC ACID 1.0M (1.0N) CVS**

Hcl = 36.46g/mol



**UN Class:** 8 /UN1789 PG-III **EC No.:** 231-595-7 **Danger**  
**Cas No.:** 7647-01-0 **Index No.:** 017-002-01-X  
**Hazard:** H314 H335  
**Precaution:** P261 P280 P305+P351+P338 P310  
**Notes:** 6 x 1M 100ml ampoules, each makes 1L of 0.1M solution.  
**Chemical info shown for ampoule not diluted solution.**

Cat No.	Grade	Assay	Info.	Per
ESC55356		0.1M	Ampoule	6



**HYDROGEL (SODIUM POLYACRYLATE)**(C<sub>3</sub>H<sub>3</sub>NaO<sub>2</sub>)<sub>n</sub>



**UN Class:** N/A **EC No.:** N/A  
**Cas No.:** 9003-04-7 **Index No.:** Not listed  
**Hazard:** Not considered hazardous  
**Precaution:** No additional precautions required




Cat No.	Grade	Assay	Info.	Per
ESC55372		95%		500g










HYDROQUINONE (BENZENE-1,4-DIOL OR QUINOL)				
$C_6H_4(OH)_2 = 110.11g/mol$ 				
<b>UN Class:</b> 9 /UN3077 PG-III		<b>EC No.:</b> 204-617-8		
<b>Cas No.:</b> 123-31-9		<b>Index No.:</b> 604-005-00-4		
<b>Hazard:</b> H351 H341 H302 H318 H312 H400				
<b>Precaution:</b> P273 P280 P305+P351+P338 P301+P312				
Cat No.	Grade	Assay	Info.	Per
ESC55374		99%		100g



HYDROGEN PEROXIDE 20 VOLS (DIOXIDANE)				
$H_2O_2 = 34.01g/mol$ 				
<b>UN Class:</b> N/A		<b>EC No.:</b> 231-765-0		Warning
<b>Cas No.:</b> 7722-84-1		<b>Index No.:</b> 008-003-00-9		
<b>Hazard:</b> H302 H319				
<b>Precaution:</b> P305+P351+P338 P337+P313				
Cat No.	Grade	Assay	Info.	Per
ESC55380		6% w/v		2L


HYDROGEN PEROXIDE 100 VOLS (DIOXIDANE)				
$H_2O_2 = 34.01g/mol$ 				
<b>UN Class:</b> 5.1 /UN2014 PG-II		<b>EC No.:</b> 231-765-0		Danger
<b>Cas No.:</b> 7722-84-1		<b>Index No.:</b> 008-003-00-9		
<b>Hazard:</b> H302 H315 H318 H355				
<b>Precaution:</b> P261 P280 P301+P312 P302+P351 P304+P340 P305+P351+P338				
Cat No.	Grade	Assay	Info.	Per
ESC55376		29-30%		1L
ESC55378		29-30%		500ml



HYDROXYLAMMONIUM CHLORIDE (HYDROXYLAMINE HYDROCHLORIDE)				
$NH_2OH \cdot HCl = 69.49g/mol$ 				
<b>UN Class:</b> 8(6.1) /UN2923 PG-II		<b>EC No.:</b> 226-798-2		Warning
<b>Cas No.:</b> 5470-11-1		<b>Index No.:</b> 612-123-00-2		
<b>Hazard:</b> H290 H351 H312 H302 H373 H319 H315 H317 H400				
<b>Precaution:</b> P201 P273 P281 P302+P352 P305+P351+P338 P309+P311				
Cat No.	Grade	Assay	Info.	Per
ESC55382		98%		100g

INDIGO CARMINE C.I.73015				
N/A 				
<b>UN Class:</b> N/A		<b>EC No.:</b> 212-728-8		Warning
<b>Cas No.:</b> 860-22-0		<b>Index No.:</b> Not listed		
<b>Hazard:</b> H302				
<b>Precaution:</b> P264 P270 P301+P312 P330 P501				
Cat No.	Grade	Assay	Info.	Per
ESC55384		N/A	11.4- 13.0	5g

INDOL-3-YL-ACETIC ACID (IAA)				
$C_{10}H_9NO_2 = 175.18g/mol$				
<b>UN Class:</b> N/A		<b>EC No.:</b> 201-748-2		
<b>Cas No.:</b> 87-51-4		<b>Index No.:</b> Not listed		
<b>Hazard:</b> Not considered hazardous				
<b>Precaution:</b> No additional precautions required				
Cat No.	Grade	Assay	Info.	Per
ESC55386		96%		1g

IODINE				
$I_2 = 253.81g/mol$ 				
<b>UN Class:</b> 8(6.1) /UN3495 PG-III		<b>EC No.:</b> 231-442-4		Warning
<b>Cas No.:</b> 7553-56-2		<b>Index No.:</b> 053-001-00-3		
<b>Hazard:</b> H332 H312 H400				
<b>Precaution:</b> P273 P280				
Cat No.	Grade	Assay	Info.	Per
ESC55395		99.5%		100g

IODINE 0.05M (0.1N) SOLUTION				
$I_2 = 253.81g/mol$				
<b>UN Class:</b> 8(6.1) /UN3495 PG-III		<b>EC No.:</b> 231-442-4		
<b>Cas No.:</b> 7553-56-2		<b>Index No.:</b> 053-001-00-3		
<b>Hazard:</b> Not considered hazardous				
<b>Precaution:</b> No additional precautions required				
Cat No.	Grade	Assay	Info.	Per
ESC55389		0.05M	Solution	500ml
ESC55388		0.05M	Solution	1L

IODINE 1% SOLUTION IN KI				
<b>UN Class:</b> N/A		<b>EC No.:</b> N/A		
<b>Cas No.:</b> N/A		<b>Index No.:</b> Not listed		
<b>Hazard:</b> Not considered hazardous				
<b>Precaution:</b> No additional precautions required				
Cat No.	Grade	Assay	Info.	Per
ESC55392		1%		500ml
ESC55393		1%		1L



**1-IODOBUTANE (BUTYL IODIDE)**CH<sub>3</sub>(CH<sub>2</sub>)<sub>3</sub>I = 184.02g/mol

33°C

**UN Class:** 3 /UN1993 PG-III **EC No.:** 208-824-4 **Danger**  
**Cas No.:** 542-69-8 **Index No.:** Not listed

**Hazard:** H226 H331  
**Precaution:** P210 P405 P501

Cat No.	Grade	Assay	Info.	Per
ESC55398		99%		25ml

**IDOETHANE (ETHYL IODIDE)**C<sub>2</sub>H<sub>5</sub>I = 155.97g/mol

53°C

**UN Class:** 3 /UN1993 PG-III **EC No.:** 200-833-1 **Danger**  
**Cas No.:** 75-03-6 **Index No.:** Not listed

**Hazard:** H302 H315 H317 H319 H334  
**Precaution:** P261 P280 P305+P351+P338 P342+P311

Cat No.	Grade	Assay	Info.	Per
ESC55400		99%		25ml

**IRON METAL - FILINGS**

Fe = 55.85g/mol

**UN Class:** N/A **EC No.:** 231-096-4 **Warning**  
**Cas No.:** 7439-89-6 **Index No.:** Not listed

**Hazard:** Not considered hazardous  
**Precaution:** No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC55402		97%	Coarse (1.0mm)	500g

**IRON POWDER REDUCED BY HYDROGEN**

Fe = 55.85g/mol



**UN Class:** 4.1 /UN3089 PG-III **EC No.:** 231-096-4 **Danger**  
**Cas No.:** 7439-89-6 **Index No.:** Not listed

**Hazard:** H228  
**Precaution:** No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC55406		96%		500g

**IRON (II) SULPHIDE LUMP (FERROUS SULPHIDE)**

FeS = 87.91g/mol



**UN Class:** N/A **EC No.:** 215-268-6 **Warning**  
**Cas No.:** 1317-37-9 **Index No.:** Not listed

**Hazard:** H400  
**Precaution:** P273

Cat No.	Grade	Assay	Info.	Per
ESC55420		90%		500g

**IRON (II) CHLORIDE 4-WATER (FERROUS CHLORIDE)**FeCl<sub>2</sub> • 4H<sub>2</sub>O = 198.81g/mol

**UN Class:** 8 /UN3260 PG-III **EC No.:** 231-843-4 **Danger**  
**Cas No.:** 13478-10-9 **Index No.:** Not listed

**Hazard:** H302 H315 H318  
**Precaution:** P280 P305+P351+P338

Cat No.	Grade	Assay	Info.	Per
ESC55409		99%		500g

**IRON (II) OXALATE**Fe<sub>2</sub>CO<sub>4</sub> • 2H<sub>2</sub>O = 179.89g/mol

**UN Class:** N/A **EC No.:** N/A **Warning**  
**Cas No.:** 6047-25-2 **Index No.:** 607-007-00-3

**Hazard:** H302 H312  
**Precaution:** P280 P301+P312

Cat No.	Grade	Assay	Info.	Per
ESC55412		98%		100g

**IRON (II,III) OXIDE (MAGNETITE)**Fe<sub>3</sub>O<sub>4</sub> = 231.53g/mol

**UN Class:** 3 /UN1294 PG-II **EC No.:** N/A **Warning**  
**Cas No.:** N/A **Index No.:** 607-007-00-3

**Hazard:** Not considered hazardous  
**Precaution:** No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC55436		N/A		100g

**IRON (II) SULPHATE 7-WATER (FERROUS SULPHATE)**FeSO<sub>4</sub> • 7H<sub>2</sub>O = 278.01g/mol

**UN Class:** N/A **EC No.:** 231-753-5 **Warning**  
**Cas No.:** 7782-63-0 **Index No.:** 026-003-01-4

**Hazard:** H302 H319 H315  
**Precaution:** P305+P351+P338

Cat No.	Grade	Assay	Info.	Per
ESC55416		98%		500g



IRON (III) CHLORIDE 6-WATER (FERRIC CHLORIDE)				
$\text{FeCl}_3 \cdot 6\text{H}_2\text{O} = 270.3\text{g/mol}$				
<b>UN Class:</b> 8 /UN3260 PG-III		<b>EC No.:</b> 231-729-4		
<b>Cas No.:</b> 10025-77-1		<b>Index No.:</b> Not listed		
<b>Hazard:</b> H302 H314				
<b>Precaution:</b> P280 P305+P351+P338 P310				
Cat No.	Grade	Assay	Info.	Per
ESC55424		98%		500g

IRON (III) CHLORIDE ANHYDROUS (FERRIC CHLORIDE)				
$\text{FeCl}_3 = 162.2\text{g/mol}$				
<b>UN Class:</b> 8 /UN1773 PG-III		<b>EC No.:</b> 231-729-4		Danger
<b>Cas No.:</b> 7705-08-0		<b>Index No.:</b> Not listed		
<b>Hazard:</b> H302 H315 H318 H411				
<b>Precaution:</b> P273 P280 P305+P351+P338				
Cat No.	Grade	Assay	Info.	Per
ESC55428		96%		500g

IRON (III) NITRATE 9-WATER (FERRIC NITRATE)				
$\text{Fe}(\text{NO}_3)_3 \cdot 9\text{H}_2\text{O} = 404\text{g/mol}$				
<b>UN Class:</b> 5.1 /UN1466 PG-III		<b>EC No.:</b> 233-899-5		Warning
<b>Cas No.:</b> 7782-61-8		<b>Index No.:</b> Not listed		
<b>Hazard:</b> H272 H315 H319 H335				
<b>Precaution:</b> P220 P261 P305+P351+P338				
Cat No.	Grade	Assay	Info.	Per
ESC55432		98%		500g

IRON (III) OXIDE (FERRIC OXIDE)				
$\text{Fe}_2\text{O}_3 = 159.69\text{g/mol}$				
<b>UN Class:</b> N/A		<b>EC No.:</b> 215-168-2		Warning
<b>Cas No.:</b> 1309-37-1		<b>Index No.:</b> Not listed		
<b>Hazard:</b> H315 H319 H335				
<b>Precaution:</b> P261 P305+P351+P338				
<b>Notes:</b> Red/Brown in colour				
Cat No.	Grade	Assay	Info.	Per
ESC55438		95%		500g

IRON (III) SULPHATE HYDRATED TECH (FERRIC SULPHATE)				
$\text{Fe}_2(\text{SO}_4)_3 \cdot x\text{H}_2\text{O} = 399.88\text{g/mol}$				
<b>UN Class:</b> N/A		<b>EC No.:</b> 233-072-9		Warning
<b>Cas No.:</b> 15244-10-7		<b>Index No.:</b> Not listed		
<b>Hazard:</b> H302 H319 H335				
<b>Precaution:</b> P261 P305+P351+P338				
Cat No.	Grade	Assay	Info.	Per
ESC55440		95%		500g

JANUS GREEN STAIN C.I.11050				
<b>UN Class:</b> N/A		<b>EC No.:</b> 220-695-6		
<b>Cas No.:</b> 2869-83-2		<b>Index No.:</b> Not listed		
<b>Hazard:</b> Not considered hazardous				
<b>Precaution:</b> No additional precautions required				
Cat No.	Grade	Assay	Info.	Per
ESC55442		N/A	Powder	1g
ESC55443		1%	Powder	100ml

KAOLIN LIGHT (ALUMINUM SILICATE HYDROXIDE)				
$\sim\text{Al}_2\text{Si}_2\text{O}_5(\text{OH})_4 = 258.16\text{g/mol}$				
<b>UN Class:</b> N/A		<b>EC No.:</b> 310-194-1		
<b>Cas No.:</b> 1332-58-7		<b>Index No.:</b> Not listed		
<b>Hazard:</b> Not considered hazardous				
<b>Precaution:</b> No additional precautions required				
Cat No.	Grade	Assay	Info.	Per
ESC55444		N/A		1kg

#### KEROSENE WHITE SEE PARAFFIN OIL


KINETIN				
$\text{C}_{10}\text{H}_9\text{N}_5\text{O} = 215.22\text{g/mol}$				
<b>UN Class:</b> N/A		<b>EC No.:</b> 208-382-2		
<b>Cas No.:</b> 525-79-1		<b>Index No.:</b> Not listed		
<b>Hazard:</b> Not considered hazardous				
<b>Precaution:</b> No additional precautions required				
Cat No.	Grade	Assay	Info.	Per
ESC55445		99%		1kg

DL-LACTIC ACID (2-HYDROXYPROPIONIC ACID)				
$\text{CH}_3\text{CH}(\text{OH})\text{COOH} = 90.08\text{g/mol}$				
<b>UN Class:</b> N/A		<b>EC No.:</b> 209-954-4		Danger
<b>Cas No.:</b> 50-21-5		<b>Index No.:</b> Not listed		
<b>Hazard:</b> H315 H318				
<b>Precaution:</b> P280 P305+P351+P338				
Cat No.	Grade	Assay	Info.	Per
ESC55459		88%		500ml

LACTOSE				
$\text{C}_{12}\text{H}_{22}\text{O}_{11} \cdot \text{H}_2\text{O} = 360.31\text{g/mol}$				
<b>UN Class:</b> N/A		<b>EC No.:</b> 200-559-2		
<b>Cas No.:</b> 64044-51-5		<b>Index No.:</b> Not listed		
<b>Hazard:</b> Not considered hazardous				
<b>Precaution:</b> No additional precautions required				
Cat No.	Grade	Assay	Info.	Per
ESC55460		98%		500g




**LATEX** $(C_3H_5NaO_2)_n$ **UN Class:** N/A**EC No.:** N/A**Cas No.:** 9003-04-7**Index No.:** Not listed**Hazard:** Not considered hazardous**Precaution:** No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC55462		N/A		500ml

**DI-LAUROYL PEROXIDE (DODECANOYL PEROXIDE)** $[CH_3(CH_2)_{10}CO]_2O_2 = 398.62g/mol$ **UN Class:** 5.2 /UN3106 PG-II**EC No.:** 203-326-3

Danger

**Cas No.:** 105-74-8**Index No.:** 617-003-00-3**Hazard:** H242**Precaution:** P220 P280 P410 P420

Cat No.	Grade	Assay	Info.	Per
ESC55463		98%		25g

**LEAD METAL**

Pb = 207.2g/mol

**UN Class:** N/A**EC No.:** 231-100-4

Danger


**Cas No.:** 7439-92-1**Index No.:** Not listed**Hazard:** H302 H332 H360 H373 H410**Precaution:** P201 P273 P308+P313

Cat No.	Grade	Assay	Info.	Per
ESC55474		N/A	Shot 3mm dia.	500g

**LEAD (II) ACETATE 3-WATER (LEAD (II) ETHANOATE)** $Pb(CH_3CO_2)_2 \cdot 3H_2O = 379.33g/mol$ **UN Class:** 6.1 /UN1616 PG-III**EC No.:** 206-104-4

Danger



**Cas No.:** 6080-56-4**Index No.:** 082-005-00-8**Hazard:** H360Df H373 H410**Precaution:** P201 P273 P308+P313 P501

Cat No.	Grade	Assay	Info.	Per
ESC55476		98%		500g

**LEAD (II) BROMIDE** $PbBr_2 = 367.01g/mol$ **UN Class:** 6.1 /UN2291 PG-III**EC No.:** 233-084-4

Danger


**Cas No.:** 10031-22-8**Index No.:** 082-001-00-6**Hazard:** H360Df H332 H302 H373 H410**Precaution:** P201 P273 P308+P313 P501

Cat No.	Grade	Assay	Info.	Per
CHE291647		98%		100g
CHE291648		98%		250g

**LEAD (II,IV) OXIDE (RED LEAD)** $Pb_3O_4 = 685.6g/mol$ **UN Class:** 5.1 /UN1479 PG-II**EC No.:** 215-235-6

Danger


**Cas No.:** 1314-41-6**Index No.:** 082-001-00-6**Hazard:** H360Df H302 H332 H272 H373 H410**Precaution:** P201 P220 P273 P308+P313 P501

Cat No.	Grade	Assay	Info.	Per
ESC55488		97%		500g

**LEAD (IV) OXIDE (LEAD DIOXIDE)** $PbO_2 = 239.2g/mol$ **UN Class:** 5.1(6.1) /UN1872 PG-III**EC No.:** 215-174-5

Danger


**Cas No.:** 1309-60-0**Index No.:** 082-001-00-6**Hazard:** H360Df H302 H332 H272 H373 H410**Precaution:** P201 P220 P273 P308+P313 P501

Cat No.	Grade	Assay	Info.	Per
ESC55496		95%		250g

**LEAD (II) SULPHATE** $PbSO_4 = 303.26g/mol$ **UN Class:** 9 /UN3077 PG-III**EC No.:** 231-198-9

Danger


**Cas No.:** 7446-14-2**Index No.:** 082-001-00-6**Hazard:** H360Df H332 H302 H373 H410**Precaution:** P201 P273 P308+P313 P501

Cat No.	Grade	Assay	Info.	Price	Per
ESC55492		99%		15.95	100g


**LEAD (II) SULPHIDE** $PbS = 239.27g/mol$ **UN Class:** 9 /UN3077 PG-III**EC No.:** 215-246-6

Danger


**Cas No.:** 1314-87-0**Index No.:** 082-001-00-6**Hazard:** H360Df H332 H302 H373 H410**Precaution:** P201 P273 P308+P313 P501


Cat No.	Grade	Assay	Info.	Per
ESC55494		98%		100g


**LEISHMAN'S STAIN****UN Class:** N/A**EC No.:** 235-732-1**Cas No.:** 12627-53-1**Index No.:** Not listed**Hazard:** Not considered hazardous**Precaution:** No additional precautions required



Cat No.	Grade	Assay	Info.	Per
ESC55499		N/A		5g







DL-LEUCINE				
$(\text{CH}_3)_2\text{CHCH}_2\text{CH}(\text{NH}_2)\text{CO}_2\text{H} = 131.17\text{g/mol}$				
UN Class: N/A		EC No.: 231-729-4		
Cas No.: 328-39-2		Index No.: Not listed		
Hazard: Not considered hazardous				
Precaution: No additional precautions required				
Cat No.	Grade	Assay	Info.	Per
ESC55501		99%		5g




L-LEUCINE				
$(\text{CH}_3)_2\text{CHCH}_2\text{CH}(\text{NH}_2)\text{CO}_2\text{H} = 131.17\text{g/mol}$				
UN Class: N/A		EC No.: 200-522-0		
Cas No.: 61-90-5		Index No.: Not listed		
Hazard: Not considered hazardous				
Precaution: No additional precautions required				
Cat No.	Grade	Assay	Info.	Per
ESC55502		99%		25g



LIME WATER (LIMEWATER)				
$\text{Ca}(\text{OH})_2 = 74.09\text{g/mol}$				
UN Class: N/A		EC No.: 215-137-3		
Cas No.: 1305-62-0		Index No.: Not listed		
Hazard: Not considered hazardous				
Precaution: No additional precautions required				
Notes: For detecting Carbon dioxide				
Cat No.	Grade	Assay	Info.	Per
ESC55504		N/A		500ml



LIMONENE (DIPENTENE)				
$\text{C}_{10}\text{H}_{16} = 136.24\text{g/mol}$				
				
UN Class: 3 / UN2052 PG-III		EC No.: 205-341-0		Warning
Cas No.: 138-86-3		Index No.: 601-029-00-7		
Hazard: H226 H315 H317 H410				
Precaution: P273 P280 P501				
Notes: For detecting Carbon dioxide				
Cat No.	Grade	Assay	Info.	Per
ESC55506		98%		250ml



LIMONENE (R)-(+)-				
$\text{C}_{10}\text{H}_{16} = 136.23\text{g/mol}$				
				
UN Class: 3 / UN2052 PG-III		EC No.: 227-813-5		Warning
Cas No.: 5989-27-5		Index No.: 601-029-00-7		
Hazard: H226 H315 H317 H410				
Precaution: P210 P241 P303+P361+P353				
Cat No.	Grade	Assay	Info.	Per
ESC55507		97%		25ml

LIMONENE (S)-(-)-				
$\text{C}_{10}\text{H}_{16} = 136.23\text{g/mol}$				
				
UN Class: 3 / UN2052 PG-III		EC No.: 227-815-6		Warning
Cas No.: 5989-54-8		Index No.: 601-029-00-7		
Hazard: H226 H315 H317 H410				
Precaution: P210 P241 P303+P361+P353				
Cat No.	Grade	Assay	Info.	Per
ESC55508		97%		25ml

LITHIUM METAL IN LIQUID PARAFFIN				
$\text{Li} = 6.94\text{g/mol}$				
				
UN Class: 4.3 / UN1415 PG-I		EC No.: 231-102-5		Danger
Cas No.: 7439-93-2		Index No.: 003-001-00-4		
Hazard: H260 H314				
Precaution: P223 P231+P232 P280 P305+P351+P338				
Cat No.	Grade	Assay	Info.	Per
ESC55510		99%	SURCHARGE	10g
ESC55511		99%	SURCHARGE	25g

LITHIUM CARBONATE				
$\text{Li}_2\text{CO}_3 = 73.89\text{g/mol}$				
				
UN Class: N/A		EC No.: 209-062-5		Warning
Cas No.: 554-13-2		Index No.: Not listed		
Hazard: H302 H319 H332				
Precaution: P305+P351+P338				
Cat No.	Grade	Assay	Info.	Per
ESC55513		99%		500g

LITHIUM CHLORIDE ANHYDROUS				
$\text{LiCl} = 42.39\text{g/mol}$				
				
UN Class: N/A		EC No.: 231-212-3		Warning
Cas No.: 7447-41-8		Index No.: Not listed		
Hazard: H302 H315 H319 H335				
Precaution: P261 P305+P351+P338				
Cat No.	Grade	Assay	Info.	Per
ESC55515		98.5%		500g

LITHIUM HYDROXIDE				
$\text{LiOH} \cdot \text{H}_2\text{O} = 41.96\text{g/mol}$				
				
UN Class: N/A		EC No.: 215-183-4		Danger
Cas No.: 1310-66-3		Index No.: Not listed		
Hazard: H302 H314				
Precaution: P280 P305+P351+P338 P310				
Cat No.	Grade	Assay	Info.	Per
ESC55517		98%		500g



**LITHIUM NITRATE ANHYDROUS**LiNO<sub>3</sub> = 68.95g/mol

**UN Class:** 5.1 /UN2722 PG-III **EC No.:** 232-218-9 **Warning**  
**Cas No.:** 7790-69-4 **Index No.:** Not listed

**Hazard:** H272  
**Precaution:** P220

Cat No.	Grade	Assay	Info.	Per
ESC55519		98%		100g

**L-LYSINE MONOHYDROCHLORIDE**H<sub>2</sub>N(CH<sub>2</sub>)<sub>4</sub>CH(NH<sub>2</sub>)CO<sub>2</sub>H • HCl = 182.65g/mol

**UN Class:** N/A **EC No.:** 211-519-9  
**Cas No.:** 657-27-2 **Index No.:** Not listed

**Hazard:** Not considered hazardous  
**Precaution:** No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC55522		99%		100g

**LITMUS**

**UN Class:** N/A **EC No.:** 215-739-6  
**Cas No.:** 1393-92-6 **Index No.:** Not listed

**Hazard:** Not considered hazardous  
**Precaution:** No additional precautions required  
**Notes:** pH 5.0-8.0

Cat No.	Grade	Assay	Info.	Per
ESC55520		N/A	Powder	25g

**LYCOPodium POWDER**

N/A



**UN Class:** 4.1 /UN1325 PG-II **EC No.:** 282-002-3 **Danger**  
**Cas No.:** 8023-70-9 **Index No.:** Not listed

**Hazard:** H228  
**Precaution:** P210

Cat No.	Grade	Assay	Info.	Per
ESC55530		97%		50g

**LUGOL'S IODINE SOLUTION**

**UN Class:** N/A **EC No.:** N/A  
**Cas No.:** N/A **Index No.:** Not listed

**Hazard:** Not considered hazardous  
**Precaution:** No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC55524		N/A		1L

**MAGNESIUM METAL - POWDER**

Mg = 24.31g/mol



**UN Class:** 4.3(4.2) /UN1418 PG-II **EC No.:** 231-104-6 **Danger**  
**Cas No.:** 7439-95-4 **Index No.:** 012-001-00-3

**Hazard:** H260 H250  
**Precaution:** P222 P223 P231+P232

Cat No.	Grade	Assay	Info.	Per
ESC55534		99.5%	SURCHARGE	100g
ESC55536		99.5%	SURCHARGE	500g

**LUMINOL (3-AMINOPHTHALHYDRAZIDE)**Nh<sub>2</sub> . C<sub>6</sub>H<sub>3</sub> . CO . NH . NH . CO = 177.16g/mol

**UN Class:** N/A **EC No.:** 208-309-4  
**Cas No.:** 521-31-3 **Index No.:** Not listed

**Hazard:** H315 H319 H335  
**Precaution:** P261 P305+P351+P338

Cat No.	Grade	Assay	Info.	Per
ESC55527		97%		1g
ESC55528		98%		1g

**MAGNESIUM METAL - TURNINGS**

Mg = 24.31g/mol






**UN Class:** 4.1 /UN1869 PG-III **EC No.:** 231-104-6 **Danger**  
**Cas No.:** 7439-95-4 **Index No.:** 012-002-00-9


**Hazard:** H228 H261 H252  
**Precaution:** P210 P231+P232 P235+P410


Cat No.	Grade	Assay	Info.	Per
ESC55537		99.5%		100g
ESC55538		99.5%		250g





MAGNESIUM CHLORIDE 6-WATER				
$MgCl_2 \cdot 6H_2O = 203.31g/mol$				
UN Class: N/A		EC No.: 232-094-6		
Cas No.: 7791-18-6		Index No.: Not listed		
Hazard: Not considered hazardous				
Precaution: No additional precautions required				
Cat No.	Grade	Assay	Info.	Per
ESC55544		97.5%		500g


MAGNESIUM CARBONATE BASIC - HEAVY				
$MgCO_3 = 84.31g/mol$				
UN Class: N/A		EC No.: 235-192-7		
Cas No.: 39409-82-0		Index No.: Not listed		
Hazard: Not considered hazardous				
Precaution: No additional precautions required				
Cat No.	Grade	Assay	Info.	Per
ESC55540		MgO = 30%	Heavy	250g
ESC55541		MgO = 30%	Heavy	500g


MAGNESIUM CARBONATE BASIC - LIGHT				
$MgCO_3 = 84.31g/mol$				
UN Class: N/A		EC No.: 235-192-7		
Cas No.: 39409-82-0		Index No.: Not listed		
Hazard: Not considered hazardous				
Precaution: No additional precautions required				
Cat No.	Grade	Assay	Info.	Per
ESC55542		MgO = 30%	Light	500g


MAGNESIUM HYDROXIDE				
$Mg(OH)_2 = 58.32g/mol$				
UN Class: N/A		EC No.: 215-170-3		Warning
Cas No.: 1309-42-8		Index No.: Not listed		
Hazard: H315 H319 H335				
Precaution: P261 P305+P351+P338				
Cat No.	Grade	Assay	Info.	Per
ESC55547		95%		500g


MAGNESIUM NITRATE 6-WATER				
$Mg(NO_3)_2 \cdot 6H_2O = 256.41g/mol$				
UN Class: 5.1 / UN1474 PG-III		EC No.: 233-826-7		Warning
Cas No.: 13446-18-9		Index No.: Not listed		
Hazard: H319				
Precaution: P305+P351+P338				
Cat No.	Grade	Assay	Info.	Per
ESC55552		98%		500g

MAGNESIUM OXIDE - HEAVY				
$MgO = 40.3g/mol$				
UN Class: N/A		EC No.: 215-171-9		
Cas No.: 1309-48-4		Index No.: Not listed		
Hazard: Not considered hazardous				
Precaution: No additional precautions required				
Cat No.	Grade	Assay	Info.	Per
ESC55556		98%		500g

MAGNESIUM OXIDE - LIGHT				
$MgO = 40.3g/mol$				
UN Class: N/A		EC No.: 215-171-9		
Cas No.: 1309-48-4		Index No.: Not listed		
Hazard: Not considered hazardous				
Precaution: No additional precautions required				
Cat No.	Grade	Assay	Info.	Per
ESC55560		98%		500g

MAGNESIUM SULPHATE - DRIED (DRIED)				
$MgSO_4 \cdot xH_2O = 120.38g/mol$				
UN Class: N/A		EC No.: 231-298-2		
Cas No.: 22189-08-8		Index No.: Not listed		
Hazard: Not considered hazardous				
Precaution: No additional precautions required				
Cat No.	Grade	Assay	Info.	Per
ESC55564		97%		500g

MAGNESIUM SULPHATE 7-WATER				
$MgSO_4 \cdot 7H_2O = 246.47g/mol$				
UN Class: N/A		EC No.: 231-298-2		Warning
Cas No.: 10034-99-8		Index No.: Not listed		
Hazard: H302				
Precaution: P264 P270 P301+P312 P330				
Cat No.	Grade	Assay	Info.	Per
ESC55566		99%		1kg

MAGNESIUM SULPHATE ANHYDROUS				
$MgSO_4 = 120.37g/mol$				
UN Class: N/A		EC No.: 231-298-2		
Cas No.: 7487-88-9		Index No.: Not listed		
Hazard: Not considered hazardous				
Precaution: No additional precautions required				
Cat No.	Grade	Assay	Info.	Per
ESC55568		98%		500g



**MALACHITE GREEN C.I.42000 (BASIC GREEN 4)**

N/A



**UN Class:** 6.1 /UN2811 PG-III **EC No.:** 219-441-7 **Danger**  
**Cas No.:** 2437-29-8 **Index No.:** 602-096-00-5

**Hazard:** H361d H302 H318 H410  
**Precaution:** P272 P280 P305+P351+P338 P501

Cat No.	Grade	Assay	Info.	Per
ESC55570		N/A		5g

**MANGANESE (II) CARBONATE** $MnCO_3 = 114.95g/mol$ 

**UN Class:** N/A **EC No.:** 209-942-9  
**Cas No.:** 598-62-9 **Index No.:** Not listed

**Hazard:** Not considered hazardous  
**Precaution:** No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC55583		93%		500g

**MALEIC ACID (CIS-BUTENEDIOIC ACID OR TOXILIC ACID)** $CH(COOH):CH(COOH) = 116.07g/mol$ 

**UN Class:** N/A **EC No.:** 203-742-5 **Warning**  
**Cas No.:** 110-16-7 **Index No.:** 607-095-00-3

**Hazard:** H302 H319 H335 H315 H317  
**Precaution:** P261 P280 P305+P351+P338

Cat No.	Grade	Assay	Info.	Per
ESC55572		99%		500g

**MANGANESE (II) CHLORIDE 4-WATER** $MnCl_2 \cdot 4H_2O = 197.91g/mol$ 

**UN Class:** N/A **EC No.:** 231-869-6 **Warning**  
**Cas No.:** 13446-34-9 **Index No.:** Not listed

**Hazard:** H302  
**Precaution:** No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC55586		98%		500g

**MALONIC ACID (PROPANEDIOIC ACID)** $CH_2(COOH)_2 = 104.06g/mol$ 

**UN Class:** N/A **EC No.:** 205-503-0 **Warning**  
**Cas No.:** 141-82-2 **Index No.:** Not listed

**Hazard:** H302 H318  
**Precaution:** P280 P305+P351+P338

Cat No.	Grade	Assay	Info.	Per
ESC55574		98%		500g

**MANGANESE (II) SULPHATE 1-WATER** $MnSO_4 \cdot H_2O = 169.02g/mol$ 

**UN Class:** 9 /UN3077 PG-III **EC No.:** 232-089-9 **Warning**  
**Cas No.:** 10034-96-5 **Index No.:** 025-003-00-4

**Hazard:** H373 H411  
**Precaution:** P273

Cat No.	Grade	Assay	Info.	Per
ESC55589		98%		500g

**MALTOSE** $C_{12}H_{22}O_{11} \cdot H_2O = 360.31g/mol$ 

**UN Class:** N/A **EC No.:** 200-716-5  
**Cas No.:** 6363-53-7 **Index No.:** Not listed

**Hazard:** Not considered hazardous  
**Precaution:** No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC55576		97%		100g

**MANGANESE (IV) OXIDE FOR O2 PREPARATION** $MnO_2 = 86.94g/mol$ 

**UN Class:** 5.1 /UN1479 PG-II **EC No.:** 215-202-6 **Warning**  
**Cas No.:** 1313-13-9 **Index No.:** 025-001-00-3

**Hazard:** H332 H302  
**Precaution:** No additional precautions required  
**Notes:** For the preparation of Oxygen

Cat No.	Grade	Assay	Info.	Per
ESC55592		97%	Powder	250g

**MANGANESE FLAKE ELECTROLYTIC** $Mn = 54.94g/mol$ 

**UN Class:** N/A **EC No.:** 231-105-1  
**Cas No.:** 7439-96-5 **Index No.:** Not listed

**Hazard:** Not considered hazardous  
**Precaution:** No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC55578		99%		100g

**MANGANESE (IV) OXIDE** $MnO_2 = 86.94g/mol$ 


**UN Class:** N/A **EC No.:** 215-202-6 **Warning**  
**Cas No.:** 1313-13-9 **Index No.:** 025-001-00-3


**Hazard:** H332 H302  
**Precaution:** No additional precautions required





Cat No.	Grade	Assay	Info.	Per
ESC55595		90%	Tech. Powder	500g

















MANNITOL				
$C_6H_{14}O_6 = 182.17g/mol$				
UN Class: N/A		EC No.: 200-711-8		
Cas No.: 69-65-8		Index No.: Not listed		
Hazard: Not considered hazardous				
Precaution: No additional precautions required				
Cat No.	Grade	Assay	Info.	Per
ESC55597		98%		100g

D (+) MANNOSE				
$C_6H_{12}O_6 = 180.16g/mol$				
UN Class: N/A		EC No.: 215-202-6		
Cas No.: 3458-28-4		Index No.: Not listed		
Hazard: Not considered hazardous				
Precaution: No additional precautions required				
Cat No.	Grade	Assay	Info.	Per
ESC55232		99%		5g

MARBLE CHIPS (CALCIUM CARBONATE ORE)				
$CaCO_3 = 100.09g/mol$				
UN Class: N/A		EC No.: N/A		Warning
Cas No.: 13397-26-7		Index No.: Not listed		
Hazard: H315 H318 H335				
Precaution: P261 P280 P305+P351+P338				
Cat No.	Grade	Assay	Info.	Per
ESC55599		97%	2-4mm	3kg
ESC55600		97%	6-9mm	3kg
ESC55601		97%	9-12mm	3kg






MENTHOL				
$C_{10}H_{20}O = 156.27g/mol$				 
UN Class: N/A		EC No.: 218-690-9		Danger
Cas No.: 2216-51-5		Index No.: Not listed		
Hazard: H315 H318 H335				
Precaution: P261 P280 P305+P351+P338				
Cat No.	Grade	Assay	Info.	Per
ESC55602		99%		100g




MERCURY (II) CHLORIDE (MERCURIC CHLORIDE)				
$HgCl_2 = 271.5g/mol$				   
UN Class: 6.1 /UN1624 PG-II		EC No.: 231-299-8		Danger
Cas No.: 7487-94-7		Index No.: 080-010-00-X		
Hazard: H341 H361f H300 H372 H314 H410				
Precaution: P264 P273 P280 P305+P351+P338 P310 P501				
Cat No.	Grade	Assay	Info.	Per
ESC55604		99%		100g




MERCURY (II) OXIDE RED (MERCURIC OXIDE RED)				
$HgO = 216.59g/mol$				  
UN Class: 6.1 /UN1641 PG-II		EC No.: 244-654-7		Danger
Cas No.: 21908-53-2		Index No.: 080-002-00-6		
Hazard: H330 H310 H300 H373 H410				
Precaution: P260 P264 P273 P280 P284 P302+P350				
Cat No.	Grade	Assay	Info.	Per
ESC55607		N/A		100g




METHANAL	SEE FORMALDEHYDE
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METHANOIC ACID	SEE FORMIC ACID
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METHANOL (METHYL ALCOHOL)				
$CH_3OH = 32.04g/mol$				  
UN Class: 3(6.1) /UN1230 PG-II		EC No.: 200-659-6		Danger
Cas No.: 67-56-1		Index No.: 603-001-00-X		
Hazard: H225 H331 H311 H301 H370				
Precaution: P210 P260 P280 P301+P310 P307+P317				
Cat No.	Grade	Assay	Info.	Per
ESC55609		99%	GR	1L
ESC55610		99%	HPLC	1L

METHYL ACETATE				
$CH_3COOCH_3 = 74.08g/mol$				 
UN Class: 3 /UN1231 PG-II		EC No.: 201-185-2		Danger
Cas No.: 79-20-9		Index No.: 607-021-00-X		
Hazard: H225 H319 H336 EUH066				
Precaution: P210 P261 P305+P351+P338				
Cat No.	Grade	Assay	Info.	Per
ESC55612		98.5%		1L

METHYLATED SPIRIT (INDUSTRIAL DENATURED ALCOHOL)				
$(C_2H_5OH \& CH_3OH)$				 
UN Class: 3 /UN1170 PG-II		EC No.: N/A		Danger
Cas No.: N/A		Index No.: Not listed		
Hazard: H225 H371				
Precaution: P210 P260				
Cat No.	Grade	Assay	Info.	Per
ESC55614		>98%	2-4mm	5L

METHYLATED SPIRIT (MINERALISED DENATURED ALCOHOL)				
$(C_2H_5OH \& CH_3OH)$				 
UN Class: 3 /UN1170 PG-II		EC No.: N/A		Danger
Cas No.: N/A		Index No.: Not listed		
Hazard: H225 H371				
Precaution: P210 P260				
Cat No.	Grade	Assay	Info.	Per
ESC55615		N/A	Mineralised	1L



**METHYL BENZOATE** $C_6H_5COOCH_3 = 136.15g/mol$ 

**UN Class:** N/A **EC No.:** 202-259-7 **Warning**  
**Cas No.:** 93-58-3 **Index No.:** Not listed  
**Hazard:** H302 H319  
**Precaution:** P305+P351+P338

Cat No.	Grade	Assay	Info.	Per
ESC55617		99%	9-12mm	500ml

**METHYLBENZENE** SEE TOLUENE**METHYL BLUE C.I.42780**

N/A



**UN Class:** N/A **EC No.:** 249-352-9 **Warning**  
**Cas No.:** 28983-56-4 **Index No.:** Not listed  
**Hazard:** H302 H315 H319 H335  
**Precaution:** P261 P305+P351+P338

Cat No.	Grade	Assay	Info.	Per
ESC55619		N/A		25g

**2-METHYLBUTANE** SEE ISO-PENTANE**3-METHYL-1-BUTANOL** SEE ISO-AMYL ALCOHOL**3-METHYLBUTYL ACETATE** SEE ISO-AMYL ACETATE**METHYLENE BLUE C.I.52015**

N/A



**UN Class:** N/A **EC No.:** 200-515-2 **Warning**  
**Cas No.:** 7220-79-3 **Index No.:** Not listed  
**Hazard:** H302 H315 H319 H335  
**Precaution:** P261 P305+P351+P338

Cat No.	Grade	Assay	Info.	Per
ESC55631		N/A		50g
ESC55632		N/A		100g

**METHYLENE BLUE 1% AQUEOUS SOLUTION**

**UN Class:** N/A **EC No.:** N/A  
**Cas No.:** N/A **Index No.:** Not listed  
**Hazard:** Not considered hazardous  
**Precaution:** No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC55634		1%		125ml

**METHYLENE CHLORIDE** SEE DICHLOROMETHANE**METHYL ETHYL KETONE** SEE 2-BUTANONE**METHYL METHACRYLATE MONOMER** $CH_2=C(CH_3)COOCH_3 = 100.12g/mol$ 

**UN Class:** 3 /UN1247 PG-II **EC No.:** 201-297-1 **Danger**  
**Cas No.:** 80-62-6 **Index No.:** 607-035-00-6  
**Hazard:** H225 H335 H315 H317  
**Precaution:** P210 P261 P280

Cat No.	Grade	Assay	Info.	Per
ESC55636		99.5%		500ml

**METHYL 4-HYDROXYBENZOATE** $HOOC_6H_4CO_2CH_3 = 152.15g/mol$ 

**UN Class:** N/A **EC No.:** 202-785-7 **Warning**  
**Cas No.:** 99-76-3 **Index No.:** Not listed  
**Hazard:** H315 H319 H335  
**Precaution:** P261 P305+P351+P338

Cat No.	Grade	Assay	Info.	Per
ESC55638		98%		50g

**METHYL ORANGE C.I.13025**

N/A



**UN Class:** 6.1 /UN3143 PG-III **EC No.:** 208-925-3 **Danger**  
**Cas No.:** 547-58-0 **Index No.:** Not listed  
**Hazard:** H301  
**Precaution:** P301+P310

Cat No.	Grade	Assay	Info.	Per
ESC55621		N/A	2-4mm	50g
ESC55622		N/A	9-12mm	100g

**METHYL ORANGE 0.04% SOLUTION**

**UN Class:** 3 /UN1993 PG-III **EC No.:** N/A  
**Cas No.:** N/A **Index No.:** Not listed  
**Hazard:** H225  
**Precaution:** P210

Cat No.	Grade	Assay	Info.	Per
ESC55624		0.04%	pH 2.9-4.6	500ml

**METHYL ORANGE - XYLENE CYANOL (SCREENED METHYL ORANGE)** $HOOC_6H_4CO_2CH_3 = 152.15g/mol$ 

**UN Class:** 3 /UN1993 PG-III **EC No.:** N/A  
**Cas No.:** N/A **Index No.:** Not listed  
**Hazard:** H301 H335 H315 H319  
**Precaution:** P261 P280 P301+P310 P305+P351+P338


Cat No.	Grade	Assay	Info.	Per
ESC55627		N/A	pH 2.9-4.6	5g



## METHYL ORANGE - XYLENE CYANOL SOLUTION

UN Class: 3 /UN1993 PG-III  
 Cas No.: N/A  
 Hazard: H225 H371  
 Precaution: P210 P260

EC No.: N/A  
 Index No.: Not listed

Cat No.	Grade	Assay	Info.	Per
ESC55628		0.36%	pH 2.9-4.6	500ml


## 2-METHYLPROPAN-1-OL (ISO-BUTYL ALCOHOL)

$(\text{CH}_3)_2\text{CHCH}_2\text{OH} = 74.12\text{g/mol}$



UN Class: 3 /UN1212 PG-III  
 Cas No.: 78-83-1  
 Hazard: H226 H335 H315 H318 H336  
 Precaution: P261 P280 P305+P351+P338

EC No.: 201-148-0  
 Index No.: 603-108-00-1  
 Danger

Cat No.	Grade	Assay	Info.	Per
ESC54786		98%		1L


## 2-METHYLPROPAN-2-OL (TERT-BUTYL ALCOHOL)

$(\text{CH}_3)_3\text{COH} = 74.12\text{g/mol}$



UN Class: 3 /UN1120 PG-II  
 Cas No.: 75-65-0  
 Hazard: H225 H332 H319 H335  
 Precaution: P210

EC No.: 200-889-7  
 Index No.: 603-005-00-1  
 Danger

Cat No.	Grade	Assay	Info.	Per
ESC54789		98.5%		1L

## METHYL RED C.I.13020

UN Class: N/A  
 Cas No.: 493-52-7  
 Hazard: Not considered hazardous  
 Precaution: No additional precautions required

EC No.: 207-776-1  
 Index No.: Not listed

Cat No.	Grade	Assay	Info.	Per
ESC55626		N/A	pH 4.2-6.3	100g


## METHYL SALICYLATE (METHYL 2-HYDROXYBENZOATE OR OIL OF WINTERGREEN)

$2-(\text{HO})\text{C}_6\text{H}_4\text{CO}_2\text{CH}_3 = 152.12\text{g/mol}$



UN Class: N/A  
 Cas No.: 119-36-8  
 Hazard: H302 H315 H319 H335  
 Precaution: P261 P305+P351+P338


EC No.: 204-317-7  
 Index No.: Not listed  
 Warning

Cat No.	Grade	Assay	Info.	Per
ESC55629		99%		500ml

## MINERAL WOOL

UN Class: N/A  
 Cas No.: N/A  
 Hazard: H351  
 Precaution: No additional precautions required

EC No.: N/A  
 Index No.: 650-016-00-2

Cat No.	Grade	Assay	Info.	Per
ESC55639		N/A		500g

## MINERAL WOOL - SUPERWOOL 607

UN Class: N/A  
 Cas No.: 436083-99-7  
 Hazard: H351  
 Precaution: No additional precautions required

EC No.: N/A  
 Index No.: Not listed


Cat No.	Grade	Assay	Info.	Per
ESC55640		N/A		500g

## MUREXIDE (AMMONIUM PURPURATE)

$\text{C}_8\text{H}_5\text{N}_5\text{O}_6 \cdot \text{H}_3\text{N} = 284.19\text{g/mol}$

UN Class: N/A  
 Cas No.: 3051-09-0  
 Hazard: Not considered hazardous  
 Precaution: No additional precautions required

EC No.: 221-266-6  
 Index No.: Not listed

Cat No.	Grade	Assay	Info.	Per
ESC55641		97%		25g


## NAPHTHALENE CRYSTALS

$\text{C}_{10}\text{H}_8 = 128.17\text{g/mol}$



UN Class: 4.1 /UN1334 PG-III  
 Cas No.: 91-20-3  
 Hazard: H351 H302 H410  
 Precaution: P273 P281 P501

EC No.: 202-049-5  
 Index No.: 601-052-00-2  
 Warning

Cat No.	Grade	Assay	Info.	Per
ESC55643		99%		500g


## 1-NAPHTHOL (NAPHTHALEN-1-OL)

$\text{C}_{10}\text{H}_7\text{OH} = 144.17\text{g/mol}$



UN Class: 6.1 /UN2811 PG-III  
 Cas No.: 90-15-3  
 Hazard: H312 H302 H335 H315 H318  
 Precaution: P261 P280 P305+P351+P338

EC No.: 201-969-4  
 Index No.: 604-029-00-5  
 Danger

Cat No.	Grade	Assay	Info.	Price	Per
ESC54761		98%		15.95	100g



**2-NAPHTHOL (NAPHTHALEN-2-OL)** $C_{10}H_7OH = 144.17g/mol$ 

**UN Class:** 9 /UN3077 PG-III **EC No.:** 205-182-7 **Warning**  
**Cas No.:** 135-19-3 **Index No.:** 604-007-00-5

**Hazard:** H332 H302 H400  
**Precaution:** P273 P305+P351+P338

Cat No.	Grade	Assay	Info.	Per
ESC54792		98%		100g

**NEUTRAL RED C.I.50040** $C_{15}H_{17}ClN_4 = 288.78g/mol$ 

**UN Class:** N/A **EC No.:** 209-035-8  
**Cas No.:** 553-24-2 **Index No.:** Not listed

**Hazard:** Not considered hazardous  
**Precaution:** No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC55659		N/A	pH 6,8-8,0	5g

**NICKEL METAL - FOIL**

Ni = 58.71g/mol



**UN Class:** N/A **EC No.:** 231-111-4 **Danger**  
**Cas No.:** 7440-02-0 **Index No.:** 028-002-00-7

**Hazard:** H351 H372 H317  
**Precaution:** P280 P314

Cat No.	Grade	Assay	Info.	Per
ESC55661		>99%	Foil 0,15mm	100g

**NICKEL (II) CARBONATE BASIC** $\sim NiCO_3 \cdot 2Ni(OH)_2 \cdot 4H_2O = 342.1g/mol$ 

**UN Class:** 9 /UN3077 PG-III **EC No.:** 235-715-9 **Danger**  
**Cas No.:** 12607-70-4 **Index No.:** 028-010-00-0

**Hazard:** H302 H315 H317 H332 H334 H341 H350i H360 H372 H410  
**Precaution:** P201 P261 P273 P280 P308+P313 P501

Cat No.	Grade	Assay	Info.	Per
ESC55663		Ni = 46%		100g

**NICKEL (II) CHLORIDE 6-WATER (NICKEL DICHLORIDE)** $NiCl_2 \cdot 6H_2O = 237.69g/mol$ 

**UN Class:** 6.1 /UN3288 PG-III **EC No.:** 231-743-0 **Danger**  
**Cas No.:** 7791-20-0 **Index No.:** 028-011-00-6

**Hazard:** H350i H341 H360FD H331 H301 H372 H315 H334 H317 H410  
**Precaution:** P201 P261 P273 P280 P301+P310 P311

Cat No.	Grade	Assay	Info.	Price	Per
ESC55665		97%		15,95	500g

**NICKEL (II) NITRATE 6-WATER** $Ni(NO_3)_2 \cdot 6H_2O = 290.79g/mol$ 

**UN Class:** 5.1 /UN2725 PG-III **EC No.:** 236-068-5 **Danger**  
**Cas No.:** 13478-00-7 **Index No.:** Not listed

**Hazard:** H350i H341 H360 H272 H302 H315 H317 H318 H332 H334 H372 H410  
**Precaution:** P201 P220 P261 P273 P280 P305+P351+P338

Cat No.	Grade	Assay	Info.	Per
ESC55676		99.5%		250g

**NICKEL (II) OXIDE BLACK TECHNICAL**

NiO = 74.69g/mol



**UN Class:** N/A **EC No.:** 215-215-7 **Danger**  
**Cas No.:** 1313-99-1 **Index No.:** 028-003-00-2

**Hazard:** H350i H372 H317 H413  
**Precaution:** P201 P280 P308+P313

Cat No.	Grade	Assay	Info.	Per
ESC55668		N/A		100g

**NICKEL (II) SULPHATE HYDRATED** $NiSO_4 \cdot 6\cdot H_2O$ 

**UN Class:** 9 /UN3077 PG-III **EC No.:** 232-104-9 **Danger**  
**Cas No.:** 15244-37-8 **Index No.:** 028-009-00-5

**Hazard:** H350i H360 H372 H317 H302 H315 H332 H334 H341 H410  
**Precaution:** P201 P261 P273 P280 P308+P313 P501

Cat No.	Grade	Assay	Info.	Per
ESC55672		98%		250g

**NIGROSIN C.I.50420 (ACID BLACK 2)**

**UN Class:** N/A **EC No.:** N/A  
**Cas No.:** 8005-03-6 **Index No.:** Not listed

**Hazard:** Not considered hazardous  
**Precaution:** No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC55682		N/A		5g



**NINHYDRIN (INDAN-1,2,3-TRIONE)** $C_8H_4COC(OH)_2CO = 178.14g/mol$ 



**UN Class:** N/A **EC No.:** 207-618-1 **Warning**  
**Cas No.:** 485-47-2 **Index No.:** Not listed




**Hazard:** H302 H315 H319 H335  
**Precaution:** P261 P305+P351+P338


Cat No.	Grade	Assay	Info.	Per
ESC55684		98%		25g







NINHYDRIN SPRAY				
N/A				
12°C				
<b>UN Class:</b> 3 /UN1219 PG-II		<b>EC No.:</b> N/A		Danger
<b>Cas No.:</b> N/A		<b>Index No.:</b> Not listed		
<b>Hazard:</b> H225 H319 H336				
<b>Precaution:</b> P210 P261 P305+P351+P338				
Cat No.	Grade	Assay	Info.	Per
ESC55686		N/A		100ml



NITROBENZENE				
C <sub>6</sub> H <sub>5</sub> NO <sub>2</sub> = 123.11g/mol				
<b>UN Class:</b> 6.1 /UN1662 PG-II		<b>EC No.:</b> 202-716-0		Danger
<b>Cas No.:</b> 98-95-3		<b>Index No.:</b> 609-003-00-7		
<b>Hazard:</b> H301 H311 H331 H351 H361f H372 H411				
<b>Precaution:</b> P273 P281 P314				
Cat No.	Grade	Assay	Info.	Per
ESC55700		99%		100ml



NITRIC ACID 69%				
HNO <sub>3</sub> = 63.01g/mol				
<b>UN Class:</b> 8(5.1) /UN2031 PG-II		<b>EC No.:</b> 231-714-2		Danger
<b>Cas No.:</b> 7697-37-2		<b>Index No.:</b> 007-004-00-1		
<b>Hazard:</b> H272 H314				
<b>Precaution:</b> P220 P280 P305+P351+P338 P310				
Cat No.	Grade	Assay	Info.	Per
ESC55692		65%		2.5L
ESC55696		69-70%		2.5L

NYLON 6/6 PELLETS (POLY(HEXAMETHYLENE ADIPAMIDE))				
(C <sub>12</sub> H <sub>22</sub> N <sub>2</sub> O <sub>2</sub> ) <sub>n</sub> = 262.35g/mol				
<b>UN Class:</b> N/A		<b>EC No.:</b> N/A		
<b>Cas No.:</b> 32131-17-2		<b>Index No.:</b> Not listed		
<b>Hazard:</b> Not considered hazardous				
<b>Precaution:</b> No additional precautions required				
Cat No.	Grade	Assay	Info.	Per
ESC55702		N/A		100g

NITRIC ACID 1.0M SOLUTION				
HNO <sub>3</sub> = 63.01g/mol				
<b>UN Class:</b> 8 /UN2031 PG-II		<b>EC No.:</b> 231-714-2		Danger
<b>Cas No.:</b> 7697-37-2		<b>Index No.:</b> 007-004-00-1		
<b>Hazard:</b> H314				
<b>Precaution:</b> P280 P305+P351+P338 P310				
Cat No.	Grade	Assay	Info.	Per
ESC55688		1.0M		1L

N-OCTANE				
CH <sub>3</sub> (CH <sub>2</sub> ) <sub>6</sub> CH <sub>3</sub> = 114.23g/mol				
13°C				
<b>UN Class:</b> 3 /UN1262 PG-II		<b>EC No.:</b> 203-892-1		Danger
<b>Cas No.:</b> 111-65-9		<b>Index No.:</b> 601-009-00-8		
<b>Hazard:</b> H225 H304 H315 H336 H410				
<b>Precaution:</b> P210 P261 P273 P301+P331 P501				
Cat No.	Grade	Assay	Info.	Per
ESC55704		99%		100ml

NITRIC ACID 2.0M SOLUTION				
HNO <sub>3</sub> = 63.01g/mol				
<b>UN Class:</b> 8 /UN2031 PG-II		<b>EC No.:</b> 231-714-2		Danger
<b>Cas No.:</b> 7697-37-2		<b>Index No.:</b> 007-004-00-1		
<b>Hazard:</b> H314				
<b>Precaution:</b> P280 P305+P351+P338 P310				
Cat No.	Grade	Assay	Info.	Per
ESC55690		2.0M		1L

OCTAN-1-OL (OCTYL ALCOHOL)				
CH <sub>3</sub> (CH <sub>2</sub> ) <sub>7</sub> OH = 130.23g/mol				
<b>UN Class:</b> N/A		<b>EC No.:</b> 203-917-6		Warning
<b>Cas No.:</b> 111-87-5		<b>Index No.:</b> Not listed		
<b>Hazard:</b> H315 H319				
<b>Precaution:</b> P305+P351+P338				
Cat No.	Grade	Assay	Info.	Per
ESC55712		94-98%		1L



**OCTADECANOIC ACID** SEE STEARIC ACID

**OCTADEC-9-ENOIC ACID** SEE OLEIC ACID

**ISO-OCTANE** SEE 2,2,4-TRIMETHYLPENTANE

#### OCT-1-ENE

$\text{CH}_3(\text{CH}_2)_7\text{CH}=\text{CH}_2 = 112.21\text{g/mol}$



21°C

**UN Class:** 3 / UN3295 PG-II

**EC No.:** 203-893-7

Danger

**Cas No.:** 111-66-0

**Index No.:** Not listed

**Hazard:** H225 H304 H315 H319 H411

**Precaution:** P210 P273 P301+P310 P305+P351+P338 P331

Cat No.	Grade	Assay	Info.	Per
ESC55714		97%		100ml

#### OIL - CASTOR

**UN Class:** N/A

**EC No.:** 232-293-8

**Cas No.:** 8001-79-4

**Index No.:** Not listed

**Hazard:** Not considered hazardous

**Precaution:** No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC55716		98%		500ml

#### OIL - CLOVE

N/A



**UN Class:** N/A

**EC No.:** N/A

Warning

**Cas No.:** 8000-34-8

**Index No.:** Not listed

**Hazard:** H315 H319 H335

**Precaution:** P261 P305+P351+P338

Cat No.	Grade	Assay	Info.	Per
ESC55717		95%		100ml

#### OIL - CRUDE (SUBSTITUTE) (C.L.E.A.P.S.E FORMULATION)

N/A



**UN Class:** 3 / UN1286 PG-II

**EC No.:** N/A

Danger

**Cas No.:** N/A

**Index No.:** Not listed

**Hazard:** H350 H304 H319 H225

**Precaution:** P281 P301+P310 P331 P305+P351+P338 P210

Cat No.	Grade	Assay	Info.	Per
ESC55720		N/A		500ml

#### OIL - LINSEED

N/A



**UN Class:** N/A

**EC No.:** 232-278-6

Warning

**Cas No.:** 8001-26-1

**Index No.:** Not listed

**Hazard:** H302 H312 H315 H317 H319 H332 H335

**Precaution:** P261 P280 P305+P351+P338

Cat No.	Grade	Assay	Info.	Per
ESC55721		95%		500ml

#### OIL - OLIVE

**UN Class:** N/A

**EC No.:** 232-277-0

**Cas No.:** 8001-25-0

**Index No.:** Not listed

**Hazard:** Not considered hazardous

**Precaution:** No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC55723		95%		500ml

#### OIL - TURPENTINE

N/A



**UN Class:** 3 / UN1299 PG-III

**EC No.:** 232-350-7

Danger

**Cas No.:** 8006-64-2

**Index No.:** 650-002-00-6

**Hazard:** H226 H332 H312 H302 H304 H319 H315 H317 H411

**Precaution:** P273 P280 P301+P310 P305+P351+P338 P331

Cat No.	Grade	Assay	Info.	Per
ESC55724		91%		500ml

#### OLEIC ACID (9-OCTADECENOIC ACID)

$\text{CH}_3(\text{CH}_2)_7\text{CH}=\text{CH}(\text{CH}_2)_7\text{COOH} = 282.46\text{g/mol}$



**UN Class:** N/A

**EC No.:** 204-007-1

Warning

**Cas No.:** 112-80-1

**Index No.:** Not listed

**Hazard:** H315 H319

**Precaution:** P305+P351+P338

Cat No.	Grade	Assay	Info.	Per
ESC55725		0.8%		1L

#### O.N.P.G (2-NITROPHENYL-BETA-D-GALACTOPYRANOSIDE)

$\text{C}_{12}\text{H}_{15}\text{NO}_8 = 301.25\text{g/mol}$

**UN Class:** N/A

**EC No.:** 206-716-1

**Cas No.:** 369-07-3

**Index No.:** Not listed

**Hazard:** Not considered hazardous

**Precaution:** No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC55730		98%		1g

#### ORANGE G (ACID ORANGE 10)

N/A = 452.37g/mol

**UN Class:** N/A

**EC No.:** N/A

**Cas No.:** 1936-15-8


**Index No.:** Not listed




**Hazard:** Not considered hazardous



**Precaution:** No additional precautions required




Cat No.	Grade	Assay	Info.	Per
ESC55731		N/A		10g








ORCEIN SYNTHETIC (NATURAL RED 28)				
N/A				
UN Class: N/A		EC No.: 215-750-6		Warning
Cas No.: 1400-62-0		Index No.: Not listed		
Hazard: H302 Precaution: No additional precautions required				
Cat No.	Grade	Assay	Info.	Per
ESC55732		N/A		5g





ORCEIN ACETIC (LA COUR)				
N/A  				
UN Class: 8 /UN2790 PG-III		EC No.: N/A		Danger
Cas No.: N/A		Index No.: Not listed		
Hazard: H226 H314 Precaution: P280 P305+P351+P338 P310				
Cat No.	Grade	Assay	Info.	Per
ESC55733		N/A	0.6% Solution	100ml



ORCEIN PROPIONIC				
N/A 				
UN Class: N/A		EC No.: N/A		Danger
Cas No.: N/A		Index No.: Not listed		
Hazard: H314 Precaution: P260 P280 P305+P351+P338				
Cat No.	Grade	Assay	Info.	Per
ESC55734		N/A	0.6% Solution	100ml



ORTHOPHOSPHORIC ACID (PHOSPHORIC ACID)				
$H_3PO_4 = 98g/mol$ 				
UN Class: 8 /UN1805 PG-III		EC No.: 231-633-2		Danger
Cas No.: 7664-38-2		Index No.: 015-011-00-6		
Hazard: H314 Precaution: P260 P280 P305+P351+P338				
Cat No.	Grade	Assay	Info.	Per
ESC55735		85%		1L
ESC55736		85%		2.5L

OXALIC ACID 2-WATER (ETHANEDIOIC ACID)				
$(COOH)_2 \cdot 2H_2O = 126.07g/mol$ 				
UN Class: 8 /UN3261 PG-III		EC No.: 205-634-3		Warning
Cas No.: 6153-56-6		Index No.: 607-006-00-8		
Hazard: H312 H302 Precaution: P280				
Cat No.	Grade	Assay	Info.	Per
ESC55727		99.5%		500g
ESC55728		99.5%	PURIFIED	500g

PALMITIC ACID (HEXADECANOIC ACID)				
$CH_3(CH_2)_{14}COOH = 256.42g/mol$ 				
UN Class: N/A		EC No.: 200-312-9		Warning
Cas No.: 57-10-3		Index No.: Not listed		
Hazard: H319 Precaution: P305+P351+P338				
Cat No.	Grade	Assay	Info.	Per
ESC55737		95%		100g

PANCREATIN FROM PIG PANCREAS				
N/A  				
UN Class: N/A		EC No.: 232-468-9		Danger
Cas No.: 8049-47-6		Index No.: 647-014-00-9		
Hazard: H319 H335 H315 H334 Precaution: P261 P305+P351+P338 P342+P311				
Cat No.	Grade	Assay	Info.	Per
ESC55738		97%		25g
ESC55739		97%		100g

PARAFFIN LIQUID LIGHT				
N/A 				
UN Class: N/A		EC No.: 232-384-2		Warning
Cas No.: 8012-95-1		Index No.: Not listed		
Hazard: H319 Precaution: P305+P351+P338				
Cat No.	Grade	Assay	Info.	Per
ESC55740		98%		1L


PARAFFIN OIL (KEROSENE OIL)				
N/A 				
UN Class: 3 /UN1223 PG-III		EC No.: 232-366-4		Danger
Cas No.: 8008-20-6		Index No.: 649-404-00-4		
Hazard: H304 Precaution: P301+P310				
Cat No.	Grade	Assay	Info.	Per
ESC55742		97%		500ml



**PARAFFIN WAX 56-58°C**

UN Class: N/A EC No.: 232-315-6  
 Cas No.: 8002-74-2 Index No.: Not listed

Hazard: Not considered hazardous  
 Precaution: No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC55744		97%		500g

**ISO-PENTANE (2-METHYLBUTANE)**

$\text{CH}_3\text{CH}_2\text{CH}(\text{CH}_3)_2 = 72.15\text{g/mol}$



UN Class: 3 / UN1265 PG- EC No.: 201-142-8 Danger  
 Cas No.: 78-78-4 Index No.: 601-006-00-1

Hazard: H225 H304 H336 H411 EUH066  
 Precaution: P210 P261 P273 P301+P310 P331

Cat No.	Grade	Assay	Info.	Per
ESC55452		N/A		2.5L


**N-PENTANE**

$\text{CH}_3(\text{CH}_2)_3\text{CH}_3 = 72.15\text{g/mol}$



UN Class: 3 / UN1265 PG-II EC No.: 203-692-4 Danger  
 Cas No.: 109-66-0 Index No.: 601-006-00-1

Hazard: H225 H304 H336 H411 EUH066  
 Precaution: P210 P261 P273 P301+P310 P331

Cat No.	Grade	Assay	Info.	Per
ESC55708		99%		2.5L



**PENTAN-1-OL (N-AMYL ALCOHOL)**

$\text{CH}_3(\text{CH}_2)_4\text{OH} = 88.15\text{g/mol}$



UN Class: 3 / UN1105 PG-III EC No.: 200-752-1 Warning  
 Cas No.: 71-41-0 Index No.: 603-200-00-1

Hazard: H226 H332 H335 H315  
 Precaution: P261

Cat No.	Grade	Assay	Info.	Per
ESC55748		99%		1L
ESC55749		>99%		2.5L


**PENTAN-2-OL**

$\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}(\text{OH})\text{CH}_3 = 88.15\text{g/mol}$



UN Class: 3 / UN1105 PG-III EC No.: 227-907-6 Warning  
 Cas No.: 6032-29-7 Index No.: 603-006-00-7


Hazard: H226 H332 H335 EUH066  
 Precaution: P261

Cat No.	Grade	Assay	Info.	Per
ESC55751		99%		100ml

**PEPTONE BACTERIOLOGICAL**

UN Class: N/A EC No.: N/A  
 Cas No.: 73049-73-7 Index No.: Not listed

Hazard: Not considered hazardous  
 Precaution: No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC55753		N/A		100g


**PETROLEUM ETHER (LIGROIN)**

N/A



UN Class: 3 / UN1268 PG-II EC No.: 232-453-7 Danger  
 Cas No.: 8032-32-4 Index No.: 649-263-00-9

Hazard: H225 H304 H315 H336 H361 H373 H411  
 Precaution: P210 P261 P273 P281 P301+P310 P331

Cat No.	Grade	Assay	Info.	Per
ESC55755		95%		2.5L

**PETROLEUM JELLY - WHITE (PARAFFIN SOFT WHITE)**

UN Class: N/A EC No.: 232-373-2  
 Cas No.: 8009-03-8 Index No.: Not listed

Hazard: Not considered hazardous  
 Precaution: No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC55757		N/A		500g


**1-10-PHENANTHROLINE HYDRATE**

$\text{C}_{12}\text{H}_8\text{N}_2 \cdot \text{H}_2\text{O} = 198.22\text{g/mol}$



UN Class: 6.1 / UN2811 PG-III EC No.: 200-629-2 Danger  
 Cas No.: 5144-89-8 Index No.: 613-092-00-8

Hazard: H301 H410  
 Precaution: P273 P301+P310 P501

Cat No.	Grade	Assay	Info.	Per
ESC55759		98%		5g


**PHENOL (CARBOLIC ACID)**

$\text{C}_6\text{H}_5\text{OH} = 94.11\text{g/mol}$





UN Class: 6.1 / UN1671 PG-II EC No.: 203-632-7 Danger  
 Cas No.: 108-95-2 Index No.: 604-001-00-2




Hazard: H341 H331 H311 H301 H373 H314  
 Precaution: P261 P280 P301+P310 P305+P351+P338 P312



Cat No.	Grade	Assay	Info.	Per
ESC55761		98%		500g






PHENOLPHTHALEIN 1% SOLUTION				
N/A  13°C				
UN Class: 3 /UN1170 PG-II		EC No.: N/A		Danger
Cas No.: N/A		Index No.: Not listed		
Hazard: H225 H341 H350 Precaution: P201 P210 P281 P308+P313				
Cat No.	Grade	Assay	Info.	Per
ESC55768		0.01%	pH 8.3-10.0	1L

PHENOLPHTHALEIN				
OCOC <sub>6</sub> H <sub>4</sub> C(C <sub>6</sub> H <sub>4</sub> OH) <sub>2</sub> = 318.33g/mol 				
UN Class: N/A		EC No.: 201-004-7		Danger
Cas No.: 77-09-8		Index No.: 604-076-00-1		
Hazard: H350 H341 H361f Precaution: P201 P281 P308+P313				
Cat No.	Grade	Assay	Info.	Per
ESC55775		N/A	pH 8.3-10.0	50g
ESC55776		N/A	pH 8.3-10.0	100g

PHENOL RED (PHENOLSULFONPHTHALEIN)				
C <sub>19</sub> H <sub>14</sub> O <sub>5</sub> S = 354.38g/mol 				
UN Class: N/A		EC No.: 205-609-7		Warning
Cas No.: 143-74-8		Index No.: Not listed		
Hazard: H315 H319 H335 Precaution: P261 P305+P351+P338				
Cat No.	Grade	Assay	Info.	Per
ESC55764		N/A		25g




DL-PHENYLALANINE (DLPA)				
C <sub>6</sub> H <sub>5</sub> CH <sub>2</sub> CH(NH <sub>2</sub> )COOH = 165.19g/mol				
UN Class: N/A		EC No.: 205-756-7		
Cas No.: 150-30-1		Index No.: Not listed		
Hazard: Not considered hazardous Precaution: No additional precautions required				
Cat No.	Grade	Assay	Info.	Per
ESC55766		99%		5g


PHENYLAMINE                      SEE ANILINE



PHENYLAMMONIUM CHLORIDE SEE ANILINE HYDROCHLORIDE



PHENYLETHYLENE              SEE STYRENE

PHENYLMETHANOL              SEE BENZYL ALCOHOL

PHENYL SALICYLATE (PHENYL-2-HYDROXYBENZOATE OR SALOL)				
C <sub>6</sub> H <sub>4</sub> (OH)COOC <sub>6</sub> H <sub>5</sub> = 214.22g/mol 				
UN Class: N/A		EC No.: 204-259-2		Warning
Cas No.: 118-55-8		Index No.: Not listed		
Hazard: H315 H319 H335 Precaution: P261 P305+P351+P338				
Cat No.	Grade	Assay	Info.	Per
ESC55771		99%		100g
ESC55772		99%		250g

PHLOROGLUCINOL 2-WATER (BENZENE-1,3,5-TRIOL)				
C <sub>6</sub> H <sub>3</sub> (OH) <sub>3</sub> • 2H <sub>2</sub> O = 162.14g/mol				
UN Class: N/A		EC No.: 203-611-2		
Cas No.: 6099-90-7		Index No.: Not listed		
Hazard: Not considered hazardous Precaution: No additional precautions required				
Cat No.	Grade	Assay	Info.	Per
ESC55779		95%		10g

PHLOROGLUCINOL 5% SOLUTION - ALCOHOLIC				
N/A  13°C				
UN Class: 3 /UN1170 PG-II		EC No.: N/A		Danger
Cas No.: N/A		Index No.: Not listed		
Hazard: H225 H371 Precaution: P210 P260				
Cat No.	Grade	Assay	Info.	Per
ESC55780		N/A		100ml

PHOSPHORUS - RED				
P = 30.97g/mol  13°C				
UN Class: 4.1 /UN1338 PG-III		EC No.: 231-768-7		Danger
Cas No.: 7723-14-0		Index No.: 015-002-00-7		
Hazard: H228 H412 Precaution: P210 P273				
Cat No.	Grade	Assay	Info.	Per
ESC55784		98%		100g

PHOSPHORIC ACID SEE ORTHOPHOSPHORIC ACID



## PHOSPHOROUS PENTACHLORIDE

N/A



**UN Class:** 8 /UN1806 PG-II **EC No.:** N/A **Danger**  
**Cas No.:** N/A **Index No.:** Not listed  
**Hazard:** H330 H302 H373 H314 EUH014 EUH029  
**Precaution:** P260 P280 P284 P305+P351+P338 P310

Cat No.	Grade	Assay	Info.	Per
ESC55787		N/A		500g

## PHOSPHORUS PENTOXIDE (PHOSPHORIC ANHYDRIDE)

P<sub>2</sub>O<sub>5</sub> = 141.94g/mol

**UN Class:** 8 /UN1807 PG-II **EC No.:** 215-236-1 **Danger**  
**Cas No.:** 1314-56-3 **Index No.:** 015-010-00-0  
**Hazard:** H314  
**Precaution:** P280 P305+P351+P338 P310

Cat No.	Grade	Assay	Info.	Per
ESC55790		95%		250g

## PHTHALIC ACID (BENZENE-1,2-DICARBOXYLIC ACID)

C<sub>6</sub>H<sub>4</sub>(COOH)<sub>2</sub> = 166.13g/mol

**UN Class:** N/A **EC No.:** 201-873-2 **Warning**  
**Cas No.:** 88-99-3 **Index No.:** Not listed  
**Hazard:** H315 H319 H335  
**Precaution:** P261 P305+P351+P338

Cat No.	Grade	Assay	Info.	Per
ESC55793		98%		250g

## PHTHALIC ANHYDRIDE (2-BENZOFURAN-1,3-DIONE)

COC<sub>6</sub>H<sub>4</sub>COO = 148.12g/mol

**UN Class:** 8 /UN2214 PG-III **EC No.:** 201-607-5 **Danger**  
**Cas No.:** 85-44-9 **Index No.:** 607-009-00-4  
**Hazard:** H302 H335 H315 H318 H334 H317  
**Precaution:** P261 P280 P305+P351+P338 P342+P311

Cat No.	Grade	Assay	Info.	Per
ESC55796		99.5%		500g

## POLY(VINYL ALCOHOL) (ETHENOL)

(CH<sub>2</sub>:CHOH)<sub>n</sub> = 17000g/mol

**UN Class:** N/A **EC No.:** N/A  
**Cas No.:** 9002-89-5 **Index No.:** Not listed  
**Hazard:** Not considered hazardous  
**Precaution:** No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC55799		85%		250g
ESC55800		87 - 90%		500g

## PEPTONE BACTERIOLOGICAL

**UN Class:** N/A **EC No.:** N/A  
**Cas No.:** 73049-73-7 **Index No.:** Not listed  
**Hazard:** Not considered hazardous  
**Precaution:** No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC55753		N/A		100g

## POTASSIUM METAL IN LIQUID PARAFFIN

K = 39.1g/mol



**UN Class:** 4.3 /UN2257 PG-I **EC No.:** 231-119-8 **Danger**  
**Cas No.:** 7440-09-7 **Index No.:** 019-001-00-2  
**Hazard:** H260 H314 EUH014  
**Precaution:** P223 P231+P232 P280 P305+P351+P338

Cat No.	Grade	Assay	Info.	Per
ESC55805		98%	SURCHARGE	25g
ESC55806		98%	SURCHARGE	100g

## POTASSIUM BROMATE

KBrO<sub>3</sub> = 167g/mol

**UN Class:** 5.1 /UN1484 PG-II **EC No.:** 231-829-8 **Danger**  
**Cas No.:** 7758-01-2 **Index No.:** 035-003-00-6  
**Hazard:** H271 H350 H301  
**Precaution:** P201 P220 P301+P310 P308+P313

Cat No.	Grade	Assay	Info.	Price	Per
ESC55814		99.5%		15.95	250g

## POTASSIUM BROMIDE

Kbr = 119g/mol



**UN Class:** N/A **EC No.:** 231-830-3 **Warning**  
**Cas No.:** 7758-02-3 **Index No.:** Not listed  
**Hazard:** H315 H319 H335  
**Precaution:** P261 P305+P351+P338

Cat No.	Grade	Assay	Info.	Per
ESC55818		99%		500g

## POTASSIUM CARBONATE ANHYDROUS

K<sub>2</sub>CO<sub>3</sub> = 138.21g/mol

**UN Class:** N/A **EC No.:** 209-529-3 **Warning**  
**Cas No.:** 584-08-7 **Index No.:** Not listed  
**Hazard:** H302 H315 H319 H335  
**Precaution:** P261 P305+P351+P338

Cat No.	Grade	Assay	Info.	Per
ESC55821		99.5%		500g



POTASSIUM CHLORATE				
$\text{KClO}_3 = 122.55\text{g/mol}$				
<b>UN Class:</b> 5.1 /UN1485 PG-II		<b>EC No.:</b> 223-289-7		Danger
<b>Cas No.:</b> 3811-04-9		<b>Index No.:</b> 017-004-00-3		
<b>Hazard:</b> H271 H332 H302 H411				
<b>Precaution:</b> P220 P273				
Cat No.	Grade	Assay	Info.	Per
ESC55824		98%		500g

POTASSIUM CHLORIDE				
$\text{KCl} = 74.55\text{g/mol}$				
<b>UN Class:</b> N/A		<b>EC No.:</b> 231-211-8		
<b>Cas No.:</b> 7447-40-7		<b>Index No.:</b> Not listed		
<b>Hazard:</b> Not considered hazardous				
<b>Precaution:</b> No additional precautions required				
Cat No.	Grade	Assay	Info.	Per
ESC55828		99%		500g
ESC55829		>99%		1kg

POTASSIUM CHROMATE				
$\text{K}_2\text{CrO}_4 = 194.19\text{g/mol}$				
<b>UN Class:</b> 6.1 /UN3288 PG-III		<b>EC No.:</b> 232-140-5		Danger
<b>Cas No.:</b> 7789-00-6		<b>Index No.:</b> 024-006-00-8		
<b>Hazard:</b> H350i H340 H319 H335 H315 H317 H410				
<b>Precaution:</b> P201 P261 P273 P280 P305+P351+P338 P308+P313				
Cat No.	Grade	Assay	Info.	Per
ESC55832		99%		500g

TRI-POTASSIUM CITRATE				
$\text{C}_6\text{H}_5\text{K}_3\text{O}_7 \cdot \text{H}_2\text{O} = 324.41\text{g/mol}$				
<b>UN Class:</b> N/A		<b>EC No.:</b> N/A		
<b>Cas No.:</b> 6100-05-6		<b>Index No.:</b> Not listed		
<b>Hazard:</b> Not considered hazardous				
<b>Precaution:</b> No additional precautions required				
Cat No.	Grade	Assay	Info.	Per
ESC55835		99%		500g

POTASSIUM DICHROMATE				
$\text{K}_2\text{Cr}_2\text{O}_7 = 294.18\text{g/mol}$				
<b>UN Class:</b> 6.1 /UN3087 PG-II		<b>EC No.:</b> 231-906-6		Danger
<b>Cas No.:</b> 7778-50-9		<b>Index No.:</b> 024-002-00-6		
<b>Hazard:</b> H272 H350 H340 H360FD H330 H301 H372 H312 H314 H334 H317 H410				
<b>Precaution:</b> P201 P220 P260 P273 P280 P284				
Cat No.	Grade	Assay	Info.	Per
ESC55838		99%	SURCHARGE	250g

POTASSIUM DIHYDROGEN PHOSPHATE				
$\text{KH}_2\text{PO}_4 = 136.09\text{g/mol}$				
<b>UN Class:</b> N/A		<b>EC No.:</b> 231-913-4		
<b>Cas No.:</b> 7778-77-0		<b>Index No.:</b> Not listed		
<b>Hazard:</b> Not considered hazardous				
<b>Precaution:</b> No additional precautions required				
Cat No.	Grade	Assay	Info.	Per
ESC55842		98%		500g

POTASSIUM FERRICYANIDE (POTASSIUM HEXACYANOFERRATE (III))				
$\text{K}_3\text{Fe}(\text{CN})_6 = 329.24\text{g/mol}$				
<b>UN Class:</b> N/A		<b>EC No.:</b> 237-323-3		Warning
<b>Cas No.:</b> 13746-66-2		<b>Index No.:</b> Not listed		
<b>Hazard:</b> EUH032				
<b>Precaution:</b> No additional precautions required				
Cat No.	Grade	Assay	Info.	Per
ESC55846		99%		100g
ESC55847		99%		250g

POTASSIUM FERROCYANIDE (POTASSIUM HEXACYANOFERRATE (II))				
$\text{K}_4\text{Fe}(\text{CN})_6 \cdot 3\text{H}_2\text{O} = 422.39\text{g/mol}$				
<b>UN Class:</b> N/A		<b>EC No.:</b> 237-722-2		Warning
<b>Cas No.:</b> 14459-95-1		<b>Index No.:</b> Not listed		
<b>Hazard:</b> EUH032				
<b>Precaution:</b> No additional precautions required				
Cat No.	Grade	Assay	Info.	Per
ESC55850		98.5%		250g

POTASSIUM HYDROGEN CARBONATE (POTASSIUM BICARBONATE)				
$\text{KHCO}_3 = 100.12\text{g/mol}$				
<b>UN Class:</b> N/A		<b>EC No.:</b> 206-059-0		
<b>Cas No.:</b> 298-14-6		<b>Index No.:</b> Not listed		
<b>Hazard:</b> Not considered hazardous				
<b>Precaution:</b> No additional precautions required				
Cat No.	Grade	Assay	Info.	Per
ESC55853		99.5%		500g



DI-POTASSIUM HYDROGEN PHOSPHATE				
$\text{K}_2\text{HPO}_4 = 174.18\text{g/mol}$				
<b>UN Class:</b> N/A		<b>EC No.:</b> 231-834-5		
<b>Cas No.:</b> 7758-11-4		<b>Index No.:</b> Not listed		
<b>Hazard:</b> Not considered hazardous				
<b>Precaution:</b> No additional precautions required				
Cat No.	Grade	Assay	Info.	Per
ESC55250		98%		500g



**POTASSIUM HYDROGEN PHTHALATE**COOH • C<sub>6</sub>H<sub>4</sub> • COOK = 204.22g/mol

UN Class: N/A                      EC No.: 212-889-4  
 Cas No.: 877-24-7                Index No.: Not listed


Hazard: Not considered hazardous  
 Precaution: No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC55860		99.5%		250g
ESC55861		99.5%		500g

**POTASSIUM HYDROGEN SULPHATE (POTASSIUM BISULPHATE)**KHSO<sub>4</sub> = 136.16g/mol

UN Class: 8 /UN2509 PG-II                      EC No.: 231-594-1                      Danger  
 Cas No.: 7646-93-7                      Index No.: 016-056-00-4


Hazard: H314 H335  
 Precaution: P261 P280 P305+P351+P338 P310

Cat No.	Grade	Assay	Info.	Per
ESC55865		98%		250g

**POTASSIUM HYDROGEN TARTRATE (CREAM OF TARTAR)**KO<sub>2</sub>CCH(OH)CH(OH)COOH = 188.18g/mol

UN Class: N/A                      EC No.: 212-769-1  
 Cas No.: 868-14-4                Index No.: Not listed

Hazard: Not considered hazardous  
 Precaution: No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC55869		98%		250g


**POTASSIUM HYDROXIDE FLAKE**

KOH = 56.11g/mol



UN Class: 8 /UN1813 PG-II                      EC No.: 215-181-3                      Danger  
 Cas No.: 1310-58-3                      Index No.: 019-002-00-8

Hazard: H290 H302 H314  
 Precaution: P260 P280 P303+P361+P353 P305+P351+P338

Cat No.	Grade	Assay	Info.	Per
ESC55873		85%		500g



**POTASSIUM HYDROXIDE PELLETS**

KOH = 56.11g/mol



UN Class: 8 /UN1813 PG-II                      EC No.: 215-181-3                      Danger  
 Cas No.: 1310-58-3                      Index No.: 019-002-00-8


Hazard: H290 H302 H314  
 Precaution: P260 P280 P303+P361+P353 P305+P351+P338

Cat No.	Grade	Assay	Info.	Per
ESC55876		85%		250g
ESC55877		90%		500g

**POTASSIUM IODATE (V)**

UN Class: 5.1 /UN1479 PG-II                      EC No.: 231-831-9                      Danger  
 Cas No.: 7758-05-6                      Index No.: Not listed


Hazard: H272 H315 H319 H335  
 Precaution: P220 P261 P305+P351+P338

Cat No.	Grade	Assay	Info.	Per
ESC55881		99%		100g

**POTASSIUM IODATE (VII) (POTASSIUM PERIODATE)**KIO<sub>4</sub> = 230g/mol

UN Class: 5.1 /UN1479 PG-II                      EC No.: 232-196-0                      Danger  
 Cas No.: 7790-21-8                      Index No.: Not listed

Hazard: H272 H315 H319 H335  
 Precaution: P220 P261 P305+P351+P338




Cat No.	Grade	Assay	Info.	Per
ESC55885		99%		100g

**POTASSIUM IODIDE**

KI = 166g/mol

UN Class: N/A                      EC No.: 231-659-4  
 Cas No.: 7681-11-0                Index No.: Not listed


Hazard: Not considered hazardous  
 Precaution: No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC55889		99%		100g
ESC55890		99%		250g
ESC55891		99%		500g


**POTASSIUM MANGANATE (VII) (POTASSIUM PERMANGANATE)**KMnO<sub>4</sub> = 158.03g/mol


UN Class: 5.1 /UN1490 PG-II                      EC No.: 231-760-3                      Danger  
 Cas No.: 7722-64-7                      Index No.: 025-002-00-9


Hazard: H272 H302 H410  
 Precaution: P220 P273 P501


Cat No.	Grade	Assay	Info.	Per
ESC55893		99%	Powder	500g





POTASSIUM MANGANATE SOLUTION (VII)				
$\text{KMnO}_4 = 158.03\text{g/mol}$				
UN Class: N/A		EC No.: 231-760-3		Danger
Cas No.: 7722-64-7		Index No.: 025-002-00-9		
Hazard: Not considered hazardous Precaution: No additional precautions required				
Cat No.	Grade	Assay	Info.	Per
ESC55895		0.02M (0.1N)		1L


POTASSIUM PERSULPHATE (DIPOTASSIUM PEROXODISULPHATE)				
$\text{K}_2\text{S}_2\text{O}_8 = 270.32\text{g/mol}$				
UN Class: 5.1 / UN1492 PG-III		EC No.: 231-781-8		Danger
Cas No.: 7727-21-1		Index No.: 016-061-00-1		
Hazard: H272 H302 H319 H335 H315 H334 H317 Precaution: P220 P261 P280 P305+P351+P338 P342+P311				
Cat No.	Grade	Assay	Info.	Per
ESC55909		98%		500g


POTASSIUM METABISULPHITE (DIPOTASSIUM DISULPHITE)				
$\text{K}_2\text{S}_2\text{O}_5 = 222.32\text{g/mol}$				
UN Class: N/A		EC No.: 240-795-3		Warning
Cas No.: 16731-55-8		Index No.: Not listed		
Hazard: H315 H319 H335 Precaution: P261 P305+P351+P338				
Cat No.	Grade	Assay	Info.	Per
ESC55897		96%		500g


POTASSIUM SODIUM TARTRATE (ROCHELLE SALT)				
$\text{KOCOCH(OH)CH(OH)COONa} \cdot 4\text{H}_2\text{O} = 282.22\text{g/mol}$				
UN Class: N/A		EC No.: 206-156-8		
Cas No.: 6381-59-5		Index No.: Not listed		
Hazard: Not considered hazardous Precaution: No additional precautions required				
Cat No.	Grade	Assay	Info.	Per
ESC55912		99%		500g


POTASSIUM NITRATE				
$\text{KNO}_3 = 101.1\text{g/mol}$				
UN Class: 5.1 / UN1486 PG-III		EC No.: 231-818-8		Warning
Cas No.: 7757-79-1		Index No.: Not listed		
Hazard: H272 Precaution: P220				
Cat No.	Grade	Assay	Info.	Per
ESC55899		99%		500g

POTASSIUM SULPHATE				
$\text{K}_2\text{SO}_4 = 174.26\text{g/mol}$				
UN Class: N/A		EC No.: 231-915-5		Danger
Cas No.: 7778-80-5		Index No.: Not listed		
Hazard: H314 Precaution: P280 P310 P305+P351+P338				
Cat No.	Grade	Assay	Info.	Per
ESC55914		>98%		500g

POTASSIUM NITRITE				
$\text{KNO}_2 = 85.1\text{g/mol}$				
UN Class: 5.1 / UN1488 PG-II		EC No.: 231-832-4		Danger
Cas No.: 7758-09-0		Index No.: 007-011-00-X		
Hazard: H272 H301 H400 Precaution: P220 P273 P301+P310				
Cat No.	Grade	Assay	Info.	Per
ESC55901		97%		100g

POTASSIUM THIOCYANATE				
$\text{KSCN} = 97.18\text{g/mol}$				
UN Class: N/A		EC No.: 206-370-1		Warning
Cas No.: 333-20-0		Index No.: 615-030-00-5		
Hazard: H332 H312 H302 H412 Precaution: P273 P280				
Cat No.	Grade	Assay	Info.	Per
ESC55917		97%		500g

POTASSIUM OXALATE 1-WATER (POTASSIUM ETHANEDIOATE)				
$(\text{COOK})_2 \cdot \text{H}_2\text{O} = 184.23\text{g/mol}$				
UN Class: N/A		EC No.: 209-506-8		Warning
Cas No.: 6487-48-5		Index No.: Not listed		
Hazard: H302 H312 Precaution: P280				
Cat No.	Grade	Assay	Info.	Per
ESC55904		98%		500g

L-PROLINE				
UN Class: N/A		EC No.: 205-702-2		
Cas No.: 147-85-3		Index No.: Not listed		
Hazard: Not considered hazardous Precaution: No additional precautions required				
Cat No.	Grade	Assay	Info.	Per
ESC55919		98%		5g



**PROPANAL (PROPIONALDEHYDE)**CH<sub>3</sub>CH<sub>2</sub>CHO = 58.08g/mol

**UN Class:** 3 /UN1275 PG-II **EC No.:** 204-623-0 **Danger**  
**Cas No.:** 123-38-6 **Index No.:** 605-018-00-8  
**Hazard:** H225 H319 H335 H315  
**Precaution:** P210 P261 P305+P351+P338

Cat No.	Grade	Assay	Info.	Per
ESC55928		97%		250ml

**PROPANE-1-2-DIOL (PROPYLENE GLYCOL)**CH<sub>3</sub>CH(OH)CH<sub>2</sub>OH = 76.1g/mol

**UN Class:** N/A **EC No.:** 200-338-0  
**Cas No.:** 57-55-6 **Index No.:** Not listed

**Hazard:** Not considered hazardous  
**Precaution:** No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC55932		99%		500ml

**PROPIONIC ACID (PROPANOIC ACID)**CH<sub>3</sub>CH<sub>2</sub>COOH = 74.08g/mol

**UN Class:** 8(3) /UN3463 PG-II **EC No.:** 201-176-3 **Danger**  
**Cas No.:** 79-09-4 **Index No.:** 607-089-00-0  
**Hazard:** H314  
**Precaution:** P280 P305+P351+P338 P310

Cat No.	Grade	Assay	Info.	Per
ESC55935		99%		250ml
ESC55936		99%		500ml

**PROPAN-1-OL (N-PROPYL ALCOHOL)**CH<sub>3</sub>CH<sub>2</sub>CH<sub>2</sub>OH = 60.1g/mol

**UN Class:** 3 /UN1274 PG-II **EC No.:** 200-746-9 **Danger**  
**Cas No.:** 71-23-8 **Index No.:** 603-003-00-0  
**Hazard:** H225 H318 H336  
**Precaution:** P210 P261 P280 P305+P351+P338

Cat No.	Grade	Assay	Info.	Per
ESC55921		99%		500ml

**PROPAN-2-OL (ISO-PROPYL ALCOHOL)**(CH<sub>3</sub>)<sub>2</sub>CHOH = 60.1g/mol

**UN Class:** 3 /UN1219 PG-II **EC No.:** 200-661-7 **Danger**  
**Cas No.:** 67-63-0 **Index No.:** 603-117-00-0  
**Hazard:** H225 H319 H336  
**Precaution:** P210 P261 P305+P351+P338

Cat No.	Grade	Assay	Info.	Per
ESC55924		99.5%		1L
ESC55925		99.5%		2.5L

**PYRIDINE**C<sub>5</sub>H<sub>5</sub>N = 79.1g/mol

**UN Class:** 3 /UN1282 PG-II **EC No.:** 203-809-9 **Danger**  
**Cas No.:** 110-86-1 **Index No.:** 613-002-00-7  
**Hazard:** H225 H332 H312 H302  
**Precaution:** P210

Cat No.	Grade	Assay	Info.	Per
ESC55939		99%		500ml

**PYROGALLOL (1,2,3-TRIHYDROXYBENZENE)**C<sub>6</sub>H<sub>3</sub>(OH)<sub>3</sub> = 126.11g/mol

**UN Class:** 6.1 /UN2811 PG-III **EC No.:** 201-762-9 **Warning**  
**Cas No.:** 87-66-1 **Index No.:** 604-009-00-6  
**Hazard:** H341 H332 H312 H302 H412  
**Precaution:** P273 P281

Cat No.	Grade	Assay	Info.	Per
ESC55941		99%		100g

**QUININE**C<sub>20</sub>H<sub>24</sub>N<sub>2</sub>O<sub>2</sub> • 3H<sub>2</sub>O = 378.47g/mol

**UN Class:** N/A **EC No.:** 205-003-2 **Warning**  
**Cas No.:** 130-95-0 **Index No.:** Not listed  
**Hazard:** H302 H315 H317 H319 H335  
**Precaution:** P261 P280 P305+P351+P338

Cat No.	Grade	Assay	Info.	Per
ESC55943		97%		1g

**RENNET POWDER**C<sub>20</sub>H<sub>24</sub>N<sub>2</sub>O<sub>2</sub> • 3H<sub>2</sub>O = 378.47g/mol

**UN Class:** N/A **EC No.:** 232-645-0 **Danger**  
**Cas No.:** 9001-98-3 **Index No.:** 647-009-00-1  
**Hazard:** H319 H335 H315 H334  
**Precaution:** P261 P305+P351+P338 P342+P311

Cat No.	Grade	Assay	Info.	Per
ESC55945		N/A		25g

**RESAZURIN TABLETS**

**UN Class:** N/A **EC No.:** N/A  
**Cas No.:** 5508-82-3 **Index No.:** Not listed  
**Hazard:** Not considered hazardous  
**Precaution:** No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC55947		N/A	pH 4.2-6.3	25 pk
ESC55948		N/A	pH 4.2-6.3	100 pk



**RESORCINOL (BENZENE-1,3-DIOL)** $C_6H_4(OH)_2 = 110.11g/mol$ 

**UN Class:** 6.1 /UN2876 PG-III      **EC No.:** 203-585-2      **Warning**  
**Cas No.:** 108-46-3      **Index No.:** 604-010-00-1

**Hazard:** H302 H315 H319 H400  
**Precaution:** P273 P305+P351+P338 P301+P312

Cat No.	Grade	Assay	Info.	Per
ESC55950		98%		100g

**SCHIFF'S REAGENT (FOR DETECTION OF ALDEHYDES)**

N/A



**UN Class:** N/A      **EC No.:** N/A      **Danger**  
**Cas No.:** N/A      **Index No.:** Not listed

**Hazard:** H290 H314 H350  
**Precaution:** P201 P280 P305+P351+P338 P310

Cat No.	Grade	Assay	Info.	Per
ESC55967		N/A		250ml

**SAFRANIN O STAIN C.I.50240 (BASIC RED 2)** $C_{20}H_{12}N_2O_2 \cdot 3H_2O = 378.47g/mol$ 

**UN Class:** N/A      **EC No.:** 207-518-8      **Danger**  
**Cas No.:** 477-73-6      **Index No.:** Not listed

**Hazard:** H318  
**Precaution:** P280 P305+P351+P338

Cat No.	Grade	Assay	Info.	Per
ESC55956		N/A	Powder	5g

**SCHULTZE'S SOLUTION (CHLOR-ZINC-IODINE SOLUTION)**

N/A



**UN Class:** N/A      **EC No.:** N/A      **Danger**  
**Cas No.:** N/A      **Index No.:** Not listed

**Hazard:** H302 H314 H410  
**Precaution:** P273 P280 P305+P351+P338 P310 P501

Cat No.	Grade	Assay	Info.	Per
ESC55969		N/A		100ml

**SAFRANIN O 1% AQUEOUS SOLUTION**

**UN Class:** N/A      **EC No.:** 207-518-8  
**Cas No.:** 477-73-6      **Index No.:** Not listed

**Hazard:** Not considered hazardous  
**Precaution:** No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC55953		1%	Solution	100ml

**SEBACOYL CHLORIDE**

N/A



**UN Class:** 8 /UN3265 PG-II      **EC No.:** 203-843-4      **Danger**  
**Cas No.:** 111-19-3      **Index No.:** Not listed

**Hazard:** H302 H310 H314  
**Precaution:** P280 P302+P350 P305+P351+P338 P310

Cat No.	Grade	Assay	Info.	Per
ESC55972		97%		25ml

**SALICYLIC ACID (2-HYDROXYBENZOIC ACID)** $C_6H_4(OH)COOH = 138.12g/mol$ 

**UN Class:** N/A      **EC No.:** 200-712-3      **Danger**  
**Cas No.:** 69-72-7      **Index No.:** Not listed

**Hazard:** H302 H318  
**Precaution:** P280 P305+P351+P338

Cat No.	Grade	Assay	Info.	Per
ESC55959		99%		100g
ESC55961		99%		500g
ESC55962		99.5%		1kg

**SEBACOYL CHLORIDE 5% IN CYCLOHEXANE**

N/A



**UN Class:** 3 /UN1145 PG-II      **EC No.:** N/A      **Danger**  
**Cas No.:** N/A      **Index No.:** Not listed

**Hazard:** H225 H304 H315 H336 H410  
**Precaution:** P210 P273 P280 P301+P330+P331 P307+P311

Cat No.	Grade	Assay	Info.	Per
ESC55974		N/A		100ml

**SILICA SAND (ACID WASHED)**

**UN Class:** N/A      **EC No.:** 231-545-4  
**Cas No.:** 7631-86-9      **Index No.:** Not listed

**Hazard:** Not considered hazardous  
**Precaution:** No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC55965		N/A	pH 4.2-6.3	5kg
ESC55964		N/A	pH 4.2-6.3	1kg

**L-SERINE**

**UN Class:** N/A      **EC No.:** 200-274-3  
**Cas No.:** 56-45-1      **Index No.:** Not listed

**Hazard:** Not considered hazardous  
**Precaution:** No additional precautions required


Cat No.	Grade	Assay	Info.	Per
ESC55976		98.5%		5g



**SILICA GEL**

UN Class: N/A EC No.: 231-545-4  
 Cas No.: 112926-00-8 Index No.: Not listed

Hazard: Not considered hazardous  
 Precaution: No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC55983		98%		500g


**SILICA GEL SELF-INDICATING (BLUE-PINK)**

N/A



UN Class: N/A EC No.: 231-545-4 Danger  
 Cas No.: 112926-00-8 Index No.: Not listed


Hazard: H350i H412  
 Precaution: P201 P273 P308+P313

Cat No.	Grade	Assay	Info.	Per
ESC55978		97%		500g

**SILICA GEL SELF-INDICATING (ORANGE) (ORANGE TO COLOURLESS)**

UN Class: N/A EC No.: 231-545-4  
 Cas No.: 112926-00-8 Index No.: Not listed


Hazard: Not considered hazardous  
 Precaution: No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC55981		97%		500g

**SILICON (IV) OXIDE (SILICON DIOXIDE)**SiO<sub>2</sub> = 60.08g/mol

UN Class: N/A EC No.: 231-545-4 Warning  
 Cas No.: 7631-86-9 Index No.: Not listed

Hazard: H319 H335  
 Precaution: P261 P305+P351+P338


Cat No.	Grade	Assay	Info.	Per
ESC55985		97%		250g

**SILVER WIRE**

Ag = 107.87g/mol

UN Class: N/A EC No.: 231-131-3  
 Cas No.: 7440-22-4 Index No.: Not listed




Hazard: Not considered hazardous  
 Precaution: No additional precautions required  
 Notes: Approximately 150mm

Cat No.	Grade	Assay	Info.	Per
ESC55987		N/A		10g

**SILVER NITRATE**AgNO<sub>3</sub> = 169.87g/mol

UN Class: 5.1 / UN1493 PG-II EC No.: 231-853-9 Danger  
 Cas No.: 7761-88-8 Index No.: 047-001-00-2



Hazard: H272 H314 H410  
 Precaution: P220 P273 P280 P305+P351+P338 P310 P501

Cat No.	Grade	Assay	Info.	Per
ESC55993		99.9%		10g
ESC55994		99.9%		25g
ESC55996		99.9%		100g

**SILVER NITRATE 0.1M (0.1N) SOLUTION**AgNO<sub>3</sub> = 169.87g/mol

UN Class: 9 / UN3082 PG-III EC No.: 231-853-9 Warning  
 Cas No.: 7761-88-8 Index No.: 047-001-00-2


Hazard: H315 H319 H412  
 Precaution: P273 P280 P305+P351+P338 P337+P313

Cat No.	Grade	Assay	Info.	Per
ESC55989		0.1M	0.1M (0.1N)	500ml
ESC55991		0.1M	0.1M (0.1N)	2.5L

**SILVER SULPHATE**Ag<sub>2</sub>SO<sub>4</sub> = 311.8g/mol

UN Class: N/A EC No.: 233-653-7 Warning  
 Cas No.: 10294-26-5 Index No.: Not listed

Hazard: H315 H319 H335 H400  
 Precaution: P261 P273 P305+P351+P338

Cat No.	Grade	Assay	Info.	Per
ESC55998		98.5%		10g



**SOAP SOLUTION**

N/A






UN Class: 3 / UN1170 PG-II EC No.: N/A Danger  
 Cas No.: N/A Index No.: Not listed





Hazard: H225 H371  
 Precaution: P210 P260



Cat No.	Grade	Assay	Info.	Per
ESC55999		N/A	Clark's	1L
ESC56000		N/A	Wanklyn's	1L












SODA LIME				
N/A				
<b>UN Class:</b> 8 /UN1907 PG-III		<b>EC No.:</b> N/A		Danger
<b>Cas No.:</b> 8006-28-8		<b>Index No.:</b> Not listed		
<b>Hazard:</b> H314				
<b>Precaution:</b> P280 P305+P351+P338 P310				
Cat No.	Grade	Assay	Info.	Per
ESC56001		98%	Granulated	500g
ESC56002		98%	Self-Indicating	1kg

SODIUM METAL IN LIQUID PARAFFIN				
Na = 22.99g/mol				 
<b>UN Class:</b> 4.3 /UN1428 PG-I		<b>EC No.:</b> 231-132-9		Danger
<b>Cas No.:</b> 7440-23-5		<b>Index No.:</b> 011-001-00-0		
<b>Hazard:</b> H260 H314				
<b>Precaution:</b> P223 P231+P232 P280 P301+P310				
Cat No.	Grade	Assay	Info.	Per
ESC56005		99%	SURCHARGE	50g
ESC56006		99%	SURCHARGE	100g

SODIUM ACETATE ANHYDROUS (SODIUM ETHANOATE)				
CH <sub>3</sub> COONa = 82.03g/mol				
<b>UN Class:</b> N/A		<b>EC No.:</b> 204-823-8		Warning
<b>Cas No.:</b> 127-09-3		<b>Index No.:</b> Not listed		
<b>Hazard:</b> H319				
<b>Precaution:</b> P305+P351+P338				
Cat No.	Grade	Assay	Info.	Per
ESC56014		98%		500g





SODIUM ALGINATE				
<b>UN Class:</b> N/A		<b>EC No.:</b> N/A		
<b>Cas No.:</b> 9005-38-3		<b>Index No.:</b> Not listed		
<b>Hazard:</b> Not considered hazardous				
<b>Precaution:</b> No additional precautions required				
Cat No.	Grade	Assay	Info.	Per
ESC56018		97%		100g
ESC56020		97%		500g





SODIUM AZIDE				
NaN <sub>3</sub> = 65.01g/mol				 
<b>UN Class:</b> 6.1 /UN1687 PG-II		<b>EC No.:</b> 247-852-1		Danger
<b>Cas No.:</b> 26628-22-8		<b>Index No.:</b> 011-004-00-7		
<b>Hazard:</b> H300 H400 H410 EUH032				
<b>Precaution:</b> P273 P501				
Cat No.	Grade	Assay	Info.	Per
ESC56022		99%		100g



SODIUM BENZOATE				
C <sub>6</sub> H <sub>5</sub> COONa = 144.1g/mol				
<b>UN Class:</b> N/A		<b>EC No.:</b> 208-534-8		Warning
<b>Cas No.:</b> 532-32-1		<b>Index No.:</b> Not listed		
<b>Hazard:</b> H319				
<b>Precaution:</b> P305+P351+P338				
Cat No.	Grade	Assay	Info.	Per
ESC56025		99%		500g

#### SODIUM BICARBONATE SEE SODIUM HYDROGEN CARBONATE

#### SODIUM BISULPHATE SEE SODIUM HYDROGEN SULPHATE

SODIUM BOROHYDRIDE (SODIUM TETRAHYDRIDOBORATE)				
NaBH <sub>4</sub> = 37.83g/mol				  
<b>UN Class:</b> 4.3 /UN1426 PG-I		<b>EC No.:</b> 241-004-4		Danger
<b>Cas No.:</b> 16940-66-2		<b>Index No.:</b> Not listed		
<b>Hazard:</b> H260 H301 H311 H314				
<b>Precaution:</b> P223 P231+P232 P280 P301+P310				
Cat No.	Grade	Assay	Info.	Per
ESC56027		99%	SURCHARGE	100g

SODIUM BROMATE				
NaBrO <sub>3</sub> = 150.89g/mol				  
<b>UN Class:</b> 5.1 /UN1494 PG-II		<b>EC No.:</b> 232-160-4		Danger
<b>Cas No.:</b> 7789-38-0		<b>Index No.:</b> Not listed		
<b>Hazard:</b> H272 H302 H315 H319 H335				
<b>Precaution:</b> P220 P261 P305+P351+P338				
Cat No.	Grade	Assay	Info.	Per
ESC56030		99%		500g

SODIUM BROMIDE				
NaBr = 102.89g/mol				
<b>UN Class:</b> N/A		<b>EC No.:</b> 231-599-9		Warning
<b>Cas No.:</b> 7647-15-6		<b>Index No.:</b> Not listed		
<b>Hazard:</b> H319				
<b>Precaution:</b> P305+P351+P338				
Cat No.	Grade	Assay	Info.	Per
ESC56034		99%		500g



**SODIUM CARBONATE 10-WATER** $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O} = 286.14\text{g/mol}$ 

**UN Class:** N/A **EC No.:** 207-838-8 **Warning**  
**Cas No.:** 6132-02-1 **Index No.:** 011-005-00-2  
**Hazard:** H319  
**Precaution:** P305+P351+P338

Cat No.	Grade	Assay	Info.	Per
ESC56037		98%	Clark's	1kg

**SODIUM CARBONATE ANHYDROUS** $\text{Na}_2\text{CO}_3 = 105.99\text{g/mol}$ 

**UN Class:** N/A **EC No.:** 207-838-8 **Warning**  
**Cas No.:** 497-19-8 **Index No.:** 011-005-00-2  
**Hazard:** H319  
**Precaution:** P305+P351+P338

Cat No.	Grade	Assay	Info.	Per
ESC56044		99%		500g
ESC56045		99%		1kg

**SODIUM CHLORATE (V)** $\text{NaClO}_3 = 106.44\text{g/mol}$ 

**UN Class:** 5.1 /UN1495 PG-II **EC No.:** 231-887-4 **Danger**  
**Cas No.:** 7775-09-9 **Index No.:** 017-005-00-9  
**Hazard:** H271 H302 H411  
**Precaution:** P220 P273

Cat No.	Grade	Assay	Info.	Per
ESC56049		99%		500g

**SODIUM CHLORIDE** $\text{NaCl} = 58.44\text{g/mol}$ 

**UN Class:** N/A **EC No.:** 231-598-3  
**Cas No.:** 7647-14-5 **Index No.:** Not listed  
**Hazard:** Not considered hazardous  
**Precaution:** No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC56053		99%		500g
ESC56054		99%		1kg

**MANGANESE (II) CARBONATE** $\text{MnCO}_3 = 114.95\text{g/mol}$ 

**UN Class:** N/A **EC No.:** 209-942-9  
**Cas No.:** 598-62-9 **Index No.:** Not listed  
**Hazard:** Not considered hazardous  
**Precaution:** No additional precautions required

Cat No.	Grade	Assay	Info.	Per
CHE291774		93%		500g

**SODIUM CHLORIDE - GRANULAR** $\text{NaCl} = 58.44\text{g/mol}$ 

**UN Class:** N/A **EC No.:** 231-598-3  
**Cas No.:** 7647-14-5 **Index No.:** Not listed  
**Hazard:** Not considered hazardous  
**Precaution:** No additional precautions required  
**Notes:** Large Granules - 0.5-2cm grains  
 Not suitable for human consumption

Cat No.	Grade	Assay	Info.	Per
ESC56056		98%	Granular	1kg

**SODIUM CHLORIDE - ROCK SALT (SODIUM CHLORIDE TECHNICAL)**

**UN Class:** N/A **EC No.:** 231-598-3  
**Cas No.:** 7647-17-5 **Index No.:** Not listed  
**Hazard:** Not considered hazardous  
**Precaution:** No additional precautions required  
**Notes:** Not suitable for human consumption

Cat No.	Grade	Assay	Info.	Per
ESC56058		97%		1kg
ESC56059		97%		500g

**SODIUM CHROMATE 4-WATER** $\text{Na}_2\text{CrO}_4 \cdot 4\text{H}_2\text{O} = 234.03\text{g/mol}$ 

**UN Class:** 6.1 /UN3288 PG-II **EC No.:** 231-889-5 **Danger**  
**Cas No.:** 10034-82-9 **Index No.:** 024-018-00-3  
**Hazard:** H350 H340 H360FD H330 H301 H372 H312 H314 H334 H317 H410  
**Precaution:** P201 P260 P273 P280 P284 P301+P310

Cat No.	Grade	Assay	Info.	Per
ESC56061		96%		250g

**TRI-SODIUM CITRATE 2-WATER** $\text{HOC}(\text{COONa})(\text{CH}_2\text{COONa})_2 \cdot 2\text{H}_2\text{O} = 294.1\text{g/mol}$ 

**UN Class:** N/A **EC No.:** 200-675-3  
**Cas No.:** 6132-04-3 **Index No.:** Not listed  
**Hazard:** Not considered hazardous  
**Precaution:** No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC56244		99%		500g



**SODIUM DICHROMATE (VI) ANHYDROUS** $\text{Na}_2\text{Cr}_2\text{O}_7 = 268\text{g/mol}$ 

**UN Class:** 6.1(5.1)/UN3086 PG-II **EC No.:** 234-190-3 **Danger**  
**Cas No.:** 10588-01-9 **Index No.:** 024-004-00-7  
**Hazard:** H272 H350 H340 H360FD H330 H301 H312 H372 H314 H334 H317 H410  
**Precaution:** P201 P220 P260 P273 P280 P284

Cat No.	Grade	Assay	Info.	Per
ESC56065		99%		500g

**SODIUM FORMATE** $\text{HCOONa} = 68.01\text{g/mol}$ 

**UN Class:** N/A **EC No.:** 205-488-0  
**Cas No.:** 141-53-7 **Index No.:** Not listed  
**Hazard:** Not considered hazardous  
**Precaution:** No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC56078		98%		500g

**SODIUM DIHYDROGEN PHOSPHATE 2-WATER** $\text{NaH}_2\text{PO}_4 \cdot 2\text{H}_2\text{O} = 156.01\text{g/mol}$ 

**UN Class:** N/A **EC No.:** 231-449-2  
**Cas No.:** 13472-35-0 **Index No.:** Not listed  
**Hazard:** Not considered hazardous  
**Precaution:** No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC56068		98%		500g

**SODIUM HYDROGEN CARBONATE (SODIUM BICARBONATE)** $\text{NaHCO}_3 = 84.01\text{g/mol}$ 

**UN Class:** N/A **EC No.:** 205-633-8  
**Cas No.:** 144-55-8 **Index No.:** Not listed  
**Hazard:** Not considered hazardous  
**Precaution:** No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC56085		99%		500g
ESC56086		99%		1kg

**SODIUM DIHYDROGEN PHOSPHATE ANHYDROUS** $\text{NaH}_2\text{PO}_4 = 119.98\text{g/mol}$ 

**UN Class:** N/A **EC No.:** 231-449-2 **Warning**  
**Cas No.:** 7558-80-7 **Index No.:** Not listed  
**Hazard:** H319  
**Precaution:** P305+P351+P338

Cat No.	Grade	Assay	Info.	Per
ESC56070		98%		1kg

**DI-SODIUM HYDROGEN PHOSPHATE 2-WATER** $\text{Na}_2\text{HPO}_4 \cdot 2\text{H}_2\text{O} = 177.99\text{g/mol}$ 

**UN Class:** N/A **EC No.:** 231-448-7  
**Cas No.:** 10028-24-7 **Index No.:** Not listed  
**Hazard:** Not considered hazardous  
**Precaution:** No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC55254		98%		500g

**SODIUM DODECYL SULPHATE (SODIUM LAURYL SULPHATE)** $\text{CH}_3(\text{CH}_2)_{11}\text{OSO}_3\text{Na} = 288.38\text{g/mol}$ 

**UN Class:** 4.1 /UN2926 PG-II **EC No.:** 205-788-1 **Danger**  
**Cas No.:** 151-21-3 **Index No.:** Not listed  
**Hazard:** H228 H302 H311 H315 H319 H335  
**Precaution:** P210 P261 P280 P305+P351+P338 P312

Cat No.	Grade	Assay	Info.	Per
ESC56072		98%		500g

**DI-SODIUM HYDROGEN PHOSPHATE 12-WATER** $\text{Na}_2\text{HPO}_4 \cdot 12\text{H}_2\text{O} = 358.14\text{g/mol}$ 

**UN Class:** N/A **EC No.:** 231-448-7  
**Cas No.:** 10039-32-4 **Index No.:** Not listed  
**Hazard:** Not considered hazardous  
**Precaution:** No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC55256		98%		1kg

**SODIUM FLORIDE** $\text{NaF} = 41.99\text{g/mol}$ 

**UN Class:** 6.1 /UN1690 PG-III **EC No.:** 231-667-8 **Danger**  
**Cas No.:** 7681-49-4 **Index No.:** 009-004-00-7  
**Hazard:** H301 H319 H315  
**Precaution:** P301+P310 P305+P351+P338

Cat No.	Grade	Assay	Info.	Per
ESC56075		98%		500g

**DI-SODIUM HYDROGEN PHOSPHATE ANHYDROUS** $\text{Na}_2\text{HPO}_4 = 141.96\text{g/mol}$ 

**UN Class:** N/A **EC No.:** 231-448-7  
**Cas No.:** 7558-79-4 **Index No.:** Not listed  
**Hazard:** Not considered hazardous  
**Precaution:** No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC55252		98%		500g



**SODIUM HYDROGEN SULPHATE (SODIUM BISULPHATE)**NaHSO<sub>4</sub> = 120.06g/mol

**UN Class:** N/A **EC No.:** 231-665-7 **Danger**  
**Cas No.:** 7681-38-1 **Index No.:** 016-046-00-X  
**Hazard:** H318  
**Precaution:** P280 P305+P351+P338

Cat No.	Grade	Assay	Info.	Per
ESC56082		98%		500g

**SODIUM HYDROXIDE - PEARL POWDER (CAUSTIC SODA)**

NaOH = 40g/mol



**UN Class:** 8 /UN1823 PG-II **EC No.:** 215-185-5 **Danger**  
**Cas No.:** 1310-73-2 **Index No.:** 011-002-00-6  
**Hazard:** H314  
**Precaution:** P280 P305+P351+P338 P310

Cat No.	Grade	Assay	Info.	Per
ESC56095		96%	Pearl powder	500g

**SODIUM HYDROXIDE - PELLETS (CAUSTIC SODA)**

NaOH = 40g/mol



**UN Class:** 8 /UN1823 PG-II **EC No.:** 215-185-5 **Danger**  
**Cas No.:** 1310-73-2 **Index No.:** 011-002-00-6  
**Hazard:** H314  
**Precaution:** P280 P305+P351+P338 P310

Cat No.	Grade	Assay	Info.	Per
ESC56093		97%		500g

**SODIUM HYDROXIDE 0.1M (0.1N)**

NaOH = 40g/mol

**UN Class:** 8 /UN1824 PG-III **EC No.:** 215-185-5  
**Cas No.:** 1310-73-2 **Index No.:** 011-002-00-6  
**Hazard:** Not considered hazardous  
**Precaution:** No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC56088		0.1M		1L

**SODIUM HYDROXIDE 0.1M (0.1N) CVS**

NaOH = 40g/mol



**UN Class:** 8 /UN1824 PG-III **EC No.:** 215-185-5 **Danger**  
**Cas No.:** 1310-73-2 **Index No.:** 011-002-00-6  
**Hazard:** H314  
**Precaution:** P280 P305+P351+P338 P310  
**Notes:** 6 x 1M 100ml ampoules, each makes 1L of 0.1M solution.  
**Chemical info shown for ampoule not diluted solution.**

Cat No.	Grade	Assay	Info.	Price	Per
ESC56089		0.1M	Ampoule	15.95	6

**SODIUM HYDROXIDE 1.0M (1.0N) CVS**

NaOH = 40g/mol



**UN Class:** 8 /UN1824 PG-II **EC No.:** 215-185-5 **Danger**  
**Cas No.:** 1310-73-2 **Index No.:** 011-002-00-6  
**Hazard:** H314  
**Precaution:** P280 P305+P351+P338 P310  
**Notes:** 6 x 1M 100ml ampoules, each makes 1L of 0.1M solution.  
**Chemical info shown for ampoule not diluted solution.**

Cat No.	Grade	Assay	Info.	Per
ESC56090		1.0M	Ampoule	6

**SODIUM HYDROXIDE 2.0M (2.0N)**

NaOH = 40g/mol



**UN Class:** 8 /UN1824 PG-II **EC No.:** 215-185-5 **Danger**  
**Cas No.:** 1310-73-2 **Index No.:** 011-002-00-6  
**Hazard:** H314  
**Precaution:** P280 P305+P351+P338 P310

Cat No.	Grade	Assay	Info.	Per
ESC56091		2.0M		1L

**SODIUM HYDROXIDE 40% SOLUTION**

NaOH = 40g/mol



**UN Class:** 8 /UN1824 PG-II **EC No.:** 215-185-5 **Danger**  
**Cas No.:** 1310-73-2 **Index No.:** 011-002-00-6  
**Hazard:** H314  
**Precaution:** P280 P305+P351+P338 P310

Cat No.	Grade	Assay	Info.	Per
ESC56097		0.4%		1L

**SODIUM HYPOCHLORITE SOLUTION**



NaClO = 74.44g/mol







**UN Class:** 8 /UN1791 PG-III **EC No.:** 231-668-3 **Danger**  
**Cas No.:** 7681-52-9 **Index No.:** 017-011-00-1  
**Hazard:** H314 H400 EUH031  
**Precaution:** P260 P273 P280 P301+P330+P331 P303+P361+P353 P305+P351+P338



Cat No.	Grade	Assay	Info.	Per
ESC56099		10 - 15%		2.5L







SODIUM IODATE				
$\text{NaIO}_3 \cdot \text{H}_2\text{O} = 215.91\text{g/mol}$				
				
<b>UN Class:</b> 5.1 / UN1479 PG-II		<b>EC No.:</b> 231-672-5		Danger
<b>Cas No.:</b> 7681-55-2		<b>Index No.:</b> Not listed		
<b>Hazard:</b> H272 H302 H334 H317				
<b>Precaution:</b> P220 P261 P342+P311				
Cat No.	Grade	Assay	Info.	Per
ESC56101		99.5%		100g



SODIUM NITRITE				
$\text{NaNO}_2 = 69\text{g/mol}$				
				
<b>UN Class:</b> 5.1 / UN1500 PG-III		<b>EC No.:</b> 231-555-9		Danger
<b>Cas No.:</b> 7632-00-0		<b>Index No.:</b> 007-010-00-4		
<b>Hazard:</b> H272 H301 H400				
<b>Precaution:</b> P220 P273				
Cat No.	Grade	Assay	Info.	Per
ESC56112		98%		500g



SODIUM IODIDE				
$\text{NaI} = 149.89\text{g/mol}$				
				
<b>UN Class:</b> N/A		<b>EC No.:</b> 231-679-3		Warning
<b>Cas No.:</b> 7681-82-5		<b>Index No.:</b> Not listed		
<b>Hazard:</b> H315 H319 H400				
<b>Precaution:</b> P305+P351+P338				
Cat No.	Grade	Assay	Info.	Per
ESC56103		99%		100g



SODIUM OXALATE (SODIUM ETHANEDIOATE)				
$\text{NaOCCOONa} = 134\text{g/mol}$				
				
<b>UN Class:</b> 6.1 / UN3467 PG-III		<b>EC No.:</b> 200-550-3		Warning
<b>Cas No.:</b> 62-76-0		<b>Index No.:</b> 607-007-00-3		
<b>Hazard:</b> H312 H302				
<b>Precaution:</b> P280				
Cat No.	Grade	Assay	Info.	Per
ESC56114		99.5%		500g

SODIUM METABISULPHITE (SODIUM DISULPHITE)				
$\text{Na}_2\text{S}_2\text{O}_5 = 190.11\text{g/mol}$				
				
<b>UN Class:</b> N/A		<b>EC No.:</b> 231-673-0		Danger
<b>Cas No.:</b> 7681-57-4		<b>Index No.:</b> 016-063-00-2		
<b>Hazard:</b> H302 H318				
<b>Precaution:</b> P280 P305+P351+P338				
Cat No.	Grade	Assay	Info.	Per
ESC56108		98.5%		500g

SODIUM PERSULPHATE (SODIUM PEROXODISULPHATE)				
$\text{Na}_2\text{S}_2\text{O}_8 = 238.1\text{g/mol}$				
				
<b>UN Class:</b> 5.1 / UN1505 PG-III		<b>EC No.:</b> 231-892-1		Danger
<b>Cas No.:</b> 7775-27-1		<b>Index No.:</b> Not listed		
<b>Hazard:</b> H272 H302 H315 H317 H319 H334 H335				
<b>Precaution:</b> P220 P261 P280 P305+P351+P338 P342+P311				
Cat No.	Grade	Assay	Info.	Per
ESC56117		96%		500g

SODIUM NITRATE				
$\text{NaNO}_3 = 84.99\text{g/mol}$				
				
<b>UN Class:</b> 5.1 / UN1498 PG-III		<b>EC No.:</b> 231-554-3		Warning
<b>Cas No.:</b> 7631-99-4		<b>Index No.:</b> Not listed		
<b>Hazard:</b> H272 H302 H315 H319 H335				
<b>Precaution:</b> P220 P261 P305+P351+P338				
Cat No.	Grade	Assay	Info.	Per
ESC56110		98%		500g

TRI-SODIUM PHOSPHATE 12-WATER				
$\text{Na}_3\text{PO}_4 \cdot 12\text{H}_2\text{O} = 380.12\text{g/mol}$				
				
<b>UN Class:</b> N/A		<b>EC No.:</b> 231-509-8		Warning
<b>Cas No.:</b> 10101-89-0		<b>Index No.:</b> Not listed		
<b>Hazard:</b> H315 H319 H335				
<b>Precaution:</b> P305+P351+P338				
Cat No.	Grade	Assay	Info.	Per
ESC56248		98%		500g

SODIUM SALICYLATE (SODIUM 2-HYDROXYBENZOATE)				
$\text{HOC}_6\text{H}_4\text{COONa} = 160.1\text{g/mol}$				
				
<b>UN Class:</b> N/A		<b>EC No.:</b> 200-198-0		Danger
<b>Cas No.:</b> 54-21-7		<b>Index No.:</b> Not listed		
<b>Hazard:</b> H302 H315 H318 H335				
<b>Precaution:</b> P261 P280 P305+P351+P338				
Cat No.	Grade	Assay	Info.	Per
ESC56127		99%		250g



**SODIUM SILICATE SOLUTION (SODIUM TRISILICATE)** $\text{Na}_2\text{O} \cdot 3\text{SiO}_2 = 242.33\text{g/mol}$ 

**UN Class:** N/A **EC No.:** 215-687-4 **Danger**  
**Cas No.:** 1344-09-8 **Index No.:** Not listed

**Hazard:** H314 H335  
**Precaution:** P261 P280 P305+P351+P338 P310

Cat No.	Grade	Assay	Info.	Per
ESC56130		98%		2.5L

**SODIUM SILICATE POWDER (SODIUM METASILICATE)** $\text{Na}_2\text{SiO}_2 = 122.06\text{g/mol}$ 

**UN Class:** 8 /UN3253 PG-III **EC No.:** 229-912-9 **Danger**  
**Cas No.:** 6834-92-0 **Index No.:** Not listed

**Hazard:** H314 H335  
**Precaution:** P261 P280 P305+P351+P338 P310

Cat No.	Grade	Assay	Info.	Per
ESC56132		98%		500g

**SODIUM SULPHATE ANHYDROUS** $\text{Na}_2\text{SO}_4 = 142.04\text{g/mol}$ 

**UN Class:** N/A **EC No.:** 231-820-9  
**Cas No.:** 7757-82-6 **Index No.:** Not listed

**Hazard:** Not considered hazardous  
**Precaution:** No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC56134		99%		500g

**SODIUM SULPHIDE 9-WATER** $\text{Na}_2\text{S} \cdot 9\text{H}_2\text{O} = 240.18\text{g/mol}$ 

**UN Class:** 8 /UN1849 PG-II **EC No.:** 215-211-5 **Danger**  
**Cas No.:** 1313-84-4 **Index No.:** 016-009-00-8

**Hazard:** H314 H400  
**Precaution:** P273 P280 P305+P351+P338 P310

Cat No.	Grade	Assay	Info.	Per
ESC56136		95%		500g

**SODIUM SULPHITE ANHYDROUS (SODIUM SULPHITE (IV))** $\text{Na}_2\text{SO}_3 = 126.04\text{g/mol}$ 

**UN Class:** N/A **EC No.:** 231-821-4 **Warning**  
**Cas No.:** 7757-83-7 **Index No.:** Not listed

**Hazard:** EUH031  
**Precaution:** No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC56138		96%		500g

**SODIUM TAUROGLYCOCHOLATE****SEE BILE SALTS****DI-SODIUM TETRABORATE 10-WATER (BORAX POWDER)** $\text{Na}_2\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O} = 381.37\text{g/mol}$ 

**UN Class:** N/A **EC No.:** 215-540-4 **Danger**  
**Cas No.:** 1303-96-4 **Index No.:** 005-011-01-1

**Hazard:** H360FD  
**Precaution:** P201 P308+P313

Cat No.	Grade	Assay	Info.	Per
ESC55258		98%		500g

**SODIUM THIOSULPHATE 5-WATER** $\text{Na}_2\text{S}_2\text{O}_3 \cdot 5\text{H}_2\text{O} = 248.18\text{g/mol}$ 

**UN Class:** N/A **EC No.:** 231-867-5  
**Cas No.:** 10102-17-7 **Index No.:** Not listed

**Hazard:** Not considered hazardous  
**Precaution:** No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC56143		99%		500g
ESC56144		99%		1kg

**SODIUM THIOSULPHATE ANHYDROUS** $\text{Na}_2\text{S}_2\text{O}_3 = 158.11\text{g/mol}$ 

**UN Class:** N/A **EC No.:** 231-867-5  
**Cas No.:** 7772-98-7 **Index No.:** Not listed

**Hazard:** Not considered hazardous  
**Precaution:** No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC56146		97%		500g

**SODIUM THIOSULPHATE 0.1M (0.1N)** $\text{Na}_2\text{S}_2\text{O}_3 = 158.11\text{g/mol}$ 

**UN Class:** N/A **EC No.:** 231-867-5  
**Cas No.:** 10102-17-7 **Index No.:** Not listed

**Hazard:** Not considered hazardous  
**Precaution:** No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC56140		0.1M		1L

**SODIUM THIOSULPHATE 1M (1N)** $\text{Na}_2\text{S}_2\text{O}_3 = 158.11\text{g/mol}$ 

**UN Class:** N/A **EC No.:** 231-867-5  
**Cas No.:** 10102-17-7 **Index No.:** Not listed


**Hazard:** Not considered hazardous  
**Precaution:** No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC56142		1M		2.5L



## SOIL INDICATOR - PH 4.0-8.0

UN Class: N/A EC No.: 216-643-7  
 Cas No.: 1633-05-2 Index No.: Not listed  
 Hazard: Not considered hazardous  
 Precaution: No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC56148		97%		500ml

## SOLOCHROME BLACK SEE ERIOCHROME BLACK T



## STANNIC SEE TIN (IV)

## STANNOUS SEE TIN (II)

## STARCH


$(C_6H_{10}O_5)_n$

UN Class: N/A EC No.: 232-679-6  
 Cas No.: 9005-25-8 Index No.: Not listed  
 Hazard: Not considered hazardous  
 Precaution: No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC56149		N/A		100g
ESC56151		N/A		500g

## STARCH - SOLUBLE

UN Class: N/A EC No.: 232-679-6  
 Cas No.: 9005-25-8 Index No.: Not listed  
 Hazard: Not considered hazardous  
 Precaution: No additional precautions required



Cat No.	Grade	Assay	Info.	Per
ESC56153		N/A	Soluble	500g

## SASTEARIC ACID (OCTADECANOIC ACID)TARCH

$CH_3(CH_2)_{16}COOH = 284.48g/mol$




UN Class: N/A EC No.: 200-313-4 Warning  
 Cas No.: 57-11-4 Index No.: Not listed  
 Hazard: H315  
 Precaution: No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC56158		93%		500g
ESC56159		93%		1kg

## STEEL WOOL


UN Class: N/A EC No.: N/A  
 Cas No.: N/A Index No.: Not listed  
 Hazard: Not considered hazardous  
 Precaution: No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC56161		N/A		450g

## STRONTIUM CARBONATE

$SrCO_3 = 147.63g/mol$

UN Class: N/A EC No.: 216-643-7  
 Cas No.: 1633-05-2 Index No.: Not listed  
 Hazard: Not considered hazardous  
 Precaution: No additional precautions required


Cat No.	Grade	Assay	Info.	Per
ESC56163		97%		100g

## STRONTIUM CHLORIDE 6-WATER

$SrCl_2 \cdot 6H_2O = 266.62g/mol$



UN Class: N/A EC No.: 233-971-6 Danger  
 Cas No.: 10025-70-4 Index No.: Not listed  
 Hazard: H318  
 Precaution: P280 P305+P351+P338


Cat No.	Grade	Assay	Info.	Per
ESC56166		95%		100g

## STRONTIUM NITRATE

$Sr(NO_3)_2 = 211.63g/mol$



UN Class: 5.1 /UN1507 PG-III EC No.: 233-131-9 Warning  
 Cas No.: 10042-76-9 Index No.: Not listed  
 Hazard: H272 H302 H315 H319 H335  
 Precaution: P220 P261 P305+P351+P338


Cat No.	Grade	Assay	Info.	Per
ESC56169		99%		100g

## STYRENE MONOMER (PHENYLETHYLENE)

$C_6H_5CH=CH_2 = 104.15g/mol$





UN Class: 3 /UN2055 PG-III EC No.: 202-851-5 Warning  
 Cas No.: 100-42-5 Index No.: 601-026-00-0  
 Hazard: H226 H332 H319 H315  
 Precaution: P305+P351+P338

Cat No.	Grade	Assay	Info.	Per
ESC56171		99%		250ml

## SUCROSE (CANE SUGAR)

$C_{12}H_{22}O_{11} = 342.3g/mol$

UN Class: N/A EC No.: 200-334-9  
 Cas No.: 57-50-1 Index No.: Not listed  
 Hazard: Not considered hazardous  
 Precaution: No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC56173		N/A		1kg
ESC56174		N/A		5kg



**SUCCINIC ACID (BUTANEDIOIC ACID)**HOOCCH<sub>2</sub>CH<sub>2</sub>COOH = 118.09g/mol

**UN Class:** N/A **EC No.:** 203-740-4 **Danger**  
**Cas No.:** 110-15-6 **Index No.:** Not listed

**Hazard:** H315 H318 H335  
**Precaution:** P261 P280 P305+P351+P338

Cat No.	Grade	Assay	Info.	Per
ESC56176		99%		100g

**SULPHANILIC ACID (4-AMINO BENZENE SULPHONIC ACID)**4-(H<sub>2</sub>N)C<sub>6</sub>H<sub>4</sub>SO<sub>3</sub>H = 173.19g/mol

**UN Class:** N/A **EC No.:** 204-482-5 **Warning**  
**Cas No.:** 121-57-3 **Index No.:** 612-014-00-X

**Hazard:** H319 H315 H317  
**Precaution:** P280 P305+P351+P338

Cat No.	Grade	Assay	Info.	Per
ESC56186		99 %		500g

**SUDAN (III) C.I.26100**C<sub>22</sub>H<sub>16</sub>N<sub>4</sub>O = 352.39g/mol

**UN Class:** N/A **EC No.:** 201-638-4  
**Cas No.:** 85-86-9 **Index No.:** Not listed

**Hazard:** Not considered hazardous  
**Precaution:** No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC56178		N/A		100g

**SULPHUR FINE POWDER**

S = 32.07g/mol



**UN Class:** 4.1 /UN1350 PG-III **EC No.:** 231-722-6 **Warning**  
**Cas No.:** 7704-34-9 **Index No.:** 016-094-00-1

**Hazard:** H228 H315  
**Precaution:** P210 P302+P352

Cat No.	Grade	Assay	Info.	Per
ESC56188		N/A		500g

**SUDAN III ALCOHOLIC SOLUTION**C<sub>22</sub>H<sub>16</sub>N<sub>4</sub>O = 352.39g/mol

**UN Class:** 3 /UN1170 PG-II **EC No.:** N/A **Danger**  
**Cas No.:** N/A **Index No.:** Not listed

**Hazard:** H225 H302 H371  
**Precaution:** P210 P280 P260 P301+P312

Cat No.	Grade	Assay	Info.	Per
ESC56180		N/A		100ml

**SULPHURIC ACID 98%**H<sub>2</sub>SO<sub>4</sub> = 98g/mol

**UN Class:** 8 /UN1830 PG-II **EC No.:** 231-639-5 **Danger**  
**Cas No.:** 7664-93-9 **Index No.:** 016-020-00-8

**Hazard:** H314  
**Precaution:** P280 P305+P351+P338 P310

Cat No.	Grade	Assay	Info.	Per
ESC56199		98%		2.5L

**SUDAN IV C.I.26105**C<sub>24</sub>H<sub>20</sub>N<sub>4</sub>O = 380.44g/mol

**UN Class:** N/A **EC No.:** 201-635-8  
**Cas No.:** 85-83-6 **Index No.:** Not listed

**Hazard:** Not considered hazardous  
**Precaution:** No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC56182		N/A		100g

**SULPHURIC ACID 0.05M (0.1N)**H<sub>2</sub>SO<sub>4</sub> = 98.08g/mol

**UN Class:** N/A **EC No.:** 231-639-5  
**Cas No.:** 7664-93-9 **Index No.:** 016-020-00-8

**Hazard:** Not considered hazardous  
**Precaution:** No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC56193		0.05M		2.5L

**SULPHAMIC ACID (AMIDOSULPHONIC ACID)**NH<sub>2</sub>SO<sub>3</sub>H = 97.09g/mol

**UN Class:** 8 /UN2967 PG-III **EC No.:** 226-218-8 **Warning**  
**Cas No.:** 5329-14-6 **Index No.:** 016-026-00-0

**Hazard:** H319 H315 H412  
**Precaution:** P273 P305+P351+P338

Cat No.	Grade	Assay	Info.	Per
ESC56184		99%		500g

**SULPHURIC ACID 0.05M (0.1N) CVS**H<sub>2</sub>SO<sub>4</sub> = 98.08g/mol



**UN Class:** 8 /UN2796 PG-II **EC No.:** 231-639-5 **Warning**  
**Cas No.:** 7664-93-9 **Index No.:** 016-020-00-8



**Hazard:** H315 H319  
**Precaution:** P280 P305+P351+P338  
**Notes:** 6 x 1M 100ml ampoules, each makes 1L of 0.1M solution.  
**Chemical info shown for ampoule not diluted solution.**



Cat No.	Grade	Assay	Info.	Per
ESC56192		0.05M	Ampoule	6










SULPHURIC ACID 0.5M (1.0N)				
$H_2SO_4 = 98.08g/mol$ 				
UN Class: 8 /UN2796 PG-II		EC No.: 231-639-5		Warning
Cas No.: 7664-93-9		Index No.: 016-020-00-8		
Hazard: H315 H319 Precaution: P280 P305+P351+P338				
Cat No.	Grade	Assay	Info.	Per
ESC56190		0.5M		2.5L




SULPHURIC ACID 0.5M (1.0N) CVS				
$H_2SO_4 = 98.08g/mol$ 				
UN Class: 8 /UN2796 PG-II		EC No.: 231-639-5		Warning
Cas No.: 7664-93-9		Index No.: 016-020-00-8		
Hazard: H314 Precaution: P280 P305+P351+P338 P310 Notes: 6 x 1M 100ml ampoules, each makes 1L of 0.1M solution. Chemical info shown for ampoule not diluted solution.				
Cat No.	Grade	Assay	Info.	Per
ESC56195		0.5M	Ampoule	6




SULPHURIC ACID 1M (2N)				
$H_2SO_4 = 98.08g/mol$ 				
UN Class: 8 /UN2796 PG-II		EC No.: 231-639-5		Warning
Cas No.: 7664-93-9		Index No.: 016-020-00-8		
Hazard: H315 H319 Precaution: P280 P305+P351+P338				
Cat No.	Grade	Assay	Info.	Per
ESC56196		1.0M		500ml



SULPHURIC ACID 2M (4N)				
$H_2SO_4 = 98.08g/mol$ 				
UN Class: 8 /UN2796 PG-II		EC No.: 231-639-5		Danger
Cas No.: 7664-93-9		Index No.: 016-020-00-8		
Hazard: H314 Precaution: P280 P305+P351+P338 P310				
Cat No.	Grade	Assay	Info.	Per
ESC56198		2.0M		500ml





TANNIC ACID				
$C_76H_{52}O_{46} = 1701.2g/mol$				
UN Class: N/A		EC No.: 215-753-2		
Cas No.: 1401-55-4		Index No.: Not listed		
Hazard: Not considered hazardous Precaution: No additional precautions required				
Cat No.	Grade	Assay	Info.	Per
ESC56201		98%		100g

L-(-)-TARTARIC ACID (2,3-DIHYDROXYBUTANEDIOIC ACID)				
$HO_2CCH(OH)CH(OH)CO_2H = 150.09g/mol$ 				
UN Class: N/A		EC No.: 201-766-0		Warning
Cas No.: 87-69-4		Index No.: Not listed		
Hazard: H315 H319 H335 Precaution: P261 P305+P351+P338				
Cat No.	Grade	Assay	Info.	Per
ESC55456		99%		500g

TETRACHLOROETHYLENE				
$CCl_2=CCl_2 = 165.83g/mol$  				
UN Class: 6.1 /UN1897 PG-III		EC No.: 204-825-9		Warning
Cas No.: 127-18-4		Index No.: 602-028-00-4		
Hazard: H351 H411 Precaution: P273 P281				
Cat No.	Grade	Assay	Info.	Per
ESC56203		98%		1L

TETRAHYDROFURAN (OXOLANE)				
$C_4H_8O = 72.11g/mol$   <span style="float: right;">-17°C</span>				
UN Class: 3 /UN2056 PG-II		EC No.: 203-726-8		Danger
Cas No.: 109-99-9		Index No.: 603-025-00-0		
Hazard: H225 H319 H335 EUH019 Precaution: P210 P261 P305+P351+P338				
Cat No.	Grade	Assay	Info.	Per
ESC56205		99%		1L

TETRAZOLIUM SALT (2,3,5-TRIPHENYLTETRAZOLIUM CHLORIDE)				
$[C_{18}H_{15}CN(N(C_6H_5)_2)_2N]Cl \cdot H_2O = 334.8g/mol$ 				
UN Class: N/A		EC No.: 206-071-6		Warning
Cas No.: 298-96-4		Index No.: Not listed		
Hazard: H315 H319 H335 Precaution: P261 P305+P351+P338				
Cat No.	Grade	Assay	Info.	Per
ESC56207		98%		25g


THIOUREA (THIOCARBAMIDE)				
$NH_2CSNH_2 = 76.12g/mol$   				
UN Class: 6.1 /UN2811 PG-III		EC No.: 200-543-5		Warning
Cas No.: 62-56-6		Index No.: 612-082-00-0		
Hazard: H351 H361d H302 H411 Precaution: P273 P281				
Cat No.	Grade	Assay	Info.	Per
ESC56209		98%		100g



**L-THREONINE** $\text{CH}_3\text{CH}(\text{OH})\text{CH}(\text{NH}_2)\text{CO}_2\text{H} = 119.12\text{g/mol}$ 

UN Class: N/A                      EC No.: 200-774-1  
 Cas No.: 72-19-5                      Index No.: Not listed


Hazard: Not considered hazardous  
 Precaution: No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC56211		N/A		25g

**THYMOL** $2[(\text{CH}_3)_2\text{CH}]_2\text{C}_6\text{H}_3-5-(\text{CH}_3)\text{OH} = 150.22\text{g/mol}$ 

UN Class: 8 /UN3261 PG-III                      EC No.: 201-944-8                      Danger  
 Cas No.: 89-83-8                      Index No.: 604-032-00-1

Hazard: H302 H314 H411  
 Precaution: P260 P280 P305+P351+P338 P310

Cat No.	Grade	Assay	Info.	Per
ESC56217		99.5%		100g

**THYMOL BLUE** $\text{C}_{27}\text{H}_{30}\text{O}_5\text{S} = 466.59\text{g/mol}$ 

UN Class: N/A                      EC No.: 200-973-3  
 Cas No.: 76-61-9                      Index No.: Not listed


Hazard: Not considered hazardous  
 Precaution: No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC56215		N/A		25g

**THYMOL BLUE 0.04% INDICATOR SOLUTION**

UN Class: N/A                      EC No.: N/A  
 Cas No.: N/A                      Index No.: Not listed


Hazard: Not considered hazardous  
 Precaution: No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC56213		0.04%	Solution	500ml

**THYMOLPHTHALEIN** $\text{C}_{28}\text{H}_{30}\text{O}_4 = 430.54\text{g/mol}$ 

UN Class: N/A                      EC No.: 204-729-7  
 Cas No.: 125-20-2                      Index No.: Not listed

Hazard: Not considered hazardous  
 Precaution: No additional precautions required


Cat No.	Grade	Assay	Info.	Per
ESC56219		N/A		25g

**TIN METAL - FOIL**

Sn = 118.71g/mol

UN Class: N/A                      EC No.: 231-141-8  
 Cas No.: 7440-31-5                      Index No.: Not listed

Hazard: Not considered hazardous  
 Precaution: No additional precautions required


Cat No.	Grade	Assay	Info.	Per
ESC56222		99.5%	Foil 0.035mm	100g

**TIN METAL - GRANULATED**

Sn = 118.71g/mol

UN Class: N/A                      EC No.: 231-141-8  
 Cas No.: 7440-31-5                      Index No.: Not listed

Hazard: Not considered hazardous  
 Precaution: No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC56225		99.5%	Granulated	100g


**TIN METAL - POWDER**

Sn = 118.71g/mol



UN Class: N/A                      EC No.: 231-141-8                      Warning  
 Cas No.: 7440-31-5                      Index No.: Not listed


Hazard: H319 H335  
 Precaution: P261 P305+P351+P338

Cat No.	Grade	Assay	Info.	Per
ESC56227		99%	Powder	1g

**TITANIUM (IV) OXIDE (TITANIUM DIOXIDE)** $\text{TiO}_2 = 79.87\text{g/mol}$ 

UN Class: N/A                      EC No.: 236-675-5  
 Cas No.: 13463-67-7                      Index No.: Not listed


Hazard: Not considered hazardous  
 Precaution: No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC56228		98%		500g

**TOLUENE (METHYL BENZENE)** $\text{C}_6\text{H}_5\text{CH}_3 = 92.14\text{g/mol}$ 

UN Class: 3 /UN1294 PG-II                      EC No.: 203-625-9                      Danger  
 Cas No.: 108-88-3                      Index No.: 601-021-00-3

Hazard: H225 H361d H304 H373 H315 H336  
 Precaution: P210 P261 P281 P301+P310 P331


Cat No.	Grade	Assay	Info.	Per
ESC56230		98%		1L



## TOLUIDINE BLUE O C.I.52040

 $C_{15}H_{16}ClN_3S = 305.83g/mol$ 


**UN Class:** N/A **EC No.:** 202-146-2  
**Cas No.:** 92-31-9 **Index No.:** Not listed  
**Hazard:** Not considered hazardous  
**Precaution:** No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC56233		N/A		25g

## TRIETHYLAMINE

 $(C_2H_5)_3N = 101.19g/mol$ 


**UN Class:** 3 /UN1296 PG-II **EC No.:** 204-469-4 **Danger**  
**Cas No.:** 121-44-8 **Index No.:** 612-004-00-5  
**Hazard:** H225 H332 H312 H302 H314  
**Precaution:** P210 P280 P305+P351+P338 P310

Cat No.	Grade	Assay	Info.	Per
ESC56252		97%		500ml

## 2-2-4-TRIMETHYLPENTANE (ISO-OCTANE)

 $(CH_3)_2CHCH_2C(CH_3)_3 = 114.23g/mol$ 


**UN Class:** 3 /UN1262 PG-II **EC No.:** 203-892-1 **Danger**  
**Cas No.:** 111-65-9 **Index No.:** 601-009-00-8  
**Hazard:** H225 H304 H315 H336 H410  
**Precaution:** P210 P261 P273 P301+P331 P501

Cat No.	Grade	Assay	Info.	Per
ESC54775		99%		1L

## TRICHLOROACETIC ACID

 $CCl_3COOH = 163.39g/mol$ 


**UN Class:** 8 /UN1839 PG-II **EC No.:** 200-927-2 **Danger**  
**Cas No.:** 76-03-9 **Index No.:** 607-004-00-7  
**Hazard:** H314 H410  
**Precaution:** P273 P280 P305+P351+P338 P310 P501

Cat No.	Grade	Assay	Info.	Per
ESC56236		98%		100g

## L-TRYPTOPHAN

**UN Class:** N/A **EC No.:** 200-795-6  
**Cas No.:** 73-22-3 **Index No.:** Not listed


**Hazard:** Not considered hazardous  
**Precaution:** No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC56225		99%		25g

## TRICHLOROETHYLENE (TCE)

 $ClCH=CCl_2 = 131.39g/mol$ 

**UN Class:** 6.1 /UN1710 PG-III **EC No.:** 201-167-4 **Danger**  
**Cas No.:** 79-01-6 **Index No.:** 602-027-00-9  
**Hazard:** H350 H341 H319 H315 H336 H412  
**Precaution:** P201 P261 P273 P281 P305+P351+P338 P308+P313


Cat No.	Grade	Assay	Info.	Per
ESC56239		97%		1L

## L-TYROSINE

N/A




**UN Class:** N/A **EC No.:** 200-460-4 **Warning**  
**Cas No.:** 60-18-4 **Index No.:** Not listed  
**Hazard:** H315 H319 H335  
**Precaution:** P261 P305+P351+P338

Cat No.	Grade	Assay	Info.	Per
ESC56258		98.5%		25g

## TRIETHANOLAMINE (TRIS(2-HYDROXYETHYL)AMINE)

 $N(CH_2CH_2OH)_3 = 149.19g/mol$ 

**UN Class:** N/A **EC No.:** 203-049-8 **Warning**  
**Cas No.:** 102-71-6 **Index No.:** Not listed  
**Hazard:** H319  
**Precaution:** P305+P351+P338



Cat No.	Grade	Assay	Info.	Per
ESC56251		97%		1L

## UNIVERSAL INDICATOR SOLUTION PH 4 - 11

N/A




**UN Class:** 3 /UN1170 PG-II **EC No.:** N/A **Danger**  
**Cas No.:** N/A **Index No.:** Not listed  
**Hazard:** H371  
**Precaution:** P260

Cat No.	Grade	Info.	Per
ESC56261		pH 4-11 Indicator Solution	500ml
ESC56262		pH 4-11 Indicator Solution	1L





**URANYL NITRATE**

$UO_2(NO_3)_2 \cdot 6H_2O = 502.13g/mol$




**UN Class:** 5.1 /UN1477 PG-II      **EC No.:** 233-266-3      **Danger**  
**Cas No.:** 13520-83-7      **Index No.:** 092-002-00-3

**Hazard:** H330 H300 H373 H411  
**Precaution:** P260 P280 P270 P301+P310 P501

Cat No.	Grade	Assay	Info.	Per
ESC562664		98%		1g
ESC562665		98%		5g

**WHITE SPIRIT**



N/A



**UN Class:** 3 /UN1300 PG-III      **EC No.:** 265-185-4      **Danger**  
**Cas No.:** 64742-82-1      **Index No.:** 649-330-00-2

**Hazard:** H226 H304 H336 H411  
**Precaution:** P261 P273 P301+P310 P331

39°C


Cat No.	Grade	Assay	Info.	Per
ESC56272		N/A		1L
ESC56273		N/A		2.5L

**UREA (CARBAMIDE)**

$NH_2CONH_2 = 60.06g/mol$


**UN Class:** N/A      **EC No.:** 200-315-5  
**Cas No.:** 57-13-6      **Index No.:** Not listed

**Hazard:** Not considered hazardous  
**Precaution:** No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC56267		99%		500g

**XYLENE (DIMETHYLBENZENE)**



$C_6H_4(CH_3)_2 = 106.17g/mol$



**UN Class:** 3 /UN1307 PG-III      **EC No.:** 215-535-7      **Danger**  
**Cas No.:** 1330-20-7      **Index No.:** 601-022-00-9

**Hazard:** H226 H332 H312 H315  
**Precaution:** P280

33°C


Cat No.	Grade	Assay	Info.	Per
ESC56277		98%		1L
ESC56278		98%		5L

**L-VALINE**

$(CH_3)_2CHCH(NH_2)COOH = 117.15g/mol$

**UN Class:** N/A      **EC No.:** 200-773-6  
**Cas No.:** 72-18-4      **Index No.:** Not listed



**Hazard:** Not considered hazardous  
**Precaution:** No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC56269		99%		25g

**YEAST - DRIED**


**UN Class:** N/A      **EC No.:** N/A  
**Cas No.:** N/A      **Index No.:** Not listed

**Hazard:** Not considered hazardous  
**Precaution:** No additional precautions required

Cat No.	Grade	Assay	Info.	Per
ESC56280		N/A		100g
ESC56282		N/A		500g


**VANILLIN (4-HYDROXY-3-METHOXYBENZALDEHYDE)**

$C_8H_8O_3 = 152.15g/mol$



**UN Class:** N/A      **EC No.:** 204-465-2      **Warning**  
**Cas No.:** 121-33-5      **Index No.:** Not listed

**Hazard:** H319  
**Precaution:** P305+P351+P338


Cat No.	Grade	Assay	Info.	Per
ESC56270		N/A		100g

**WATER DEIONISED**

$H_2O = 18.02g/mol$

**UN Class:** N/A      **EC No.:** N/A  
**Cas No.:** 7732-18-6      **Index No.:** Not listed

**Hazard:** Not considered hazardous  
**Precaution:** No additional precautions required


Cat No.	Grade	Assay	Info.	Per
ESC56271		N/A		20L

**ZINC METAL - FOIL**


$Zn = 65.39g/mol$



**UN Class:** N/A      **EC No.:** 231-175-3  
**Cas No.:** 7440-66-6      **Index No.:** Not listed



**Hazard:** Not considered hazardous  
**Precaution:** No additional precautions required



Cat No.	Grade	Assay	Info.	Per
ESC56290		99%	Foil 0.38mm	250g






ZINC METAL - GRANULATED				
$Zn = 65.39g/mol$				
UN Class: N/A		EC No.: 231-175-3		
Cas No.: 7440-66-6		Index No.: Not listed		
Hazard: Not considered hazardous				
Precaution: No additional precautions required				
Cat No.	Grade	Assay	Info.	Per
ESC56285		99.9%	Granules	500g



ZINC METAL - POWDER				
$Zn = 65.39g/mol$				
				
UN Class: 4.3(4.2) / UN1436 PG-II		EC No.: 231-175-3		Warning
Cas No.: 7440-66-6		Index No.: 030-001-00-1		
Hazard: H260 H250 H410				
Precaution: P222 P223				
Cat No.	Grade	Assay	Info.	Per
ESC56288		99%	SURCHARGE	100g



ZINC ACETATE (ZINC ETHANOATE)				
$Zn(CH_3COO)_2 \cdot 2H_2O = 219.5g/mol$				
				
UN Class: 9 / UN3077 PG-III		EC No.: 209-170-2		Warning
Cas No.: 5970-45-6		Index No.: Not listed		
Hazard: H302 H319 H400				
Precaution: P273 P305+P351+P338				
Cat No.	Grade	Assay	Info.	Per
ESC56293		98.5%		500g



ZINC BROMIDE				
$ZnBr_2 = 225.2g/mol$				
				
UN Class: 8 / UN3260 PG-III		EC No.: 231-718-4		Danger
Cas No.: 7699-45-8		Index No.: Not listed		
Hazard: H314 H400				
Precaution: P273 P280 P305+P351+P338 P310				
Cat No.	Grade	Assay	Info.	Per
ESC56297		98%		500ml



ZINC CARBONATE BASIC (ZINC HYDROXIDE CARBONATE)				
$(ZnCO_3)_2 \cdot (Zn(OH)_2)_3 = 350.2g/mol$				
UN Class: N/A		EC No.: 226-076-7		
Cas No.: 5263-02-5		Index No.: Not listed		
Hazard: Not considered hazardous				
Precaution: No additional precautions required				
Cat No.	Grade	Assay	Info.	Per
ESC56301		54%		500g

ZINC CHLORIDE				
$ZnCl_2 = 136.3g/mol$				
				
UN Class: 8 / UN2331 PG-III		EC No.: 231-592-0		Danger
Cas No.: 7646-85-7		Index No.: 030-003-00-2		
Hazard: H302 H314 H410				
Precaution: P273 P280 P305+P351+P338 P310 P501				
Cat No.	Grade	Assay	Info.	Per
ESC56305		97.5%		500g

ZINC NITRATE 6-WATER				
$Zn(NO_3)_2 \cdot 6H_2O = 297.49g/mol$				
				
UN Class: 5.1 / UN1514 PG-II		EC No.: 231-943-8		Danger
Cas No.: 10196-18-6		Index No.: Not listed		
Hazard: H272 H302 H315 H319 H335				
Precaution: P220 P261 P305+P351+P338				
Cat No.	Grade	Assay	Info.	Per
ESC56308		98%		500g

ZINC OXIDE				
$ZnO = 81.39g/mol$				
				
UN Class: 9 / UN3077 PG-III		EC No.: 215-222-5		Warning
Cas No.: 1314-13-2		Index No.: 030-013-00-7		
Hazard: H410				
Precaution: P271 P501				
Cat No.	Grade	Assay	Info.	Per
ESC563112		99.8%		500g

ZINC SULPHATE 7-WATER				
$ZnSO_4 \cdot 7H_2O = 287.54g/mol$				
				
UN Class: 9 / UN3077 PG-III		EC No.: 231-793-3		Danger
Cas No.: 7446-20-0		Index No.: 030-006-00-9		
Hazard: H302 H318 H410				
Precaution: P273 P280 P305+P351+P338 P501				
Cat No.	Grade	Assay	Info.	Per
ESC56316		98%		500g

ZINC SULPHIDE				
$ZnS = 97.46g/mol$				
				
UN Class: N/A		EC No.: 215-251-3		Warning
Cas No.: 1314-98-3		Index No.: Not listed		
Hazard: Not considered hazardous				
Precaution: No additional precautions required				
Cat No.	Grade	Assay	Info.	Per
ESC56320		N/A		500g





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# ENVIROMENTS

- Geology
- Weather
- Solar System





**Environmental Extremes Kit**

Train students to think like scientists and engineers using this complete introductory environmental studies unit. Eight experimental protocols lead students through 4-6 weeks of hands-on, scientifically sound experimentation demonstrating current environmental concerns using live plants and erosion models. Includes reusable supplies and instructions to simulate the conditions of acid rain, saline soils, drought, and erosion. Students actively learn proper scientific method, cost analysis, and the iterative cycle of engineering before they design and complete individualized projects. Ideal for biology, environmental studies, or agriculture courses. May be purchased with or without pH meters and digital scales. Includes a complete instructor's manual with reproducible student materials. Designed for 24 students. Targets Grades: 6-12. Acids are not included.

Kit Contains:

Instructor's Manual w/ Reproducible Student Data Sheets, Stirring Rods, Weigh Dishes, Markers, Graduated Cylinders, Flasks, Gloves, Parafilm, Rulers, Cups, Deli Containers, Potting Soil, Petri Dishes, Seeds, Sodium Chloride, Construction Paper, Masking Tape, Paper Towel Roll, Forceps, Magnifiers, Spoons, Write-N-Wipe Boards, Spray Bottle, 16 oz, Alcohol Wipe,70%, Scoop, Stainless Steel.

ESE53627



**Environmental Extremes Plus**

Train students to think like scientists and engineers using this complete introductory environmental studies unit. Eight experimental protocols lead students through 4-6 weeks of hands-on, scientifically sound experimentation demonstrating current environmental concerns using live plants and erosion models. Includes reusable supplies and instructions to simulate the conditions of acid rain, saline soils, drought, and erosion. Students actively learn proper scientific method, cost analysis, and the iterative cycle of engineering before they design and complete individualized projects. Ideal for biology, environmental studies, or agriculture courses. May be purchased with or without pH meters and digital scales. Includes a complete instructor's manual with reproducible student materials. Designed for 24 students. Targets Grades: 6-12. Acids are not included.

Kit Contains:

Instructors Manual w/ Reproducible Student Data Sheets, Stirring Rods, Weigh Dishes, Markers, Graduated Cylinders, Flasks, Gloves, Parafilm, Rulers, Cups, Deli Containers, Potting Soil, Petri Dishes, Seeds, Sodium Chloride, Construction Paper, Masking Tape, Paper Towel Roll, Forceps, Magnifiers, Spoons, Write-N-Wipe Boards, Spray Bottle, 16 oz, Alcohol Wipe,70%, pH Meter, Pocket Pen,Digital, Scale,Digital,2000Gx0.1G, Scoop, Stainless Steel.

ESE53626



**Volcanic Eruptions**

A hands-on volcano model building project complete with safe, simulated lava eruptions. Learn all about types of volcanoes, parts of a volcano, how volcanoes function, and precious gems volcanoes may produce. Building materials are appropriate for elementary and middle school classrooms. Also investigate underwater volcanoes with the included demonstration. Baking soda and vinegar required but not included. Kit includes enough materials for 24 students working in six groups of four. Meets national standards for Grades 3-8.

ESE53628





**Ocean Trash Can**

This exercise examines various types of pollutants, their sources, and their effects on the ocean, its inhabitants and the surrounding coastline. Students classify ocean pollution into five basic categories; debris, toxins, dissolved nutrients, particulates, and oil. They model the effects of ocean pollution with activities examining a variety of topics: the effect of the pH of various liquids on calcium carbonate; the effects of dilution, buffering capacity, salt and acid runoff; acid rain; the ability of water to purify itself; and oil spill clean-up. As a final project, students design and write a newsletter containing articles with pertinent pollution topics such as current laws, pollution, effects, bioaccumulation, and prevention. Requires four class periods plus research time. Required, but not included: six 1 gallon milk containers. Designed for 24 students working in six groups of four.

Kit Contains:

Instructor Manual, Student Data Sheets, Plastic Cups, Cupcake Liners, Sand, Tums, pH Strips, Radish Seeds, Sea Salt, Styrofoam Peanuts, Feathers, Yarn, Plastic Bags, Cotton Balls, Animal Fur, Wire

ESE53625



**Seawater Analysis**

By volumetric titration, students analyse the chloride content of seawater samples from the Atlantic Ocean, the Pacific Ocean, and the Gulf of Mexico. The constant ratio of dissolved substances in sea water allows the concentration of salt and other elements to be extrapolated from the chlorine concentration. Student may obtain additional water samples for analysis, as the materials included are sufficient for the titration's to be repeated three times. Designed for 24 students working in six groups of four. Required, but not included: 25 ml burette. Contains silver nitrate. Grades 10-12

ESE53629



**Amazing Waves**

Seven activities take students through the examination and observation of waves, wave properties, and their influence on the coastline. Includes three demonstrations (types of waves, wave creation, and wave action) two hands on activities (regarding wave motion, sediments, and beach erosion), a research and presentation project applying science and engineering to societal issues, and a written assignment with art connections. Special emphasis on Influence of Engineering, Technology, and Science on Society and the Natural World; Human Impacts on Earth Systems; Ecosystem Dynamics, Functioning, and Resilience; The Roles of Water in Earth's Surface Processes; and Problem Solving. Requires computers with internet connections for research projects and a document projector (optional). Designed for 24 students working in 6 groups of 4. Grades 5-9

ESE53630



**Make An Ocean**

This project allows students to model four ocean ecology scenarios as they investigate the effect of farm and industrial waste on marine life. Brine shrimp populations, water pH and water density are monitored throughout the progression of ecological contamination, water treatment, and recovery. During the study, students learn about life cycles and representative sampling. The kit makes an ideal class project or can be completed in small groups. Materials included allow the experiment to be repeated up to five times. Required, but not included: five 1 gallon containers, balance or scale, and a flashlight. Grades 4-6

ESE53633





**Ocean Science**

The purpose of this exercise is to examine the physical and chemical properties of seawater and learn how these properties affect the ocean currents and environments. Students visualize convection currents as they track the effects of density, temperature, pressure, and salinity. They learn the effects of heat from the sun, precipitation, evaporation, freezing and thawing of sea ice and the inflow of fresh water from rivers. Students extrapolate what they learn and further research to determine the effects of three scenarios on the surrounding water and land environments and inhabitants: 1) a new dam being built on a large river that flows into a bay, 2) melting of the polar ice cap, and 3) a global temperature drop to 0°C. Then they present their conclusions in a panel discussion. Required, but not included: refrigerator or freezer, ice, Thermometers, and 18 large beakers or jars. Designed for 24 students working in six groups of four. Grades 5-9

ESE53631



**The Physical & Chemical Resources Of The Ocean**

This kit is designed to examine salt, not only as the most obvious property of seawater, but also as one of its most valuable chemical resources and a critical component in the creation of ocean currents. Students learn about the varying salt concentrations of seawater and its amazingly uniform composition. They also learn how salt can be removed from seawater. Experiments include: Determining Salinity by Evaporation, Determining Salinity Using a Hydrometer, Desalination by Freezing, and Desalination Using a Solar Still. Allow five class periods. Required, not included: refrigerator or freezer, hot plate, balance (x .01g), chloride/salinity test kit, and laboratory glassware. Designed for 24 students work in groups of four. Grades: 9-12.

ESE53632



**Human Activity & Environment**

Students study food web relationships and how natural and human induced changes in the environment such as severe storms, drought, floods, housing developments, road salt, fertilizer runoff, and fire upset the balance of ecosystems. Nature's ability to restore balance between the number of different types of organisms, such as predators and prey, in natural habits of the community are demonstrated. Activities include, The Salted Roads, The Runoff, Flooded Farms, and The Forest Community. Conservation is discussed in terms of using natural resources wisely to help keep the natural balance. Required, but not included: fresh celery, dominoes, recycled milk jugs or flower pots, beakers or jars, yeast, salt, and sugar. Designed for 24 students working in six groups of four. Grades 5-8

ESE53634



**The Reef Restaurant**

The purpose of this exercise is to study the effects of certain environmental conditions on the coral reef and its associated food web. The lab teaches the students about natural resources, environmental quality, and natural and human induced hazards (including specific sources of pollution). Includes two activities, allow three class periods. Required, but not included: clear plastic 2L bottles, liquid fertilizer, and small light sources. Designed for 24 students working in six groups of four. Grades 5-9

ESE53635





**Soil Analysis Kit**

Students gain hands on experience identifying, characterizing, and describing Earth Materials through seven different experiments determining texture, composition, particle size range, density, permeability, porosity, and pH. They learn how soils are formed, assess properties important in determining agricultural and commercial use, and discover characteristics important in assessing soil drainage, erosion, and fertility. The kit includes loam, silt, clay, sandy soil, topsoil, fine sand, coarse sand, and gravel so that classic comparisons may be made. Includes sieve sets and all required supplies for testing, complete instructor's manual with worksheets, assessment materials, and answer keys. Packaged in a reusable plastic tote. Balance recommended. Grades 7-12

ESE53636



**Soil Analysis Refill**

Soil Analysis Refill. Grades 7-12

ESE53637

**Soil Test Apparatus**

Use to measure soil pH.

Consist of :

- Test Tube Ø 16 x 150 mm 4 pcs
- Test Tube Ø13 x 100 mm 6 pcs
- Dropping Pipette 15 cm, Red Bulb 2 pcs
- Barium Sulphate (100 g/bottle) 1 pc
- Aquadest (200 ml/bottle) 1 pc
- Spoon, Stainless Steel 1 pc
- Universal Indicator (10 booklet/pack) 1 pc
- Test Tube Brush Ø 24 mm 1 pc
- Manual Book Soil Test Apparatus 1 pc
- Wooden Box 1 pc

Dimension : (L) 20.00 x (W) 19.00 x (H) 19.00 cm

Weight :1.330 kg



ESE53641





**Igneous Basic Collection Set/10**

This Igneous Rocks Collection includes a set of 10 specimens enclosed in a handy, plastic storage container. The included rock identification chart, complete with images and a brief description will help kids better understand how Igneous rocks were created. A perfect starter set for the young budding geologist! (Actual dimensions: 8x4.68x1, 1 lb.)

ESE53660



**Igneous Rock Collection**

Contains 15 representative specimens of intrusive and extrusive igneous rocks, each approximately 1-1/2" x 1-1/2". Includes key and chart.

ESE53671



**Rock Collection Igneous Rock**

The rocks /minerals were placed in a box and given a cover. Each rock / minerals sample is placed on the bulkhead so that no scattered rocks in the box

**Size :**

- Rocks/Minerals : ? 3 x 3 x 3 cm
- Storage box : 230 x 170 x 37 mm
- Material : Storage box made from plastic
- Equipment with a map collection of minerals / mining ores for ease in identifying

**Consist of 8 samples Igneous Rock :**

1. Basalt
2. Granite
3. Pegmatite
4. Obsidian
5. Dacite
6. Diorite
7. Peridotite
8. Pumice

Dimension :(L) 23.00 x (W) 17.00 x (H) 4.00 cm

Weight :0.355 kg

ESE53638



**Metamorphic Basic Collection Set/10**

This Metamorphic Collection includes a set of 10 specimens enclosed in a handy, plastic storage container. The included rock identification chart, complete with images and a brief description will help kids better understand how metamorphic rocks were created. A perfect starter set for the young budding geologist!(Actual dimensions: 8x4.68x1, 1 lb.)

ESE53659



**Metamorphic Rock Collection**

Contains 15 representative metamorphic rock specimens, each approximately 1-1/2" x 1-1/2", number-coded in a compartmented container. Includes key and chart.

ESE53672





### Rock Collection Metamorphic Rock

The rocks /minerals were placed in a box and given a cover. Each rock / minerals sample is placed on the bulkhead so that no scattered rocks in the box.

#### Size :

Rocks/Minerals : 3 x 3 x 3 cm

Storage box : 230 x 170 x 37 mm

Material : Storage box made from plastic

Equipped with a map collection of minerals / mining ores for ease in identifying

#### Consist of 10 specimens of metamorphic rock:

- |                      |                 |
|----------------------|-----------------|
| 1. Home blend Schist | 6. Slate        |
| 2. Black Marble      | 7. Gneiss       |
| 3. Red Marble        | 8. Micca Schist |
| 4. Phyllite          | 9. Serpentinite |
| 5. Quartzite         | 10. Pure Marble |

Dimension :(L) 23.00 x (W) 17.00 x (H) 4.00 cm

Weight :0.370 kg

ESE53640



### Rock Collection Sedimentary Rock

The rocks /minerals were placed in a box and given a cover. Each rock / minerals sample is placed on the bulkhead so that no scattered rocks in the box.

#### Size :

Rocks/Minerals : 3 x 3 x 3 cm

Storage box : 230 x 170 x 37 mm

Material : Storage box made from plastic

Equipped with a map collection of minerals / mining ores for ease in identifying

Consist of 10 specimens of sedimentary rocks:

1. Limestone
2. Clay
3. Gypsum
4. Sandstone
5. Limonite
6. Breccia
7. Shale
8. Tufa
9. Travertine
10. Conglomerate

ESE53639



### Sedimentary Basic Collection Set/10

This Sedimentary Collection includes a set of 10 specimens enclosed in a handy, plastic storage container. The included rock identification chart, complete with images and a brief description will help kids better understand how sedimentary rocks were created. A perfect starter set for the young budding geologist!(Actual dimensions: 8x4.68x1, 1 lb.

ESE53661



### Rocks & Minerals Basic Collection Set

This Rocks & Minerals Collection includes a set of 24 specimens (6 each of Metamorphic, Sedimentary, Igneous, and Minerals) enclosed in a handy, plastic storage container. A rock identification chart, complete with images, is included to help kids categorize their collection. A perfect starter set for the young budding geologist! (Actual dimensions: 6.25x4.75x.63; .32 lbs.)

ESE53663

### Sedimentary Rock Collection

Contains 15 representative sedimentary rock specimens, each approximately 1-1/2" x 1-1/2". Includes key and chart.

ESE53673





**Mineral Kit, Eduscience Prim (Set Of 1)**

A collection of 12 specimens to represent igneous, sedimentary, metamorphic rocks and minerals. Designed for the basic earth science studies, earth materials and characteristics, and properties of various types of rocks.

Each specimen is glued on 30 x 40 mm plastic sheet and equipped with number and identification label

There are 3 extra compartments and plastic sheets in the box for rocks locally collected rocks by the students.

Dimension : (L) 22.70 x (W) 17.30 x (H) 5.50 cm

Weight : 0.780 kg

ESE53642



**Fracture Collection**

The important types of fracture are demonstrated with this collection. Six specimens approximately 1-1/2" x 1-1/2", number coded.

ESE53668



**Mineral Study Kit Basic**

Students learn to identify these 15 common minerals by observing and testing their physical properties. Activity guide, magnifying glass, streak plate, and nail included.

ESE53667



**Lustre Collection**

Recognition of the kind and degree of lustre of some minerals is an aid to identification. This collection provides examples of both metallic and non-metallic types of lustre. 15 specimens, approximately 1-1/2" x 1-1/2", number-coded. Includes insert.

ESE53670



**Minerals Basic Collection Set/10**

This Minerals Collection includes a set of 10 specimens enclosed in a handy, plastic storage container. The included rock identification chart, complete with images and a brief description will help kids better understand how minerals were created. A perfect starter set for the young budding geologist! (Actual dimensions: 8x4.68x1, 1 lb.)

ESE53662



**Crystal Collection Basic Collection Set/9**

This set of 9 specimens illustrating isometric, hexagonal, tetragonal, orthorhombic and monoclinic crystal systems.

ESE53664





**Cleavage Collection**

Cleavage is a readily recognizable property of some minerals and follows the internal crystal structure of that mineral. Terms used in crystallography apply to the cleavage plans. 6 specimens approximately 1 1/2" x 1 1/2". Includes insert.

ESE53669



**Tenacity Collection**

Various terms such as brittleness, elasticity, flexibility, malleability and selectivity are used to describe the particular property of some minerals. Six specimens 1-1/2" x 1-1/2".

ESE53678



**Moh's Scale Of Hardness W/ Diamond**

The Moh's Hardness Scale collection is set of 10 specimens in their order from the softest (#1 Talc) to the hardest (#10 Diamond included). There are indicators on the card which instruct the students what will affect the surface of each of these specimens. This economy version of the Hardness Collection has specimens measuring 1/2" to 3/4" in size.

ESE53666



**Moh's Scaled Of Hardness Mounted**

The Moh's Hardness Scale collection is mounted on a 5 1/2" X 7 1/8" full colour card-stock which holds 9 specimens in their order from the softest (#1 Talc) to the hardest (#10 Diamond - not included). There are indicators on the card which instruct the students what will affect the surface of each of these specimens. This economy version of the Hardness Collection has specimens measuring 1/2" to 3/4" in size. The card is packaged in a resalable zip lock bag.

ESE53665



**The Rock Cycle Chart Only**

This hands-on project enables students to examine and identify individual rock specimens as a study unit in earth science. A graphic representation of how the major families of rocks form the dynamic process called the rock cycle. Igneous, sedimentary and metamorphic rock specimens are mounted on this enlarged 18" x 24" multi-color chart that comes complete with a wood frame

ESE53676





**General Fossil Collection**

A selection of 15 fossils to illustrate the major life forms present throughout geologic history. A descriptive key sheet and geologic time chart introduces students to basic fossils and match the fossil to the era

ESE53679



**Geological Time And Fossils Chart**

This completely revised multicolours chart depicts the entire geologic time scale with most current geologic dating information. Representative fossils from the corresponding geologic periods are mounted on the chart. Chart size, 18" x 24" and comes with a wood frame.

ESE53674

**Life On Earth - A Fossil History Model**

Life on Earth – A Fossil History is an exciting product designed to help students understand how life has changed over vast periods of geologic time. Constructed of durable vinyl, the 23.5" X 24.5" colourful 3-D model allows students to correlate 21 replica "fossils" to realistic looking rock layers. Illustrations and "fossil" include both marine and terrestrial life forms from the Pre-Cambrian through the present. Eons, eras, periods, epoch sand years are clearly shown on the chart. The Teacher's Guide includes: classroom activities, pre/post tests, reference materials, and glossary.

ESE53675



**Geology Models, Set/8**

Discover the complexities of geological facts with this series of eight fully detailed geology models. In addition to surface formations, cross-sectioning depicts subsurface structures. Models are accompanied by a Teacher's Guide, numerically keyed to each individual model, allowing focused study of specific features. Each model is 14"x 12" and is sturdy enough for student handling or wall display.

8 Models Included:

- Coastline of Submergence
- Volcanism
- Fault Block Mountains
- Alpine Glaciation
- Dome Mountains
- Continental Glaciation
- Folded Mountains
- Coastal Plain

ESE53652







**Geology Models, Set/4 I**

Dispel the puzzling complexity of geological facts with this series of Four detailed geology models. In addition to surface formations, cross-sectioning depicts subsurface structures. Accompanying Teacher's Guide is numerically keyed to each individual model, allowing focused study of specific features. Each model is 14" x 12" and is sturdy enough for student handling or wall display. Models 1-4.

ESE53653



**Geology Models, Set/4 II**

Dispel the puzzling complexity of geological facts with this series of four detailed geology models. In addition to surface formations, cross-sectioning depicts subsurface structures. Accompanying Teacher's Guide is numerically keyed to each individual model, allowing focused study of specific features. Each model is 14" x 12" and is sturdy enough for student handling or wall display. Models 8-5.

ESE53654



**Landforms Discovery Pack W/ CD**

Use this kit for the entire class or set up a self-directed activity centre ,Eight 3-D models form a landscape showing geologic and geographic details. The accompanying CD's or tapes provide detailed scientific and cultural information in a field trip format. The CD's are keyed to numbered features on the various models. Discovery pack includes 8 models, 7 tapes or 2 CD's, student workbook, Teacher's Guide and convenient storage unit.

ESE53655



**Alpine Glacier Model**

These models will give students the opportunity to observe the effects of glacial movement without having to endure glacial time. First model depicts a glacier in its active stage, while the second model shows post-glacial conditions. Using the second model, students can create their own glacier using ice and sand to observe glacial melting and deposition of glacial till. Each model is 18" x 24", formed in high impact plastic. Teacher's Guide included.

ESE53656

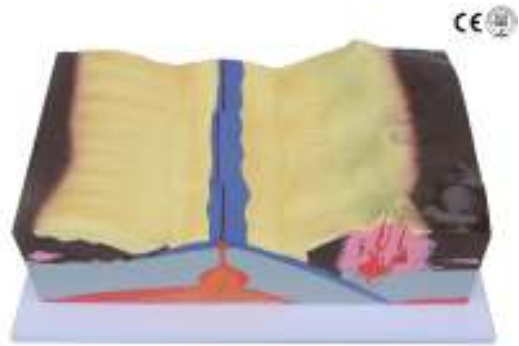




**Volcano Model**

Beautifully detailed stratovolcano and composite volcano model. Illustrates the various crusts, lava tube, volcano formation, and step sided formation of cone shape ,Section showing flow of magma. Made of unbreakable material, coloured. Showing vertical section for students to view the path that magma takes on its upward course the volcano. Mounted on base .  
Measures 410mm. L x 410mm. W x 20mm. H.

ESE53643



**Volcano Model**

Model of an underwater volcano that forms a new seabed. The model shows how new seabed is made and what happens when earthquake collides. It also shows folds and fakes. The model is made of strong, soft plastic (PVC). Dimensions: 53 x 38 x 25 cm

ESE53644



**Fold and Fault-age Model**

Students at all levels can visualize the causes and forces that shape the earth's surface. In case of compression or stretching of stone layers, there may be fouling. In case of multiple fences or breakages, blocks can be moved up (Horst) or down (grab). The model illustrates this in an excellent way. You can also show how oil traps are formed.  
The model is made of strong, soft plastic (PVC). Size: 53 x 38 x 30 cm

ESE53645



**Stream Table Kit**

Basic and smaller version of the Hydro-Geology Stream Table, this kit includes a plastic tray, drain trough, tray support and siphon tube. This economical stream table provides students the chance to create their own landforms and follow the changes in the stream as it ages. Includes 4 page Teacher's Guide including 3 activities. Great for use in the classroom or as an outdoor activity. Also is used with the ESCP program. Sand not included. One, 50lb. pail of sand is sufficient. 14 x 46 x 2.5

ESE53657



**Hydro-Geology Stream Table With Cart & Accessories**

Capture students' attention as they learn first hand the impact of water on the development of land formations. This stream table allows the class to create actual streams, lakes and related landforms. Stream cut-offs, piracy, deltas, beaches, land erosion and many other phenomena can be created. High impact, 26"W x 66"L x 6"Dplastic stream table is virtually unbreakable and easy to clean. Once water and sand are added, the unit is completely self-contained. Two separate stream flows provide for simultaneous study of separate streams. Flow rates and water levels are easily controlled.

ESE53658





**Seismograph Model**

Our Seismograph Model gives students a better understanding of how earthquakes are measured and calculated to determine intensity. This small table top unit will captivate your students as they try to top the Richter Scale. Simulate your own earthquakes and the seismograph will accurately record their intensity. The kit comes complete with a detailed Teacher's Guide

ESE53677



**Telescope**  
Telescope

ESI61415



**Telescope**  
Telescope

ESI61417



**Telescope**  
Telescope

ESI61414



**Telescope**  
Telescope

ESE53651



**Telescope**  
Telescope

ESI61418



**Telescope**  
Telescope

ESI61419





### Environmental Engineering Oil Spill Management

Students simulate deep-ocean and beach crude oil spills as they engage in the work of an environmental engineering team using models to learn the physical and chemical properties of oil and experience how scientists approach oil spill disasters. This comprehensive kit not only teaches environmental impact, basic oil biology, micelles structures, and chemistry concepts such as hydrophobic and hydrophilic interactions, but has students simulating basic oil containment and removal techniques using their own oil spill models. Includes a quantitative analysis of absorbent materials, hands on skimming and dispersant activities, and an experimental introduction to the concept of bioremediation. Students work as a team to research and systematically design an oil spill solution, use the iterative cycle to improve their solutions, and learn to argue their points of view. Great for applying knowledge and teaching higher order thinking skills including creative thinking, reasoning, decision making, and problem solving. Designed to accommodate 24 students working in groups of two. Plan to spend several weeks on the unit.

#### Kit Contains:

Instructor Manual w/ Reproducible Student Data Sheets  
 , Test Tubes/Stoppers, Vegetable Oil, Stopwatch, Test Tube Rack, Graduated Cylinders, Corn Syrup, Food Colouring, Empty Bottles w/ Caps, Potting Soil, Aluminium Pan, Sand, Gravel, Pipettes, Spoons, Paper Towel Strips, Tubing, Fabric (Cotton, Polyester), Deli Container, Thermometer, Sugar Packet, Scale, Digital, 500g, Yeast Packet, Strainer, Dish-washing Liquid, Cocoa Powder, Scoop, Stainless Steel, Gloves, Nylon Stocking, Cotton Balls, Beaker, Copy Paper, Shredded, Scissors, Weigh Dish, Mixed Seashells,

ESE53812

### Water Testing Saddlebag

Our unique water testing saddlebag is perfect for those who are interested in environmental sciences. It may be used to test for the effects of water pollution in fresh bodies of water. This saddlebag is ideal for outdoor use as it is designed to be worn over the shoulder, on the side of the body for safety and easy access. Each test kit has enough materials to perform over 100 tests and can be used for a class of 30 students or more. Step-by-step laminated picture instructions, an instructor's manual with background information, reproducible student data sheets, and colour-coded reagents are included.

#### Kit Contains:

Instructor Manual,  
 Total Alkalinity Test Kit 1 drop=10ppm as CaCO<sub>3</sub>  
 Acidity Test Kit 1 drop=2 or 10ppm as CaCO<sub>3</sub>  
 Total Hardness Test Kit 1 drop=10ppm as CaCO<sub>3</sub>  
 Dissolved Oxygen Test Kit (0-10ppm)  
 25 Nitrate Test Strips (0-50ppm)  
 100 pH Test Strips (2-9 range)  
 10 pH Colour Cards

ESE53813

### Water Kit (Set Of 10)

The water kit is ideal for use by Primary School students, aged 6-12 years. The student will be able to understand the basic properties of water.

Versatility of the kit enable the students to perform experiments using their own ideas.

#### Consist of :

Beaker Plastic 10 pcs  
 TRANSPARENT Plastic Hose OD = 10, ID = 7 mm, p = 1200 mm 10 pcs  
 Metal Sheet # 0.2 x 60 x 60 mm 10 pcs  
 Metal Vessel # 0.2 x 60 x 60 mm 10 pcs  
 Plasticine 25 mm 10 pcs  
 Dropping Pipette ? 6 x 75 mm 10 pcs  
 Bottle 330 ml (Clear Plastic, Narrow Mouth and Cap) 10 pcs  
 Board # 5 x 150 x 200 mm 10 pcs  
 Box Corrugated Plastic 410 x 280 x 191 mm (# 3 mm, Green colour) 1 p

#### Experiment topics :

Basic concept of horizontal plane  
 Water balance  
 Flow of water  
 Condition of an object in water : floating, sinking and to be suspended  
 Dimension :(L) 42.00 x (W) 30.00 x (H) 20.00 cm  
 Weight :2.505 kg

ESE53814





**Weather Model**

Combination with a detailed Teacher's Guide, this 16" x 12" x 3" 3-D model will help students understand weather fronts and other meteorological concepts. Students can conduct detailed studies of air mass structures, cloud types, precipitation, temperatures, pressure and warm and cold fronts. Building upon this base of information, direction and speed of fronts can be measured, giving students the option of forecasting weather conditions for specific times and locations.

ESE53817



**Teaching Tornado Model**

Every classroom needs a Teaching Tornado! Finally, weather related phenomenon comes right into the classroom. Your students will love this demonstration model that teaches the principles of how tornadoes form. Students will learn about how a strong up draft is important, about convergence and rotation, funnel speed and how it is related to funnel width, and many more exciting tornado facts! Guide includes 7 fascinating experiments. Dry ice is not necessary to complete this experiment. Assembly time is approximately 30 minutes.

ESE53816



**Cloud Model Activity Set**

Our 3-D model promotes basic understanding of cloud types in the classroom or outdoors, in addition to science and math skills. Removable labels let students identify cloud structures and altitudes on 24" x 18" model. Includes 3-ring binder with glossary, key, black-line master and a full-colour overhead transparency

ESE53815



**Water Cycle Study Cards, Set/10**

Water is not only the most significant liquid on Earth, it is also one of the most unusual. Help your students understand the properties of water with this set of 10, 8 1/2" x 11" study cards.

ESE53819





**Water Cycle Model (Includes Lesson Plan)**

Make it rain in your classroom! Students can duplicate the individual processes of the water cycle (evaporation, condensation and precipitation) with this ingenious model.

ESE53818



**Evaporation Kit**

The Evaporation Kit is designed to show the variability of evaporation rates and the factors which cause these variations. The kit enables students to draw conclusions as to how temperature, humidity, air movement, and surface area affect evaporation.

ESE53820

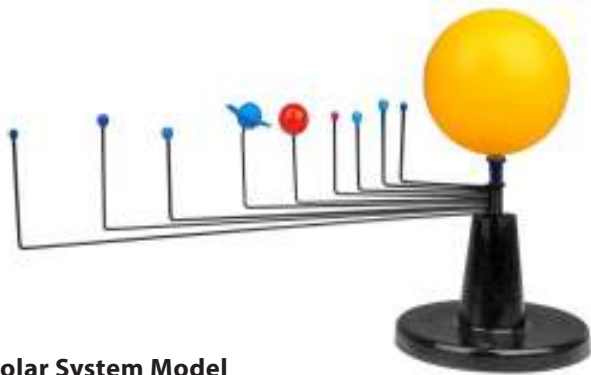


**Air Pollution Kit**

Using a controlled environment and a common air pollutant, your students will observe the direct effect sulphur dioxide has on plants. Squash and marigold plants are germinated and then placed in an SO<sub>2</sub> saturated environment where growth is monitored and recorded. This kit includes one activity that is conducted for 5 days. Teacher's guide and reproducible student worksheets are also included.

ESE53821





**Solar System Model**

Model of the solar system was created for show the position of the solar system, on these props the sun is modelled with the a big yellow ball at the Centre of the solar system which surrounded by the composition of the planet.

**Size :**

- Sun : 150 mm
- Base : 210 mm

**Material :**

- Sun and base : Plastic
- Rod sleeve : Steel, black

Solar model and the 9 planets, all planets can rotate smoothly around the solar

Dimension : (L) 59.00 x (W) 21.00 x (H) 34.50 cm  
Weight :1.000 kg

ESE53948



**Planetarium Without Lamp**

Used to simulate the position, rotation and revolution of the earth and moon, and for demonstrate some natural event the system earth-moon-sun.

**Size :**

- Sun : 150 mm
- Earth : 70 mm
- Moon : 18 mm

Material : Sun, Earth, and Moon : Plastic

**Colour :**

- Sun : Yellow
- Moon : Pearl white
- Earth : Maps of the earth

Holder equipped with a scale showing the 4 seasons

Model rotation of the earth around the sun made by rotating the shaft with a gear system

Dimension : (L) 49.50 x (W) 21.00 x (H) 34.50 cm  
Weight :1.300 kg

ESE53950



**Planetarium With Lamp**

Showing between position and motion of the sun, earth and moon. System can be played by hand, so that automatically rotate the earth around the

Earth to the sun, and make the moon circulating around the earth.

Complete with manual book.

**Dimension :** (L) 55.00 x (W) 26.00 x (H) 45.00 cm

**Weight :** 4.000 kg

ESE53951



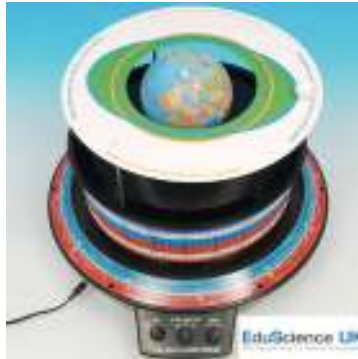
**Orbit Tellurium 1**

A model of the Sun, which lights up, and the planets as far as Neptune. The Earth has a moon. The planets can be moved around the Sun by hand, and the Moon around the Earth. For demonstrating the shape and motions of the solar system. Batteries are not supplied.

Height: 10cm; Diameter of largest orbit (Neptune): 38cm

ESE53956





### Helios Planetarium

The Helios Planetarium gives a clear visualisation of the six classical planets (Mercury - Saturn) orbiting at their correct relative speed and stars remaining in their positions in the sky.

All versions of the model (0142, 0150 and 0151) include the electric geared orrery and star dome and enable you to study the following topics:

The Planets in their orbits (length of a year, inferior and superior planets)

The phases of Venus

The Moon and its phases (external light source required)

Eclipse basics

Time - solar, sidereal and G.M.T.

The ecliptic and the Zodiacal constellations

How the planets appear to move against the night sky

Use of the Helios outside at night - where should the stars appear in the sky?

With the large Earth and Moon accessories that are included in versions 0150 and 0151 you can also watch as the Earth rotates on its axis while the Moon orbits it every 29.5 'days'. Using an external light source (torch, projector), the larger size of Earth and Moon enables you to demonstrate the following events much more clearly:

Day and night

Shadows and the seasons

The Moon's month, phases and eclipses

The Pole Star, circumpolar stars and a nocturnal

The Moon and stars from different positions on Earth

The tides

Space travel

Items 0142 and 0150 are supplied with a star dome for the northern hemisphere. Product reference 0151 is supplied with a star dome for the southern hemisphere.

### Helios Orrery & Northern Star Dome

**ESE53952**

### Helios Planetarium Northern Stars (With Large Earth And Moon Access)

**ESE53953**

### Helios Planetarium Southern Stars (With Large Earth And Moon Access)

**ESE53954**

### Extra Dome For Southern Hemisphere

**ESE53955**



### Solar System Posters

A set of laminated posters of the Sun and 9 planets printed to scale. Includes physical data about the planets and distances between them at the scale printed, giving a real feel for the scale of the universe. Poster sizes: heights - planets 30cm, Sun 49cm; widths - various

**ESE53958**







### Orbit Tellurium 2

The new flexible design instantly engages pupils and illustrates complex relationships more easily.

Rotate the model and watch as the Earth orbits the Sun, the moon orbits the Earth and the Earth spins on its axis.

Shine the light from the sun onto the Earth to model night and day, the seasons and eclipses and create shadows.

Use the small-scale Earth and Moon on an inclined orbit to give an accurate demonstration of the phases of the moon and show why eclipses do not happen every month.

Subjects to study: Day and night. Seasons of the year. The sun's movement across the sky. Changing length of daylight. Shadows. The phases of the Moon. The crescent moon from different latitudes. Eclipses of the Moon and Sun. Use of sundials and shadow sticks. Lunar months and festivals linked to the Moon.

Contains: Tellurium model with accessory tidy, two sizes of Earth and Moon, stick-on model person, sundial, date, eclipse and phase of the moon indicator cards plus teacher guide with suggested activities. Power transformer included.

Size: 65 cm long, 25 cm high

ESE53957



### Celestial Globe, Transparent

Globes inside celestial sky TRANSPARENT described the location of stars, including nebulae, constellations, galaxies, binary star.

#### Size :

- Globe dia. 70 mm

- Celestial sky TRANSPARENT dia. ? 170 mm

Complete with the horizon as well as coordinate and equatorial system

Complete with number of latitude, longitude and name of the country

Complete with manual book

Dimension : (L) 32.00 x (W) 32.00 x (H) 36.00 cm

Weight : 2.200 kg

ESE53949

### ECONOMY CELESTIAL GLOBE



### Celestial Globe Economy

The Economy Celestial Globe measures 8" in diameter and illustrates many of the same astronomical concepts as the larger versions. The globe can be disassembled for easier storage. Constellations, right ascension and declination lines, and the ecliptic cover the globe. A moveable Earth and Sun complete the kit. A Teacher's Guide with assembly instructions and activities are included.

ESE53959



### Biogas Kit

Create your own bio-renewable energy using readily available organic waste materials with this biogas kit. Biogas is now used to power engines, generate electricity, cook food, and heat homes. This kit includes a biogas digester, a one gallon biogas collection bag, all necessary fittings and tubing, a check valve, a combustion nozzle assembly, and safety equipment for one person (goggles, gloves, and apron). Supply approximately 2 gallon of antibiotic-free manure as your biomass. Expect significant gas production in about three to five days. Simply vary the biomass source and/or digestion temperature and you have a variety of comparative experiments to analyse. Rabbit manure works well.

#### Kit Contains:

Instructions, Fitting, Brass, Check Valve, Elbow Barb, Drainage Bag, Jar w/ Screw Cap, Goggles, Impact, Lab Apron, Gloves, O-Ring, Vinyl Repair Patches

ESE54019





EduScience UK



# PHYSICS AND POWER SUPPLY



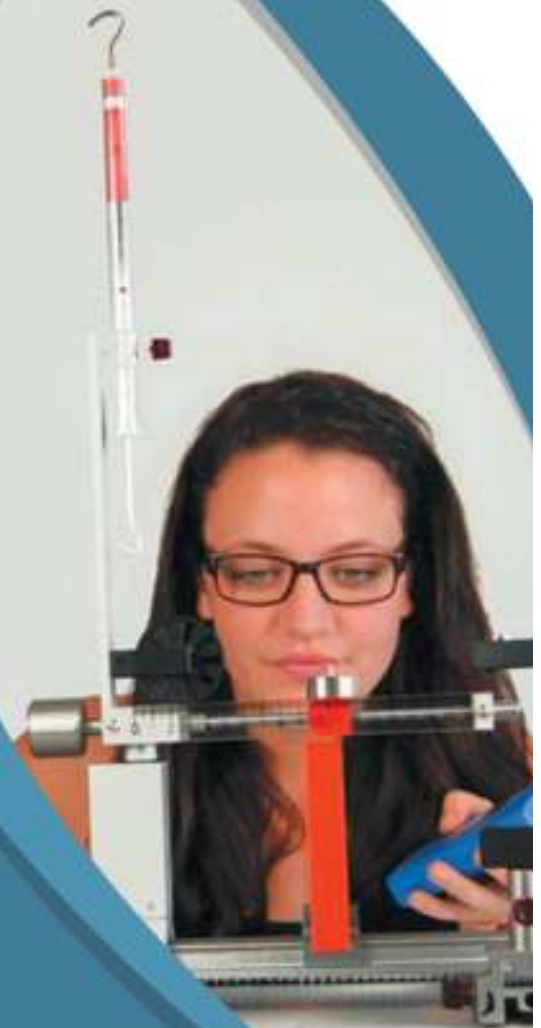
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# PHYSICS & POWER SUPPLY

- Data Logging & Sensors
- Electricity & Magnetism
- Electronic
- Forces & Energy
- Materials Properties
- Measurements
- Light, Sound & Waves
- Atomic Physics
- Power Supply Units



## CMES Data Logger

Is a modern advanced graphic data-logger. It is a hand-held Linux device equipped with two processors and 8 GB memory. Works standalone and with Windows and MAC computers.

Display: 5" high-resolution capacitive color touch screen

Resolution: 12-bit

Maximum sampling rate: 1 MHz

Sensor inputs: Four analogue BT inputs, two digital BT inputs

Built-in: Sound sensor, 3-axis

Accelerometer (2g, 4g, 8 g)

Wireless connectivity: Wi-Fi and Blue-tooth®

Computer connection: USB mini port

USB port: Full USB for USB peripherals

Power: Rechargeable battery, charging via USB from computer or via power adapter

Software on board: Coach Linux

Software on computer: Coach (Windows and MAC)

Includes: Power adapter, USB cable and User's Guide.

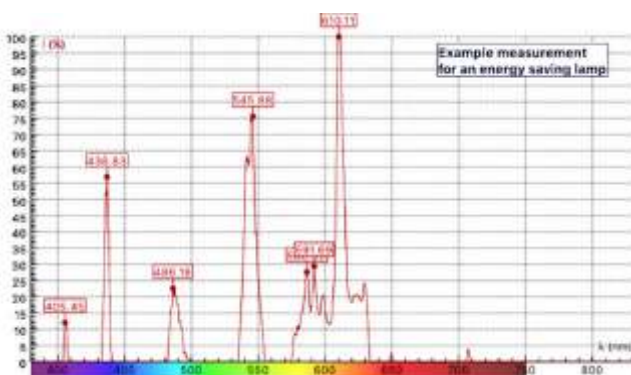
The dedicated desktop applications, installed on CMES, offer tools for collecting data, managing user files, setting up the device and its wireless connection, browsing the web, watching video files, playing audio files, etc. All applications can be easily updated via the CMES Update server available via a Wi-Fi connection.

The powerful Coach Application, installed on CMES, offers live sensor data displays, real-time graphing, tools for data processing and possibilities to create new or open ready-to-go student activities, enriched with texts, images and web-pages. Coach 7 and Coach 7 Lite support measurements with CMES.

During such measurement CMES is connected to the computer via a USB port or communicates via a Wi-Fi connection, and is controlled by Coach running on the computer. The collected data are transferred in real-time to the computer and the measurement can be followed directly on the computer screen. By using wireless connectivity and the VNC protocol the CMES's screen can be remotely viewed and controlled from any computer or mobile device connected to the same network.



ESD50000



## Data Logger Software, Desktop 5years Single User License

Our Coach software is the most versatile and complete software for STEM Education.

Coach integrates ICT tools, which resemble technologies used by professional scientists and facilitate an inquiry-based approach to education. By collecting high-quality, real-time data, constructing and using models, using simulations and visualizations, comparing results from experiments and models, students can be actively involved in authentic learning activities.

Coach 7 is the successor of Coach 6 and offers new features and enhancements of our unique and powerful environment.

ESD50013



## Accelerometer Low-g

The Low-g Accelerometer BT10i can be used to study accelerations in one-dimensional motions. The sensing element of the sensor is located inside the small round box, which can be mounted on a moving object. This is the best choice for most experiments.

Range: -5 g .. 5 g Accuracy: 0.05 g

### Can be used to:

- Measure acceleration of a moving car, in elevators, on playground apparatus, during amusement park rides,
- Determine the tilt of an object,
- Investigate accelerations during body movements.

ESD50130

## Accelerometer High-g

The High-g Accelerometer BT11i can be used to study larger accelerations in one-dimensional motions. The sensing element of the sensor is located inside the small round box, which can be mounted on a moving object.

Range: -25 g .. 25 g - Accuracy: 0.2 g

### Can be used to:

- measure acceleration during collisions,
- investigate larger accelerations.

ESD50131





### Angle Sensor \*

The Angle sensor 013i is a potentiometer, which has a pulley to attach a string to. The sensor is suitable for detecting angle changes and (small) displacements.

Range : 270° (turn), 140 mm (displacement) Resolution

#### Can be used to:

- Study a pendulum period,
- Measure small displacements,
- Investigate harmonic motion.

ESD50132



### Charge Sensor

The Charge sensor BT19i measures electrostatic charges. It can replace a traditional electroscope by showing not only the polarity of the charge but also performing quantitative measurements. The sensor has three operating ranges, which can be selected using a switch.

Range: -5 .. 5 nC, -25 .. 25 nC, -100 .. 100 C - Resolution (12-bits): 0.0025 nC, 0.013 nC, 0.05 nC

#### Can be used to:

- Measure magnitude and sign of the charge on different objects,
- Investigate electrostatic phenomena,
- Charging by induction, friction and by contact.

ESD50133



### Current Sensor High-Range

The Current sensor BT21i is a general-purpose sensor to measure currents in the range between -5 and 5 A. It has two banana (4-mm) plugs for easy connection. The sensing element is a 0.04 Ω resistor connected between the red and black terminals.

Range: -5 .. +5 A

Resolution (12-bit): 3.8 mA

#### Can be used to:

- Investigate relationships between voltage and current,
- Verify Ohm's law,
- Measure currents in series and parallel electrical circuits.

ESD50134



### Current Sensor Low-Range \*

The Current sensor 0222i can be used to measure currents in the range between -500 and 500 A. It has two banana (4-mm) plugs for easy connection. The sensing element is a 0.4 Ω resistor connected between the red and black terminals.

Range: -500 .. +500 mA

Resolution (12-bit): 0.38 mA

#### Can be used to:

- Investigate relationships between voltage and current, verify Ohm's law,
- Measure currents in series and parallel electrical circuits.

ESD50135



### Oxygen Gas Sensor \*

The Oxygen Gas sensor BT59i measures the gaseous oxygen concentration. The wide measurement range allows it to be used in study of human and cellular respiration.

Range: 0 .. 100% - Resolution (12-bit): 0.03% Lifetime: 5 years in open air

#### Can be used to:

- Monitor changes in oxygen concentration during photosynthesis and respiration of plants,
- Monitor respiration of animals, insects, or germinating seeds,
- Measure the oxygen levels during human respiration.

ESD50033



### Force Sensor

The Force sensor BT42i measures pushing and pulling forces. It uses strain gauge technology. The sensor has two measurement ranges, which can be selected using a switch.

Range: -5 .. 5N, -50 .. 50 N. Resolution (12-bit): 0.003 N, 0.03 N Includes: a thumbscrew, a utility handle, a bumper and a hook.

#### Can be used to:

- Replace a hand-held spring scale, can be
- Mounted on a ring stand or on a dynamics cart to study collisions.
- Measure of centripetal or frictional forces, study Newton's laws, investigate static and kinetic friction.

ESD50136

**NOTE** All \* Marked sensors need a sensor cable (IEEE1394-BT) ESD50250, which has to be purchased separate.





**Relative Humidity Sensor**

Relative Humidity Sensor The Relative Humidity sensor BT72i measures relative humidity. The sensor consists of an integrated circuit, which uses a capacitive polymer to sense humidity. The holes in the sensor box provide air circulation.

Range: 0 to 100 %

Resolution (12-bit): 0.04 % RH

**Can be used to:**

- Study transpiration rates of plants,
- Optimize conditions in a greenhouse or terrarium,
- Determine good days for static electric demonstration.

ESD50034



**Thermocouple \***

The Thermocouple sensor 0135i measures temperatures in two ranges, which can be selected using the switch. The sensor uses a thermocouple type K, which consists of Chromega and Alomega wires that are welded together to form a measuring junction.

Range: -200.. 1300 °C , -20 .. 110 °C

Resolution (12-bit): 0.39 °C, 0.035 °C

**Can be used to:**

- Measure the temperature inside a Bunsen burner flame or candles,
- Determine the melting point of copper, bismuth, or other solids,
- Measure temperature in specific heat experiments.

ESD50039



**Temperature Sensor \***

This Temperature sensor BT01 is a low-cost, general-purpose temperature sensor that can be used to measure temperature in the range of -40°C to 140°C, in liquids (water, mild acidic solutions) and air. The sensing element of the sensor is an NTC thermistor, which is positioned in a stainless steel tube. The thermistor is a variable resistor whose resistance decreases non-linearly with increasing temperature.

Range: -20 °C .. 140 °C, Accuracy: 2°C at -40°C, 0.6 at 30°C, 1.8°C at 140°C

**Can be used to:**

- Monitor indoor and outdoor temperatures.
- Monitor freezing and boiling water,
- investigate the temperature during endothermic and exothermic reactions.
- Investigate evaporation

ESD50036



**Temperature Sensor**

The Temperature sensor BT84i measures temperature and temperature differences in the range between -18 °C to 110 °C. This sensor uses the solid-state temperature transducer, whose output is linearly proportional to the temperature. The transducer is positioned in the point of a stainless steel tube. In liquids the response of the temperature sensor is quite fast (in between 1.3 and 2.0 s).

Range: -20 °C to 110 °C, Resolution (12-bit): 0.07 °C

**Can be used to:**

- Monitor indoor and outdoor temperatures.
- Monitor freezing and boiling water,
- Investigate the temperature during endothermic and exothermic reactions.
- Investigate evaporation.

ESD50141



**Light Sensor with three ranges**

The Light sensor BT50i measures light intensity and has three measurement ranges, which can be selected using a switch. Because of its ranges the sensor is suitable as well for indoor as for outdoor measurements. Full sun illumination is within the range of the sensor. The spectral response of the sensor approximates the response of the human eye.

Ranges: 0 .. 1500 lux, 0 .. 15000 lux, and 0 .. 150000 lux Resolution (12-bit): 0.37 lx, 3.7 lx, 37 lx

**Can be used to:**

- Verify inverse square law.
- Investigate light reflection and absorption,
- Study solar energy.
- Monitor monitoring sunrise and sunset times.

ESD50082

**NOTE** All \* Marked sensors need a sensor cable (IEEE1394-BT) ESD50250, which has to be purchased separate.





### Light Sensor \*

The Light sensor 0142i measures light intensities in the range between 0 and 200 lux. It consists of a photo-transistor, which receives light through a glass fiber. Because of its range the sensor is suitable for measurements in normal indoor situations. The sensor can also be used as a light gate.

Range: 0 .. 200 lx - Resolution (12-bit): 0.05 lx

Can be used to:

- Verify inverse square law,
- monitor changes in light caused by a chemical reaction,
- Investigate light reflection and absorption,
- investigate light interference patterns.

ESD50143



### Pressure Sensor

The Pressure sensor BT66i is designed to measure absolute gas pressure. The pressure is measured via a pressure valve, which is located on the side of the box. The sensor has two measurement ranges, which can be selected using a switch.

Range: 0 .. 700 kPa, 0 .. 130 kPa

Resolution (12-bit): 0.2 kPa, 0.04 kPa

Includes: a plastic 20-ml syringe with Luer-lock, two plastic tubes (5 cm and 45 cm long), a three-way valve with Luer-lock connectors, two Luer-lock connectors.

Can be used to:

- Measure pressure changes in gas-law experiments, Boyle's and Gay-Lussac's laws,
- Measure vapour pressure of liquids.
- Measure air pressure for weather studies.

ESD50088



### Magnetic Field Sensor \*

The Magnetic field sensor 024i contains a Hall-element, which is sensitive to a magnetic field. It has two measurement Ranges, which can be selected using a switch. The sensor is suitable for measuring the magnetic field inside coils, or near permanent magnets.

Ranges: -10 .. +50 mT, -100 .. +500 mT - Resolution (12-bit): 0.024 mT, 0.24 mT

Can be used to:

- Measure the magnetic field near a (strong) permanent magnet,
- Investigate the magnetic field near a current-carrying wire,
- Measure the magnetic field near or inside a coil or solenoid.

ESD50146



### Light Sensor \*

The low-cost Light sensor 0513 measures light intensity and is sensitive to the visible light spectrum and also infrared. Because of its range the sensor is suitable for measurements in normal indoor situations.

Range: 0.1 .. 10 W/m<sup>2</sup>

Can be used to:

- Verify inverse square law.
- Monitor change in light caused by a chemical reaction,
- Measure the rapid changes of the light intensity.

ESD50144



### Motion Detector \* (digital BT)

The Motion Detector 0664 uses ultrasound to measure the distance between the sensor and an object. This Motion Detector has a digital BT connector and can be connected to digital inputs of CMES Data logger

Range: 0.2 .. 6 to 12 m (depending on an

Object's shape, size and surface) Frequency of ultrasound: 50 kHz - Typical accuracy:  $\pm 1$  mm Includes: a steel rod.

Can be used to:

- Record motions during walking towards and away from the sensor,
- Investigate simple harmonic motion.
- Record motions of objects dropped or tossed upward.

ESD50147

**NOTE** All \* Marked sensors need a sensor cable (IEEE1394-BT) ESD50250, which has to be purchased separate.





### Photo-gate with Pulley

The Photo-gate BT63i is a traditional photo-gate, which consists of a light gate allowing detecting objects passing between the photo-gate arms. In this light gate, a narrow infrared beam is directed to a fast infrared detector, which produces very accurate signals for timing. The external (laser) gate mode allows detecting objects passing outside the photo-gate arms.

Includes: a pulley attachment and a steel support rod. The EduScience Drop counter can be attached to the photo-gate for titration experiments (not supplied has to be purchased separately Order Code 0662drop). Up to five photo-gates can be chained in a daisy-chain configuration and connected to a single interface input (IEEE1394 cable not supplied, this cable has to be ordered separately Order Code 07662).

**Can be used to:**

- Count events,
- Measure the speed of a moving (rolling) object (with the pulley attachment),
- Measure volume in titration experiments (with the drop counter attachment),
- Study pendulum periods,
- Measure the acceleration due to gravity (e.g. by using a picket fence).

ESD50149



### Radiation Sensor \*

The Radiation sensor BT70i detects alpha, beta and gamma ionizing radiation. The sensor outputs a pulse when decay is detected. Also, a clicking sound is emitted and a LED light flashes. The sensor is suitable to detect low-level radiation, emitted by e.g. potassium fertilizers or gas lantern mantles. Range: 0 .. 1000 cps (counts per second)

Can be used to:

- Monitor background radiation,
- Record radioactive decay and determine half-life,
- Investigate radiation versus shielding.

ESD50150



### UVB Sensor \*

The UVB sensor 0389 measures the intensity of ultraviolet radiation. This sensor consists of a broadband UV sensitive silicon photo-diode and responds primarily to UVB radiation.

Range: 290 to 320 nm

Resolution (12-bit): 0.25 mW/m<sup>2</sup>

Can be used to:

- Measure the UVB transmittance of various sunglasses and regular glasses,
- Measure the UVB intensity as a function of time throughout the day,
- Measure the UVB transmittance of fabrics, both wet and dry.

ESD50153



### Motion Detector \* (analogue BT)

The Motion Detector BT55i uses ultrasound to measure the distance between the sensor and an object. This Motion Detector has an analogue BT connector and can be connected only to CMES

Range: 0.2 .. 6 to 12 m (depending on an object's shape, size and surface)

Frequency of ultrasound: 50 kHz Typical accuracy: ± 1 mm Includes: a steel rod.

**Can be used to:**

- Record motions during walking towards and away from the sensor,
- Investigate simple harmonic motion,
- Record motions of objects dropped or tossed upward

ESD50148



### Sound Sensor

The Sound sensor BT80i consists of a microphone followed by an internal amplifier. It measures variations in air pressure caused by sound waves. Because of the high sensitivity, the sensor is very much suited to detect pressure pulses. The dB-calibration in the Coach software allows using this sensor for dB-measurements (up to 124 dB).

Range: -45 .. 45 Pa, Resolution (12-bit): 22 MPa

Can be used to:

- Measure sound waveforms and beat patterns,
- Investigate human voice and sounds from various musical instruments,
- Measure the speed of sound through air and other materials

ESD50151

**NOTE** All \* Marked sensors need a sensor cable (IEEE1394-BT) ESD50250, which has to be purchased separate.







**UVA Sensor \***

The UVA sensor 0388 measures the intensity of ultraviolet radiation. This sensor consists of a broadband UV sensitive silicon photo-diode and responds primarily to UVA radiation. Range: 320 .. 390 nm Resolution (12-bit): 5 mW/m<sup>2</sup>

**Can be used to:**

- Measure the UVA transmittance of various sunglasses and regular glasses,
- Measure the UVA intensity as a function of time throughout the day,
- Measure the UVA transmittance of fabrics, both wet and dry

ESD50152



**Voltage Sensor (Differential) \***

This Voltage sensor 0210i is designed for measuring voltages between 10 .. +10 V. The sensor has differential inputs; measurements can be done directly across circuit elements without the constraints of common grounding. It has two 4-mm plugs for easy connection. Range: -10 .. +10V Resolution (12-bit): 6.5 mV

**Can be used to:**

- Measure voltages in AC and DC circuits
- record characteristics of a light bulb or a diode,
- Measure voltages in series and parallel electrical circuits.

ESD50154



**Voltage Sensor (Differential)**

This Voltage sensor BT32i is designed for measuring voltages between -500 and +500 mV. The sensor has differential inputs; measurements can be done directly across circuit elements without the constraints of common grounding. It has two 4-mm plugs for easy connection.

Range: -500 .. +500 mV - Resolution (12-bit): 338  $\mu$ V

**Can be used to:**

- Measure small voltages in AC and DC circuits.
- Record characteristics of a light bulb or a diode
- Measure voltages in series and parallel electrical circuits.

ESD50155



**Voltage Sensor \***

This Voltage sensor BT02 is a low-cost, generic sensor that measures voltage. This sensor has a direct connection to the inputs of a measurement interface. It has two banana (4-mm) plugs for easy connection.

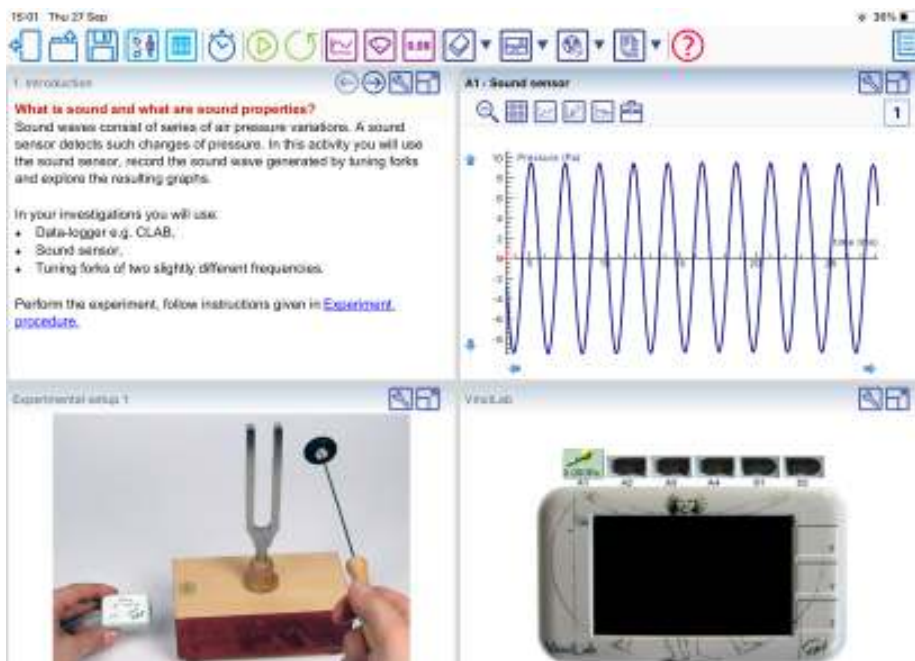
Range: -10 .. +10 V. - Resolution (12-bit): 4.9 mV

**Can be used to:**

- Measure voltage during discharging of a capacitor
- Investigate battery life
- Record electromagnetic induction.

ESD50156

**NOTE** All \* Marked sensors need a sensor cable (IEEE1394-BT) ESD50250, which has to be purchased separate.





**Basic Physics Sensors Bundle Kit**

• Current Sensor BT21i • Voltage Sensor 0210i • Force Sensor BT42i • Motion Detector 0664 • Light Sensor BT50i • Pressure Sensor BT66i • Sound Sensor BT80i • 2 x Temperature Sensors BT01 • 2 x Photo-gates with Smart Pulley BT63i • 4 Sensor Cables BTsc\_4

ESD50157



**Physics Sensors Extension Bundle Kit**

• Accelerometer BT10i • Charge sensor BT19i • Current sensor 0222i • Voltage Sensor BT32i • Magnetic Field Sensor 024i • Radiation Sensor BT70i

ESD50158





**BT-BT Extension cable (analogue)**  
A 5-m long cable for extending the length of analogue BT sensor cables.  
**ESD50247**



**Adapter 4mm – BT**  
For connecting sensors with 4-mm plugs to interfaces with BT inputs such as CMES Data-logger.  
**ESD50248**



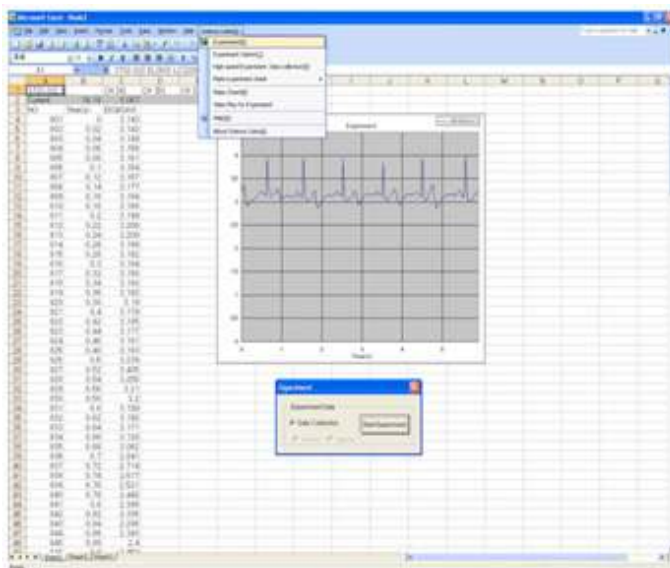
**Data-logger stand**  
Plastic stand for the CMES data-logger.  
**ESD50249**



**BT - IEEE1394 cable**  
The BT – IEEE1394 sensor cable (1.5 m length) is used for BT sensors, which are equipped with the IEEE1394 socket. These sensor cables are sold per piece (BTsc\_1) and in packages of four (BTsc\_4).  
**ESD50250**

**Xlogger system introduction**

Xlogger is an innovative new data logging system using direct USB sensors & Excel\* for data capture and analysis. Our sensors plug straight into USB ports on any Windows computer. No dedicated software program just Microsoft Excel\*  
Data is logged directly into Excel\* and graphed automatically  
Simple toolbar commands control everything  
Completely intuitive - start logging straight away  
Students work in the familiar Excel\* environment  
All the power of Excel\* for analysing data is immediately available  
All the standard sensors with new ones being developed  
Simply plug them in and start logging (no calibration needed)  
Robust construction and encapsulated leads



**ES Data-logging Software**

Xlogger is an innovative new data logging system using direct USB sensors & Excel\* for data capture and analysis. Our sensors plug straight into USB ports on any Windows computer. No dedicated software program just Microsoft Excel\*  
Data is logged directly into Excel\* and graphed automatically Simple toolbar commands control everything Completely intuitive - start logging straight away Students work in the familiar Excel\* environment All the power of Excel\* for analysing data is immediately available All the standard sensors with new ones being developed Simply plug them in and start logging (no calibration needed) Robust construction and encapsulated leads

**ESD50014**





**USB Accelerometer 5G Sensor**  
Xlogger Accelerometer 5G.

ESD50199



**USB Relative Humidity Sensor**

Xlogger Relative Humidity Sensor.  
Range: 0 to 100% - Resolution:  $\pm 0.4\%$  - Accuracy:  $\pm 2\%$  at 25°C

ESD50187



**USB Light Gate Sensor**  
Xlogger Light Gate Set (pair).

ESD50201



**USB Magnetic Field Sensor.**

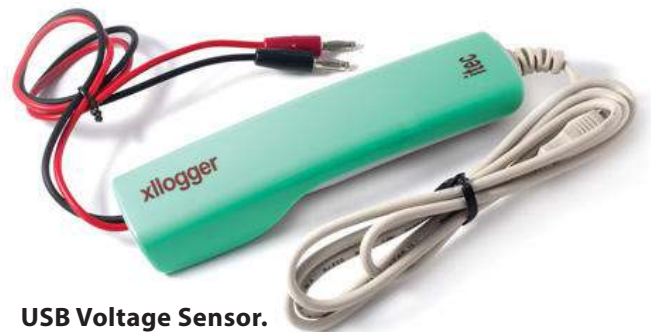
Xlogger Magnetic Field Sensor.  
Range: -50 to +50 G Linear Hall Effect Sensor

ESD50200



**USB Sound Sensor.**  
Xlogger Sound Sensor.

ESD50202



**USB Voltage Sensor.**

Xlogger Voltage Sensor.  
Range:  $\pm 12.0\text{V}$  - Resolution:  $\pm 3.1\text{mV}$

ESD50203





**USB Current Sensor**  
 Xlogger Current Sensor.  
 Range: DC  $\pm 1.0$  A - Resolution:  $\pm 6.0$  Ma

ESD50204



**USB Motion Sensor**  
 Xlogger Distance (Motion) Sensor.  
 Range: 0.4 - 6.0 m - Resolution: App 1.5 mm - Beam: cone,  $\sim 15$

ESD50205



**USB Barometer Sensor**  
 Xlogger Barometer.  
 Range: 0 to +2068 hPa (mbar) - Resolution: 0.6 hPa

ESD50188



**USB Force Sensor**  
 USB Force Sensor

ESD50206



**USB Temperature Sensor**  
 USB Temperature Sensor

ESD50185



**USB Light Sensor**  
 USB Light Sensor

ESD50186



**Dynamics System**

The Dynamics system is designed for use in physics enabling more accurate and precise experiments by minimizing friction. It can be used independently or with EduScience Software and sensors, such as the Light gates, motion sensor, force and accelerometer.

Typical experiments include:

- Newton's Law
- Conservation of Energy
- Uniform Motion
- Spring Constant
- Motion under constant acceleration
- Inelastic collisions & Elastic collisions

ESD50241





**Resonance kit**

The Resonance Kit 060 is a set for measurement and control activities around the concept of Resonance. The kit consists of an adjustable base, a plastic tube, a movable coil, a movable force sensor holder, a spring, a spring holder and a magnet. Instead of a metal rod, a Force sensor (not included in the kit) for measuring spring oscillations can be used. The measurements of induced EMF due to the periodic motion of a magnet can be done. The current carried through the coil can be controlled (turning on and off) through outputs of the interface and the way this influences the magnet, hanging on the spring, can be observed.

ESD50255



**Actuator Set**

The Actuator Set 062 can be used to introduce the students to the basics of control technology. The set consists of the following elements: 3 red and 3 black 4-mm wires, 12-V switch, lamp holder with 3 coloured 12-V bulbs, 12-V buzzer, 12-V direct current motor, and propeller to connect to motor. All elements make use of the 4-mm buses.

ESD50258



**Switch Module**

The Switch Module 063 is a solid-state-relay (SSR) that allows you to control 110 – 230 V devices by a voltage of 3 V DC or more up to 25 V). The relay is connected to the mains (110 V up to 230 V) via a Euro-connector at the rear of the module. The relay can supply devices up to 1150 W.

ESD50259



**System Board**

The System Board 0020 is designed for logic, measurement, control and automation experiments. The sections of the System Board:

The Input block gathers data from the environment and conditions the signal for processing. The signal comes from a sensor in case of a measuring or control system, or a keyboard in case of a computer system. The Processing block processes the signal to achieve a specific system goal. The Output block presents the processed data in a form useful for the user (measurement system) or on the basis of the signal, carries out an action (control system). The Extra components block consists of a 4-bit AD converter and connection to the computer.

ESD50256



**Heating Coil**

The Heating Coil 018 can be used as an actuator in control systems. The coil has 4 mm plugs for easy connection. The Heating Coil has to be supplied with 24 volt or less.

ESD50260

**Mains adapter 9 V for System Board**

ESD50257



**Compass**

PLOTTING COMPASS, Different Diameter In aluminium or plastic case, with card dial/ Scale graduated in degree 0-360

- ESP59038** DIA. 25MM In aluminium case with card dial
- ESP59039** DIA. 38MM In aluminium case with card dial
- ESP59040** DIA. 42MM In Plastic Case with point of the compass and needle locking device
- ESP59041** DIA. 50MM In aluminium case with card dial
- ESP59042** DIA. 75MM In aluminium case with card dial
- ESP59043** DIA. 100MM In aluminium case with card dial



**Magnet , U Shape Magnet**

Used in some physics experiment in the laboratory

**Dimensions :**

- Overall: Dia 20 x 61 x 80mm
- Sectional **Dimensions :** 10 x 20mm
- Space between poles: 41mm

Material: Al-Fe-C

Painted Red for North and Blue for South

ESP59049



**Horseshoe Magnet**

chrome steel horseshoe magnets with keepers

- ESP59076** **Dimensions :** 75MM
- ESP59077** **Dimensions :** 100 MM
- ESP59078** **Dimensions :** 125 MM
- ESP59079** SET OF 3 DIFFERENT SIZES



**Magnet , U Shape Magnet, ALNICO**

U SHAPE MAGNET, ALNICO, 37 x 6 x 10mm Centre Gap 9mm. With Keepers.

ESP59050



**U Shape Magnet , Alnico**

U SHAPE MAGNET, MADE OF ALNICO , With Keepers.

- ESP59051** **Dimensions :** 37 X 6 X 10 Mm Centre Gap 9Mm
- ESP59052** **Dimensions :** 50 X 15 X 10Mm Centre Gap 20Mm
- ESP59053** **Dimensions :** 75 X 15 X 10Mm Centre Gap 20Mm

**Cylindrical Magnet**

Cylindrical magnet , Supplied In pair, with keeper.

- ESP59054** **Dimensions :** 37 X 10MM (LENGTH X DIA.) ALNICO
- ESP59055** **Dimensions :** 50 X 10MM (LENGTH X DIA.) ALNICO
- ESP59056** **Dimensions :** 75 X 10MM (LENGTH X DIA.) ALNICO
- ESP59057** **Dimensions :** 100 X 10MM (LENGTH X DIA.) ALNICO
- ESP59058** **Dimensions :** 37 X 12MM (LENGTH X DIA.) Chrome steel
- ESP59059** **Dimensions :** 50 X 12MM (LENGTH X DIA.) Chrome steel
- ESP59060** **Dimensions :** 75 X 12MM (LENGTH X DIA.) Chrome steel
- ESP59061** **Dimensions :** 100 X 12MM (LENGTH X DIA.) Chrome steel



**Bar Magnet Rectangular 6 X 19 X 70mm, Red-Blue**

Rectangular Bar Magnet 6 x 19 x 70mm, Red-Blue

**Dimensions :** Overall 6 x 19 x 70mm

Material: ALNICO LNG12

Poles of magnet is painted red for North and Blue for South With hole in the centre

ESP59062

rectangular bar magnet made of ALNICO,,Powerful and permanent, in pair, with keepers. Supplied in Cardboard box.

- ESP59063    **Dimentions :** 50 X 15 X 10 MM    ALNICO
- ESP59064    **Dimentions :** 75 X 15 X 10 MM    ALNICO
- ESP59065    **Dimentions :** 100 X 15 X 10 MM    ALNICO
- ESP59066    **Dimentions :** 150 X 15 X 10 MM    ALNICO
- ESP59067    **Dimentions :** 50 X 15 X 15 MM    ALNICO



**Magnetic Disc Neodymium**

Neodymium magnets have the greatest pulling force of all permanent magnets. We can supply various shapes and sizes of Neodymium magnets. Please contact us for further details.

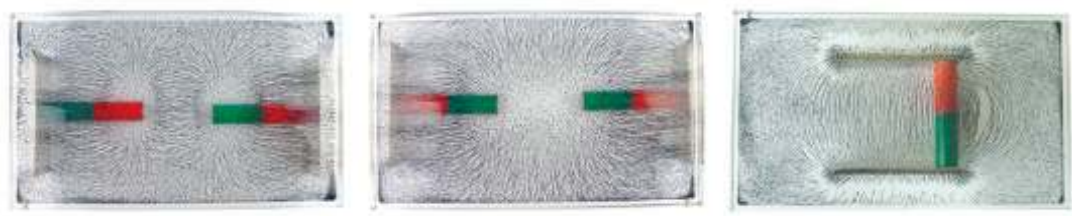
**Dimentions :** 10 x 4mm. Pk10.

- ESP59070    **Dimentions :** 10 x 4 MM PK 10
- ESP59071    **Dimentions :** 15 x 4 MM PK 4
- ESP59072    **Dimentions :** 20 x 10 MM PK 4

**Magnet, Bar Magnet, Plastic**

Overall size 80 x 12 x 15mm, per pair with plastic cover.

ESP59068



**Magnetic Field Demo Set**

Set Including : 1 no Magnetic field plate , 1 no Supporting plate for bar magnets, 2nos Bar Magnet, Alnico, D=10 mm, L=50 mm , 2 nos Pole lamination , 60 x 25 mm

ESP59083



**Magnetic Field Frame ,Field Pattern Window- Transparent**

A white frame with transparent window containing magnetic powder in a water based solution for showing magnetic field patterns. When a magnet is present the particles of iron inside become slightly magnetised, so they attract each other and cluster into the lines that show the magnetic field patterns. Includes a pair of small ferrite block magnets and a pair of plastic cased bar magnets and teachers leaflet.

**Dimentions :** 225 x 130 x 15mm.

ESP59084







### Student Magnetism Kit

Kit consisting of:

2x Bar Magnet, 1x Iron filings in box, 1x Pocket compass, 1x Earth-model for magnetic field of earth globe, 1x Magnetic field sensor, 1x Plug pin with needle, 2x Supporting plate for bar magnets, 4x Threaded bolt steel, L=40 mm, 1x Insulating block with socket, 1x Bearing bush for cylindrical magnets, 1x Magnetic field plate, 2x Pole lamination SE, 60 x 25 mm, 1x Paper clip in container, set of 10, 1x Paper clip with string, 1x Test tube 16x150 mm, plastics, 1x Magnetic field sheet, 1x Magnetic rubber bar, 1x Soft iron ring, 1x Iron nails in box

#### Storage:

1x Box insert Magnetism, SE  
1x Storage box II small, with cover,  
Box -insert plan with 2 labels

ESP59080



### Magnet Kit

Selection of magnets and materials, assembled in plastic tray with cardboard sleeve. Includes Alnico bars, Alnico button magnets, ferrite blocks & rings, chrome steel horseshoe magnet, Alnico horseshoe magnet, coloured squares of magnetic rubber, plotting compasses 19mm, compasses 14.5mm, chrome rods and Lodestone piece.

ESP59081



### Magnet Kit Deluxe

A comprehensive selection of magnets and materials packed in a robust storage case. Includes alnico bars, alnico button magnets, round and square coaxial bars, ferrite blocks and rings, chrome steel horseshoe magnet, alnico horseshoe magnet, iron filings bubble, pair of plastic cased bar magnets, coloured squares of magnetic rubber, chrome steel bars, a metal disc set and plotting compasses.

**Dimensions of case :** 320mm x 220mm x 50mm..

ESP59082





**Magnetic Field Demonstrator -3D**

Allows students to observe magnetic fields in three as well as two dimensions. This unique device consists of two half hexagonal acrylic containers with metal filings. The two parts, connected with hinges, can be swung open or closed. A strong bar magnet is placed between the containers to reveal the cross section of a magnetic field.

**Dimensions :** 5 in. x 5 in. x 5 in.

ESP59085



**Magnetic Field Demonstrator -Set Of 3**

A conductor models in straight, loop and coil shape, embedded into temperature resistant nylon profiles, iron filings in viscous medium in sealed acrylic cuvette

**Dimensions of the cuvette :** 107 x 96 mm

ESP59086



**Magnaprobe**

This small magnet suspended in a gimbals mount shows forces between magnetic poles; induced magnetism; shapes of magnetic fields; direction of magnetic fields; and properties of a field produced by an electric current. **Dimensions :** 118\*37\*3mm

ESP59088



**Magnaprobe, Big Demo**

Magnetic field sensor, large

ESP59089



**Electromagnet U Form**

Iron, U core, circular section, with flat ends, has one bobbin in each limb wound with enamelled copper wire, with armature.

ESP59090



**Globe For Magnaprobe, Big Demo , 200 mm**

An illustration of the magnetic field around the earth as well as demonstrating inclination.

Coloured globe, made of robust plastic, labelled in English, pivoted appropriate slope, with sleeve for mounting a magnet 15x80mm; D=200 mm; (Delivered without magnet) Including Bar magnet, Alnico, 80x15 mm.

ESP59091



**Magnet, Floating Ring Magnets**

Demonstrate laws of magnetic attraction and repulsion. Consists of a stand with 5 magnetic rings sealed in plastic case to reduce wear and breakage.

ESP59093





### Magnetiser

- Devices that can penetrate strong magnetic fields to carbon steel's dense steel and insert or remove magnetic force
  - It is magnetized by DC current and can be demagnetized by AC current.
- Experimental method
- When you want to insert magnetic force, put the sample into the bobbin of the magnetiser and place the switch in the magnetization position and push it 2-3 times at intervals of 0.5 ~ 1 second.
  - In case of de-matching, put the switch in the demagnetizing position, push the push button as in the case of magnetization and take out the object slowly. Power AC220V, 2 magnetized balls

ESP59094



### Metal Discs Set

For demonstrating that some metals are magnetic whilst others are not and for general 'Metal Identification' exercises. Comprises sixteen discs, 25mm dia. 2 each of Mild steel, Stainless Steel, Brass, Zinc, Nickel, Bronze, Aluminium and Copper. One of each is stamped with the name of metal, the other is unmarked.

ESP59096



### Lenz'S Law - Loop

To demonstrate Lenz's laws. The apparatus moves when a magnet passes through the closed loop and does not move the loop is open, proving Lenz's Law. Magnet not included.

ESP59098



### Tangent Galvanometer

Used to demonstrate how a current loop generates a magnetic field. Consists of an acrylic hoop 12.7 cm in diameter wrapped with 2 coils of copper wire - one coil has 5 turns and the other 10, 3 binding posts which allow connections to 5, 10 or 15 turns and a compass.

ESP59100



### Oersted's Apparatus

To show action of electric current on a magnet. A 75mm cobalt steel needle supported on a pivot is mounted on base and is surrounded by a copper strip rectangle with two terminals.

ESP59103



### Search Coil

Designed to comply with the new A Level curriculum in mind this new search coil consists of a 3300 turn bobbin mounted at the end of a 200mm long tube and allows the investigation of magnetic field strength. Two 4mm leads connect to any standard VOLTMETER (mV range required) or Oscilloscope to give an indication of the field strength.

ESP59106

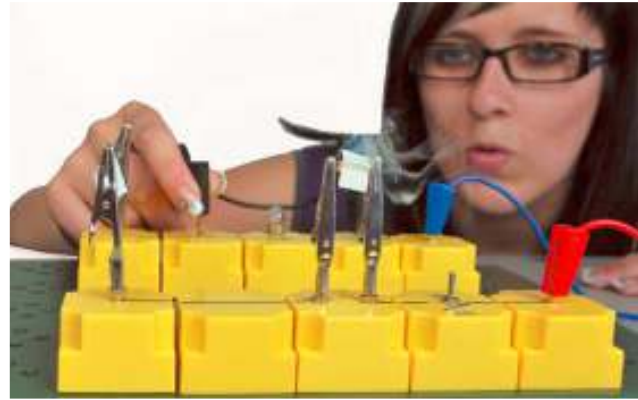




**Student Electricity Kit**

Kit consisting of:

- 1x Plug-in panel, small
- 2x Connecting lead, 25 cm, black
- 1x Connecting lead, 50 cm, red
- 1x Connecting lead, 50 cm, blue
- 1x Connecting lead, 75 cm, red
- 1x Connecting lead, 75 cm, blue
- 4x PIB connector
- 5x PIB wire, straight
- 2x PIB wire, straight, with socket
- 1x PIB wire, T-shaped, with socket
- 4x PIB wire, T-shaped
- 4x PIB wire, angled, with socket
- 2x PIB wire, angled
- 1x PIB wire, interrupted, with sockets
- 1x PIB switch, ON/OFF
- 2x PIB two-way switch
- 1x PIB resistor 100 Ohm
- 1x PIB resistor 500 Ohm
- 1x PIB resistor 1 kOhm
- 2x PIB battery (accu) 1.2V



- 2x PIB with adapter bush
- 2x PIB lamp socket E 10
- 1x Electrolysis tank
- 1x Conductors and non-conductors, set of
- 1x Electrodes, set of
- 2x Light bulb, 2.5 V/0.2 A, E10
- 2x Light bulb, 10 V/50 mA, E10
- 1x Fuse wire, D = 0.1 mm, bobbin red
- 1x Resistance wire, D = 0.2 mm, bobbin blue
- 1x Copper wire, D = 0.2 mm, bobbin black
- 4x Crocodile clip with plug
- 2x Holder with slit and hole, SE
- Storage:
- 1x Box-insert Electricity 1, SE
- 1x Storage box II small, with cover,
- Box -insert plan with 2 labels

ESP59110



**Electronics Basic Set «compact» (MBC)**

consisting of:

- 1x MBC (Magnetic block) Lead., T-shaped
- 1x MBC Resistor 500 Ohm
- 1x MBC Resistor 1 kOhm
- 1x MBC Resistor 10 kOhm
- 1x MBC PTC-Resistor

- 1x MBC LDR-Resistor
- 1x MBC Capacitor 100 µF
- 1x MBC Capacitor 1000 µF
- 1x MBC Si-Diode
- 1x MBC LED red
- 1x MBC Transistor NPN, base left
- 1x MBC Buzzer
- 2x Jumper plug MBC, black
- 1x Jumper plug with connector terminal
- 1x Storage box II small, with cover
- Including manual for more than 20 experiments to the topics:
- Semiconductors
- Diodes
- Transistors
- Capacitors

ESP59113





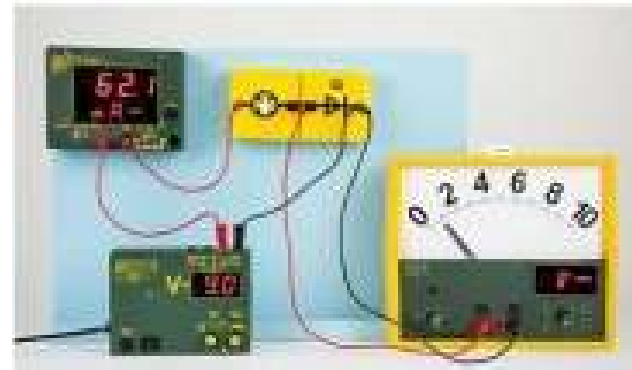
### Electricity Basic Set «compact» (MBC)

Robust plastic housing (ABS) with transparent bottom plate

- Circuit symbol (silkscreen printing)
- Suitable sockets for 4-mm safety plug
- Base plate with neodymium magnets
- **Dimensions** : 84 x 84 x 39 mm

consisting of:

- 2x MBC (Magnetic block) Lamp socket E10
- 1x MBC ON / OFF switch
- 1x MBC Resistor 5 Ohm
- 1x MBC Resistor 10 Ohm
- 4x Battery-Holder with outlets, magnetic
- 3x Clamp socket, magnetic, small
- 1x Fuse wire, D = 0.1 mm, L = 50 m, bobbin red
- 1x Constantan Wire, D = 0,2 mm, blue
- 1x Copper Wire, D = 0,2 mm, black
- 1x Conductors and non-conductors, set of 7 Stk.
- 3x Light bulb, 2.5 V / 70 mA (1.5 V / 50 mA), E10
- 3x Light bulb, 4 – 12 V / 40 – 70 mA, E10
- 2x Crocodile clip, plain metal
- 1x Tray for electrolysis
- 3x Connecting lead, 25 cm, red
- 3x Connecting lead, 25 cm, black



- 1x Connecting lead, 50 cm, red
- 1x Connecting lead, 50 cm, black
- 1x Storage box II small, with cover
- Box-insert plan with 2 labels

Including manual for more than 20 experiments such as:

- Basics of electricity
- Electrical resistance
- Therman energy derived from electrical energy
- Work and power

ESP59112



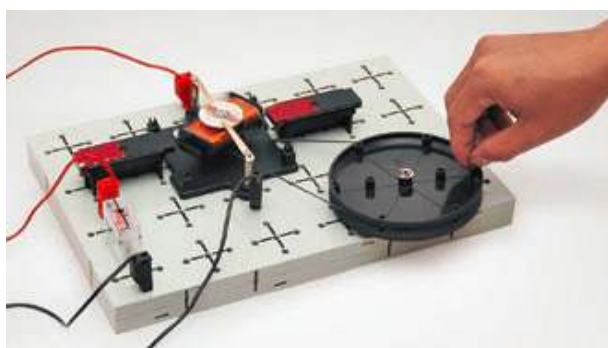
### Bottom-shelf for MBC system

Powder-coated metal plate for experiments in electricity or electronics as a "compact" system

Free experimental area: approx. 50 x 33 cm

ESP59114





### Electricity and Magnetism Kit 1

Consist of:

Assembly Board 120 Holes with Screen Printing Logo 1 pc  
 Bridge Connector 10 pcs  
 Alligator Clip, Red and Black 2 pcs  
 Change Switch 2 pcs  
 I Core 1 pc  
 U Core 1 pc  
 Coil 250 Turns 1 pc  
 Coil 500 Turns 1 pc  
 Coil 1000 Turns 1 pc  
 Clamp Plug 4 pcs  
 Spring Plug 2 pcs  
 Rectangular Bar Magnet 6 x 19 x 70 mm, Red-Black 2 pcs  
 Compass Model 1 pc  
 Electrolysis Vessel 1 pc  
 Copper Electrode 1 pc  
 Zinc Electrode 1 pc  
 Iron Electrode 1 pc  
 Lead Electrode 1 pc  
 Resistor 47 Ohm, 2W 1 pc  
 Resistor 100 Ohm, 2W 1 pc  
 Single Polar Switch 1 pc  
 Lamp Bulb E 10, 6V/0.5 A 4 pcs  
 Lamp Holder E 10, Lateral 2 pcs  
 Constantan Wire 25 m 1 pc  
 Nichrom Wire 25 m 1 rol  
 Fuse Wire 25 m 1 rol  
 Iron Powder 100 g 1 pc

Battery Holder 4 pcs  
 Connecting Lead DC 50 cm, Red 2 pcs  
 Connecting Lead DC 50 cm, Black 2 pcs  
 PVC Rod 2 pcs  
 Plexiglass Rod 2 pcs  
 Plotting Compasses, Plastic 10 pcs  
 Basic Meter 90 2 pcs  
 Diode 1N4002 1 pc  
 U Magnet (U082) 1 pc  
 Bimetal set 1 set  
 Magnet SMP 1 pc  
 Box and tray 1 set

#### Support tools (sold separately) :

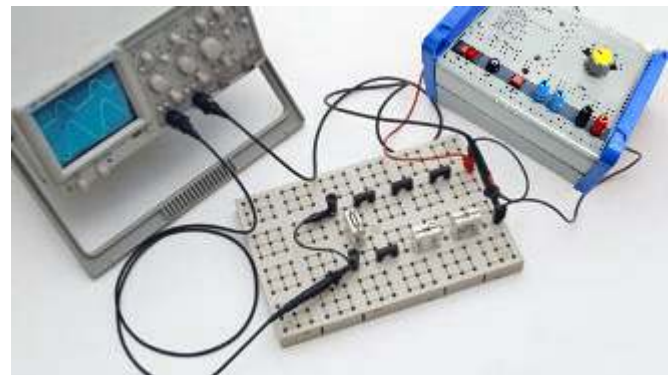
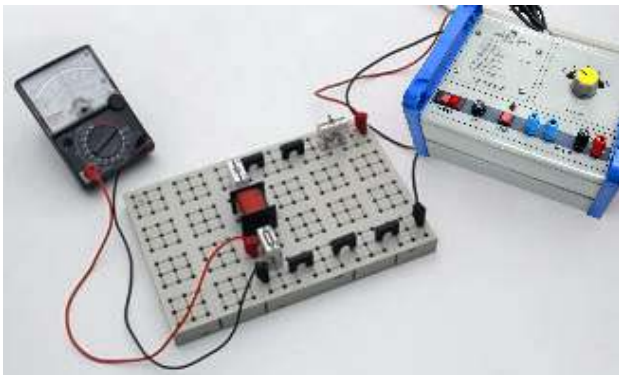
Stand Base with 3 Clamps 2 pcs (Available in Mechanic Kit)  
 Stand Foot 2 pcs (Available in Mechanic Kit)  
 Stand Rod 10 x 250 mm, Stainless Steel 2 pcs (Available in Mechanic Kit)  
 Stand Rod 10 x 500 mm, Stainless Steel 2 pcs (Available in Mechanic Kit)  
 Nylon Thread 1 rol (Available in Mechanic Kit)  
 Bosshead Clamp 2 pcs (Available in Mechanic Kit)  
 Universal Clamp 70 mm 2 pcs (Available in Mechanic Kit)  
 Power Supply 3A, 36W (ESP60751) 1 pc  
 Analog Multimeter, 1 pc

**Dimensions :** (L) 61.00 x (W) 26.00 x (H) 17.00 cm

**Weight :** 4.500 kg

ESP59115





## Electricity and Magnetism Kit 2

### Experiment Topics

#### Capacitor Circuit

LU 1 Capacitors in Parallel

LU 2 Capacitors in Series

#### Resistance Circuit

LU 3 Ohm's Law

LU 4 Resistivity

LU 5 Resistance in Series

LU 6 Resistance in Parallel

#### Electromagnetic

LU 7 Magnetic Field around Electric Currents

LU 8 Electromagnetic

#### Electromagnetic Induction

LU 9 Magnetic Force (Lorentz)

LU 10 Electromotive Force Induction

LU 11 Electromotive Force Self Induction

LU 12 Transformer

#### AC Circuit

LU 13 Series R-C Circuit

LU 14 Series R-L Circuit

LU 15 Series R-L-C Circuit

Rectifier

LU 16 Diode Characteristics

LU 17 Half-Wave Rectifier

LU 18 Full-Wave Rectifier

LU 19 Rectifier

#### Transistor Circuit

LU 20 Transistor Circuit I

LU 21 Transistor Circuit II

LU 22 Transistor Circuit III

Manual Book Electric and Magnet Kit 1 exp

Box and Tray Electric and Magnet Kit ESP59116 set

#### Additional tool (sold separately) :

-Power Supply 3A, 36W (ESP60751)

-Audio Frequency Generator (ESP60296)

-Analog Multimeter

-Oscilloscope 20 MHz, ESP60487

**Dimensions :** (L) 60.00 x (W) 28.00 x (H) 16.50 cm

**Weight :** 4.550 kg

ESP59116



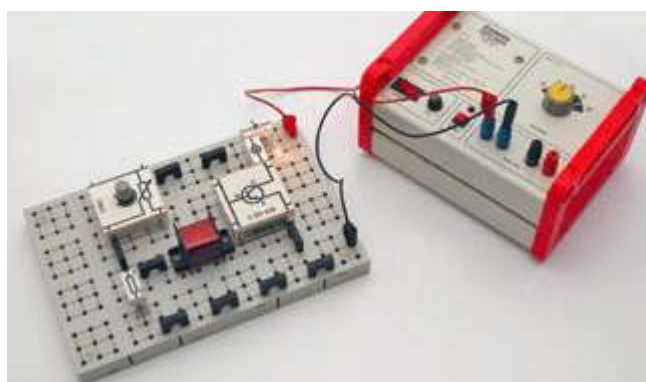


### Electricity and Magnetism Kit 3

Used with primary circuit, electrical resistance, energy and electrical power, magnetism and electromagnetic experiments.

Consist of:

Assembly Board 120 Holes 1 pc  
 Bridge Connector 10 pcs  
 Alligator Clip, Red and Black 2 pcs  
 Change Switch 2 pcs  
 I Core 1 pc  
 U Core 1 pc  
 Coil 250 Turns 1 pc  
 Coil 500 Turns 1 pc  
 Coil 1000 Turns 1 pc  
 Clamp Plug 4 pcs  
 Spring Plug 2 pcs  
 Rectangular Bar Magnet 6 x 19 x 70 mm, Red-Black 1 pair  
 Compass Model 1 pc  
 Electrolysis Vessel 1 pc  
 Copper Electrode 1 pc  
 Zinc Electrode 1 pc  
 Steel Electrode 1 pc  
 Lead Electrode 1 pc  
 Resistor 47 Ohm, 2W 2 pcs  
 Resistor 56 Ohm, 2W 2 pcs  
 Resistor 100 Ohm, 2W 2 pcs  
 Resistor 470 Ohm, 2W 2 pcs  
 LED, Red 1 pc  
 Single Polar Switch 1 pc  
 Lamp Holder E 10, Lateral 2 pcs  
 Lamp Bulb E 10, 6V/3W 4 pcs  
 Constantan Wire 25 m 1 roll  
 Nichrom Wire 25 m 1 roll  
 Fuse Wire 25 m 1 roll  
 Copper Wire 0.35 mm, 15 m 1 roll  
 Iron Powder 1 pc  
 Battery Holder 4 pcs  
 Connecting Lead DC 50 cm, Red 2 pcs  
 Connecting Lead DC 50 cm, Black 2 pcs  
 PVC Rod 2 pcs  
 Plexiglass Rod 2 pcs  
 Wool 200 x 200 mm 1 pc  
 Silk 200 x 200 mm 1 pc



Plotting Compasses, Plastic 10 pcs  
 Electrical Motor/Generator, Type 1 1 set  
 Box and Tool Container 1 set

Component are installed on a section box, completed with electronic symbol and spring plug  
 Plug and switch standar system is 4 mm with range 19 mm

#### Support Tools (sold separately) :

Stand Base with 3 Clamps 2 pcs (Available in Mechanics Kit)  
 Stand Foot 2 pcs (Available in Mechanics Kit)  
 Stand Rod 10 x 250 mm, Stainless Steel 2 pcs (Available in Mechanics Kit)  
 Stand Rod 10 x 500 mm, Stainless Steel 2 pcs (Available in Mechanics Kit)  
 Nylon Thread 1 roll (Available in Mechanics Kit)  
 Pulley 100 mm, Plastic 2 pcs (Available in Mechanics Kit)  
 Axle with Plug 1 pc (Available in Mechanics Kit)  
 Coupling Rod 2 pcs (Available in Mechanics Kit)  
 Bosshead 2 pcs (Available in Hydrostatics and Heat Kit)  
 Universal Clamp 70 mm 2 pcs (Available in Hydrostatics and Heat Kit)  
 Alcohol Thermometer -10 C – 110 C 1 pc (Available in Hydrostatics and Heat Kit)  
 Power Supply 3A, 36W (ESP60751) 1 pc  
 Analog Multimeter 1 pc  
 Basic Meter model 90 2 pcs

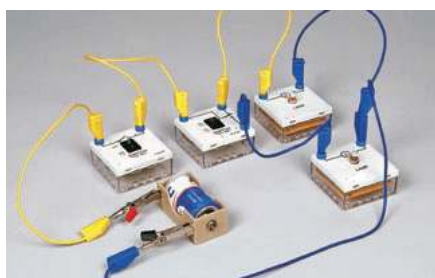
**Dimensions :** (L) 61.00 x (W) 26.00 x (H) 17.00 cm

**Weight :** 4.700 kg

ESP59117







### Electricity and Magnetism Kit 4

Experiment Topics

Fundamental Principle

LU-1 Simple Circuit

LU-2 One Way and Two Way Single Pole Switches

LU-3 Circuit to Turn on a Lamp From Two Switches

LU-4 Measuring Voltage. The VOLTMETER I

LU-5 Measuring Voltage. The VOLTMETER II

LU-6 Measuring Current. The Ammeter

LU-7 Conductor and Non Conductors

LU-8 Conducting and Non Conducting Liquids I

LU-9 Conducting and Non Conducting Liquids II

Electric Resistance

LU-10 Ohm's Law

LU-11 Using Ohm's Law to Determine Resistances

LU-12 The Resistances of a Lamp

LU-13 Lamps in Series and Short Circuit

LU-14 Resistors in Series

LU-14a Resistors in Series II

LU-15 Lamps in Parallel

LU-16 Resistors In Parallel

LU-17 Combined Series and Parallel Connection of Resistors

LU-18 Internal Resistance of Dry Cell

LU-19 The Voltage Divider

LU-20 The Potentiometer as Voltage Divider

LU-21 Rheostat (Variable Resistor)

Electrical Energy and Power

LU-22 Heat Energy from Electric Energy

LU-23 Light Energy from Electric Energy

LU-24 Making a Fuse

LU-25 Power in Electric Circuit

LU-26 Heater

LU-27 Electric Energy Consumed by a Water Heater

Electrochemistry and Capacitor

LU-28 Voltage Generator by Metals Immersed in

Electrolyte Solution

LU-29 Capacitors

Electromagnet

LU-30 Magnetic Field Around a Straight Wire

LU-31 Magnetic Field Around a Circular Wire

LU-32 Magnetic Field Around a Solenoid

LU-33 Electromagnets

Electromagnetic Induction

LU-34 Electromagnetic Induction

LU-35 Electromagnetic Induction II

LU-36 Laminated and Not Laminated Iron Core

LU-37 Useful Eddy Current

LU-38 The Transformer

AC Circuit

LU-39 Alternating Voltage and Current

LU-40 Capacitive Reactance

LU-41 Inductive Reactance

LU-42 AC Magnetizing Current

LU-43 Thompson's Ring

LU-44 RC and RL Series in AC Circuit. Phase Difference

supplied with experiment manual book

**Dimensions** : (L) 61.00 x (W) 44.00 x (H) 16.00 cm

**Weight** : 7.950 kg

ESP59118





### Student Electromagnetism Kit

Kit consisting of:

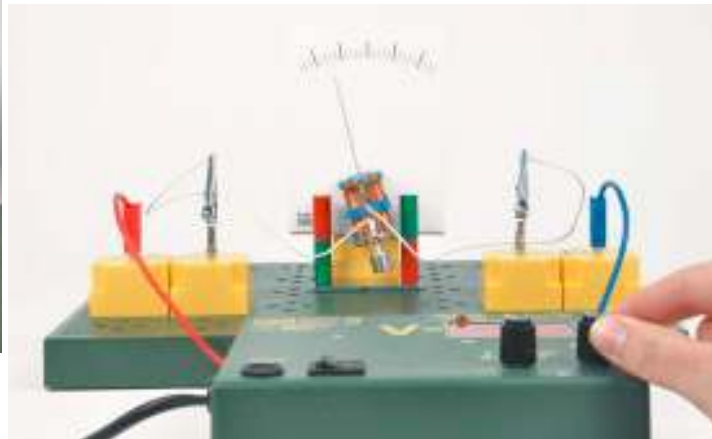
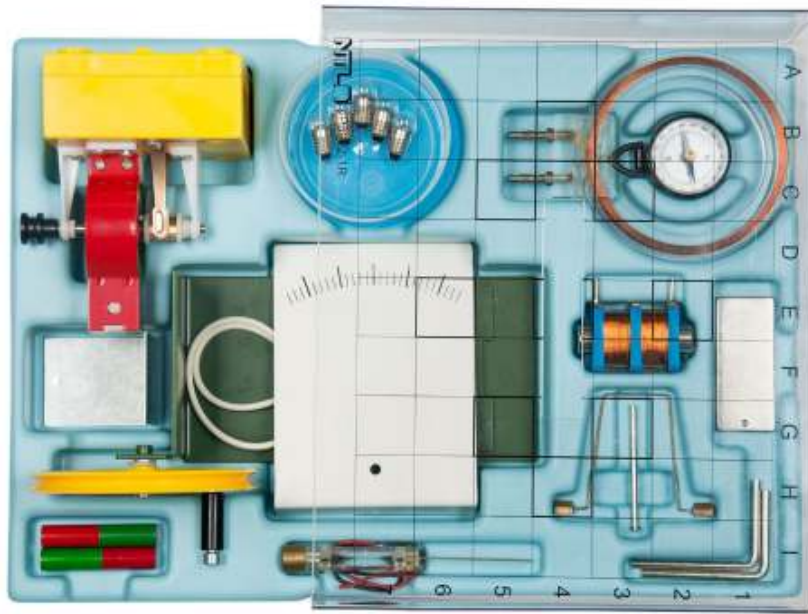
- 1x PIB (Plug in Board) with heating coil
- 1x PIB glow lamp
- 1x PIB pushbutton
- 1x Iron core solid, L=50 mm
- 1x Contact pin SE
- 2x Pole lamination SE, 60 x 25 mm
- 2x Commutator brush
- 1x Magnet holder
- 1x Commutator disc
- 1x Collecting ring disc
- 1x Bimetallic strip
- 1x Flat spring steel, 0.2 mm
- 1x Flat spring brass
- 1x PIB motor
- 1x PIB for coil 800 turns
- 1x PIB for coil with 27800 turns
- 1x Coil with 800 turns, blue
- 1x Coil 2 x 800 turns, red
- 1x Iron core laminated
- 2x Bearing pin

#### Storage:

- 1x Box insert Electromagnetism
- 1x Storage box II mini, with cover,
- Box -insert plan with 2 labels

ESP59119





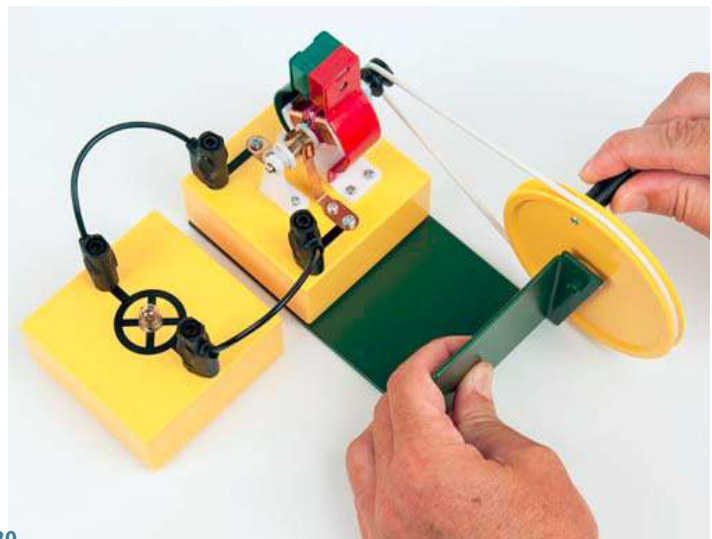
**Student Electrostatics Kit**

Kit consisting of:

- 1x Axis for moving coil
- 1x Pointer for moving coil
- 1x Pole lamination , 60 x 25 mm
- 1x Motor/Generator Model
- 2x Bar Magnet, AlNiCo, D=10 mm, L=50 mm
- 5x Light bulb, 4 V/40 mA, E10
- 1x Moving coil with hole, blue
- 1x Iron core solid, L=50 mm
- 1x Electromagnetic swing
- 2x Electrode, right angled
- 1x Holder for pocket compass
- 1x Induction coil
- 1x Pocket compass
- 1x Scale for moving coil

**Storage**

- 1x Box insert Electrostatics
- 1x Storage box II small, with cover,
- Box -insert plan with 2 labels



ESP59120





**Electrical Motor**

Part of Electricity Kit. Dimension 6.5cm (L) x 2.80cm (W) x 8.20cm (H).  
Weight 0.118kg

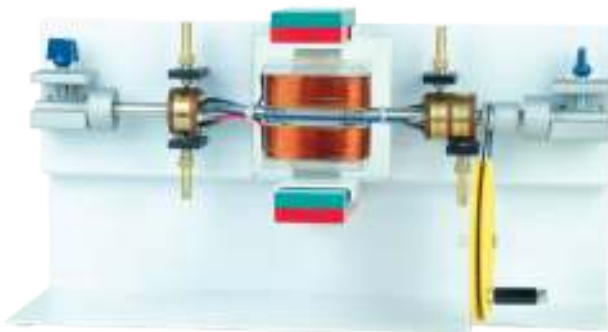
ESP59123



**Electric Motor Simple**

This simple motor kit is easy to build, and demonstrates the basic principles of electromagnetism. The directions are complete, easy-to-follow, and include a short explanation of the working of the motor. Battery not included. Product contains a small magnet. Magnets and metal objects sticking together inside a body can cause serious damage. Seek medical help if a magnet is swallowed. Grades 3+

ESP59125



**Motor - Generator unit, Demonstrator**

Large, ready-to-use working model of a motor / generator. Thanks to the open front design, students can clearly see how the parts of the model work even from a large distance. Power is supplied by elastic carbon brushes on the commutator or slip rings. The removable rotor (length: 356 mm) runs on two ball bearings. On the bottom there is a large drive pulley with a crank and belt.

Comes with two plastic-coated plate magnets, 82 x 42 x 18 mm.

**Dimensions :** 360 x 110 x 180 mm

ESP59131



**Electric Motor**

An electric motor model with commutator. All parts are visible including the magnet

It runs on 1.5 - 6 V DC supply

Complete with 4mm socket terminals

**Dimensions :** (L) 11.5 x (W) 7.5 x (H) 3.00cm

**Weight :** 0.058 kg

ESP59124



**Mini Motor DC**

This little yet powerful motor is idea for hundreds of electrical experiments and projects.

ESP59128

Voltage requirements : 1.5V ~ 4.5V, 0.2A

ESP59129

Voltage requirements : 3V ~ 6V, 0.2A

ESP59130

Voltage requirements : 6V ~ 12V, 0.2A



**Generator Model**

This generator model can be used to show the motion energy transform to electric power. This AC/DC generator model is hand operated. Exposed construction to show the working mechanism. Magnetic field come from removable U Magnet.

**Dimensions :** Overall 250 x 150 x 140mm

Base thickness: 18mm

4mm screwed socket

Type current output AC and DC

ESP59132





**U And I Core**

Used for assembly of electromagnetic model for several applications such as transformer, generator, motor, relay, counter, etc.

**Dimensions :** 76 x 18 x 115 mm (assembled), Material: Dynamo lamination sheet, Consists of U and I core, completed with clamping screw, **Dimensions :** (L) 10.50 x (W) 7.00 x (H) 2.00cm

ESP59135



**COIL Size: 64 x 53x 40mm**

Copper wire coil on hard plastic base with 4mm plug terminals to mounted on Assembly Board

Can be mounted on U-core and I-core

Can be installed on the assembly board and assembly with U-I core built trafo with voltage comparator same with winding ratio

Plastic base is marked with coil turn direction and number of turns

**Dimensions :** (L) 6.50 x (W) 4.00 x (H) 6.00

**ESP59136** 1000 TURNS Copper wire Dia 0.5mm, **Weight :** 0.190 kg

**ESP59137** 250 TURNS Copper wire Dia 0.9mm, **Weight :** 0.116 kg

**ESP59138** 500 TURNS Copper wire Dia 0.5mm, **Weight :** 0.116 kg



**COIL Size: Overall 56 x 48 x 38mm**

Hole: 34 x 23mm

Used to basic principles transformer alternating current (AC) and various experiments in both electromagnetic current (DC). It has smaller electrical currents

Material: Coil holder made of plastic

**ESP59139** 1200 TURNS **Dimensions :** (L) 6.10 x (W) 5.00 x (H) 4.00cm, **Weight :** 0.160kg

**ESP59140** 3600 TURNS **Dimensions :** (L) 5.40 x (W) 4.30 x (H) 3.30cm, **Weight :** 0.045kg



**Coil , Demountable Size approx. 108 x 71 x 81 mm**

Used to basic principles transformer alternating current (AC) and various experiments in both electromagnetic direct current (DC). The body coil using plastic Complete with 4mm socket terminal used in conjunction with the Core Clamp (ESP59152) and The Cores



**Core Clamp, Demountable**

This clamp is used to clamp together the I and U cores and the coils. Overall

**Dimensions :** 200 x 190 x 160mm

Material:

- Body: Cast iron, - Locking bolts: Brass plated EduScience, High clamping jaws can be adjusted as needed, Used with U and I Core, Demountable and Coils Demountable ,

**Dimensions :** (L) 19.00 x (W) 20.00 x (H) 15.50cm

ESP59152

	Turns, Demountable	Wire: Dia	Weight wire
<b>ESP59141</b>	120	1.8mm	450gr
<b>ESP59142</b>	300	1.2mm	500gr
<b>ESP59143</b>	1000	0.8 mm	760gr
<b>ESP59144</b>	2400	0.5 mm	700gr
<b>ESP59145</b>	3600	0.4 mm	850gr
<b>ESP59146</b>	60-0-60	1.8 mm	450gr
<b>ESP59147</b>	120-0-120	1.2 mm	395gr
<b>ESP59148</b>	500-0-125	1.0 mm	750gr
<b>ESP59149</b>	1200-0-1200	0.5 mm	700gr"
<b>ESP59150</b>	1500-0-500	0.6 mm	880gr
<b>ESP59151</b>	5000-0-250	0.35 mm	750gr





**Faradays coil**

To show electromagnetic induction generated secondary coil by variation of current in a primary coil

The primary coil **Dimensions** : dia 24 x 60mm

The primary coil has 43 windings of copper wire which can carry a current of up to 5A and has a resistance of 0.15 ohm

The second coils has 1300 windings of copper wire which can carry a current of 0.2A and has resistance of 75 ohm

Provided with a soft iron core measuring 120 x dia 11mm

**Dimension:** (L) 10.00 x (W) 10.00 x (H) 14.00cm

**Weight:** 0.349 kg

ESP59154



**Primary And Secondary Coil**

This primary-secondary coil is ideal for studying electricity and magnetism in the physics classroom. It is also an excellent demonstration induction coil that is remarkably easy to use. Consisting of two wire coils and one soft iron core, it features a primary (inner) coil heavy wire and a secondary (outer) coil of fine wire. Both coils feature binding posts attached to sturdy plastic mountings which are non-metallic for maximum efficiency, Use requires battery, galvanometer, and switch. Grades 6-12.

ESP59156



**Induction Coil, Superior**

This induction coil is capable of producing a spark with an input of 6 to 12 V DC and is therefore ideal for use with vacuum tubes, audiometers etc. A fully adjustable vibrator system is incorporated and spark suppression capacitors are housed in the base. A pair of pointer electrodes are supplied with the instrument. Pointer electrode have an insulating handle for adjustment of the spark gap. Low voltage input is via a pair of mounted 4 mm Sockets. Spark 25mm.

ESP59158



**Induction Coil (100 mm )**

This is a device that uses a DC current as a power source and boosts the voltage induced by a contact-less oscillator to a high voltage by a high-voltage coil.

- The +, - polarity of the second high voltage can be changed and the frequency can be adjusted.
- Can be used as a power source for spectral tube, vacuum discharge tube creek tube, etc., and can prevent damage to pipes used as stable voltage discharge of DC. Type B: AC220V, DC12V, detector (discharge rod) included

Function: Frequency control, polarity switching, discharge distance Max. 100 mm

Size 300\*300\*160mm 4.8Kg

ESP59157



**Induction Coil 500 Turns**

Coil 500 Turns, Use to connect with connecting lead, Overall Dimensions : 64 x 53 x 40mm, Copper wire dia. 0.5mm coil on hard plastic base with 4mm socket, Plastic base is marked with coil turn direction and number of turns Can be mounted on U-core and I-core

**Dimensions** : 6.50cm (L) x 4.00cm (W) x 6.00cm (H)

ESP59159



**Copper Wire Od 0.6 mm, 15 m**

Copper Wire OD 0.6 mm, 15 m, Wire **Dimensions** : 0.6mm length 15m, Wire spool: size 47 x 40 mm, Material: Enamelled copper wire

Wire spool: Plastic, Wire wrapped around at spool

ESP59161





### Laplace Law

To demonstrate the electromagnetism. A pair of powerful magnets in U shape holder. A pair of brass rail with 4mm socket is used for demonstration. A brass axle with two plastic discs is free to roll along the rails and complete the circuit between rails. As the axle placed on the rails near the poles of magnets and power supplied to the rails, the axle repelled and rolls away from the centre of magnetic field along the rails.

ESP59163



### Paper Bush

For demonstrating how charges of the same polarity repel each other, bush consisting of strips of paper ( $L = 210$  mm,  $B = 10$  mm), mounted on a 4-mm plug

ESP59167



### Line Of Streamers

For displaying an electrical field, a number of strips of paper ( $L = 200$  mm,  $B = 10$  mm) attached to a rubber band ( $L = 200$  mm), clasp at the ends of the band, may be mounted on conducting sphere with a diameter of 200 - 300 mm

ESP59168



### Insulating Mat

Rubber mat for insulating persons and apparatus from the ground;  
**Dimensions** : 400 x 400 mm

ESP59169



### High-Voltage Power Supply, 18 KV

Continuously variable high-voltage power supply for experiments in electrostatics. This instrument is easy to transport and can be mounted magnetically; the 20-mm LED display allows readings to be taken even from a distance.

#### TECHNICAL DATA :

Output: 0 ... + 18 kV, continuously variable, Max. 0.5 mA  
Voltage indicator: 7-segment LED display, digit height: 20 mm  
Power supply: 4 x 1.5 V Mignon cells (included) or 5.5-mm hollow DC jack for 6V / 500 mA external power supply P3120-6N  
The green ABS plastic case is labelled in yellow, and 10 strong neodymium magnets are inset in the rear panel for mounting the device magnetically.

#### Recommended accessory :

Mains transformer 6V DC / 500 mA  
S-shaped assembly platform

**Dimensions** : approx. 160 x 120 x 45 mm

**Weight** : approx. 970 g

ESP59166



### Pointed Wheel 02

ESP59170





**Electrostatic Experiments Kit**

This module enables experiments on electrostatics in combination with a Wimshurst machine or a Van de Graaff generator.

- robustly designed equipment,
- the equipment is stored in predefined places,
- in impact-resistant plastic casing, with lid,
- delivery includes experiment manual

Set consisting of:

- 1x Round base with stand tube
- 1x Insulating support
- 1x Paper bush
- 1x Needle on a plug
- 1x Pointed wheel 02
- 1x Flash-board
- 1x Set of chimes
- 1x Capacitor plates with cylinder
- 1x Sphere with metal surface

- 1x Grains for copier-principle
- 1x Connecting leads SE, 50 cm, black
- 1x Connecting leads SE, 75 cm, red
- 1x Pad of paper for copier-principle
- 1x Liquid glue

Storage:

- 1x Box insert electrostatics Demo, foam
- 1x Storage box II large, with cover

Experiments:

- Spark discharge
- Point discharge
- Paper bush
- Flash-board
- Set of chimes
- Bouncing ball
- Principle of a copier
- Electrostatic filter

ESP59173

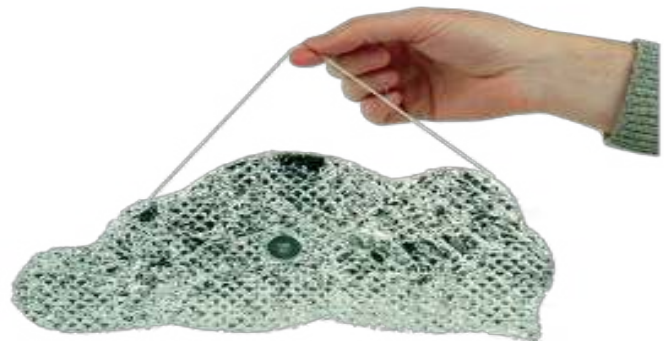


**House With Lightning Conductor**

To describe the effect and function of a lightning conductor on a house; model of a house with translucent front; fluorescent tube on the inside for indication of the charges and its derivation; fluorescent tube on the outside with conductor-adaptor for demonstrating the conduction of a lightning bolt; placed upright on isolated "meadow" with grounding plug socket.

**Dimensions :** 200 x 90 x 310 mm

ESP59174



**Thundercloud**

For demonstrating the discharge of a thundercloud on a house (with lightning conductors); large cloud-model; with 4-mm jack and carrying strap.

**Dimensions :** approx.. 320 x 150 mm

ESP59175







**Electrostatic Kit**

Electrostatic kit is a set of tools which can be used to do experiment concerning the electrostatic. Electrostatic is produced by rubbing acetate cellulose or polietilen strip with existing wool. Completed with equipment that can be used for experiments : electrostatic force, capacitance, the law of conservation of charge.

- Consists of:
- 1 pc Electroscope
  - 2 pcs Polythene Strip
  - 2 pcs Cellulose Acetate bar
  - 1pc Wool 200 x 200mm
  - 4 pcs Polystyrene Ball Metal Coat
  - 1 roll soft Nylon Cord
  - 1 pc Electroforus
  - 2 pcs Politin Board
  - 1 pc Switching charge
  - 2 pcs Aluminium Cup
  - 1 pc Stirrup
  - 1 pc Aluminium Sheet
  - 1 Manual Book, Electrostatic Kit

ESP59176

**Student Electrostatic Kit**

- Kit consisting of:
- 2x Electroscope
  - 1x Acrylic bar
  - 1x Plastics bar
  - 1x Plastics bar, with drilling
  - 1x Polyethylene rubber pad
  - 1x Aluminium bar
  - 1x Acrylic bar, with drilling
  - 1x Fluorescent lamp
  - 2x Insulating block with socket
  - 1x Plug pin with needle
  - 2x Aluminium-stripe
  - 1x Faraday beaker
  - 1x Beaker glass

- Storage:**
- 1x Box insert Electrostatics,
  - 1x Storage box II, mini, with cover,
  - Box -insert plan with 2 labels



ESP59177



**Gold Leaf Electroscope**  
 In sheet metal case, with glass window and fitted with 4 mm earthing socket. A metal disc passes through an insulating polythene bush and ends in a flat support for gold leaf. With a transparent graduated scale to show quantum of deflection. With a supply of leaves and instructions.

ESP59179



**Electroscope Pointer Type**  
 With a pivoted aluminium pointer moving over the graduated scale. Eliminates problem of breaking of leaves and their re-fixing.

ESP59182





**Electroscope student**

For electrostatics experiments and for displaying potential;  
Aluminium strip with a notch for balancing the robust pointer  
(L = 140 mm) made from aluminium; mounted with very little friction;  
height: approx. 160 mm

ESP59183



**Insulating Block With Socket**

To be used as "insulated" base, plastic block with 4-mm bush

ESP59171



**Electroscope Digital Demo Unit**

Demonstration meter for measuring high electrostatic voltages, unlike mechanical electroscopes, this instrument delivers exact and clear quantitative readings as well as the polarity of the charge, the value measured can be frozen using the hold switch, this instrument is easy to transport and can be mounted magnetically, the 26-mm LED display allows readings to be taken from a distance

**TECHNICAL DATA :**

- Display: 2 1/2-digit LED display, digit height 26 mm
- Measurement input provided by means of specially insulated 4-mm safety jacks
- 4-mm safety jack for ground connection
- Measuring range: 0 ... 18.0 kV
- Reset button for resetting instrument to zero
- Accuracy: better than 2 % for 0 ... 10 kV
- Throw switch: ON/OFF
- Throw switch: measure sample - freeze measured value (hold)
- Power supply: 4 x 1.5 V Mignon cells (included) or 5.5-mm hollow DC jack for 6 V/500 mA external power supply (not included)
- Case: green ABS plastic with yellow labelling
- Dimensions :** approx. 160x120x45 mm,
- Weight :** approx. 483 g

ESP60262



**Pith Ball Electroscope**

With the Pith Ball Electroscope, see pith balls be repulsed and attracted during your electrostatic study

- ESP59185 Type 1
- ESP59186 Type 2



**Electrostatic Rods**

ELECTROSTATIC RODS, are used for generating static charges for the teaching and the demonstration of electrostatics. **Dimensions :** 30 O x 10 mm. (Length x Diameter )

- ESP59189 Polythene
- ESP59191 Nylon
- ESP59193 Ebonite
- ESP59195 Glass
- ESP59197 Perspex





### Electrostatic Cloth Rubber

Electrostatic cloth, used for generating static charges for the teaching and the demonstration of electrostatics. **Dimensions** : 250 mm square.

<b>Esp59199</b>	Silk (Viscose)
<b>Esp59201</b>	Woollen
<b>Esp59203</b>	Flannel



### Wimshurt Machine

Wimshurt machine is an electro static generator using electrostatic induction to multiply the electric charge continuously. Wirmshust machine can produce 120 kilovolt. Static electricity is produced by two disc which are rotating in contrary direction, each disc has metal sectors. Two quadrants have different electric charges and two other quadrants have identical electric charges. Wirmshust machine consists of pair of plexiglass disc enclosed aluminium sheet and Thin plastic sheet (28 sector aluminium sheet and plastic sheet), two charge storage tube (Leyden Jar), A Pair of electrodes with the tip of the balls and isolator holder, Set of rotator and two 4 mm socket terminal. This machine is operated by hand.

#### Specification :

- Plexiglass Disc : 30 cm
- Maximum distance an electric arc : 100 mm
- **Dimensions** : 30 x 20 x 39 cm
- **Weight** : 1.5 kg

ESP59205



### Van De Graff Generator With Accessories Irwin

The Irwin Van de Graff generator is designed to be operated by hand (which confirms that the charge generated is independent of mains electricity) or by mains electricity from an additional power source required. This rugged unit will help you give demonstrations that will impress the socks off your students, or at least stand their hair on end. It is ideal for performing all basic electrostatic experiments on a large and spectacular scale! With sparks of 8 cm to as high as 12 to 15 cm, yet a maximum continuous current of just 10 micro-amps, it's quite safe for classroom use. The unit requires minimal assembly when shipped and is supplied with an extra transport belt.

#### Features

Neon indicator and a helicopter. Rubber drive belt, Silicon main belt, Discharge sphere, Head of hair

#### Dimensions :

Sphere Diameter 280mm, Overall height 760mm, Base length 380mm, Base depth 230mm, Weight 8kg

ESP59208



### Van De Graff Generator, With Accessories Set

Design for electrostatics experiment, which extremely with low current intensity are needed. Robust design and high quality material, provided long live of usage in laboratory.

#### Dimensions :

- Conductor sphere : 220 mm - Spark gap length : 50 To 100 mm - Power Supply voltage : 220V AC  
Total height : 630 mm - Bottom plate : 195 x 195 mm - Mass : 5.3 kg

Material conductor sphere : Stainless steel

The set Consist of : Van de Graff Generator 1 pc, Conductor Sphere on Rod 1 set, Perspex Pillar with Metallised Sphere 1 pc, Faraday Pail 1 pc, Metallised Spheres in TRANSPARENT Cylinder 1 pc, Hair Model 1 pc, Electric Whirl 1 pc, discharge Ball 1 pc, Discharge Pointer 1 pc, Additional Comb 1 pc, Rubber Belt 1 pc, Lamp Neon 60V 1 pc, Manual Book 1 pc, Complete with 4 mm socket on top of the sphere, use for attaching the accessories , Can produce sparks approx 200 kV in 5-6 cm length (depends on ambient condition), Complete with electronic speed control and 220 V AC motor, Can be operated manually by moving the driving belt, Supplied with a plastic protective cover and manual

**Weight** : 10.400 kg

ESP59210





**Spare Charge Collecting Belt**

This item is a charge collecting belt only and does not include the Van de Graff.

ESP59221



**Van De Graff Generator**

Van de Graff generator is a static electric machine which produces very high DC voltage by collecting and storing electric charge on the hollowed spherical surface. This apparatus can be operated in two ways. First is using a 220 volt AC electric motor which has speed adjuster. Second is directly run by hand. Changing the running method is easily done by displacing the rubber belt from the motor to hand pulley or vice versa.

**Dimensions :**

- Approx. : 690 x 195 x 195 mm
- Charge collecting sphere : 220 mm

**Weight :** 5.3 kg

Spark gap length : 50 - 100 mm (maximum)

Main voltages to run motor : 220 V

Complete with 4 mm socket mounted on the hollow spheres Part of Van de Graff Generator Set. (ESP59210)

**Dimensions :** (L) 29.00 x (W) 28.00 x (H) 70.00 cm

**Weight :** 6.600 kg

ESP59212



**Van De Graff Generator Accessories Set**

Consist of :

Conductor Sphere on Rod 1 set , Perspex Pillar with Metallised Sphere 1 pc, Faraday Pail 1 pc, Metallised Spheres in TRANSPARENT Cylinder 1 pc, Hair Model 1 pc, Electric Whirl 1 pc, Discharge Ball 1 pc, Discharge Pointer 1 pc, Neon Lamp 60V 1 pc

**Dimensions :** (L) 57.00 x (W) 23.00 x (H) 11.00 cm

**Weight :** 0.000 kg.

ESP59214



**Van De Graph Generator II**

An electrostatic generator using the friction between the outer cylinder and the inner belt

- By rotating the belt, static electricity generated by friction with the outer cylinder is stored in the upper accumulation ball.
  - Charged electricity is discharged when it is close to the charging ball on the earth side.
  - Aspiration and repulsion of static electricity, human body charging, electric power lines,
- It is used in experiments such as charging in air.
- You can adjust the power generation with speed control.
  - Built-in speed controller, drying heater charge ball Ø 200mm, charge ball Ø 70mm

**Power:** AC220V60Hz 60W

**Dimensions :** 270x230x550mm

ESP59223





### Hair Model For Van De Graff Generator

A complementary tool in the experiments Van de Graff.

#### Dimensions :

- Brass rod with plug : 4 x 50 mm

- Hairs : 0.3 x 200 mm

Material : Brass and nylon

Mounted on the plug Part of Van de Graff Generator, Set.(ESP59210)

**Dimensions :** (L) 12.00 x (W) 1.00 x (H) 1.00 cm

ESP59218

### Additional Comb For Van De Graff Generator

Use for increase the electrical charge on spherical cavity of Van de Graff.

**Dimensions :** 92.9 x 39 x 17.7 mm

Material : aluminium

Part of Van de Graff Generator, Set (ESP59210)

**Dimensions :** (L) 0.00 x (W) 0.00 x (H) 0.00 cm

ESP59220



### Plasma Ball 8 inches

A large, 8" diameter Plasma ball that looks fantastic in a darkened room. The unit may be used for illustrating EHV, capacitance effects, voltage breakdown of gases, differing energy states etc. Used with our technicians' friend tester you can demonstrate electric field strength. Our plasma ball is a miniature Tesla coil. Inside the ball is a coil of wires that have electrons going through them oscillating at a very high frequency. This shakes the atoms around the wires so hard that their electrons start to fall off! Inside the glass, the globe has a partial vacuum. This just means that some of the air has been sucked out. Because there is not as much air in there, it is easier to make electric sparks that can be seen.

The electrons then travel out into the air from the glass ball. We know this because the plasma ball lights up the light bulb. If you touch the plasma ball, all of the electrons will go through you to the ground. You see only one big spark inside the ball where you put your hand. If you stand on a stool, you are insulated from the ground and get filled with electrons. This means you can light up a fluorescent light bulb!

ESP59232



### Plate Condenser (Aepinus Condenser)

Steel plate capacitor used to investigate the relationship between charge, voltage and capacitance, as well as determining the dielectric and electric field constants.

It consists of a fixed and a movable plate on a guide rail. A centimetre scale is used to read the plate spacing. The device comes with four dielectric sample plates made of acrylic, Bakelite, plywood and cardboard.

Plate spacing: 0 to 150 mm

Plate diameter: approx. 149 mm

Plate area: 175 cm

Connection: Via 4-mm safety jacks

ESP59234



### Electric Field Apparatus

For visual demonstration of electric fields. A transparent plastic base supports a glass dish 90 mm diam. And two 4 mm socket terminals mounted on two insulated pillars with two wire point electrodes, two circular electrodes and two T-shaped electrodes.

ESP59237



### Electrode Plates

Plates for simple cell, Each plate fitted with a 4mm socket terminal.

ESP59241 Zinc

ESP59242 Carbon

ESP59243 Copper

ESP59244 Lead





**Galvanometer Spot Reflecting**

Suitable for Industrial Kelvin Double Bridge and Senior Kelvin Double Bridge. Galvanometer Resistance 125 ohms Nominal, Sensitivity 15mm scale division per micro amp., Time period 2 second, critical damping resistance 1000 ohms and working voltage is 230 Volts. AC. 50 Hz.

ESP59249



**Capacitance Substitution Box**

Our five-decade capacitance substitution box has been specifically designed for the schools market with its clear display and ease of use. Unit will simulate capacitances from 100pF to 9.9999F in 100pF steps, Max. Voltage 50V DC, The required capacitance is set by a counter with the value displayed in  $\mu$ F, nF and pF, Output is via 4mm terminals with 4mm sockets, Housed in a sturdy ABS box

**Technical Details**

Voltage rating 50V DC max.  
 Capacitance range 100pF to 9.9999F in 100pF steps  
 Accuracy 10% per decade  
 Residual capacitance 40pF

ESP59278



**Resistance Substitution Box**

A 6 decade resistance substitution box ideally suited to school or college use. The box will simulate resistances from 1 ohm to 999,999 ohms in 1 ohm steps.

ESP59280



**National Grid Kit**

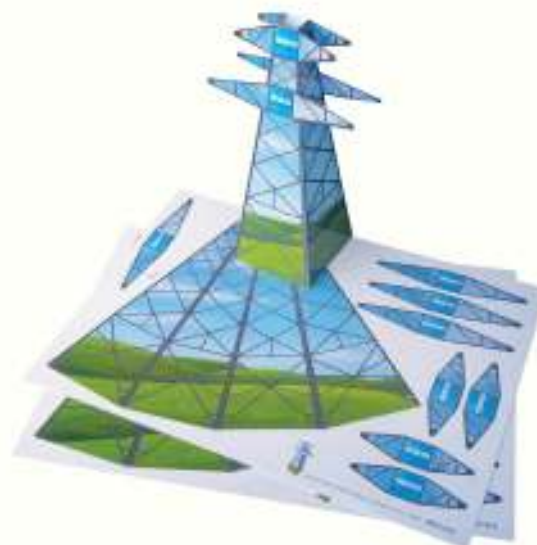
As this experiment is now featured in the Science curriculum as the 'AC power line at high voltage' we have developed a new, safe form of the experiment that can easily be set up within minutes and clearly shows students the relevant principles of the national grid high voltage transmission system.

**Each Kit contains:**

- 2 x Transmission/Receiver boxes (clear lid to enable students to investigate wiring)
- 2 x Lamp holders
- 2 x 12V 21 watt lamps
- 1 x Set of "HT" leads with touch-proof connectors
- 2 x Self-assembly fold-away pylons (display purposes only)
- Experiment instructions included
- Manufactured in the UK

\*An additional Power supply is required to carry out this experiment capable of supplying 12V AC at 5A and 6 connection wires. Our full range of power supplies can be found here.

ESP59268



**Pylons Kit**

Our additional Pylons pack contains 5 thick card sheets which once cut-out produces 5 pylons to be used in conjunction with our National Grid Kit to give your pupils a clearer explanation on how the experiment works.

ESP59269





### Electricity Simple Kit 2 ,(Set Of 1)

High quality kit, designed for teaching simple electric circuits in Primary Schools. The students will be able to acquire basic knowledge on electricity and the principle of electric power generation. They will also be able to perform experiments with their own ideas.

Experiment topics:

Simple electric circuit.

Parallel circuit.

Series circuit.

Electric conductors and non-conductors.

Application of electric energy.

Generation of electric energy by a dynamo.

Specification:

The kit contains 1 assembly board complete, 1 Switch complete, 2 lamp sockets, 2 Bulbs E 10 2.5V, 2 battery holders Complete (without battery), 3 Cable with Sticker Red, 3 Cable with Sticker Blue, 1 Conductor Holder Complete, 1 Copper-Conductor #1x15x81mm, 1 Aluminum Conductor #1 x 15 x 81 mm, 1 Steel Conductor #1 x 15 x 81mm, 1 Plastic Non Conductor #1 x 15 x 81mm, 1 Wood Non Conductor, 1 Motor complete, 1 wheel complete, 1 wheel Axle Extension, 1 Belt and 1 Nylon Rope 1500mm (L) (no. 12)

**Dimensions :** (L) 25.00 x (W) 20.00 x (H) 4.50cm

**Weight :** 0.600kg

ESP59258

### Electricity Simple Kit 2 ,(Set Of 10)

High quality kit, designed for teaching simple electric circuits in Primary Schools. The students will be able to acquire basic knowledge on electricity and the principle of electric power generation. They will also be able to perform experiments with their own ideas.

**Consist of :**

1 Assembly Board Complete 10 pcs, 2 Switch Complete 10 pcs, 3 Lamp Socket 20 pcs, 4 Bulb E 10 2.5V 20 pcs, 5 Battery Holder Complete without Battery 20 pcs, 6 Cable with Sticker, Red 30 pcs, 7 Cable with Sticker, Blue 30 pcs, 8 Conductor Holder Complete 10 pcs, 9 Copper-Conductor # 1 x 15 x 81 mm 10 pcs, 10 Aluminium-Conductor # 1 x 15 x 81 mm 10 pcs, 11 Steel-Conductor # 1 x 15 x 81 mm 10 pcs, 12 Plastic Non Conductor # 1 x 15 x 81 mm 10 pcs, 13 Wood Non Conductor 10 pcs, 14 Motor Complete 10 pcs

15 Wheel Complete 10 pcs, 16 Wheel Axle Extension 10 pcs, 17 Belt 10 pcs, 18 Nylon Rope Length 1500 mm (No.12) 10 pcs, 19 Section Box 100 mm 1 pc, 0 Section Box 40 mm 1 pc, 21 Box Corrugated Plastic 420 x 270 x 207 mm, (# 3 mm, Yellow color) 1 pc

**Experiment topics :**

.Simple electric circuit, Parallel circuit, Series circuit, Electric conductors and non-conductors, Application of electric energy, Generation of electric energy by a dynamo,

**Dimensions :** (L) 43.00 x (W) 29.00 x (H) 21.00 cm

**Weight :** 9.316 kg

ESP59259





**Decade Resistance Box**

This decade resistance substitution box provides 4 decade ranges as given below and total value 0 to 11110 Ohms with a resolution of 1 Ohm. Each decade is selected using rotary switch. All resistance values are of ±1% tolerance and 2 watts maximum ratings.

ESP59282



**Resistance Unit**

resistance units on a high stability metal film element. Improved and less expensive resistance coil. Accuracy ±1%.

- ESP59285 1 OHM
- ESP59286 5 OHM
- ESP59287 10 OHM
- ESP59288 20 OHM
- ESP59289 50 OHM
- ESP59290 100 OHM



**Rheostats, Protected**

Rheostats, protected, Single tube, for use with high voltage upto 220V, fitted with 4mm socket terminals, with protected cover.

- ESP59303 3 OHM, 12Amp
- ESP59304 10 OHM, 8Amp
- ESP59305 33 OHM, 4.4Amp
- ESP59306 100 OHM, 2.5Amp
- ESP59307 330 OHM, 1.4Amp
- ESP59308 1000 OHM, 0.8Amp



**Wheatstone Bridge**

- Measuring device using bridge circuit.
- Built-in multi stage resistors allow proportional measurement of unknown resistance.
- If the proportion between the built-in resistor and the measuring resistor does not match, the galvanometer current will move to the + or - side.

Devices made using this principle

**Configuration :** Includes resistance for measurement

**Measuring range :** 1-11110Ωm.

**Dimensions :** 330x160x120mm

ESP59325



**Multimeter Analogue**

Electronic overload protection with indicator light in all measuring ranges (no more melting fuses!) Large, robust design with holster Easy-to-read thanks to being inclined Transparent base with recessed handle to hold the device with one hand

Portable measuring device for voltage and current, DC and AC; also usable as a galvanometer.

AC/DC voltage ranges: 1 mV, 100 mV - 30 V

AC/DC current ranges: 100 µA - 3 A and 10 A

Arc scale length approx. 90 mm

- 1 mV upper value range for measuring thermal voltage or induction without a pre-amplifier
- All measuring ranges (even low current) available in AC
- Exceptional frequency response (typically -1.5 db at 20 kHz) allowing direct measurement of resonant circuits
- Large, easy-to-read mirrored scale with clear marking
- Extremely accurate, typically 1.5 %
- Durable selection switch
- 10 A range with separate input socket
- Zero at midpoint may be selected by switch

**Dimensions :** approx. 200 x 140 x 100 mm

ESP60251





### Potentiometer Wire

A one meter long resistance wire passes over a meter scale and is firmly clamped to stout brass end-plates, on wooden base. Complete with Knife-edge Jockey. Single wire

ESP59317	Single
ESP59318	Double



### Wheatstone Bridge, One Meter

This substantial bridge had broad, heavily plated brass strips mounted on polished hardwood base. Terminals with 4mm sockets are provided. 24 SWG Constantine wire is stretched along the top of a meter scale in mm and cm. Complete with Jockey.

ESP59321	Wheatstone Bridge, One Meter-2	Two Gap
ESP59322	Wheatstone Bridge, One Meter-4	Four Gap
ESP59323	Jockey	

For Wheatstone bridge and potentiometer work, with moulded ribbed insulating handle, plated-brass contact with locating notch, and a plated-brass terminal with a 4mm socket. **Dimensions** : 95 x 15mm diameter.



### Multimeter Digital True RMS Bench Top

80000 count True RMS Bench Digital Multimeter

- Large LCD, 80000 count Dual-display, Analogue bar 21 sets.
- 50 measuring functions, with basic DCV, ACV, DCA, ACA, -, CAP, Hz, etc.
- 18 types of frequency, frequency up to 8MHz, 1800 waveform
- Auto data update and refresh, auto data hold, auto peak hold.
- 36-hour dynamic record: MAG, MIN, AVG, MAX-MIN (REL-), (REL%),
- AC measuring adopts highly accurate true RMS measurement, measuring of any waveforms in AC range , -RS-232 interface
- DCV : - Range: 80mV/800mV/8V/80V/800V/1000V - Accuracy:- (0.05% 5)
- ACV : - Range: 80mV/800mV/8V/80V/750V - Accuracy:- (0.8% 50)
- DCA : - Range: 80mA/800mA/8A/20A - Accuracy:- (0.2% 10)
- ACA : - Range: 80mA/800mA/8A/20A - Accuracy:- (0.8% 20)
- Resistance: - Range: 800- /8k- /80k- /800k- /8M- /80M - Accuracy:- (0.3% 5)
- Frequency: - Range: 0.5Hz~8MHz - Accuracy:- (0.03% 2)

Capacitance: - Range: 1nF/10nF/100nF/1uF/10uF/100uF - Accuracy:- (2.5% 50)

Temperature: - Range: -50- ~1372- / -58- ~2502 - Accuracy:- (2.0% 2)

Square Wave Output: - Range: 3V / 0.5Hz~5kHz / 1%~99% - Accuracy:- 0.02%

Special Function : - Diode test - True RMS - AC DC measuring - Continuity alarm - Overloading protection - Input Impedance 10M-

Sampling rate : 4times/s; Analog bar 40 times/s , AC frequency response: 40Hz-50kHz

Range selection : Auto range , Max. display : 80000

Accessories : Test lead, Power cord, User manual, Software CD, Temperature probe

Power source : AC 110V/220V, 50Hz/60Hz , Meter




**Dimensions** : 245x220x98mm

**Net Weight** : 1.5kg

ESP59376



DIGITAL MULTIMETER

Function	3 1/2 Manual Range Digital Multimeter ES835	3 1/2 Auto Range Digital Multimeter ES833	3 5/6 Auto Range Digital Multimeter ES837	3 5/6 Auto Range Digital Multimeter ES86
				
DCV	200mV/2V/20V/200V/600V	200mV/2V/20V/200V/600V	600mV/6V/60V/600V	200mV/2V/20V/200V/1000V
ACV	200V/600V	2V/20V/200V/600V	600mV/6V/60V/600V	200mV/2V/20V/200V/750V
DCA	20uA/2mA/200mA/10A	200uA/2000uA/20mA/200mA/2A/10A	600uA/ 6000uA/ 60mA/ 600mA/ 6A/ 10A	200uA/2000uA/20mA/200mA/2A/20A
ACA	-	200uA/2000uA/20mA/200mA/2A/10A	600uA/ 6000uA/ 60mA/ 600mA/ 6A/ 10A	200uA/2000uA/20mA/200mA/2A/20A
Resistance	200Ω/2kΩ/20kΩ/2MΩ/200MΩ	200Ω/2kΩ/20kΩ/200kΩ/2MΩ/20MΩ	600Ω/ 6kΩ/ 60kΩ/ 600kΩ/ 6MΩ/ 60MΩ	200Ω/2kΩ/20kΩ/200kΩ/2MΩ/20MΩ
Capacitance	-	-	60nF/ 600nF/ 6uF/ 60uF/ 600uF/ 6mF/ 60mF	-
Frequency	-	-	10Hz/ 100Hz/ 1kHz/ 10kHz/ 100kHz/ 1MHz/ 10MHz	-
	-	(-40~1000 )°C / (0~1832 ) °F	(-40~1000 )°C / (0~1832 ) °F	(-40~1000 )°C / (0~1832 ) °F
NCV	✓ -	✓ ✓	✓ ✓	✓ -
Backlight display	✓ -	✓ ✓	✓ ✓	✓ -
Diode test	0V~2V, it displays "OL" if over 2V 0~2000	0V~2V, it displays "OL" if over 2V 0~2000	0V~3.3V, it displays "OL" if over 3.3V -	✓ -
Duty cycle	- Less than 500, it displays "OL" if over 200Ω	- Less than 500, it displays "OL" if over 200Ω	1%~99% Less than 500, it displays "OL" if over 610Ω	1%~99% Less than 500, it displays "OL" if over 200Ω
Low battery indication	Approx. less than 2.4 V ✓	Approx. less than 2.4 V ✓	Approx. less than 2.4 V ✓	Approx. less than 2.4 V ✓
Function protection	✓ About 15 minutes	✓ About 15 minutes	✓ About 15 minutes	✓ About 15 minutes
Input impedance	10MΩ 3 times/s	> 44MΩ 3 times/s	> 44MΩ 3 times/s	10MΩ 3 times/s
AC frequency response	40Hz-400Hz Manual range	40Hz-2kHz Auto range	40Hz-2kHz Auto or manual range	40Hz-400Hz Auto range
Max.display	2000 61x28mm	2000 61x28mm	6000 61x28mm	1999 54x30mm
Battery	3V AAAx2 Quiescent current about 2mA	3V AAAx2 Quiescent current about 2mA	3V AAAx2 Quiescent current about 2mA	2x 1.5V AAA Quiescent current about 2mA
SKU No	ESP59380	ESP59379	ESP59381	ESP59377



**Universal Multimeter Demo II**

Durable servo-controlled measuring instrument to measure current and voltage with high precision; can be used in any position, for example vertically or horizontally for projection.

The large scale with an arc length of approx. 200 mm, the wide signal-coloured pointer and the 26 mm high digits guarantee a hassle-free reading of the measured values even from greater distances. The LED display indicates the unit of measurement and current type and is also clearly visible from the distance. An internal electronic overload protection eliminates the annoying

and time-consuming change of fuses. The meter can also be used as a sensitive galvanometer (measuring range 1 mV-) thanks to the built-in amplifier.

Pointer setting: Zero at left or at midpoint Four insert-able double scales: 1/3 - 10/30 - 100/300 - -5 to +5/-15 to +15 (included) Measuring ranges:

DC voltage: 1 mV, 1 to 30 V

AC voltage: 1 to 30 V

DC and AC amperage: 100  $\mu$ A to 10 A

Rear panel with neodymium magnets for a stable magnetic mounting; Battery compartment for easy replacement of batteries.

Technical data :

Type of instrument : Moving-coil instrument

Internal resistance :  $R = 100 \text{ k}\Omega / \text{V}$

Working position : vertically or horizontally

Measuring inputs : 4 mm safety socket

Fuses: internal electronic overload protection

Power supply : four 1.5 V batteries (included)

or 2.5 mm hollow DC jack for 6 V external power supply

Housing : ABS plastics

**Dimensions :** 268 x 92 x 226 mm



ESP60249

**Scales For Multimeter Demo II, Transparent, Set Of 8**

Transparent inserting-scales; acrylic;

for universal multimeter demo II ESP60249

Ranges: 0-1, 0-3, 0-10, 0-30, 0-100, 0-300, -5 to +5, -15 to +15

ESP60250

**Demonstration Meter II**

Housed in a ABS plastic case 300 x 150 x 300 mm with glass front and rear. Moving coil type with accuracy of  $\pm 2.5\%$ . Basic sensitivity of meter is 5 mA, 100 mV f.s.d. The meter can be used to demonstrate the working principle of AC or DC ammeters or voltmeters with the interchangeable plastic scales, it is supplied with extended range box which allows one case to be used for different ranges.

ESP59382

**Demonstration Meter III**

Housed in a ABS plastic case 300 x 150 x 300 mm with glass front and rear. Moving coil type with accuracy of  $\pm 2.5\%$ . Basic sensitivity of meter is 5 mA, 100 mV f.s.d. The meter can be used to demonstrate the working principle of AC or DC ammeters or voltmeters with the interchangeable plastic scales. DIFFERENT DIALS ARE AVAILABLE AS PER CAT. NO.

ESP59383



**Demonstration Meter Scale**

A to be used with demonstration meter ESP59383

- ESP59384 0 – 300 V AC VOLTAGE
- ESP59385 0 – 15 V AC Voltage
- ESP59386 : 5 -0- 5 V DC Voltage
- ESP59387 1 – 15 V DC Voltage
- ESP59388 : 0 – 1 V DC Voltage
- ESP59389 : 2.5 -0 – 2.5 MA DC Current
- ESP59390 0 -10MA DC Current
- ESP59391 0 – 10 MA AC Current
- ESP59392 0 – 100 MA DC Current
- ESP59393 0 -1A DC Current
- ESP59394 0 – 1 A AC Current
- ESP59395 0 – 10A DC Current
- ESP59396 0 -10A AC Current



**LCR Meter**

**Features :**

- 32-bit core processor
- 5-digit 4.3-inch TFT LCD display
- 2 signal source output impedance: 30 Ω, 100 Ω
- 100 sets memories for internal storage/save
- 500 memories for U disk storage/save, supports FAT16 and FAT32 files
- Save the last parameter settings before power off
- Standard interface: RS-232, HANDLER, USB HOST
- Optional interface: USB DEVICE, GPIB, headset, FOOT.C foot switch

**Specifications:**

- Test parameter: |Z|, |Y|, C, L, X, B, R, G, D, Q,
- Test Signal Frequency: 100Hz,120Hz,1kHz,10kHz
- Basic Accuracy: 0.15%
- Equivalent circuit: Series, Parallel
- Mathematical function:Deviation and Percent Deviation
- Range mode:Auto, Hold, Manual Selection
- Trigger mode:Internal, Manual, External, BUS
- Measurement speed: Fast: max.30, Medium: 10, Slow: 3 (times/second) ((?1kHz))
- Average times: 1-255
- Delay time: 0-60s, step 1ms
- Calibration function: Open circuit, Short circuit, Load
- Measurement terminal: 5 terminal
- Display mode: Direct, %, V/I (monitoring tested voltage and current)
- Display: 5 digit 4.3-in LCD display

**Measurement Signal:**

Output impedance: 30 Ω, 100 Ω

Test level: 0.1V, 0.3V, 1V

Test level accuracy: 5%

**Measurement display range:**

- |Z|, R, X:0.01 M Ω – 99.999 M Ω
- |Y|, G, B: 0.0001 μS – 99.999 μS
- C:0.0001 pF – 9.9999 F
- L:0.0001 H – 999.99 H
- D:0.0001 – 9.9999
- Q:0.0001 – 9999.9
- (DEG):-179.99 -179.99
- (RAD):-3.14159 – 3.14159
- %:-999.99% – 999.99%

**Comparator and interface**

- Memory: 100 sets memories for internal parameter settings storage/save; 500 sets for U disk parameter settings storage/save
- Standard interface: Standard: RS232, USB HOST
- Optional interface: USB device, GPIB

**General:**

- Operating environment:0°C – 40°C, 80%RH
- Power source: 110/220V≈10%, 47~63Hz
- Power consumption: ≈ 30VA
- Accessories: 4-terminal Kelvin test clip leads, RS232 cable, power cord, operation manual

**Dimensions :** 265W\*100H\*340D mm

**Weight :** Approx.3.5kg

ESP59405



### Portable Applicant Tester & Checker

(Portable Appliance Tester and Checker). Performs electrical safety tests on portable appliances allowing compliance with EAWA regulations. The unit performs earth bond and insulation tests on both Class 1 and Class 2 appliances, extension leads, IEC and kettle leads etc. The unit is very simple to operate and gives clear, unambiguous pass/fail indications. Complete with test leads, instructions, pass and fail labels, a Tester's Certificate of Inspection and is fitted with moulded mains plug.



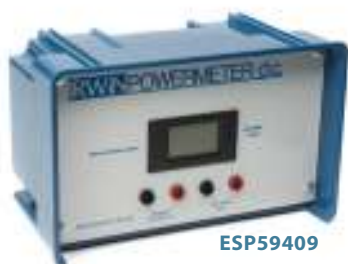
A simple to use PAT machine that allows the user to perform Class1 and Class 2 insulation tests, earth bond tests at two different current levels and extension lead tests. The compact unit clearly displays the results via coloured LEDs. A single push button initiates all the tests in a 5-second cycle.

Class 1 Earth Bond test  
Class 1 and Class 2 Electrical Insulation test  
Mains switch and circuitry test  
Extension Lead test  
IEC lead test

Results are displayed by coloured LEDs. Timed test period.

Comes complete with 100 pass labels, 50 fail labels, Earth Bond Test lead, Extension lead test lead and full instructions including sample inspection certificate.

ESP59407



ESP59409



ESP59410



ESP59411

### Power Meter D.C. IRWIN

The Irwin Power Meter D.C. uses a large backlit display which displays four important parameters.

- 1.The Voltage across the load (V)
- 2.The Current flowing through the load (A)
- 3.The Power dissipated by the load (W)
- 4.The Amount of energy converted by the load (Wh)

The Power-meter is designed to be used with a low voltage power pack and can accept input voltages in Different ranges, The load (which may draw up to 20A) is connected to the load terminal. The display unit has a multi-purpose push switch which allows the backlight to be switched on or off (the unit remembers the settings when disconnected) and allows the energy reading to be reset.

The unit displays energy in Wh rather than Joules because a Joule display would quickly overflow. This can be used as a teaching aid (1Wh=3,600J) as well as allowing the pupil to time their power usage and calculate the energy converted in Joules. They can then compare their result with the Power-meter.

Manufactured in the UK

ESP59409 Range 6.5-100V DC

ESP59410 Range 80-260V AC

ESP59411 TWIN - range 6.5-100V DC



### Galvanometer Moving Coil

DC current measuring instrument on a small scale easy to read

**Dimensions :** Overall 138mm\*97mm\*97mm

Measuring scale :  $\pm 300\mu\text{A}$

Accuracy : 2.5% on full deflection

Scale length : 75mm

Material : Plastic

4mm socket terminals

Complete with zero adjuster

**Weight :** 0.4kg

ESP59414



### Digital Galvanometer DC

• Display : 4.5 Inch with 4 segment LCD display

• Measures direct current in micro amperes. It is possible to measure micro-currents in electromagnetic induction experiments and the like.

Measuring range: + -1999

Accuracy: 0.5 class

Internal 9v battery (not included) and external power input termination is via color coded 4mm socket terminals (One year warranty).

ESP59417





**Ammeter Dual Range DC**

Ampere meter Dual Range DC  
 Two scales ampere-meter to measure DC Current in electrical work and student experiments  
 Measuring Scale: 0-500mA/ 0-5A  
 Scale length: 55mm  
 Material: Plastic  
 Zero point position: Left  
 4mm socket terminals  
 Overload protection and zero adjuster  
**Dimensions :** Overall 160 x 110 x 55mm

ESP59419



**Galvanometer**

DC current measuring instrument on a small scale. Dual Scale that is easy to read  
 Measuring scale: -50uA to 50uA  
 Accuracy: 2.5% on full deflection | Scale length: 75mm | Material: Plastic  
 Internal resistance approximately 1200 ohm, 4mm socket terminals, Complete with overload protection, with zero adjuster  
**Dimensions :** Overall 160 x 110 x 55mm

ESP59413



**Digital Milliammeter**

Range: 0 to 199 A  
 • Display : 4.5 Inch with 4 segment LCD display .  
 Internal 9v battery (not included) and external power input  
 Termination is via color coded 4mm socket terminals  
 Precision: 0.5 class (One year warranty).

ESP59422



**Ammeter Digital ( A.C.)**

Measuring range: AC 0 ~ 300V Display : 4.5 Inch with 4 segment LCD display .  
 • Used to measure alternating current (AC).  
 Accuracy: 0.5 class, voltage (AC) measurement  
 Internal 9v battery (not included) and external power input termination is via color coded 4mm socket terminals (One year warranty).

ESP59423



**Ammeter Digital ( D.C )**

Digital Ammeter ( D.C ) , (0 - 1.999 A): An Electronic Ammeter for measuring current  
 Display : 4.5 Inch with 4 segment LCD display  
 Termination is via color coded 4mm socket terminals , Precision: 0.5 class .(one year warranty).

ESP59424



**Ammeter Digital ( D.C )**

Digital D.C. Ammeter ideal for school use!  
 Range: 0-10A D.C. , Resolution: 0.01A,  
 Super strong high grade ABS case  
 Protective display window  
 Long battery life  
 Colour coded and shrouded 4mm sockets  
**Dimensions :** 95 x 90 x 75mm  
 Large bold 14mm digital LCD display  
 Power: 1 x 9v 'PP3' size battery

ESP59425





### Ammeter Analogue (D.C)

This economical, closed-back student meter offers reliability, ruggedness, and affordability all in one unit. The meter is housed in a durable black plastic case measuring 13.8 cm x 10.0 cm x 9.8 cm. The large 9.5 cm x 8.1 cm clear plastic meter face is designed for easy viewing and has an external zero adjustment. All meter movements are diode protected against overload. Five-way versatile binding posts are simple for students of all levels to use. Accuracy  $\pm 2.5\%$  of full scale. Grades 6-12.

<b>ESP59428</b>	Measuring Range : 0-5 A
<b>ESP59429</b>	Measuring Range : 0-3 A
<b>ESP59430</b>	Measuring Range : 0-1 A
<b>ESP59431</b>	Measuring Range : 0 - 10 A



### Digital Millivoltmeter (D.C)

Range: 0 to 1999 MV. DC

Frequency response,  $\pm 2\%$ : 0 to 10kHz.

• Display : 4.5 Inch with 4 segment LCD display

Battery: Internal 9v battery (not included).and external power input

Termination is via color coded 4mm socket terminals

Precision: 0.5 class.

(One year warranty).

**ESP59433**



### Voltmeter Digital (A.C.)

A.C. Voltmeter

Range: 0 to 300 V AC

Display: 31/2 , 4 segmented LCD display

Battery: Internal 9v battery (not included).and external power input

Termination is via color coded 4mm socket terminals

Accuracy: 0.5. Class

**ESP59435**



### Voltmeter Digital (D.C)

Digital VOLTMETER ( D.C ) , ( 0.01- 19.99v ) : An

Electronic VOLTMETER for measuring voltage

Display: 31/2 , 4 segmented LCD display , Precision: 0.5 class

Overload termination is via color coded 4mm

Socket terminals. Battery : Internal 9v battery (not included).

(One year warranty).

**ESP59436**

### Voltmeter Digital (D.C)

Digital D.C. Voltmeter

Purpose made for school use

Range : 0-20V D.C.

Resolution : 0.01V D.C.

Super strong high grade ABS case Protective display window, Long battery life

Colour coded and shrouded 4mm sockets

Screw locking battery compartment

Theft deterrent 'SCHOOL' Voltmeter printed on model

Large bold 14mm digital LCD display

Power: 1 x 9v 'PPF' size battery (inc.), Full 12 month guarantee

**Dimensions** : 95 x 90 x 75mm

**ESP59439**





**Voltmeter Analogue ( D.C )**

This economical, closed-back student meter offers reliability, ruggedness, and affordability all in one unit. The meter is housed in a durable black plastic case measuring 13.8 cm x 10.0 cm x 9.8 cm. The large 9.5 cm x 8.1 cm clear plastic meter face is designed for easy viewing and has an external zero adjustment. All meter movements are diode protected against overload. Five-way versatile binding posts are simple for students of all levels to use. Accuracy  $\pm 2.5\%$  of full scale. Grades 6-12.

- ESP59440** Measuring Range : 0-1 V
- ESP59441** Measuring Range : 0-10 V
- ESP59442** Measuring Range : 0-15 V
- ESP59443** Measuring Range : 0-5 V



**Ohmmeter Demo Unit**

Demonstration meter for measuring resistance and for testing diodes, the component to be measured is connected to the two 4-mm safety jacks, this instrument is easy to transport and can be mounted magnetically, the 26-mm LED display showing the measured value and the 20-mm LED display for the measurement unit allow readings to be taken easily even at a distance

**TECHNICAL DATA :**

Display: 3 1/2-digit LED display, digit height 26 mm  
 Measuring ranges: 200 Ohms, 2, 20, 200, kOhms, 2 MOhms, 2 V (diode testing)  
 Accuracy:  $\pm 0.2\% \pm 1$  digit for all ohmage ranges up to 200 kOhms, beyond that

ESP60253



**Coulombmeter**

Range 0 to 1999nC.  
 Accuracy :  $\pm 10\%$  of F.S.D.  
 Overload capability : 100V.  
 Frequency response,  $\pm 2\%$  : 0 to 10kHz.  
 Display : 3 1/2 digit LCD with polarity and low battery indication.  
 Battery : Internal 9v battery PP3 or equivalent (not included).  
 Expected Battery life : 5000 hours.  
 Automatic switch off after 50 minutes of inactivity.  
 Accuracy :  $\pm 1\%$  of full scale indication typical.

ESP59453



**Wattmeter Demo Unit**

Demonstration instrument for measuring power in low-voltage circuits, very easy to transport and magnetically mountable, the 26-mm LED display showing the measured value and the 20-mm LED display for the measurement unit allow precise readings to be taken even at a distance

**TECHNICAL DATA :**

Display: 3 1/2-digit LED display, digit height 26 mm  
 Input: 4-mm safety jacks (pair)  
 Types of measurement: true power (W), work/energy (Ws)  
 Measurement limits: 20 Veff, 2 Aeff

ESP60256







ESP59504



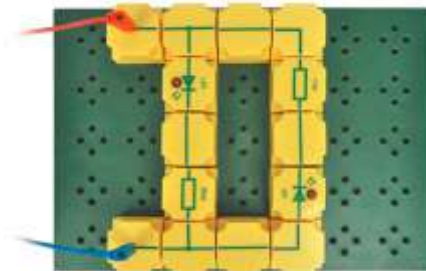
ESP59503

### Building Simple DC Circuits

Teach simple DC circuitry using actual components so students can relate it to real world applications. Kits include solder-less breadboards for hands-on exercises. Students learn to build circuits, read circuit diagrams, and investigate the effects of resistors and LEDs in series and parallel circuits. Instructor's manual is comprehensive from lesson plans through assessment. Includes reproducible stepwise student instructions, simple circuit diagrams, and complete answer keys. Middle and high school assignments are provided. Either kit includes one digital multimeter for demonstrating how to measure voltage, current, and resistance for data collection. Designed for working in groups of four. Grades 7-10

ESP59503 Class-pack

ESP59504 Single Kit



### Student Electronics supplement kit

Kit consisting of:

- 1x PIB resistor 10 kOhm
- 1x PIB resistor 47 kOhm
- 1x PIB rheostat 10 kOhm
- 2x PIB wire, straight
- 1x PIB photo resistor (LDR)
- 1x PIB varistor (VDR)
- 1x PIB NTC resistor
- 1x PIB PTC resistor
- 1x Headphone, SE
- 1x PIB capacitor 0.1  $\mu$ F
- 1x PIB capacitor 1  $\mu$ F
- 1x PIB capacitor 2  $\mu$ F
- 1x PIB capacitor 10  $\mu$ F
- 1x capacitor 100  $\mu$ F
- 1x PIB capacitor 1000  $\mu$ F
- 1x Solar cell, in plastic housing
- 1x PIB bridge rectifier
- 1x PIB potentiometer 470 Ohm
- 1x PIB wire with jack bush



- 1x PIB buzzer
- 1x PIB Zener diode 4.7 V
- 2x PIB Si diode
- 1x PIB transistor NPN, base right
- 1x PIB transistor NPN, base left
- 1x PIB transistor PNP, base left
- 1x MBC microphone
- 2x PIB LED red

**Storage:**

- 1x Box insert Electronics, plastic
- 1x Storage box II small, with cover
- Box insert plan with 2 labels

ESP59505





ESP59507



ESP59508

### Build A Crystal Radio With An Amplifier - Single Kit

Students explore wavelength, frequency and amplitude while immersed in hands-on experimentation. As students build their own old fashioned Crystal Radios, they explore the effects of coil design variations, building materials, and antennae number and length, on maximizing tuning and signal strength. Then students upgrade their crystal radio into a transistor radio. Ideal for hands on learners, as intuition plays a role in developing antenna design solutions, iterative testing, and making modifications for improvements. Great for introducing guided inquiry-based learning. Includes a complete instructor's manual with reproducible stepwise student protocols. Designed for working in groups of four. Grades 7-10

ESP59507 Single Kit

ESP59508 Class-pack



### Resistor 1 K Ohm, 0.5W

Resistor 1 kOhm, 0.5W, Tolerance: 5%

Component mounted in plastic housing with 4mm plug which protrude downward, Electronic symbol is printed on top cover, used with Assembly board 120 holes and Assembly board 216 holes, Part of Circuit Application Trainer, basic Electricity Trainer and Power Electronic Trainer

ESP59511



### Bread Board 94 Holes

Bread Board is an ideal tool for carrying out small Electronic /Electrical experiments. 94 hols which are useful for fixing the components such as IC'S, Transistors, Resistances, Diodes & Capacitors etc points which are useful for fixing the components such as IC'S, Transistors, Resistances, Diodes & Capacitors etc.

ESP59554



### Bread Board & Jumper Wire Deluxe Set

Bread Board is an ideal tool for carrying out small Electronic /Electrical experiments. It provides the following

- 1- 1600 spring loaded points which are useful for fixing the components such as IC'S, Transistors, Resistances, Diodes & Capacitors etc.
2. Interconnecting columns for supply & common / earth points.
3. Three 4mm Sockets are mounted on PCB with additional pins for connections. These sockets are primarily used for (+ve, -ve & Common) Power Supply.
4. Set of 150 wires (Single Strands) of different lengths & 10 nos. with connector on one side (Pin on one side & Female Connector on other side.)

ESP59556





**Bread Board & Jumper Wire Set**

Bread Board is an ideal tool for carrying out small Electronic /Electrical experiments. It provides the following facilities.1. Spring loaded 1600 points which are useful for fixing the components such as IC'S, Transistors, Resistances, Diodes & Capacitors etc.2. Interconnecting columns for supply & common / earth points.3. Three 4mm Sockets are mounted on PCB with additional pins for connections. These sockets are primarily used for (+ve, -ve & Common) Power Supply.4. Set of 150 wires (Single Strands) of different lengths & 10 nos. With connector on one side (Pin on one side & Female Connector on other side.)

ESP59557



**Resistor 10 OHM, 5W Fixed**

Fixed Resistor 10 Ohm, 5W  
Overall **Dimensions** : 9.9 x 9.9 x 4.7cm  
Fixed resistors with power dissipation 5W  
Mounted on plastic base with screw 4mm socket terminals

ESP59510

**Carbon Film Resistors**

1/4W Carbon Film Resistors different values PK/50 Each

ESP59513	1R	ESP59526	150R	ESP59539	22K
ESP59514	1R5	ESP59527	220R	ESP59540	33K
ESP59515	2R2	ESP59528	330R,	ESP59541	47K
ESP59516	3R3	ESP59529	470R	ESP59542	68K,
ESP59517	4R7	ESP59530	680R	ESP59543	100K
ESP59518	6R8	ESP59531	1K	ESP59544	150K
ESP59519	10R	ESP59532	1K5	ESP59545	220K
ESP59520	15R	ESP59533	2K2	ESP59546	330K
ESP59521	22R	ESP59534	3K3	ESP59547	470K
ESP59522	33R	ESP59535	4K7	ESP59548	680K
ESP59523	47R	ESP59536	6K8,	ESP59549	1M
ESP59524	68R	ESP59537	10K	ESP59550	1M5
ESP59525	100R	ESP59538	15K	ESP59551	10M.



**Sequential Logic Tutor**

Everything you need for a first course in flip-flops, counters and shift registers. Has four J-K flip-flops, five NAND gates and three Logic Input Switches. One switch is "de-bounced" and can be used for pulsing counters, shift registers etc.

The instruction manual include R-S, J-K and D-Type flip-flops, Binary and BCD Counters, Shift Register, Ring Counter, Johnson Code Counter and Chain Code Generator.

ESP59563



**Combination Logic Tutor**

Lt1 has a selection of AND, OR, NOT, NAND, NOR, Ex-OR and AND-OR-NOT logic gates to cover all aspects of combinational logic and Boolean algebra. Also has four logic indicators and logic input switches, one of which is "de-bounced".

ESP59564



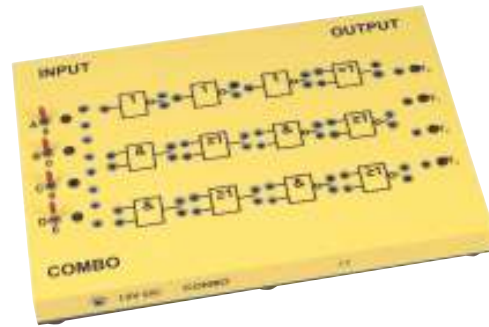


**Numerical Systems**

This panel is used to demonstrate the number systems used in information technology (binary and hexadecimal numbers). Range: 0 ... 255 or 8 bits Toggle switches are used to activate the displays showing the particular number entered. Input may be entered either as decimal or binary numbers with a toggle switch for mode selection. Three rotating knobs are available for selecting decimal digits, while binary numbers are entered by setting toggle switches. Numbers are shown on two displays: a three-digit, seven-segment LED display (26 mm) for decimal numbers and a two-digit alphanumeric display for hexadecimal numbers (22 mm). Eight LEDs (5 mm) display binary values.

**Additionally required :** ESP59571 Mains transformer 12 V DC / 2A

ESP59566



**Combo**

Introduction to basic logical expressions, combining logic gates, circuit design of EXOR gates, De Morgan's law, full and half adders, verifying the laws of Boolean algebra, coder and decoder circuits and RS flip flops (instructions for 30 example circuits).

This panel includes the following logic gates: 2 AND gates, 2 OR gates, 2 NAND gates, 2 NOR gates, 1 EXOR gate as well as, 3 NOT gates

Input: four toggle switches with 5-mm LED displays

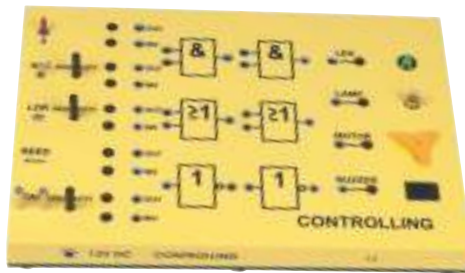
Output: four 5-mm LEDs with 4-mm jacks

Input and output elements as well as the individual gates are connected by means of 4-mm connecting leads.

Additional devices, such as a logic analyser, may be connected by means of the 4-mm jacks.

**Additionally required :** 3x Connecting leads, 25 cm, black, set of 6, 1x Mains transformer 12 V DC / 2 A - ESP59571

ESP59567



**Controlling**

This panel is used to demonstrate practical applications of digital technology in electronic and electromechanical control systems, such as motor control, a model of an alarm system and other circuits (instructions for 12 example circuits).

Input may be selected from five different, independent signal sources: a toggle switch; an NTC thermistor, used as a temperature sensor; an LDR, used as a light detector; a Reed relay contact (gas-filled magnetic switch); and a pressure-sensitive contact.

All output is accessible either as a direct or inverted signal and the current state is displayed in each case by an LED.

Output terminals are protected against short-circuiting and suited to being directly connected to the logic gates.

Logic gates: 2 NOT gates, 2 AND gates and 2 OR gates.

Four control elements are available for each output signal: an LED (5 mm, green), an E10 light bulb, a drive motor and an electromechanical buzzer. Current output state is displayed by LEDs.

Additional devices, such as a logic analyser, may be connected by means of the 4-mm jacks.

See following for a list of possible experiments.

**Additionally required :**

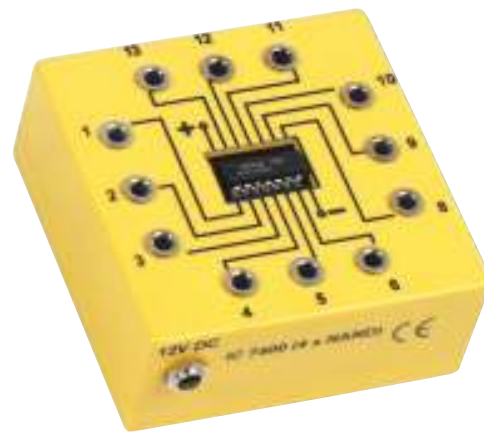
1x transformer 12 V DC / 2 A ESP59571

2x Connecting leads, 25 cm, black, set of 6

1x Bar magnet, round, 10 x 50 mm

1x Light bulb, 10 V / 50 mA, E10

ESP59568



**IC-7400 (4 x NAND)**

This industry-standard IC (IC 7400) may be controlled by means of 12 4-mm jacks.

Integrated Schmitt trigger circuits allow for a variety of digital and analogue signal sources to be directly

Connected to it (ON-OFF or Reed switch, NTC, PTC, LDR etc.).

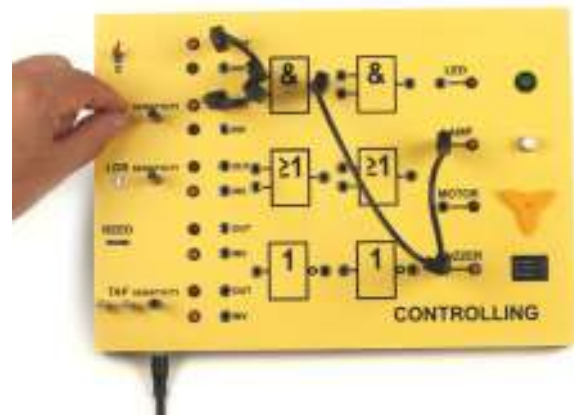
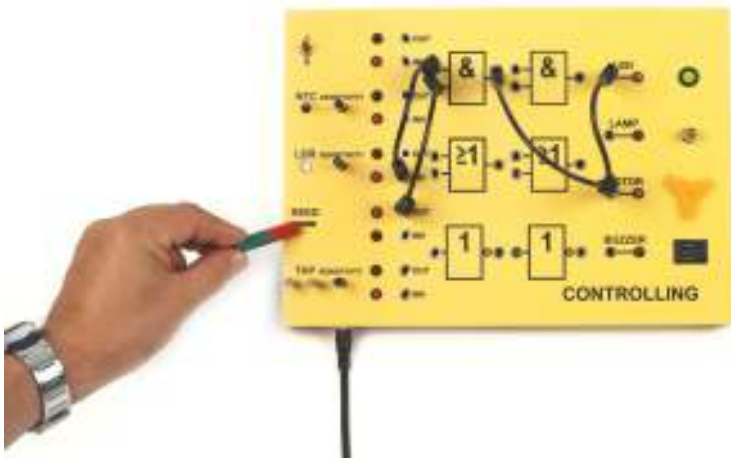
This module is designed to demonstrate the relationship between simple logic gates and industrial applications of integrated circuits.

**Additionally required :**

1x ESP59567 Combo or, 1x ESP59568 Controlling, 1x Junction cable, 4 DC plugs, 2x Connecting leads, 25 cm, black, set of 6, 1x Bar magnet, round, 10 x 50 mm, 1x Mains transformer 12 V DC / 2 A ESP59571, 1x Light bulb, 10 V / 50 mA, E10,

ESP59569





**Experiment manual "Logic", b/w booklet**

Experiment topics:

Numerical Systems ESP59566 (4 experiments):

- Decimal number system
- Binary number system
- Hexadecimal number system
- Converting between number systems

COMBO ESP59567 (30 experiments):

- NOT gate
- AND gate
- OR gate
- NAND gate
- NAND gate from AND and NOT gates
- NOR gate
- NOR gate from OR and NOT gates
- EXOR gate
- EXOR gate 1 (with AND gate)
- EXOR gate 2 (with OR gate)
- NOT gate from NAND gates
- AND gate from NAND gates
- OR gate from NAND gates
- NOT gate from NOR gates
- AND gate from NOR gates
- OR gate from NOR gates
- De Morgan 1 (NAND)
- De Morgan 2 (NOR)
- RS flip-flop from 2 NAND gates
- RS flip-flop from 2 NOR gates
- RS flip-flop (NAND) with a switch and cycle
- RS flip-flop (NOR) with a switch and cycle

- D flip-flop from NAND gates
- D flip-flop from NOR gates
- Half adder 1
- Half adder 2
- Half adder with EXOR gate
- Full adder
- Coder circuit (decimal – binary)
- Decoder circuit (binary – decimal)

CONTROLLING ESP59568 (12 experiments):

- Door control
- Motor control
- Light control
- Double security circuit
- Heating control
- Thermal protection
- Fire detector
- Air conditioning control
- Alarm system 1
- Alarm system 2
- Wasching machine control
- Refrigerator

IC 7400 (4 x NAND) ESP59569 (6 experiments):

- AND from 2 NANDs
- NOT from 2 NANDs
- NOR from 3 NANDs
- OR from 3 NANDs
- Fire detector (AND from 2 NANDs)
- Light control (OR from 3 NANDs)

ESP59570



**Mains transformer 12V DC / 2A**

Output voltage : 12 V DC / 24 VA supplied by 5.5-mm hollow DC plug  
Voltage source : 100 ... 240 V AC / 50 ... 60 Hz

**Dimensions :** approx. 90 x 60 x 37 mm

ESP59571



**Connecting leads**

Connecting leads, 25 cm, black, set of 6 (Lt)

ESP59572





**Bar Magnet**

Material: Alnico; poles covered with red or green plastic cap; D = 10 mm, L = 50 mm

ESP59573



**Light bulb**

Light bulb, 10V / 50 mA, E10 (Lt)

ESP59574

**Fuses**

With transparent glass body, quick blow type, 20mm long

- ESP59578 500 MA
- ESP59579 1 A
- ESP59580 2 A
- ESP59581 3 A
- ESP59582 5 A



**Light Emitting Diode (LED)**

5mm standard high quality LED indicators with diffused lens. Maximum voltage 3.0V D.C. PCB or panel mount.

- ESP59585 Red
- ESP59586 Yellow
- ESP59587 Green



**Soldering Iron**

With wooden / Bakelite handle, lightweight body, element tested for high insulation, with long life pencil bit

- ESP59601 25 Watts
- ESP59602 65 Watts
- ESP59603 125 Watts



**Soldering Iron Stand**

Soldering iron with stand

ESL57453



**De-soldering Pump**

High sucking power, plastic body with sturdy metal rod, easy to clean and maintain.

ESP59606



**Wire Cutter & Stripper, Deluxe**

Self adjusting tools for stripping the wire without damaging the inner core. Strips and cuts wire from 0.2 to 6mm. Suitable for electronics, industrial aviation automobiles and domestic use. Length 175mm.

ESP59608



**Wire Cutter & Stripper**

Wire Cutter Stripper Tool, For Cutting Wire, Crimping And Stripping Insulated Wire

ESP59609





**Lever, Single Kit**

The lever kit teaches students through hands-on design, construction, testing, and design iterations. Create the structure with the highest strength to weight ratio to win this engineering competition! A great way to teach middle school students basic engineering and to learn iteration by studying failure, or teach high school students basic statics, free body diagrams, failure modes, and member sizing calculations while complying with STEM education standards. Includes materials and tools for constructing levers; instruction manual with sample calculations, basswood members, balsa members, adhesive, adjustable cutters, and base material. An ideal training kit for Science Olympiad and other building competitions. Required: electric drill and bit. Grades 6-12

ESP59613



**Lever, Single Kit Refill**

Lever, Single Kit Refill. Grades 6-12

ESP59614



**Lever Test Kit**

The test kit includes everything required to test your levers for competition, except for the ballast (sand), including a test stand that can fit on any table with a lip, a loading block, a boomilever scale, a ballast scale, a scoring sheet, chain, S-hook, bucket, beaker with handle, and plastic trap. Grades 6-12

ESP59615



**Boomilever Class Challenge Kit**

The boomilever kit teaches engineering through hands-on design, construction, testing, and design iterations. Create the structure with the highest strength to weight ratio to win this engineering competition! A great way to teach middle school students basic engineering and to learn iteration by studying failure, or teach high school students basic statics, free body diagrams, failure modes, and member sizing calculations while complying with STEM education standards. Includes materials and tools for constructing boomilevers instruction manual with sample calculations, basswood members, balsa members, adhesive, adjustable cutters, and base material. An ideal training kit for Science Olympiad and other building competitions. Required: electric drill and bit. Grades 6-12

ESP59617

**Boomilever Class Challenge Kit Refill**

Boomilever Class Challenge Kit Refill. Grades 6-12

ESP59618



**Structure and Bridges Classroom Kit**

Gain a comprehensive understanding of structural engineering and learn how engineering concepts are applied in supporting or resisting loads. The class will study different types of bridges and the STEM principles that support their designs. During the unit, students will construct six working models including a house, a suspension bridge, a cable-stayed bridge, an arch bridge and two different truss bridges. They will also be challenged to build the largest free standing tower possible using the Engino? Components included in the kit. Finally, the students will apply their new knowledge to design and build a straw bridge that spans 70 cm and will support a minimum 2 kg distributed static load using only 100 plastic straws and a limited amount of masking tape. Includes all building and testing materials, instructor's manual, lesson plans, Engino hands-on activity books, building instructions, and student worksheets. Grades 7-12

ESP59620





### Heat Kit Simple

Ideal for use by Primary School students, aged 6 - 12 years. The student will be able to understand the basic knowledge on heat characteristics of materials and their conductivities with respect to heat. The experiments can be performed by the students themselves using their own ideas.

#### Experiment topics:

Expansion of water by heat, Expansion and contraction of air by changing temperature, Heat convection, Heat conduction, Heat conductors and insulators.

#### Specification:

Made with high quality standard.

#### The kit contains:

1 complete stand (Code # 9601410), 1 copper rod (Code # 9601421), 1 steel rod (Code # 82120284), 1 glass rod (Code # 9601423), 1 250 ml Erlenmeyer flask, 1 Rubber stopper with two holes dia 27/35 x 35mm, Grey, 1 Plastic Pipe OD=4mm, ID=3mm, P=170mm, 1 thermometer -10 ~ 110 C, A1.5 C, Red Spirit, 1 manometer holder (Code # 9601422), 3 plastic pipe OD=4mm, ID=3mm, P=115mm, 2 Rubber Pipe OD=4mm, ID=3mm, P=60mm, 1 spirit burner, 1 Balloon, Equipped with storage box, **Dimensions:** (L) 10.00 x (W) 11.00 x (H) 26.00cm, **Weight:** 0.470kg

**ESP59648**



### Ignition Kit Smart case

A great way to show students the relationship between volume and temperature in real-life. Our complete kit demonstrating the principles of an internal diesel and petrol combustion engine now supplied in an easy store Grattnell Smart Case. These experiments allow the student to explore volume pressure and temperature gas laws as part of the current GCSE curriculum.

#### Our kit comprises of the following:

1 x Fire syringe

When the plunger in the TRANSPARENT cylinder is rapidly pushed down over a piece of cotton an ignition occurs. This is one of the most impressive demonstrations of the heat produced when a gas is rapidly compressed - the principle of the Diesel engine ignition. Safety Glasses required. Approximately 22 cm tall.

1 x Ignition cylinder

A tough strong clear acrylic tube that when the propellant is sprayed into the tube and mixed with air then sealed with our foam bung and lit underneath produces an amazing 'POP' where the air and propellant mixture creates an explosion similar to that of a petrol engine. A fantastic experiment that students love.

1 x Grattnell's Smart Case, 2 x Spare Fire syringe seals, 1 x Cotton wool sample, 2 x Foam plugs, 1 x Lighter, 1 x Atomizer \*(supplied empty), 1 x Pair safety goggles,

\*Ignition cylinder requires cyclohexane as a recommended fuel.

**ESP59650**



### Fire Piston

Turn on to Ideal Gas Law with this explosive demonstration! As air compresses, the temperature increases and combustible material bursts into flames. Also is great for discussing adiabatic compression (rapid compression that raises air temperature) in diesel engines, the laws of thermodynamics and the resourcefulness of ancient people. The kit includes aluminium piston, cotton, two custom O-rings, and instructions. Includes Teacher's Guide.

**ESP59654**







### Hydrostatic And Heat Kit 2

Consist of :

- Special Pointer 1 pc
- Steel Pipe 1 pc
- Aluminum Pipe 1 pc
- Copper Pipe 1 pc
- Heat-Air and Liquid Circulation System 1 pc
- Radiation Detector 1 set
- Silicone Tubing 1 pc
- Overflow Vessel 1 pc
- Plastic Vessel 1 pc
- TRANSPARENT Plastic Hose 500 mm 2 pcs
- Plastic Pipe 2 pcs
- Support Clamp 2 pcs
- Hose Connector 2 pcs
- Pressure Sensor 1 pc
- U-Manometer Holder 1 pc
- Plastic Tube with Hanger 1 pc
- Plastic Tube with Load 50 gr 1 pc
- Multipurpose Glass Body Length 10 cm and marble 2 set
- Plastic Syringe 50 ml 1 pc
- Plastic Funnel 65 mm 1 pc
- Beaker 250 ml 1 pc
- Erlenmeyer Flask 100 ml 3 pcs
- Spirit Burner 60 ml, Stainless Steel 1 pc
- Measuring Cylinder 100 ml, Plastic 1 pc
- Natron Glass Tubing 6 x 300 mm 3 pcs
- Rubber Stopper with One Hole, 17/22 mm 1 pcs
- Rubber Stopper with Two Holes, 29/35 mm 1 pc
- Rubber Stopper with One Hole, 29/35 mm 3 pcs
- Rubber Stopper without Hole, 17/22 mm 1 pc
- Alcohol Thermometer without Scale 1 pc
- Alcohol Thermometer -10 C – 110 C 1 pc
- Box and Tray 1 set

#### Support Tools (sold separately) :

- Stand Base with 3 Clamps 2 pcs (Available in Mechanic Kit)
- Stand Foot 2 pcs (Available in Mechanic Kit)
- Stand Rod 10 x 250 mm, Stainless Steel 2 pcs (Available in Mechanic Kit)
- Stand Rod 10 x 500 mm, Stainless Steel 2 pcs (Available in Mechanic Kit)
- Support Block 2 pcs (Available in Mechanic Kit)
- Dynamometer 1.5 N 1 pc (Available in Mechanic Kit)
- Holding Clamp 3 pcs (Available in Mechanic Kit)
- Nylon Thread 1 pc (Available in Mechanic Kit)
- Load 50 gr 6 pcs (Available in Mechanic Kit)
- Analog Stopwatch 1 pc (Available in Mechanic Kit)
- Ruler 50 cm, Stainless steel 1 pc (Available in Mechanic Kit)



- Boss-head Clamp 2 pcs (Available in Mechanic Kit)
- Universal Clamp 70 mm 2 pcs (Available in Mechanic Kit)
- Balance 311 g 1 pc

**Dimensions :** (L) 61.00 x (W) 26.00 x (H) 17.00 cm

**Weight :** 3.000 kg,

ESP59651





**Hydrostatics And Heat Kit 3**

Used for experiments concerning to the substance (liquid) characteristic, temperature measurement, heat conduction, pump (jack) principle work.  
Conformed , ).

Consist of :

- Overflow Vessel 1 pc
- Beaker 250 ml 1 pc
- Measuring Cylinder 100 ml, Plastic 1 pc
- TRANSPARENT Plastic Hose 500 mm 2 pcs
- Plastic Funnel 70 mm 1 pc
- Support Clamp 1 pc
- Hose Connector 2 pcs
- Pressure Probe 2 pcs
- Plastic Tube with Hanger 1 pc
- Plastic Tube with Load 50 gr 1 pc
- Erlenmeyer Flask 100 ml 3 pcs
- Capillary Pipe with Scale 7 x 250 mm 3 pcs
- Plastic Basin 1 pc
- Special Pointer 1 pc
- Steel Pipe 1 pc
- Aluminum Pipe 1 pc
- Copper Pipe 1 pc
- Silicone Tubing 1 pc
- Spirit Burner 60 ml, Stainless steel 1 pc
- Alcohol Thermometer -10 C – 110 C 2 pcs
- Alcohol Thermometer 0°F – 250°F 1 pc
- Alcohol Thermometer without Scale 1 pc
- Test Tube 12 x 100 mm 2 pcs

- Rubber Stopper with One Hole, 17/22 mm 2 pcs
- Rubber Stopper with Two Holes, 29/35 mm 2 pcs
- Rubber Stopper with One Hole, 29/35 mm 3 pcs
- Rubber Stopper without Hole, 17/22 mm 2 pcs
- Multipurpose Glass Body Length 10 cm and marble 2 set
- Plastic Syringe 50 ml 1 pc
- Plastic Syringe 10 ml 1 pc
- Universal Clamp 70 mm 2 pcs
- Bosshead Clamp 2 pcs
- Student Experiment manual book
- Box and tool container (tray) 1 set

**Support Tools (sold separately) :**

- Stand Base with 3 Clamps 2 pcs (Available in Mechanic Kit)
- Stand Foot 2 pcs (Available in Mechanic Kit)
- Stand Rod 10 x 250 mm, Stainless Steel 2 pcs (Available in Mechanic Kit)
- Stand Rod 10 x 500 mm, Stainless Steel 2 pcs (Available in Mechanic Kit)
- Support Block 2 pcs (Available in Mechanic Kit)
- Dynamometer 1.5 N 1 pc (Available in Mechanic Kit)
- Holding Clamp 3 pcs (Available in Mechanic Kit)
- Nylon Thread 1 pc (Available in Mechanic Kit)
- Load 50 gr 6 pcs (Available in Mechanic Kit)
- Analog Stopwatch 1 pc (Available in Mechanic Kit)
- Ruler 50 cm, Stainless steel 1 pc (Available in Mechanic Kit)
- Balance 311 g 1 pc

**Dimensions :** (L) 61.00 x (W) 26.00 x (H) 17.00 cm

**Weight :** 3.100 kg

ESP59652



**Boss-head**

Boss-head four straight slot. Used to clamp circular and square rod.

**Dimensions:** Length : 55 mm

Material : Aluminium

Part of Heat and Hydrostatic KIT for Junior High School

**Dimensions:**

(L) 10.00 x (W) 3.00 x (H) 5.00 cm

**Weight:** 0.129 kg

ESP59655

**Plate Holder For Heating Plate**

Steel plate support with handle;

Crimped borders ensure that the glass plate or wire gauze

Does not slide when inserted;

Handle : D = 10 mm;

**Dimensions:** 160 x 160 mm

ESP59656

**Heating Plate**

SCHOTT Ceran glass plate, with grinded edges

To be used with plate holder ESP59656

**Dimensions:** 155 x 155 x 4 mm

**Calorimeter Block**

Metal, for experiments on specific heat of different metals, cylindrical metal blocks 1kg 2%. Each block has a central hole for a special immersion heater and an offset hole for thermometer.

ESP59666

**Colorimeter**

ESP59660 Colorimeter experiment kit

**Consist of:**

Calorimeter 1 pc, Cubes of Matter (5 items) 1 set, Beaker 250 ml 1 pc, Nylon Thread 1 pc, Spirit Burner 125 ml 1 pc, Tripod Stand 100 x 80 , mm 1 pc , Wire Gauze 14 x 14 cm 1 pc, Alcohol Thermometer -10 C - 110 C 1 pc.

**Dimensions:** (L) 62.00 x (W) 30.00 x (H) 9.00 cm

**Weight:** 2.400 kg"

ESP59661 Copper joules

CALORIMETER , With  $\phi 100^*110$ mm, Height Excluding terminal Inner and outer barrel copper cup, with stirrer.

ESP59662 Copper 75 x 50mm dia.

With parallel sides and rolled rim, without stirrer.

ESP59663 Copper 100 x 75mm dia.

With parallel sides and rolled rim, without stirrer.

ESP59664 Copper 75 x 50mm dia.

Polished Calorimeter as above, fitted with plastic lid fitted with rubber stopper and stirrer.

ESP59665 Copper 100 x 75mm dia.

Polished Calorimeter as above, fitted with plastic lid fitted with rubber stopper and stirrer.

**Immersion Heater For Calorimeter Block**

Specially designed for metal block calorimeters. Heating element enclosed in a metal tube with two connecting leads which are insulated with heat resistant insulation. 12V, 50W.

ESP59667





**Heat Pad Irwin Low Voltage Heatproof Mat**

The Irwin low voltage versatile heat pad that allows the user to heat up beakers, conical flasks etc. The unit heats up to about 90 degrees Celsius which is great for heating water, boiling alcohol etc. Particularly useful where teaching must be performed in a classroom without a gas supply. The unit is waterproof and splash-proof and so may be used where spillage is possible. Comes complete with leads. It is supplied bonded to a heatproof mat to protect benches and tables. If the children touch it then reflex action will remove their hand before burning can occur. Much safer than a Bunsen burner!

ESP59670

**Heat Pad Irwin Mains Heatproof Mat**

A versatile heat pad that allows the user to heat up beakers, conical flasks etc. The unit heats up to about 90 degrees Celsius which is great for heating water, boiling alcohol etc. Particularly useful where teaching must be performed in a classroom without a gas supply. The unit is waterproof and splash-proof and so may be used where spillage is possible. Comes complete with 1.5m of silicon cable and 13A mains plug. It is supplied bonded to a heatproof mat to protect benches and tables. If the children touch it then reflex action will remove their hand before burning can occur. "Much safer than a Bunsen Burner..."

ESP59671



**Leslie's Cube**

Metal plate with 130mm sides. The vertical faces of the box are blackened, roughened, vanished and polished respectively. The top opening is 75mm diameter and is fitted with a lid. The apparatus is filled with water maintained at boiling point by a low Bunsen flame. Infra red sensors maybe be used to compare the relative heat output from each of the four faces.

ESP59674



**Thermo - octagon**

For investigating the thermal radiation from a body as a function of temperature and the kind of radiation surface. The coloured surfaces get sweep outside for heat radiation, for absorption sweep inside. Hollow body with 8 surfaces, partially laminated in different colours; heat source mounted on the cover: light bulb 12 V / 20 W; Surfaces : white, black, blue, yellow, red, White - matt finished, nature polished, Nature - matt finished; **Dimensions :** approx. 150 x 150 x 105 mm

ESP59675



**Compound Strip ( Bimetallic Strip)**

A classic experiment that never grows old. Two metals (Copper and iron) of different heat expansion coefficients welded together and mounted in wooden handle. Demonstrates unequal expansion of different metals by bending when heated.

ESP59676



**Wood And Metal Cylinder**

To show that metal has a lower specific heat than wood, constructed of wood on one end and hollow metal on the other. One way is to simply let students feel both ends of the cylinder at room temperature, enabling them to see that the metal end is cooler than the wooden end. Another easy demonstration is to wrap paper on both ends and hold the cylinder over a flame for five seconds. The metal end will be relatively unmarked while the wooden end will show scorch marks.

ESP59678





### Radiant Heater

The Irwin Radiant Heat source is a compact and safe heat source for school heat radiation experiments.

It comprises a base and cage containing a custom made infra-red heating lamp of the dull emitter type. The lamp is like the old Griffin lamp but turned inside out. This means that it is impossible for a pupil to get an electric shock by prodding it with a paper clip etc.

Please note The unit can take up to half an hour to reach maximum temperature and so this time lag should be taken into account when planning lessons.

In normal use, four thermometers, one with a blackened bulb, one with a silvered bulb, one with a white bulb and one with a nude? bulb may be situated around the unit at equal distances and a heat absorption experiment performed. The lamp does not visibly glow as almost all the energy provided is converted into heat. For this reason, a cage has been placed around the lamp to prevent pupils touching it and burning themselves.

However, some experiments require more heat and so the cowl may be removed by unscrewing the four retaining screws. If this is done, the pupils should be warned of the dangers.

Manufactured in the UK

**Dimensions:** Height: 215mm | Width: 150mm | Depth: 150mm

**Weight:** 1.5kg

ESP59672



### Thermal Conductivity Of Metal Apparatus

The apparatus consists of a wood compound ring with four pointed strips of metal attached at 90 degrees to each other around the ring. The strips are attached so that their points are in the centre of the ring. At the other end of each strip there is an indentation for holding water. Each strip is made of a different metal: Aluminium, brass, copper and iron. Depending on the conductivity of the metal the water will evaporate at different times. Dia.: 130mm

ESP59681



### Thermopile "compact"

Thermopile with amplifier to convert the optical power to a voltage value.

Serves as a radiation pyrometer with a measuring device 0 ... 10V or 10 mA;

ON / OFF – switch; zero point adjustment;

Outputs are protected against short circuit;

LED-indicator for operating state;

Output voltage: Max  $\pm 14$  V; battery-driven (battery included) or

External power supply 6 - 12 V DC (Not included)

**Dimensions:** 84 x 84 x 39 mm

ESP59677



### Heat Conductivity Experiment

A very simple to use set of apparatus to compare the heat conductivity of four metal bars.

Four bars, Aluminium, Steel, Copper and Bronze are set into a plastic holder. Each bar has attached to it a solid state thermometer strip.

The unit is suspended from a clamp stand with the bar ends dipping into a beaker of very hot water. Comparison of the rate of heat progress along the four bars may be made by direct observation.

An elegant solution to an otherwise messy experiment no more Vaseline, steel balls etc.

ESP59680



### Ingen-Hausz Apparatus

To demonstrate different conductivities of different metals. Rods of 5 different metals, fitted along one side of a metal tank. Fitted with 2 Bakelite Handles for easy handling.

ESP59685





**Conductivity Of Heat Apparatus**

Conduction of Heat Apparatus

4 pieces of metal strips. They have the same form and dimension. For use to show differences in conductivities of various metals.

**Dimensions :** 125 x 15 x 3mm, mounted on hollow circular wooden base 135mm dia.

Consists of strips of copper, iron, aluminium and brass.

An indentation is made at the outer end of each strip to place wax chips on Heating with spirit or gas burner on the circular tripod Supplied without tripod and burner

**Dimensions :** 18.00 (L) x 18.00 (W) x 2.00cm (H)

**Weight :** 0.200Kg

ESP59682



**Thermal Conductivity Of Metal Apparatus Superior**

Consisting of:

1x Stand-rail base, L = 500 mm

2x Rail claw

1x Slider with setting for heat expansion

1x Slider for pointer

1x Tube for heat expansion, aluminium

1x Tube for heat expansion, iron

1x Tube for heat expansion, copper

1x Tube for heat expansion, glass

2x Pointer for heat expansion, Demo

ESP59683



**Ball And Ring**

BALL AND RING, Gravesande's mounted in rod with handle, ball with chain. Cold ball passes through the ring but does not pass when heated.

ESP59689 DIA. 19MM

ESP59690 DIA. 22MM

ESP59691 DIA. 25MM



**Thermostat Model**

A dramatic demonstration of the thermostat principle. Consists of a bimetallic strip mounted in a base. Because of the unequal expansion of the two different metals, the bimetallic strip will bend to open or close the circuit and the light bulb lights up accordingly.

ESP59687



**Bar Breaking Apparatus**

A heavy cast iron stand slotted to carry a stout iron bar, with ten cast iron breaking bars

ESP59697



**Bar and Gauge**

To illustrate expansion of metal on heating and contraction on cooling, with steel bar of length 110 x 10 mm and plated brass gauge with a cut-out to just accommodate the bar and two holes through which the bar passes when cold.

ESP59699



**Ball And Ring**

SPECIFIC HEAT CYLINDERS SET , Comprising Brass, Lead, Iron, Copper, Aluminium and Zinc. Supplied in Case.

**ESP59693**

Equal in size , size available : 30 x 10mm.

**ESP59694**

Equal in size , size available : 40 x 10mm.

**ESP59695**

Equal in mass cylinders of diameter app.16Mm ,Each cylinder adjusted to 100g. Cylinders vary in length from 5cm to 19cm to get the same mass and are drilled across cross-section near one end for suspension.

**Convection In Water Apparatus**

For demonstrating the phenomenon of thermal convection in liquids caused by temperature variation. Consists of a rectangular-shaped borosilicate glass tube 18 MM with a funnel-shaped opening at the top for filling liquids. When tube is partially filled with water and heated at one corner after adding a dye, potassium permanganate crystals, sawdust, or aluminium powder, the movement of colours or particles illustrates the formation of convection currents. Includes teacher's guide.

**ESP59701****Metal Rivets**

- ESP59707** Iron, Pk of 500gm
- ESP59708** Copper, Pk of 500gm
- ESP59709** Aluminium, Pk of 500gm
- ESP59710** Brass, Pk of 500gm

**Convection In Air Apparatus**

To show the convection of heat in air. Metal box, with sliding glass front and two detachable glass chimneys. Supplied without candles.

**ESP59703**



**Lab Table Mobile**

Table for laboratory and transport purposes; thanks to the large casters high door sills are no problem; thick plastic edges serve as protection against impacts. Plastic plates in green; 2 shelves for power supplies, measuring devices or small parts; bottom plate for experiment kits or larger items. Rack made of aluminium and silver-coated; shelves and bottom plate are easily removable, and can be taken apart and rearranged.

Working space : 750 x 500 mm

Shelf space: 750 x 244 mm and 750 x 123 mm

Bottom plate : 750 x 385 mm

Total height : 900 mm

4 pulleys (D = 75 mm), two can be locked in position

ESP59715



**Magnetic Base, D=43 Mm, With Tube And Pin**

Rubber-encased metal base with embedded neodymium magnet; for fast assembly of round rods of Max. 10 mm in diameter; normal or parallel to a metal panel; rubber jacket prevents the table surface from scratches; this also makes the base non-slip; a newly-developed clamp set with a bearing pin enables elements to be fixed onto the plate surface at variable distances; holding force on bearing pin as a point of application; as measured parallel to the table:

Magnetic base D = 43 mm: 10 - 25 N | Magnetic base D = 66 mm: 20 - 70 N  
(The holding force is dependent on the strength (thickness) of the metal panel)

ESP59720



**Assembly For Lab Table**

This assembly enables more elevated experimenting; this makes experiments easier for students to view.

Heavy power supplies or measuring devices can be placed beneath the experiment.

Two fixed special rail profiles allow fast, safe assembly of rail stand materials; can be placed on the instructor's table or portably on the lab table and fixed in position with screw clamps; cable holders are attached to the side.

Working space: 750 x 375 mm

**Total height : 305 mm** (excluding rail profile)

ESP59716



**Panel, Green/White, 900X610mm**

One side green, one side white,

**Dimensions :** approx. 90 x 62 cm

ESP59719



**Screw Clamp, Jaw Width Approx. 50 mm**

For mounting rails bases (special aluminium profile) or for assembly with a frame on tables with a maximum thickness of 48 mm;

Aluminium profile with steel pin, sturdy screw with M10 thread and pressure plate.

ESP59717



**Board Holders, Pair, Magnetic**

Board holders, pair, magnetic, L = 600 mm

ESP59718







**Magnetic Base, D=66 Mm, With Tube And Pin**

Rubber-encased metal base with embedded neodymium magnet; for fast assembly of round rods of max. 10 mm in diameter; normal or parallel to a metal panel; rubber jacket prevents the table surface from scratches; this also makes the base non-slip; a newly-developed clamp set with a bearing pin enables elements to be fixed onto the plate surface at variable distances; holding force on bearing pin as a point of application; as measured parallel to the table:  
 Magnetic base D = 43 mm: 10 - 25 N  
 Magnetic base D = 66 mm: 20 - 70 N  
 (the holding force is dependent on the strength (thickness) of the metal panel)

ESP59721



**Claw Base Simple**

Simple support base for quick set-ups; special aluminium profile ( rail base profile); silver coated, with mounted rail claws; drill hole with screw for mounting rods of Max. D = 10 mm; surface  
**Dimensions** : 265 x 220 mm

ESP59728



**Claw Base, Magnetic**

Simple magnetic support base for quick set-ups; special aluminium profile ( rail base profile), with mounted rail claws including neodymium magnets; drill hole with screw for mounting round support material with a diameter of Max. 10 mm; surface  
**Dimensions** : 265 x 220 mm

ESP59729



**Rail Claw, Simple**

Two rail claws attached to a special profile provide a support base or stabilise the track or optical bench; Fibre glass reinforced plastic with rubber feet;  
**Length** = 220 mm

ESP59722



**Rail Claw, Adjustable**

Two rail claws attached to a special profile provide a support base or stabilise the track or optical bench; Fibre glass reinforced plastic with rubber feet; with metal cylinders and levelling screws.  
**Length** = 220 mm

ESP59723



**Rail Claw, Magnetic**

Two rail claws attached to a special profile provide a support base or stabilise the track or optical bench; Fibre glass reinforced plastic with rubber feet; with strong neodymium magnets (D = 22 mm, H = 10 mm);  
**Length** = 220 mm

ESP59724



**Stand Rail Base**

Special aluminium profile; silver-coated; creates a support base with two rail claws, or for holding universal rails using clamp saddles; hole on side for optional attachment to tables using the demo table clamp

ESP59725 L=125 Mm

ESP59726 L=250 Mm

ESP59727 L=500 Mm





**Round Base With Stand Tube, Uni**  
or simple set-ups; heavy metal base with clamp socket for mounting round rods from D=3mm up to D=14mm or square rods up to s= 12,5 mm; powder-coated; M8 fixing screw  
**Dimensions** : D= 84 mm, H= 58 mm  
**Weight** : approx. 395 g

ESP59730



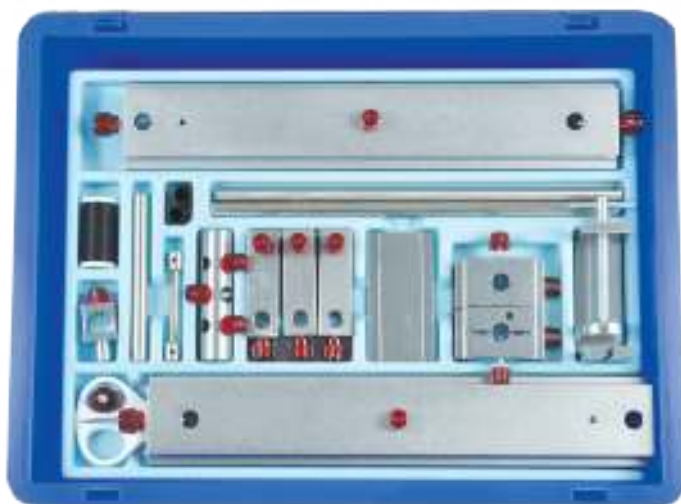
**Sliding Saddle «Sepp», H = 40 Mm**  
or a stable support of round or square rods on special aluminium profile, slide can be set at and moved to any position; special anodised aluminium profile with clamp socket, for supporting round rods of 3-14 mm in diameter or square rods of up to s = 12.5 mm; with M8 wing screw

ESP59731



**Claw Base «Sepp», 260 X 220 Mm**  
Sturdy metal stand base with large surface area; special aluminium profile anodised with clamp socket, for stable support of round or square rods and for holding sliders; laterally positioned claws made of fibre glass reinforced plastic, with rubber pads; clamp socket for holding round rods of 3-14 mm in diameter or square rods of up to s= 12.5 mm; with M8 wing screw; surface area: 265 x 220 mm (583 cm<sup>2</sup>);  
**Weight** : 383 g approx.

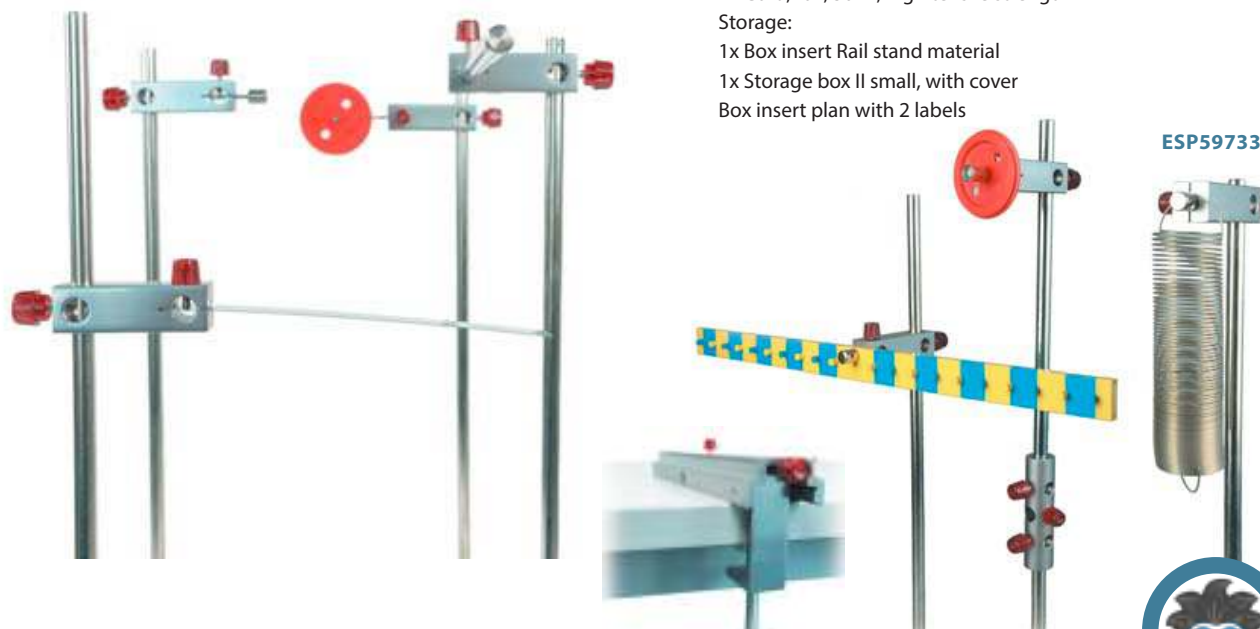
ESP59732



**Stand Material Kit**

- Kit consisting of:
- 2x Bearing pin
  - 1x Holder for dynamometer and test tubes,
  - 1x Table clamp,
  - 2x Stand rail, 300 mm, aluminium profile for use as stand base or inclined plane
  - 1x Rail connector , universal Special aluminium profile, for connecting rails
  - 3x Boss-head, universal, Rectangular aluminium profile, for mounting shafts, pins and / or springs
  - 1x Boss-head, round,
  - 1x Sliding saddle with set screw Special profile
  - 1x Slider for pointers for heat expansion Special profile
  - 2x Support rod, round, L = 250 mm, D = 10 mm
  - 2x End cap for rods, plastics Creates a stand base out of a stand rail and a support rod
  - 1x Support rod with pivot pin, L = 100 mm, D = 10 mm
  - 1x Pair of scissors, SE
  - 1x Cord, roll, 30 m, high tensile strength
- Storage:
- 1x Box insert Rail stand material
  - 1x Storage box II small, with cover
  - Box insert plan with 2 labels

ESP59733





**Simple Machines Kit**

Ideal for use by Primary School students. The student will understand the basic concepts of friction between different surfaces, the concept of lever and pulley system. Using this kit the student will be able to design their own experiments.

**Experiment topics:**

- Friction between different surfaces.
- Function of an inclined plane.
- Function of pulley system.
- Characteristic of a lever.

**Specification:**

The kit consists of: 1 friction block, 4 pulley wheels, 2 hooks, 1 rider, 1 spring balance, 1 lever, 1 hook with spring hull and 1 axle.

**Dimensions :** (L) 32.00 x (W) 8.00 x (H) 5.00cm

**Weight :** 0.285kg

ESP59735





**Mechanic Kit 1 (35 Item)**

Used for experiment principle of measurement, measuring of density, basic principles of simple plane (crank, pulley and incline plane), motion principle, wave principle, sounds principle and solar system., ).

Consist of :

- Stand Base with 3 Clamps 2 pcs
- Stand Foot 2 pcs
- Support Block 2 pcs
- Stand Rod 10 x 250 mm 2 pcs
- Stand Rod 10 x 500 mm 2 pcs
- Rod Coupling 1 pc
- Steel Ruler 50 cm 1 pc
- Dynamometer 1.5 N 1 pc
- Pointer 1 pair
- Nylon Thread 1 pc
- Load 50 gr 6 pcs
- Load 25 gr 6 pcs
- Dynamometer 3.0 N 2 pcs
- Vernier Caliper 1 pc
- Aluminum Block 1 pc
- Holding Clamp 3 pcs
- Pulley 50 mm, Plastic 2 pcs
- Pulley 100 mm, Plastic 2 pcs
- Axle with Plug 1 pc
- Load Hook 2 pcs
- Plastic Lever 1 pc
- Coupling Plug 2 pcs
- Coupling Rod 2 pcs
- Inclined Plane, 2 Measuring Scale 1 pc
- Helical Spring 0.1 N/cm 1 pc
- Friction Block 63 x 38 x 38 mm 1 pc
- Cubes of Matter (6 pcs) 1 set
- Analog Stopwatch 1 pc
- Trolley 1 pc
- Trolley with Motor 1 pc
- Stepped Block 1 pc
- Ticker Timer with Clamp Rider Paper Tape (length 150 m) 1 set
- Studnet Experiments book 1 pc
- Box and Tools Container 1 set
- Support Tools (sold separately) :**
- Overflow Vessel 1 pc (Available in Hydrostatics and Heat Kit)
- Beaker 250 ml 1 pc (Available in Hydrostatics and Heat Kit)



- Measuring Cylinder 100 ml, Plastic 1 pc (Available in Hydrostatics and Heat Kit)
- Marble 2 pcs (Available in Hydrostatics and Heat Kit)
- Balance 311 g 1 pc
- Optic Table 1 pc (Available in Optics Kit)
- Precision Rail 50 cm 2 pcs (Available in Optics Kit)
- Rail Connector 2 pcs (Available in Optics Kit)
- Foot for Rail 2 pcs (Available in Optics Kit)
- Clamp Rider 1 pc (Available in Optics Kit)
- Power Supply 3A, 36W (ESP60751) 1 pc
- Connecting Lead DC 50 cm, Red 1 pc (Available in Electric and Magnet Kit)
- Connecting Lead DC 50 cm, Black 1 pc (Available in Electric and Magnet Kit)
- Slinky 80 mm 1 pc
- Tuning Fork on Resonance Box 1 pc
- Dimensions :** (L) 61.00 x (W) 26.00 x (H) 17.00 cm
- Weight :** 5.000 kg





**Mechanic Kit 2**

Experiment Topics

- MU-1 The Vernier Calliper
- MU-2 Inclined Plane Force I
- MU-3 Inclined Plane Force II
- MU-4 Lifting an Object Along an Inclined lane
- MU-5 Average Velocity
- MU-6 Velocity and Acceleration
- MU-7 Uniform Linear Motion
- MU-8 Uniform Acceleration Motion
- MU-9 Free Fall
- MU-10 Additional of Vector
- MU-11 Hooke's Law
- MU-12 Oscillation of Spring
- MU-13 The Simple Pendulum
- MU-14 The Resultant of Two Parallel Forces

Box and Tray Mechanic Kit ESP-FE-MKU2 1 set

Manual Book Mechanic Kit 1 exp

**Support Tools (sold separately) :**

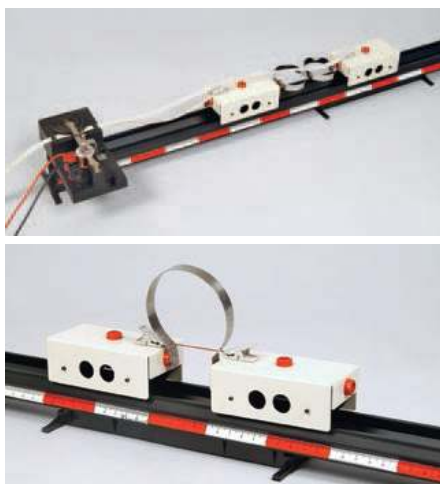
- Precision Rail 50 cm 2 pcs (Available in Optics Kit)
- Rail Connector 2 pcs (Available in Optics Kit)
- Foot for Rail 2 pcs (Available in Optics Kit)
- Optic Table 1 pc (Available in Optics Kit)
- Clamp Rider 1 pc (Available in Optics Kit)
- Table Pulley, Aluminium 1 pc (Available in Thermodynamics and Wave Kit)
- Power Supply 3A, 36W (ESP60751) 1 pc
- Ruler 50 cm, Stainless steel 1 pc

**Dimensions :** (L) 60.00 x (W) 28.00 x (H) 16.50 cm

**Weight :** 4.460 kg

ESP59738





**Mechanic Kit 3**

Used for high school student to acquire better understanding on concept in Mechanics such as velocity, acceleration, force, newton's law, conservation on momentum, conservation of energy and than concepts of vibration, simple harmonic motion, and mechanical wave.

Experiment Topics :

Kinematics And Dynamics

MU 01 The Ticker Timer

MU 02 Motion of a Trolley on a Horizontal Plane (Rail)

MU 03 Uniform Motion

MU 04 Average and Instantaneous Velocity

MU 05 Motion of a Trolley on an Inclined Rail

MU 06 Free Fall

MU 07 Newton's Law

MU 08 Collision, Linear Momentum

MU 09 Explosion

MU 10 Conservation of Mechanical Energy

Vibrations

MU 11 Simple Pendulum

MU 12 Oscillation of a Mass Suspended by a Spring

MU 13 Oscillation of a Flat Spring Loaded with Mass

at its End

MU 14 Oscillation Chart

MU 15 Acceleration Due to Gravity

MU 16 Resonance of a Simple Pendulum

MU 17 Resonance of a Spring with Mass Suspended

MU 18 Hooke's Law

Mechanical Waves

MU 19 Propagation and Reflection of Transversal Wave

MU 20 Transversal Standing Wave in a String (Cord)

MU 21 Longitudinal Standing Wave in Helical Spring

-Box and Tray Mechanics Kit for Senior High School (ESP59739) 1 set

**Support Tools (sold separately) :**

-Analog Stopwatch 1 pc

-Connecting Lead DC 25 cm, Black 1 pc

-Connecting Lead DC 25 cm, Red 1 pc

-Balance 2610 gr 1 pc

-Power Supply 5A, 12V (ESP60751/5A) 1 pc

-Audio Frequency Generator 1 pc

**Dimensions :** (L) 61.00 x (W) 44.00 x (H) 16.00 cm

**Weight :** 8.500 kg

ESP59739





### Mechanic Kit For Junior High School

#### Consist of :

Stand Base with 3 Clamps 2 pcs  
 Stand Foot 2 pcs  
 Support Block 2 pcs  
 Rod 10 x 250 mm, Stainless Steel 2 pcs  
 Stand Rod 10 x 500 mm, Stainless Steel 2 pcs  
 Ruler 50 cm, Stainless Steel 1 pc  
 Dynamometer 1.5 N 1 pc  
 Pointer 1 pair  
 Nylon Thread 1 roll  
 Load 50 gr 6 pcs  
 Dynamometer 3.0 N 2 pcs  
 Vernier Caliper 1 pc  
 Aluminum Block 1 pc  
 Holding Clamp 2 pcs  
 Pulley 50 mm, Plastic 2 pcs  
 Pulley 100 mm, Plastic 2 pcs  
 Axle with Plug 1 pc  
 Load Hook 2 pcs  
 Plastic Lever 1 pc  
 Coupling Plug 2 pcs  
 Coupling Rod 2 pcs  
 Inclined Plane, 1 Measuring Scale 1 pc  
 Helical Spring 10 N/m 1 pc  
 Friction Block 1 pc  
 Cubes of Matter (5 items) 1 set  
 Analog Stopwatch 1 pc  
 Dynamic Cart 1 pc  
 Stepped Block 1 pc  
 Ticker Timer 1 pc  
 Paper Tape for Ticker Timer, 49 mm 1 pc  
 Bosshead Clamp 2 pcs  
 Universal Clamp 70 mm 2 pcs  
 Student experiments Manual book 1  
 Box and Tray 1 set

#### Support Tools (sold separately) :

Overflow Vessel 1 pc (Available in Hydrostatics and Heat Kit)  
 Beaker 250 ml 1 pc (Available in Hydrostatics and Heat Kit)



Measuring Cylinder 100 ml, Plastic 1 pc (Available in Hydrostatics and Heat Kit)

Marble 2 pcs (Available in Hydrostatics and Heat Kit)

Balance 311 g 1 pc

Optic Table 1 pc (Available in Optics Kit)

Precision Rail 50 cm 2 pcs (Available in Optics Kit)

Penyambung Rel 2 pcs (Available in Optics Kit)

Foot for Rail 2 pcs (Available in Optics Kit)

Clamp Rider 1 pc (Available in Optics Kit)

Power Supply 3A, 36W (ESP60751) 1 pc (Available in Electric and Magnet Kit)

Connecting Lead DC 50 cm, Red 1 pc (Available in Electric and Magnet Kit)

Connecting Lead DC 50 cm, Black 1 pc (Available in Electric and Magnet Kit)

**Dimensions :** (L) 61.00 x (W) 26.00 x (H) 17.00 cm

**Weight :** 6.000 kg

ESP59740





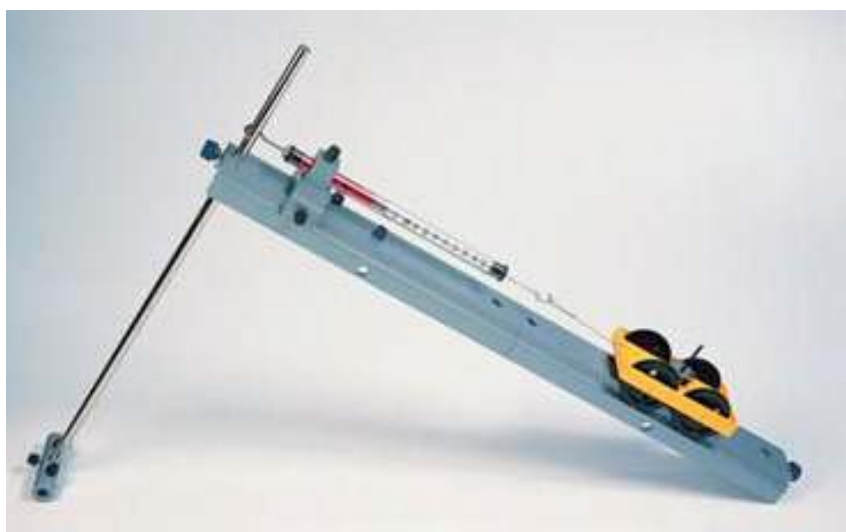
**Mechanic Kit For Grade 6-9**

Kit consisting of:

- 1x Dynamics trolley
- 1x Measuring tape, L=300 cm
- 2x Scale pan with suspension
- 1x Pointer for lever rod
- 1x Scale with graduation
- 1x Sliding saddle for lever rod
- 1x Lead (tare) shot, 50 g
- 1x Vernier calliper, plastic
- 1x Beaker plastics, 100 ml
- 1x Graduated cylinder plastics, 100 ml
- 1x Immersion probes, set of, SE
- 2x Manometer-tube, acrylic, D=8 mm, L=200 mm
- 1x Acrylic tube, D=20 mm, L=120 mm
- 1x Stopper silicone, 12.5/18/27 mm, 1 hole
- 1x Test tube glass 12x100 mm
- 4x Slotted weight, 50 g
- 4x Slotted weight, 10 g
- 2x Holder for slotted weights, 10g
- 1x Balance weights set, 1...50 g
- 2x Support rod, round, L=500 mm, D=10 mm
- 1x Acrylic tube, D=8 mm, L=80 mm
- 1x Hollow block (Archimedes)
- 1x Aluminium block
- 1x Block iron with hook, big
- 1x Block iron with hook, small
- 1x Coil spring 3 N/m, D=35 mm approx.
- 1x Coil spring 20 N/m, D=12 mm approx.
- 1x Lever rod for balance SE, L=420 mm
- 1x Flat spring steel, 0.4mm, L=165 mm
- 1x Capillary tubes, set of 3
- 1x Pulleys, set of (4 pieces), plastics
- 1x Tubing plastics, 100 cm, transparent
- 1x Tubing plastics, 16 cm, transparent
- 2x Dynamometer 2 N, transparent

**Storage:**

- 1x Box-insert Mechanics 1, SE
- 1x Storage box II big, with cover
- Box -insert plan with 2 labels



ESP59742







### Dynamic Kit

Kit consisting of:

- 2x Dynamics trolley
- 4x Slotted weight, 50 g
- 3x Slotted weight, 10 g
- 1x Holder for slotted weights, 10g,
- 2x Spring bumper
- 1x Pulley with very low friction
- 2x Car body for trolley
- 1x Flat spring for collision experiments with trolleys
- 1x Support rod, round, L=60 mm, D=10 mm
- 1x Measuring tape, L=300 cm
- 1x Trolley with variable speed
- 1x Track and optical bench,
- 2 x 50 cm, alu rail profile, anodized,
- 1x Rail bond , universal

Storage:

- 1x Box-insert Dynamics
- 1x Plastic box II big, with cover,
- Box -insert plan with 2 labels.



ESP59743





**Mechanic Kit Panel Type**

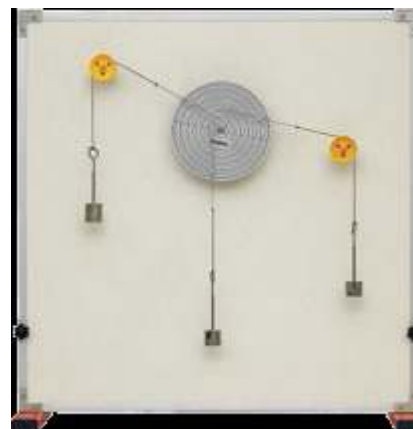
Used for investigate the nature of force by statics methods. It also help student to acquire better understanding on the concept of force, moment of force (torque) and their application to the concept of equilibrium of bodies and on the understanding of various concept used in simple machines as the mechanical advantage and the law of conservation of mechanical energy.

Experiment Topics :

- P 12 05 Hook's Law and the Measurement of Force
- P 12 08 Equilibrium and Resultant Forces
- P 12 09 Resolving a Force
- P 12 10 1 Torques for Parallel Forces
- P 12 10 2 Torques for Non-Parallel Forces (Part 1)
- P 12 10 3 Torques for Non-Parallel Forces (Part 2)
- P 12 11 Center of Gravity and Center of Mass
- P 12 12 Equilibrium of Extended Body
- P 12 06 1 Simple Machines: The Inclined Plane
- P 12 01 3 Simple Machines: The Lever
- P 12 02 4 Simple Machines: The Pulley
- P 12 03 1 Sliding Friction
- P 14 04 1 Simple Harmonic Motion: Oscillation of Mass Hanging on a Spring
- P 14 03 3 Simple Harmonic Motion: The Simple Pendulum

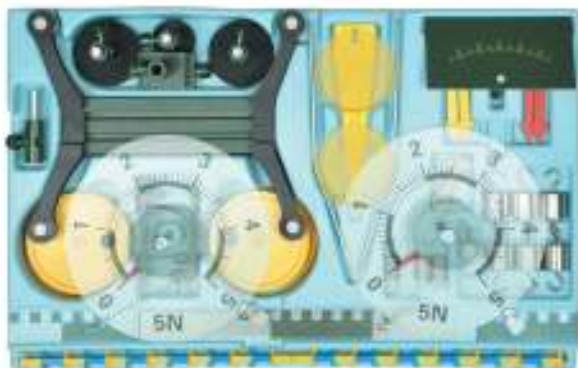
Magnetic mounting system for fast and easy setup  
Scale for convenience and accuracy

**Dimensions :** (L) 66.00 x (W) 62.00 x (H) 15.00 cm  
**Weight :** 12.000 kg



ESP59745





**Demo Mechanic Kit 1**

Consist of:

- 1x law base, magnetic, L = 200 mm
- 2x Magnetic base, D = 66 mm, with tube and pin
- 1x Magnetic base, D = 43 mm, with tube and pin
- 1x Sliding saddle, H = 34 mm
- 1x Stand tube, H = 40 mm
- 2x Torsion dynamometer 5 N
- 6x Weight on hook, 100 g, unpainted
- 1x Weight on hook, 20 g, unpainted
- 1x Coil spring, 10 N
- 2x Coil spring, 5 N / m, D = approx. 16 mm
- 1x Flat spring steel, 0.6 mm, L = 300 mm
- 1x Lever rod demo, L = 520 mm
- 1x Pointer for lever 520, metal
- 1x Scale on support
- 2x Scale pan with handle, Demo
- 4x Pulley, plastic, D = 100 mm
- 2x Bracket for pulleys D = 100 mm
- 1x Cord, white, L = 5 m
- 1x Measuring tape with scale in blocks, magnetic
- 2x Pointer, red, magnetic
- 2x Pointer, yellow, magnetic

**Storage:**

- 1x Box insert Static Mechanics 1
- 1x Storage box II big, with cover

ESP59747

**Demo Mechanic Kit 2**

consisting of:

- 1x Plate for testing centre of gravity
- 1x Plumb line
- 1x Inclined plane, simple (02)
- 1x Holder for torsion dynamometer for inclined plane
- 1x Ring for force table
- 1x Rubber band, wide
- 1x Roller
- 1x Friction block, multifunctional
- 1x Wheel and axle, demo
- 1x Crank pin, L = 50 mm
- 1x Drive belts, set of 2
- 1x Gear with 20 teeth, red
- 1x Gear with 40 teeth, yellow
- 1x Gear with 60 teeth, green
- 1x Pair of scissors, SE
- 1x Dynamics trolley, demo, 50 g
- 1x Belt pulley D = 100 mm, yellow

**Storage:**

- 1x Box insert Static Mechanics 2
- 1x Storage box II big, with cover.

ESP59748





**Predicting Trajectories**

Students explore the vertical and horizontal components of projectile motion in this laboratory investigation using ramps, time trials, and a three man slingshot. Topics include trajectory motion, acceleration due to gravity, speed, and velocity. Includes guided calculations and encourages the use of calculation to predict apex and landing. After learning the basic concepts, students go outside and collect data using water balloons and a three man sling shot! Includes instructor's manual, student worksheets, ramps, ball bearings, stopwatches, metric tapes, paper cups, string, washers, three man slingshot, and water balloons. Appropriate for any level physics course (including AP) as well as general science courses. Designed for working in groups of four to six, with materials sufficient for up to 36 students. Meets national standards for grades 9-12.

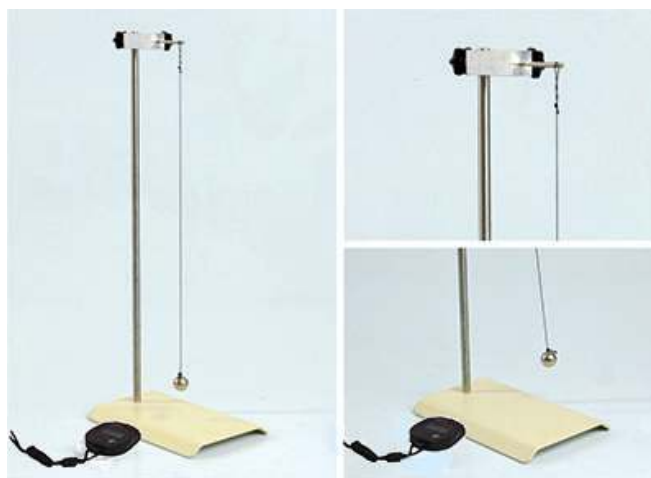
ESP59750



**Circular Motion**

A simple experiment for studying centripetal force. Topics also include tangential motion and centripetal acceleration. Students record real data to calculate real forces. Includes instructor's manual, guided calculations and assessment questions, sample data, complete answer keys, and materials for all experiments. Also includes a teacher demonstration. Required, but not included: balance or scale accurate to .01 g. Appropriate for any level physics course (including AP) as well as general science courses. Designed for working in groups of four to six, with materials sufficient for up to 36 students. Meets national standards for grades 9-12.

ESP59753



**Simple Pendulum Experiment Kit**

Consist of:

- Stand Base and Rod, Steel plate 1 pc
- Boss-head, Universal 1 pc
- Bearing Pin 1 pc
- Nylon Thread 1 pc
- Digital Stopwatch 1 pc
- Ball for Pendulum 35 g 1 pc
- Ball for Pendulum 70 g 1 pc
- Ball for Pendulum 105 g 1 pc

**Dimensions :** (L) 62.00 x (W) 30.00 x (H) 9.00 cm

**Weight :** 3.300 kg.

ESP59756



**Rotary pendulum kit**

This apparatus is used to investigate oscillation as damping is varied. Free, forced and chaotic oscillation may be generated.

The resonator consists of a wheel with spokes, made of sheet copper and mounted on ball bearings, with a flat spiral spring. The resonator is excited by means of lever mechanics, using a drive motor connected to a cam.

Rough or fine adjustment of motor speed is possible. Damping is provided by an eddy current brake. Surrounding the resonator is a scale shaped like a ring. Slits in the scale and pointers on the resonator and exciter lever can be used to project shadows for better visualising how the experiment works. Apparatus mounted on a base plate.

Motor power supply: 24 V DC, min. 600 mA

Damping unit power supply : 0 - 12 V DC, continually variable

**Dimensions :** 400 x 140 x 270 mm

ESP59765



**Centrifugal Force Demonstrator**

Use to show the effect of mass, radius, and velocity on the centripetal force of a rotating thread length 100cm , rod length : 17 cm , Pendant 10g X 7.

ESP59755





**Circular Motion Student Kit**

With this set the following experiments can be performed:

- Centrifugal force
- Centrifugal force - suspended balls
- Regulator for centrifugal force
- Centrifugal force - earth flattening rings
- Rotating liquid
- Rotating pendulum (Foucault pendulum)

**Kit consisting of:**

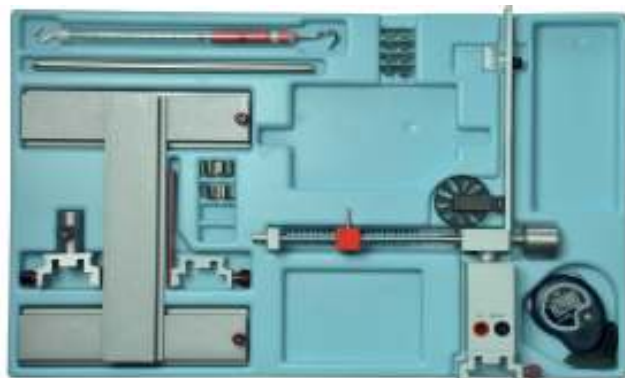
- 1x Centrifugal hoops "compact"
- 1x Watt's governor "compact"
- 1x Foucault's pendulum "compact"

- 1x Floating disk "compact"
- 1x Locking screw M3, small
- 1x Steel balls 1/2" (12.7 mm), set of 2
- 1x Rotational dynamics
- 1x Pivot bearing with transmission gear
- 1x Magnetic base for drive pulley "compact"
- 1x Drive pulley "compact", D = 100 mm
- 1x Drive belt "compact"
- 1x Assembly platform for MBCs

**Storage:**

- 1x Box insert Circular motion, SE
- 1x Storage box II small, with cover
- Box insert plan with 2 labels.

ESP59752



**Centripetal Force Apparatus**

Set includes the following :

- 1 Centripetal force apparatus with motor
- 1 Sliding saddle, H=40 mm
- 1 Slider with gate for centripetal force apparatus
- 2 Slotted weight, 50 g.
- 4 Slotted weight, 10 g.
- 1 Dynamometer 2 N, transparent
- 1 Hand-held stopwatch, digital, 1/100 s
- 1 Stand rail, 300 mm
- 2 Rail claw, simple.

ESP59754





**Simple Pendulum**

Students use simple pendulums to accurately determine the passage of time. Real data is recorded as students determine the effects of independent variables on periodicity while also learning about kinetic and potential energy. Includes instructor's manual, reproducible stepwise instructions for students, guided calculations, assessment questions, sample data, complete answer keys, and all materials for activities. Required, but not included: balance or scale accurate to .01 g. Appropriate for any level physics course (including AP) as well as general science courses. Designed for working in groups of four to six, with materials sufficient for up to 36 students. Meets national standards for grades 9-12..

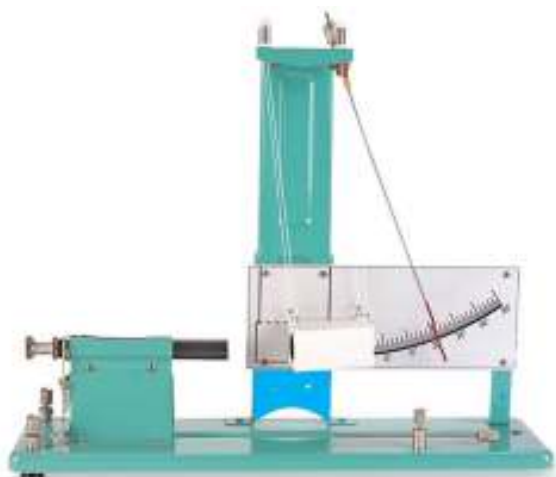
ESP59757



**Pendulum Clamps**

Any one of the pendulums can be adjusted without disturbing the others 28cm long clamp consists of a support arm attached to a rod clamp. Thumb screws keep suspended cords secure.

ESP59760



**Ballistic Pendulum Apparatus**

Unit uses a nylon pendulum with a tapered rubber insert. Both pendulum and base have levelling screws. Spring-loaded gun has a self-locking trigger and a rubber bumper to prevent damage on impact. The scale is marked in degrees and is registered by a counter-weighted needle that remains in place at the height of the arc. Grades 9-12.

ESP59763

**Pendulum Bobs**

Pendulum Bobs, Comprising a solid sphere with a small ring for suspension. Different Diameter and Material.

- ESP59768 Dia : 13 Mm Brass
- ESP59769 Dia : 19Mm Brass
- ESP59770 Dia : 25Mm Brass
- ESP59775 Dia : 13 Mm Copper
- ESP59776 Dia : 19Mm Copper
- ESP59777 Dia : 25Mm Copper
- ESP59789 Dia : 13 Mm Lead
- ESP59790 Dia : 19Mm Lead
- ESP59791 Dia : 25Mm Lead



- ESP59796 Dia : 13 Mm Aluminium
- ESP59797 Dia : 19Mm Aluminium
- ESP59798 Dia : 25Mm Aluminium
- ESP59782 Dia : 13 Mm Iron
- ESP59783 Dia : 19Mm Iron
- ESP59784 Dia : 25Mm Iron





**Accelerated Motion**

Students investigate accelerated motion using a totally reusable system with six foot tubular ramps, toy cars, bearings, and other required materials. This simple apparatus allows students to use timed trials to measure gravitational acceleration and the car's/ball's Coefficient of friction. High school curriculum includes kinetic and static coefficients of friction as well as bodies on inclined planes. Includes instructor's manual, reproducible stepwise student instructions, guided calculations including graphing of data and calculation of error, assessment questions, sample data, and complete answer keys. Appropriate for any level Physics course (including AP) as well as general science courses. Includes separate problem sets for general science and higher level Physics courses. Designed for working in groups of four to six, with materials included sufficient for up to 36 students. Meets national standards for grades 9-12.

ESP59800



**Friction Block, Multifunctional, 40X40x160mm**

For experiments on static, dynamic and rolling friction  
Surfaces: Wood, rubber, leather and abrasive paper  
Wooden area can be doubled when opening the body.  
**Dimensions :** 40 x 40 x 160 mm | Mass: approx. 200 g.

ESP59911



**Friction Block**

Aluminium block with 2 socket 4 mm for attaching plug-in components. Use with the dynamometer for frictional forces in static and sliding friction.  
2 Surface are rubber coated.  
Overall **Dimensions :** 50 x 40 x 20 mm  
Material : Aluminium and rubber  
Part of Mechanic Kit for Junior High School (ESP59740).  
**Dimensions :** (L) 5.00 x (W) 4.00 x (H) 2.00 cm

ESP59802



**Ticker Tape Timer 1**

This is a modern version of a Ticker Timer, enclosed in a plastic moulded case with a provision of 20/S and 50/S striking rates to determine the velocity and acceleration of a dynamic cart. Operates on 6volt AC.

ESP59804

**Ticker Tape Paper Roll 50 Mtr**

50mtr of paper tape roll

ESP59805

**Ticker Tape Timer Carbon Disc, 50Mm Dia**

Carbon paper disc, 50mm dia, cut from carbon paper pasted on hard paper sheet for long life durability and reusable. Box of 50.

ESP59806





**Ticker Tape Timer, Superior**

Two Crystal-controlled, Calibrated Frequencies: (10 Hz and 50 Hz), accurate to 0.1%. The 50-Hz frequency is ideal for free fall experiments. The slower 10-Hz frequency is best for most dynamics track experiments. Includes an Internal 9-V Battery, or Use an Optional External 9-V AC Adapter/ Power Supply. Carbon Paper Discs: Used for printing. The adjustable disc holder allows the printing point to be adjusted, giving a long life to the discs.

ESP59807



**Ticker Tape Timer 2**

For recording one dimensional motions (type motion, speed, acceleration) of a trolley or falling weight by analysing ticks on 9.5 mm ticker tape which are produce at fixed frequency together with motion of the objects.

**Dimensions :**

-140 x 70 x 60 mm

**-Weight :** 140 gr

Supply Voltage: 3-6 V, AC / DC

Time marker: 50 Hz

Pulse width : 0.02 second

**Dimensions :** (L) 14.00 x (W) 7.00 x (H) 6.00 cm

**Weight :** 0.140 kg

ESP59808



**Ticker Tape Timer 2 With Electronic Synch.**

For recording one dimensional motions (type motion, speed, acceleration) of a trolley or falling weight by analysing ticks on 9.5 mm ticker tape which are produce at fixed frequency together with motion of the objects.

**Dimensions :**

-Overall 140 x 70 x 65 mm

**-Weight :** 154 g

Supply Voltage : 3-6 V, AC / DC

Time marker : 50 Hz

Pulse width : 0.02 second

Used neodymium magnetic on the bat plate

Complete with electronic circuits for synchronizing vibration

**Dimensions :** (L) 15.32 x (W) 8.32 x (H) 8.14 cm

**Weight :** 0.185 kg

ESP59809



**Ticker Tape Timer 2 With Clamp Rider**

For recording one dimensional motions (type motion, speed, acceleration) of a trolley or falling weight by analysing ticks on 9.5 mm ticker tape which are produce at fixed frequency together with motion of the objects.

Overall **Dimensions :** 140 x 70 x 86 mm

Supply Voltage : 3-6 V, AC/DC

Time marker : 50 Hz

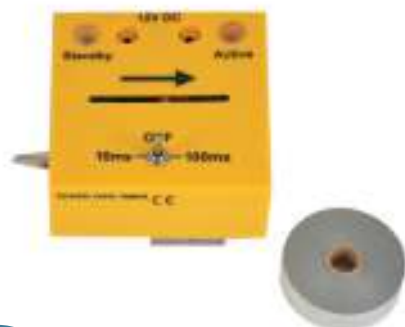
Pulse width : 0.02 second

Use with Trolley and Precision Rail. For the paper tape spare can be used Paper Tape, for Ticker Timer.

**Dimensions :** (L) 14.00 x (W) 7.00 x (H) 8.60 cm

**Weight :** 0.154 kg

ESP59810



**Ticker Tape Timer Electronic For Dynamic Kit**

For recording sequences of linear motion on a track or during free-fall experiments by means of markings on metallic paper ESP59812

Selection switch: 10ms - off - 100ms

Voltage source: 12 V DC

**Dimensions :** 84x84x66 mm

ESP59811







**Metallic Paper, Roll For Ticker Tape Timer Esp59811**

Recording paper for ticker tape timer ESP59811, Length: approx. 30 mm, W=15 mm

ESP59812



**Dynamics Trolley, Demo, 120X68 mm**

Trolley body and wheels of ABS plastic, runs with very little friction, 4 mm holes at the ends for attaching devices with 4 mm plugs, 2 mm hole for attaching string with plug two holes on the side for fastening weights, one centred, tapped hole for screwing in turret .  
Dimensions of trolley body: 120x66 mm.

ESP59814



**Car Body For Trolley ESP59814**

Can be attached to ESP59814 Dynamics trolley

ESP59815



**Adapter For Inelastic Collision For Trolleys ESP59814**

ESP59818



**Flat Spring For Collision Experiments With Trolleys ESP59814**

For demonstrating the law of conservation of momentum  
Elliptically shaped steel flat spring with 4 mm plug pin, may be inserted into dynamics trolley demo ESP59814  
Spring width: 10 mm

ESP59816



**Spring Bumper For Trolleys ESP59814**

For demonstrating the law of conservation of momentum;  
elliptically-shaped steel flat spring with 4 mm plug pin, may be inserted into dynamics trolley demo ESP59814  
Spring width: 10 mm  
**Weight : 10g**

ESP59817



**Dynamic Trolley, Wooden**

This pair of identical wooden trolleys 300mm long mounted on three wheels. A spring loaded rod is fitted to give impulse when released. Supplied complete with 3 elastic rings, 3 springs, 8 pins (for stacking), 2 rubber corks, 2 needles and 1 releasing pin.

ESP59819





**Dynamic Trolley Set, Superior**

This pair of identical wooden trolleys 300mm long mounted on three wheels with ball bearings and a spring loaded plunger is fitted to give impulse when released. Another trolley mounted on four wheels with ball bearings to give friction-less experiments. Supplied complete with 3 elastic rings, 3 springs, 4 pins (for stacking), 2 rubber corks. Supplied with 2 Masses and 2 Height Adjustable Pulleys.

ESP59821



**Dynamic Trolley (Cart), 1 Kg**

A pair of trolleys (carts) the body of which is made of metal plate, with wheels made of plastic on ball bearings so that it move with very small friction. One of the cart is provided with clamps bands and three level spring loaded plunger.

Overall **Dimensions** : 41 x 14 x 17.5 cm

**Material :**

- Cart : Steel
- Wheel : Plastic

The mass of each cart is 1000 g ( 1% accuracy)

**Dimensions** : (L) 41.00 x (W) 14.00 x (H) 17.50 cm

**Weight** : 1.980 kg

ESP59823



**Dynamic Trolley For Mechanic Kit With Motor**

Trolley with DC motor designed for mechanical experiment, especially for linear motion. Have a clip mounted on trolley body to hold end of ticker tape.

Can be run on precision rail with two kind of velocity. Equipped with 2 pcs 1.5V AA battery.

**Dimensions** : 98 x 52 x 56 mm

**Material :**

- Cart : Aluminium
- Wheel : Plastic

Equipped with speed control switch and socket 4 mm

Mass approx. : 200 g

**Part of :**

Mechanic Kit for Junior High School (37 items), Mechanic Kit for Junior High School, Mechanic Kit for Junior High School, Mechanics Kit for Senior High School (37 items), Physics Experiment Tools Package for Senior High School

**Dimensions** : (L) 12.00 x (W) 6.00 x (H) 7.00 cm

**Weight** : 0.200 kg

ESP59825



**Hall's Car Single**

Study the relationship between work and energy with this virtually frictionless plastic-wheeled car. Plastic-moulded body has a deep central well for weights and covered wheels that snap back into place if dropped. High-tech partially recessed sleeve bearings never need adjustment. Instructions. Hole at one end for attaching strings.

ESP59827



**Dynamic Trolley With Variable Speed**

Battery powered, for experiments on uniform movement, Potentiometer for stage-less adjusting of the speed. Mode switch: Ahead/Off/Back, sockets for external power supplying(non – uniform movement), Battery (9V) can be changed without opening the housing

ESP59830





**Trolley With Motor**

Trolley with DC motor designed for mechanical experiment, especially for linear motion. Have a clip mounted on trolley body to hold end of ticker tape. Can be run on precision rail with two kind of velocity. Equipped with 2 pcs 1.5V AA battery.

**Dimensions :** 98 x 52 x 56 mm

**Material :**

- Cart : Aluminium
- Wheel : Plastic

Equipped with speed control switch and socket 4 mm

Mass approx. : 200 g

**Part of :**

Mechanic Kit for Junior High School (37 items), Mechanic Kit for Junior High School, Mechanic Kit for Junior High School, Mechanics Kit for Senior High School (37 items), Physics Experiment Tools Package for Senior High School,

**Dimensions :** (L) 12.00 x (W) 6.00 x (H) 7.00 cm,

**Weight :** 0.200 kg

ESP59829



**Stand Rod 10 X 100 Mm, Stainless Steel**

inUsed as pillars in some experiments.

**Dimensions :** 10 x 100 mm

Material : Stainless steel solid Part of Mechanics Kit for Senior High School.

**Dimensions :** (L) 10.00 x (W) 1.00 x (H) 1.00 cm

ESP59834

**Stand Rod 10 X 1000 Mm, Stainless Steel**

**Dimensions :** 10 x 1000 mm

Material : Stainless steel solid Part of Free Fall Apparatus.

**Dimensions :** (L) 100.00 x (W) 1.00 x (H) 1.00 cm

**Weight :** 0.000 kg

ESP59835

**«G» By Free Fall Apparatus - Superior**

This easy to operate system is designed to demonstrate uniform acceleration due to gravity and its determination and to demonstrate conservation of mechanical energy.

**Components:**

- Support (1.80 m height)
- Electromagnet to hold the ball
- 2 highly sensitive photoelectric sensors
- Graduated ruler (1.50m length)
- Ball receptacle
- Stable cast base
- 3 screws to adjust the support in the vertical plane

Principle: The electromagnet holds the steel ball at the top of the support. When you press the button on the control box the ball falls down. During the motion the ball starts and stops the clock using the photo cells. Supplied with Digital Timer feature with Electromagnetic Control.

ESP59838





**Free Fall Apparatus**

This apparatus is designed to help the student in understanding the free fall. viz : Falling steel ball measurement, inspecting the relationship between altitude and the time taken and measuring the gravity acceleration. Time counter usage makes it possible to measure the free fall time accurately up to 100 micro second graduation. Free Fall time is measured using two photo gates. When the ball is released, Timer counter is automatically start counting the time. The timer counter will read the time taken by the ball from the magnetic holder through each of photogates. When the ball has passed the second photo gate then the Timer counter automatically stop measuring.

**Free Fall Apparatus consist of :**

- Stand Base 190 mm, A-Shaped 1 pc
  - Stand Rod 10 x 1000 mm, Stainless Steel 1 pc
  - Holding Magnet 1 pc
  - Photo-gate ES 2 pcs
  - Steel Ball 19 mm 1 pc
  - Plumb Bob 1 pc
  - Boss-head Clamp 3 pcs
  - Measuring Tape 3 m 1 pc
  - Connecting Lead for Electromagnet 1 pc
  - Timer Counter 1 pc
- Dimensions :** (L) 122.00 x (W) 24.00 x (H) 21.00 cm  
**Weight :** 7.300 kg

ESP59840



**Free Fall Apparatus Superior**

This apparatus is used for acceleration experiment by gravity and energy conservation law Attaching a steel ball to the upper part of the support for experiment and pressing the switch of the controller causes the ball to fall off.

- The steel ball can be measured with a stopwatch using an optical sensor.

Configuration: 1 / 1000sec with stopwatch, electromagnet, cylindrical support, optical sensor with 2 tape measure

**Dimensions :** 220x160x1500mm

ESP59842

**Free Fall Demo Kit**

KIT Includes : Falling body apparatus "Jumbo" Timer for falling body apparatus Support base, large, L=500 mm, Boss-head cross-pattern, demo 03, Support rod, squared, L=750 mm

ESP59843

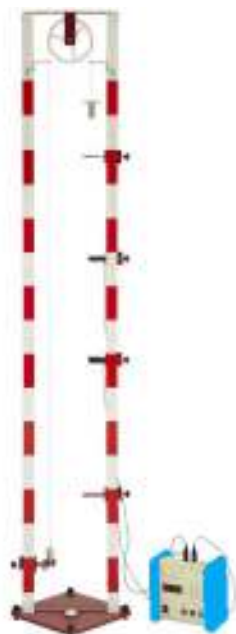


**Free Fall Tube**

Students may expect that lighter objects experience a lesser acceleration than heavier objects. That idea is supported by observing that when a piece of paper and a pencil are dropped simultaneously from the same height, the pencil reaches the ground first. What the students overlook is the action of aerodynamic force on the paper, which counteracts the gravitational influence. By evacuating air from the Free Fall Tube, the aerodynamic forces can be virtually eliminated as a variable in the demonstration. As a result, objects will fall with the same acceleration and reach the bottom of the tube at the same time. Consists of a plastic tube that is closed at each end by a vacuum-tight cap. The bottom cap is fitted with a stopcock for air evacuation.

ESP59845





**Atwood Machine 2.5 M**

Atwood Machine used for experiment uniform straight motion, uniformly accelerated motion, Newton's second law, and the calculation of the acceleration of gravity.

**Dimensions :**

- Pole height 250 cm
- Pulley 200 mm
- Each mass load (Cylinder Load with Nylon Cord) 100 g
- Additional load (slotted load) : ID 90 mm, OD 48 mm, weight 5 g

**Material :**

- Pole : Aluminium
- Pulley : Plexiglass
- Main load (Cylinder Load with Nylon Cord) : nickel plated brass
- Additional Load (slotted load) : Aluminium.

**Consist of :**

Scaled Parallel Pillars 1 pc, Precision Pulley 1 pc, Cylinder Load with Nylon Cord 2 pcs, Slotted Load 5 pcs, Catcher Platform with Hole 1 pc, Stopper Platform without Hole 1 pc, Mass Releaser Adjustable 1 pc, Buffer pole 2 pcs.

**Note :** Mounted on the wall. How to install, look in the manual book

**Dimensions :** (L) 0.00 x (W) 0.00 x (H) 0.00 cm

**Weight :** 3.500 kg

ESP59849



**Ballistics Base Unit, Demo**

For demonstrating ballistics using solid bodies or liquids; large metal scale with a coloured pointer, easily adjustable and lockable in position; hence readings can be taken from large distances; with the mounted table clamp and stand rail base profile the apparatus can be fixed to tables with a thickness of 48 mm; metal bracket for holding the launching ball; **digit height on scale :** 26 mm; **Dimensions :** 260 x 210 x 35 mm Please note: To perform the experiments, either a water throwing unit or a ball throwing unit is required!!

ESP59852



**Projectile Launcher**

A spring loaded gun hold two plastic balls on firing the gun, One ball falls straight down while the other is projected horizontally. The audible clicks when they strike the floor are simultaneous.

Size

**Pipe :** -175 x 60 x 350 mm - ID 16 mm - OD 20 mm

**Plastics ball :** Hole centre 2 mm - Ball 15.5 mm

**Material :** Plastic

ESP59854



**Ball Gun, Unit For Ballistics Base Unit ESP59852**

For demonstrating ballistics using a large ball, long pin with three striations for setting different launch speeds with tension spring, easily -triggerable trigger cylinder with finger grip for easy tensioning of the spring; may be fastened to the ballistics apparatus or ES rail profiles; incl. Wooden ball and hollow plastic sphere, D = 60 mm each; Please note : Ballistics apparatus (ESP59852) required to perform the experiments!

**Dimensions :** 180 x 54 x 60 mm

ESP59853



**Projectile launcher 2**

May be used as launcher allowing consecutive launching with the same force, for dynamics experiments involving a track; Long pin with 3 striations for adjusting and setting different speeds of launching, with tension spring, easily trigger-able trigger cylinder as well as a finger grip for tensioning the spring; may be fastened to special aluminium rail profile;

**Dimensions :** 240 x 60 x 50 mm

ESP59855





**Inertia Apparatus**

The plastic ball rests on the card - when you pull back the spring, the card shoots forward, but the ball returns to its perch on the post. This device illustrates the effect of inertia. To the observer, the ball seems not to have moved at all. Kit contains: plastic ball, stiff card, acrylic base, support post with cone-shaped depression, hardware to attach post and spring to base, and instructions. Grade 6 and up.

ESP59857



**Momentum Of Inertia Apparatus**

This tool is designed to determine the moment of inertia of various object using oscillation method. By measuring oscillation period, and put the value into an existing equation, then the moment of inertia of an object will be obtained. The moment of inertia value as the result of an experiment is compared to theoretical calculation result.

In one set of this tool, there are some test object such as ball, cylinder, disc and cone which are mountable on object container rigidly, so that it produces accurate experiment data result .One of the advantages of this tool is automatic data recording which is done by photo gates and the Timer Counter , so that data's are accurate. The Timer Counter can record up to twenty measurement data's.

ESP59858



**Air Track 1.5 M Complete Set**

Air Track is very ideal apparatus for kinematic and dynamic experiment which needs friction free state so that the experiment result is quantitatively better. Air track is provided with Photo Gates and Timer Counter which are specially designed for study in basic law of motion. Time measurement system consists of photo gates and a timer counter which is able to determine accurately the time interval when the glider passing through the photo gates. Time measurement system enables all time measuring in an experiment such as time measuring in two different places on the track and time measuring on events which are nearly at the same time such as in a collision experiment.

The air track, has 1.5 meter rail length , it is used for basic experiments only.

Provided with experiment manual book.

**Experiment topics:**

Uniform Motion, Uniform Acceleration, Instantaneous and Average, Velocity, Newton's Laws of Motion, Conservation of Momentum Conservation of Energy, Simple Harmonic Motion, Inertial and Gravitational Mass, Explosion, 'g' Measurement, Friction Force Along the Track

Some experiments need some other supporting tools or other components that can be borrowed from other kit.

ESP59860



**Air Track 2 M Complete Set**

Air Track is very ideal apparatus for kinematic and dynamic experiment which needs friction free state so that the experiment result is quantitatively better. Air track is provided with Photo Gates and Timer Counter which are specially designed for study in basic law of motion. Time measurement system consists of photo gates and a timer counter which is able to determine accurately the time interval when the glider passing through the photo gates. Time measurement system enables all time measuring in an experiment such as time measuring in two different places on the track and time measuring on events which are nearly at the same time such as in a collision experiment.

This air track has 2 meter rail length is use for advanced experiment.

Provided with experiment manual book.

**Experiment topics:**

Uniform Motion, Uniform Acceleration, Instantaneous and Average, Velocity, Newton's Laws of Motion, Conservation of Momentum, Conservation of Energy, Simple Harmonic Motion, Inertial and Gravitational Mass, Explosion, 'g' Measurement, Friction Force Along the Track

Some experiments need some other supporting tools or other components that can be borrowed from other kit.

ESP59865





**Air Track 1.5 M Complete Set II**

- High-pressure compressed air is discharged into a small hole on the track to move the glider (on the track) Equipment.
- You can make frictionless movement by adjusting the air on the top of the slide.
- Experiments without friction losses such as momentum conservation, equivalent speed motion, and one-dimensional collision can be performed.
- Optional: Photo gate timer Sliding track: aluminium tube 45x45mmx1.5m, 4 levelling screws
- Track cart: 200mm 2 pieces (with elastic plate) pulley unit: Includes weights, threads, springs, etc.
- Blower : AC220V 60Hz 1000W | Optional : 1. Track cart (100mm) - 2. Photo gate timer

ESP59861



**Timer For Air Track Set II**

ESP59871



**Kinetic Theory Model I**

To study the motion and behaviour of gas molecule, works on 9 to 12V DC, vibrates a small platform inside a transparent tube, which further vibrates steel balls inside the tube. Includes steel balls and two floats.

ESP59872



**Kinetic Theory Model II**

To study the motion and behaviour of gas molecule, works on 9 to 12V DC, vibrates a small platform inside a transparent tube, which further vibrates steel balls inside the tube. Includes steel balls and two floats.

ESP59874

**Pellets For Kinetic Theory Model II**

ESP59875



**Force Table**

For verifying laws of composition and resolution of forces, comprising machined aluminium table 40cm dia., Scale graduated 360°, on heavy vertical support rod and tripod base. Complete with one ring, 4 sliding clamp pulleys. Supplied with four cords with rings at one end, with set of slotted masses.

ESP59876



**Force Table Deluxe**

The classic table for studying a combination of forces! A steel support tube, cast legs, levelling screws, and a laminated table top make this unit very stable and highly functional for the study of equilibrium of force. Table Diameter 400 mm It is supplied with 4 sets slotted weights: 50g x1, 20g x9, 10g x1, 5g x2 | 4pcs pulley with clamps 4pcs wires | 1pc transparent protractor, and instructions.

ESP59877





**Pulley With Table Clamp**

5cm dia., Plastic pulley mounted on a 23.5cm long metal shaft with a table clamp. Pulley shaft is held in table clamp with a clamping screw.

ESP59883



**Pulley Multi-purpose**

Aluminium pulley, 70mm dia. In metal bracket with two clamping screws for bench and rod support respectively. The bracket may be clamped to a board or bench edge up to 38mm thick, screwed to a flat surface or held in a 13mm diameter support rod.

ESP59885



**Pulley Table Clamp**

Smooth running, ball bearing clamp pulley, can be clamped to surfaces up to 50mm thick and the 45mm diameter sheave is made of nylon.

ESP59887



**Pulley With Clamp Super**

Upgrade your force table and inclined plane experiments. The Super Pulley, with its integral clamp, makes set-up and alignment easy. The pulley height is fully adjustable, so you can skim the top of a force table for parallax-free readings, yet keep the force parallel to the track on an inclined plane as shown in the photo. Fits tables from 0 to 2.0 cm thick.

ESP59889



**Falling Bodies Apparatus**

Ball shooter for illustrating the principle of independent spaces horizontal and vertical motion: The throwing motion can be seen as composed of free-fall and horizontal motion. The shooter fires one ball horizontally and the other is released in free-fall. The supplied 19 mm steel balls are stored in the device.

**Dimensions :** 180 x 170 x 50 mm

ESP59895



**Projectile Launcher**

Projectile launcher is used for investigating the motion of projectile at different angle of projection (0-900). The angle is read by means of a plumb line that is attached to the unit. A spring loaded rod is used to project a ball (Projectile). This set up can be easily mounted on the edge of laboratory table.

ESP59898



**Collision In Two Dimensions**

This inexpensive apparatus provides data for investigating conservation of momentum and kinetic energy in collisions. It can also be used to compare elastic and inelastic collisions. A curved aluminium track and adjustable target support form the core of the unit. The kit provides two steel balls, a glass ball, a hollow wooden ball, and a plumb bob.

ESP59900







**Pulley Demonstration Set Advanced**

The Pulley Demonstration Set is designed to illustrate the working principle of simple machines. From the wheels on a bicycle to the gears in a car, the Pulley Demonstration System helps explain how things work. It helps student to understand the concepts of the mechanical advantage, the efficiency of fixed and moveable pulleys etc. Students perform quantitative experiments on fixed and moveable pulleys, trains of fixed and moveable pulleys, the wheel and axle and the capstan etc.

**The set includes :**

Wooden base includes Size 81 x 20cm capstans, sockets (2) and en eye hook.

Rods 3 (Dia. 12.5mm x L 81cm), Collars with Hook 8, Right Angled Clamps 3, Wheel and Axle 1, Bar for tightening 1, Vertical Rods, Masses Slotted Weights. 2x10gm, 2x20gm, 2x50gm, 4x100gm, 4x200gm, 1x500gm Total 15 weights.

Weight Hangers. 5x50gm, 1x20gm, 1x10gm.

ESP59892



**Pulley Demonstration Set Student's**

Used to demonstrate the concepts of force and mechanical equilibrium.

Contains a polished wooden base with a capstan mounted at one end and screw eye for hanging pulleys at the other, 24 degree vertical support rod, 8 degree crossbar with clamp, 8 single pulleys, 2 double pulleys, wheel and axle, 6 pulley clamps, 90 degree clamp, 9 hooked masses ranging from 10 to 1,000 g, pulley cord, and instructions.

ESP59893



**Collision Balls (Newtons Cradle)**

This economy apparatus demonstrates elastic collision well. Features a steel frame supporting five steel supporting five steel balls on tough nylon mono-filament. Completely assembled.

ESP59902



**Friction Apparatus**

This set includes a friction block and a friction board, both made of smoothly finished pine wood. The friction block has a hook for spring scale and two compartments for additional weights. It can be placed face-up or sideways. Students can vary the weight or area of contact to see their impact on the friction force. Comes with three 50 g weights and a 100 g spring scale. Size of board: 20 in. x 2 in.

**Size of block :** 4 in. x 1-1/2 in. x 1 in. Grade 6-college.

ESP59904



**Friction Board Apparatus**

To demonstrate conversion of energy, conservation of momentum projectile motion. Consists of a metal ball track to drop a steel ball. Includes two steel balls. Approx. 50cm Having provision for adjustable height which can measure degree on graduated metal scale with plumb line on metal base.

ESP59906





**Inclined Plan and Friction Board**

Use this device to study the friction between two surfaces and the forces on an inclined plane. The inclined board can be set at any angle between 0° and 45°. A hanging pan is provided to hold the desired weight. Three different-sized boards with eye hooks and a metal plate are included. Students can determine the coefficient of static friction and the coefficient of sliding friction and verify the normal and frictional components of the force exerted by the plane. Activity manual included. 26 in. x 15 in. x 4 in.

ESP59908



**Inclined Plane, Complete Set Demonstration**

For experiments on static, dynamic and rolling friction; Surfaces: Wood, rubber, leather and abrasive paper. Wooden area can be doubled when opening the body. **Dimensions** : 40 x 40 x 160 mm. Mass: approx. 200 g

ESP59910



**Friction Block, Multifunctional, 40X40x160mm**

For experiments on static, dynamic and rolling friction Surfaces: Wood, rubber, leather and abrasive paper. Wooden area can be doubled when opening the body. **Dimensions** : 40 x 40 x 160 mm. Mass: approx. 200 g.

ESP59911



**Impact Testing Apparatus**

Complete set

ESP59916



**Loop The Loop Apparatus**

This unit demonstrates the transformation between kinetic and potential energies when a steel ball runs on the 52 in. Looped aluminium track. 8 in. dia. loop. Track is mounted on a 11-1/2 in. x 4 in. Sturdy wood base. Attached basket safely catches ball. Includes two chrome plated steel balls. One-year warranty. Grade 12 and up.

ESP59913



**Loop The Loop, Advanced**

To demonstrate conversion of energy, conservation of momentum projectile motion. Consists of a metal ball track to drop a steel ball. Includes two steel balls. Approx. 50cm Having provision for adjustable height which can measure degree on graduated metal scale with plumb line on metal base.

ESP59914





### Steam Engine With Boiler

Working model, with boiler, safety valve, whistle, steam chamber and flywheel, on base, to drive dynamo models etc.

ESP59936



### Steam Generator

Seamless, III-aluminum construction

Will not collapse even if boiled dry

Durable walls are 1.5mm thick

All parts are of the same alloy, keeping corrosion to a minimum

Boiler with cap, nipple, sample cup with wooden handle, two no. 8 rubber stoppers (one with hole for thermometer), tripod stand and ring, instructions

ESP59938



### Flywheel Unit

Steel fly wheel 100 mm diam. with pulley 20 mm diam. on shaft held in brackets, mounted on base.

ESP59935



### Stirling Engine Generator

This Stirling Engine Model is a unique heat engine to show students how thermal expansion and cold shrinkage can create energy. The compact, easy-to-use engine model uses a closed-cycle thermodynamic system in which air is compressed and expanded at different temperatures to create heat energy. You see it working as the generator gains speed and begins to power LED lights.

ESP59940



### Thermoelectric Generator

This thermo electric generator demonstrates how heat energy can be converted directly into electrical energy, by placing one of the leg into hot water and the other one into cold water then enough electrical energy is generated to power the electric motor and turn the propeller.

ESP59942



### Wind Generator

Renewable energy is all around us. Learn about wind power, how to harness, young scientists will be excited about wind energy.

ESP59944



### Stirling Engine Model Transparent

Overhead functioning models (OFM)

For demonstrating the movements involved in heat engines and explaining how they work using an overhead projector, acrylic model with coloured parts, including drive shaft,

Base panel : 248x248 mm.

ESP59941





**Thermal generator with clamp**

For conversion of thermal energy into electrical energy or vice versa; acrylic housing with centrally arranged Peltier element between two cubic aluminium containers, fixed upright section with 2 safety jacks and holders for thermometers, clamp for fastening the aluminium containers to the Peltier element,

Peltier element : Max. 15 V / 3.5 A;

Aluminium container : 50 ml each

**Dimensions** : 85 x 55 x 80 mm

ESP59943



**Turbine Model**

To show conversion of mechanical energy into electrical energy. Turbine with transparent cover, inlet and outlet tubes directly connected to a dynamo. Fitted on base.

ESP59947



**Eddy Current Apparatus**

Effective device for demonstrating Lenz's law using eddy currents induced in the wall of a copper tube by a falling magnet. Two identical metal slugs with rubber ends caps, one is made of plain steel, and the other is a strong neodymium magnet. Kit also includes an activity guide.

ESP59950



**Hand Generator (Flashlight)**

This generator can be utilized with almost any experiment requiring up to 12V DC current. Housed in tough clear plastic, this unit is not only functional, but costs about half that of similar models. Can also be used as a hand-generated flashlight due to the mounted lamp on the end or use the binding post to connect an outside electrical circuit. Pistol-grip handle. Grades K-12.

ESP59952



**Turbine Model With Motor / Generator**

Easy-to-turn motor (solar motor) with long shaft for attaching a Pelton turbine, supplied with transparent Pelton Turbine unit. 4 holes on top for locking the Pelton turbine; two 4 mm safety jacks on side; ready to go at just 200 mV / 20 - 30 mA;

Magnetic housing with transparent base plate;

**Dimensions** : 84 x 84 x 39 mm.

ESP59948





### Motor Generator AC/DC Demo. Activity Model

An excellent activity model for study of the generation of electric current. The generator produces AC/DC current simultaneously when the hand wheel is turned. The generation of the AC/DC voltage is represented by bulbs. Output is through 4 mm sockets and a low voltage bulb is also provided as a simple output indicator.

ESP59955



### Solar Energy Kit Combined

Apply knowledge of solar energy in a practical experiment with this Solar Energy Kit. A solar panel housed in a metal stand, a low consumption motor with fan, a buzzer and an LED are all included for conducting a series of solar powered activities.

ESP59957



### Solar Energy Kit, Wooden Box

To demonstrate the effect of solar power in various devices, Each component in this kit connects to the solar cell. The kit includes a mounted solar cell with terminals, a motor, a LED, a rechargeable battery and an ammeter mounted on a base. Housed in a fine Wooden box. With instructions.

ESP59958



### Motor Mounted For Solar Cell

This is a small low consumption electric motor on a base specially designed to run directly from the output of the solar cell and to illustrate the direct conversion of light energy to electrical and hence to mechanical.

ESP59962



### Solar Combination Unit

Mounted on a Plastic base size 350 x 90 x 20mm approx.

A mains 60W bulb fitted on Screw type holder.

Supplied with compatible Solar Cell which further gives energy together to a Low Voltage Speaker and Low Voltage Motor fitted with Color Newton Disc.

ESP59961



### Solar Cell Mounted

For use with the motor to demonstrate the production of electrical energy directly from light energy. The apparatus comprises a selenium photo-voltaic cell.

ESP59963



**Solar Cell**

This apparatus is design for observation on solar energy become motion, sound and light energy

Complete with a VOLTMETER to measure the voltage value from the solar cell and ammeter to measure the current value from the solar cell

**Dimensions :** 32.50 (L) x 26.50 (W) x 14.00cm (H)

ESP59964



**Solar Powered Car**

Explore green energy on a small scale! This solar car operates on sunlight or a rechargeable AA battery. A four-position switch allows you to choose between running the car on the solar cell or battery, recharging the battery from the solar cell, or off. The car can also operate using a strong lamp. Measures 4-3/4 in. L x 2-3/4 in. W x 3 in. H.

ESP59965



**Solar Hydrogen Education Kit**

Explore series and parallel circuits and other physics concepts with renewable energy power from a fuel cell and solar panel. Use the power of the sun to split water and generate hydrogen gas while learning about chemistry concepts.

ESP59967



**Student Hot Water Kit**

Complete working model of a solar unit; the water circulation is very clearly shown and is therefore easy to understand; temperatures measured in the collector, the heat exchanger and the flow system. t consisting of:

- 1x Solar collector ES, 1x Heat exchanger ES,
- 1x Pyrometry chamber
- 1x Circulating membrane pump
- Self-absorbing
- Low noise level
- Minimal power consumption
- Low weight
- Small housing
- Less vibrating
- Supply voltage: 2 ... 12 V DC
- Max. Power input: 20 ... 150 mA
- Free flow rate: 150 ml / min
- Max. Pressure: 6.0 m (water)
- Max. Static suction lift: - 3.0 m (water)
- 2 tube connectors dia. (Ext.) = 4.8 mm
- Installed in magnetic housing: 84 x 84 x 39 mm
- 3x Laboratory thermometer -10 ... +110 / 1 °C
- 4x Tubing silicone, D = 3 / 6 mm, L = 24 cm
- 1x Syringe 120 ml, plastic
- Storage:
- 1x Box insert Hot water
- 1x Storage box II small, with cover
- Box-insert plan with 2 label

ESP59968



**Fuel Cell Science Kit**

Investigate the science behind salt water fuel cell technology, either by powering the included mini-turbine or creating your own power applications. Features a magnesium salt-water fuel cell, teaching students how solution concentration can affect reaction rates using electricity and a salt-water electrochemical cell. Experiment with the electro-chemistry process and measure the output of your generator.

ESP59969





### Alternative Energy - Conversion, KIT

With the module Alternative energy-conversion experiments to the Following topics can be performed:

1. Making energy feelable (9 Experiments)
2. Wind Power (3 Experiments)
3. Thermal Power (3 Experiments)
4. Hydro Power (2 Experiments)
5. Energy and temperature (2 Experiments)
6. Sun - Photovoltaic (4 Experiments)
7. Fuel cell (3 Experiments)
8. Energy storage (3 Experiments)

ESP59972



### Renewable Energy Education Kit

Full PBL unit on clean power generation includes an exploration of the environmental effects of atmospheric carbon dioxide. Hands-on activities centre on complementary attributes of different renewable energy sources. Complete student and teacher materials for up to 10 class periods of activities. For 3-4 students.

ESP59971

### Alternative Energy - conversion student kit

Kit consisting of:

1x Fire piston, 1x Ignition cylinder, 1x MBC double solar cell, 1x Clinometer for double solar cell, 1x Electric car, model, 1x Turbine in casing, 1x Motor/generator, 1x Propeller, 1x Hand generator, 1x Energy storage, 1x lamp socket E 10, 5x Light bulb, 1.5 V/50 mA, E10, 1x Set of 6 cables, ES Storage:

1x Box insert Alternative energy - conversion

1x Storage box II big, with cover,

Box -insert plan with 2 labels

ESP59970





**Petrol Engine Model Two Stroke**

Showing internal structure and operating principles of a simple piston air cooled two stroke engine, Mounted on a metal base with schematic diagram.  
Overall Height 360 mm approx.

ESP59973



**Petrol Engine Model Four Stroke**

Air cooled, four stroke, with operation of valves clearly shown. Mounted on a metal base with schematic diagram  
Overall Height 450 mm approx.

ESP59975



**Diesel Engine Model Two Stroke**

A model of two stroke diesel engine made in aluminium and unbreakable plastic. Ignition is shown by means of a miniature bulb. Fuel supply is also sectioned. With hand crank, provided for manual operation.

ESP59977

**Diesel Engine Model Four Stroke Transparent**

Overhead functioning model (OFM)  
For demonstrating the movements involved in heat engines and explaining, how they work using an overhead projector; acrylic model with coloured parts, including drive shaft;  
**Base Panel :** 248 x 248 mm



**Two-Stroke Engine, Transparent Model**

Overhead functioning model (OFM)  
For demonstrating the movements involved in heat engines and explaining, how they work using an overhead projector; acrylic model with coloured parts, including drive shaft.  
**Base Panel :** 248 x 248 mm

ESP59974



**Four-Stroke Engine, Transparent Model**

Overhead functioning model (OFM)  
For demonstrating the movements involved in heat engines and explaining, how they work using an overhead projector; acrylic model with coloured parts, including drive shaft;  
**Base Panel :** 248 x 248 mm

ESP59976



**Diesel Engine Model Four Stroke**

Four stroke water cooled diesel engine, shows functioning of fuel injection system together with hot coil starting device.

ESP59979



ESP59980







### Gas Turbine / Turbojet Engine Model

Constructed by light but strong metal, fixed on a plastic base. All major parts like intake, double stage compressor, fuel supply, axial flow, combustion chamber, turbine rotor, exhaust and jet thrust etc. are shown in the model. Cross sectional view with key card is printed on the base.

ESP59981



### Steam engine, Transparent model

Overhead functioning model (OFM) For demonstrating the movements involved in heat engines and explaining, how they work using an overhead projector; acrylic model with coloured parts, including drive shaft.

Base Panel : 248 x 248 mm

ESP59982



### Mechanical Training Modules

ESP59983	Single stage spur gear	ESP60011	Belt drive toothed
ESP59984	Single stage spur gear with intermediate gear	ESP60012	Belt drive single speed
ESP59985	Tow stage spur gear	ESP60013	Belt drive tow stage
ESP59986	Three stage spur gear	ESP60014	Belt drive (contra rotation)
ESP59987	Three speed and reverse gear	ESP60015	Belt drive multi speed
ESP59988	Worm gear	ESP60016	Chain drive with tensioner
ESP59989	Bevel gear	ESP60017	Geneva drive (Maltese cross) output
ESP59990	Rack and quadrant gear drive	ESP60018	Sliding wedge gear with straight line & accurate
ESP59991	Reversing gear, tumbler type	ESP60019	Cam with straight line and lever follower
ESP59992	Epicyclic gear (sun and planet)	ESP60020	Face cam drive (free follower)
ESP59993	Cycloidal motion	ESP60021	Mechanical training modules -face cam drive (double sided trapped f)
ESP59994	Internal rolling gear drive	ESP60022	Oldham coupling
ESP59995	Internal gear and pinion drive	ESP60023	Differential gear
ESP59996	Helical gear	ESP60024	Lathe screw cutting
ESP59997	Spiral gear 90 degree	ESP60025	Shaper model
ESP59998	Spiral gear single stage with intermediate gear	ESP60026	Crank and connecting rod
ESP59999	Herringbone gear	ESP60027	Four bar link mechanism
ESP60000	Crank drive to oscillating link	ESP60028	Bevel gear type reversing mechanism
ESP60001	Crank shaft & slider mechanism	ESP60029	Scotch yoke mechanism
ESP60002	Tow crank and linkage drive (variable velocity)	ESP60030	Ellipse tracer
ESP60003	Crank and slotted link drive (oscillator)	ESP60031	Watt mechanism
ESP60004	Crank and slotted link drive (variable velocity)	ESP60032	Peaucellier linkage drive
ESP60005	Friction wheel drive circumference	ESP60033	Pantograph mechanism
ESP60006	Cone clutch drive (single sided)	ESP60034	Allen link motion
ESP60007	Cone clutch drive (tow speed)	ESP60035	Hobbing
ESP60008	Dog clutch drive (single sided)	ESP60036	Centrifugal mechanism and clutch drive
ESP60009	Dog clutch drive (tow speed)	ESP60037	Friction wheel drive (variable speed)
ESP60010	Flat belt drive (with tensioners)	ESP60038	Crank and slotted link drive - oscillator





**Dynamometer 2 N, With Round Dial**

Thanks to a very precise torsion spring, this dynamometer shows the correct value in all pull directions, not only vertically; due to the large scale, the displayed value can be seen from a distance, making this device is highly recommendable as a demonstration measuring device; torsion spring dynamometer with a rotatable pulley with a deep notch; easily visible red metal pointer; thanks to the rotatable metal scale the zero point can be quickly and easily adjusted; hooked cord for suspending objects; with support rod D = 10 mm, L = 30 mm;

**Measuring Accuracy :** approx. ±3%;  
**Digit height on Scale :** 15 mm;  
 Diameter of scale : 200 mm

ESP60044

**Dynamometer 5 N, With Round Dial**

Thanks to a very precise torsion spring, this dynamometer shows the correct value in all pull directions, not only vertically; due to the large scale, the displayed value can be seen from a distance, making this device is highly recommendable as a demonstration measuring device; torsion spring dynamometer with a rotatable pulley with a deep notch; easily visible red metal pointer; thanks to the rotatable metal scale the zero point can be quickly and easily adjusted; hooked cord for suspending objects; with support rod D = 10 mm, L = 30 mm;

**Measuring Accuracy :** approx. ±3%;  
**Digit Height On Scale :** 15 mm;  
**Diameter of scale :** 200 mm

ESP60045

**Dynamometer 10 N, With Round Dial**

Thanks to a very precise torsion spring, this dynamometer shows the correct value in all pull directions, not only vertically; due to the large scale, the displayed value can be seen from a distance, making this device is highly recommendable as a demonstration measuring device; torsion spring dynamometer with a rotatable pulley with a deep notch; easily visible red metal pointer; thanks to the rotatable metal scale the zero point can be quickly and easily adjusted; hooked cord for suspending objects; with support rod D = 10 mm, L = 30 mm;

**Measuring Accuracy :** approx. ±3%;  
**Digit Height On Scale :** 15 mm;  
**Diameter of scale :** 200 mm

ESP60046



**Dynamometer 1 N, With Round Dial**

Thanks to a very precise torsion spring, this dynamometer shows the correct value in all pull directions, not only vertically; due to the large scale, the displayed value can be seen from a distance, making this device is highly recommendable as a demonstration measuring device; torsion spring dynamometer with a rotatable pulley with a deep notch; easily visible red metal pointer; thanks to the rotatable metal scale the zero point can be quickly and easily adjusted; hooked cord for suspending objects; with support rod D = 10 mm, L = 30 mm;

**Measuring Accuracy :** approx. ±3%;  
**Digit height on Scale :** 15 mm;  
**Diameter Of Scale :** 200 mm

ESP60043



**Lever Demonstration**

Comprises of Approximately 50cm metal rule drilled every 4cm approx. or supplied with a movable rider. A set of suitable weights with hooks. A metallic base and stand to fix the lever in a fulcrum. 2 adjustable screws on the rule to adjust a fulcrum. Two pans to be able to change the lever to a simple balance. Supplied with weights packed in Plastic case.

ESP60078



**Kitchen Scale**

Capacity : 5000 G / 200 OZ , Sensitivity : 1 G, Display Mode : G & OZ , Key Function : ON / OFF , TAR,MODE , 1.1 LTR Container ( Optional), Low Battery Indicator , Overload Indication , Auto / Manual Shut-Off , Powered by 2 X CR2032 Lithium Battery

ESP60072





### Newton Meter

Newton meters, in robust plastic transparent body, overall length 285mm approx. With upper and lower suspension hooks, with zero adjustment, scales are both in grams and newtons.

- ESP60047** Newton Meter, 100Gm/1N, 1Gm
- ESP60048** Newton Meter, 250Gm/2.5N, 5Gm
- ESP60049** Newton Meter, 500Gm/5N, 10Gm
- ESP60050** Newton Meter, 1Kg/10N, 20Gm
- ESP60051** Newton Meter, 2Kg/20N, 40Gm
- ESP60052** Newton Meter, 3Kg/30N, 60Gm
- ESP60053** Newton Meter, 5Kg/50N, 100Gm



### Precision Dynamometer

The Precision Dynamometer is available in range of weight capacities and scales. They are incredible precise and are suitable for measuring weights, masses and forces. Each different weight capacity is color coded for ease of identification. As well as offering a high level of precision, these dynamometer are also easy to read enabling accurate readings to be taken quickly and precisely.

- ESP60060** Precision dynamometer, 100gm/1n, 2gm
- ESP60061** Precision dynamometer, 250gm/2.5N, 5gm
- ESP60062** Precision dynamometer, 500gm/5n, 10gm
- ESP60063** Precision dynamometer, 1kg/10n, 20gm
- ESP60064** Precision dynamometer, 2kg/20n, 40gm
- ESP60065** Precision dynamometer, 3kg/30n, 60gm
- ESP60066** Spring balance precision dynamometer, 5kg/50n, 100gm



### force Meter

Force meter, designed to work for mass and force activity. Dual calibrated in grams and newtons.

- ESP60054** Force meter, 250gm/2.5N, 5gm
- ESP60055** Force meter, 500gm/5n, 10gm
- ESP60056** Force meter, 1kg/10n, 20gm
- ESP60057** Force meter, 2kg/20n, 40gm
- ESP60058** Force meter, 3kg/30n, 60gm
- ESP60059** Force meter, 5kg/50n, 100gm



### Precision Dynamometer, 0,1 N

The most economic way to measure drag forces, therefore perfectly suitable for student use; accurate dynamometer with long and clearly visible Newton scale; zero-point correction; guard to prevent over-extension of the spring; the transparent case allows the functioning of the coil spring to be observed; with hooks for mounting the device and suspending weights.

**Measuring Accuracy** :  $\pm 2\%$

Length of scale : 100 mm

Dynamometer case : L = 215 mm

Reading : 0,001 N

blue coloured

**Dimensions** : D = 16 mm, total L = approx. 285 mm

**ESP60069**

### Precision Dynamometer, 0,2N

The most economic way to measure drag forces, therefore perfectly suitable for student use; accurate dynamometer with long and clearly visible Newton scale; zero-point correction; guard to prevent over-extension of the spring; the transparent case allows the functioning of the coil spring to be observed; with hooks for mounting the device and suspending weights.

**Measuring Accuracy** :  $\pm 2\%$

Length of scale : 100 mm

Dynamometer case : L = 215 mm

Reading: 0,002 N

grey coloured

**Dimensions** : D = 16 mm, total L = approx. 285 mm

**ESP60070**





**Springs Large Compression - Compression Springs**  
Large compression springs. 50 Mm approx. Long, dia 10 mm and wire of 19 SWG.

ESP60067



**Springs Large Compression- Extension Springs**  
Extension springs. 50 Mm approx. Long, dia 10 mm and wire of 19 SWG.

ESP60068



ESP60073



ESP60074



ESP60076



ESP60075

**Hook's law**

ESP60073	Hook's law apparatus	Consists of a mirror scale, 12cm long and support, a spring, a weight holder and 9 slotted weights.
ESP60074	Hook's law apparatus super	Consists of scale, 12cm long and support, a spring, a weight holder and 9 slotted weights.
ESP60075	Hooks law experiment kit	<p><b>Consist of :</b> Stand Base 190mm, A-shaped 1pc, Stand Rod dia. 10 c 1000mm, with thread and tap 1 set, Universal Boss-head with Short Bearing Pin 1 pc, Scale on Stand Rod 1pc, Pointer on Spring 3 pcs, Helical Spring 10 N/m 1 pc, Helical Spring 25 N/m 1 pc, Helical Spring 4.5 N/m 1 pc, Slotted Load and Hanger 300 g (5 Loads) 1 set, Experiment Manual Book, Part of Physics Experiment Tools Package for Senior High School/Vocational School</p> <p><b>Dimensions :</b> (L) 62.00 x (W) 30.00 x (H) 9.00 cm</p> <p><b>Weight :</b> 4.200 kg</p>
ESP60076	Hooks law experiment kit	<p><b>Consist of :</b> Stand Base and Rod, Steel plate 1 pc, Boss-head, Universal 1 pc, Bearing Pin 1 pc, Helical Spring 10 N/m 1 pc, Helical Spring 25 N/m 1 pc, Helical Spring 4.5 N/m 1 pc, Slotted Load and Hanger 250 g (6 Loads) 1 set</p> <p><b>Dimensions :</b> (L) 62.00 x (W) 30.00 x (H) 9.00 cm</p> <p><b>Weight :</b> 3.250 kg</p>





**Balance Weight Physical**

Made of Polished Brass, supplied with Wooden block, as illustrated.

<b>ESP60079</b>	Capacity 500gm	Comprising 1 x 200gm, 2 x 100gm, 1 x 50gm, 1 x 20gm, 2 x 10gm, 1 x 5gm, 2 x 2gm, 1 x 1gm.
<b>ESP60080</b>	Capacity 1000gm	Comprising 1 x 500gm, 1 x 200gm, 2 x 100gm, 1 x 50gm, 1 x 20gm, 2 x 10gm, 1 x 5gm, 2 x 2gm, 1 x 1gm.
<b>ESP60081</b>	Capacity 2000gm	Comprising 1 x 1000gm, 1 x 500gm, 1 x 200gm, 2 x 100gm, 1 x 50gm, 1 x 20gm, 2 x 10gm, 1 x 5gm, 2 x 2gm, 1 x 1gm.



**Weight Set Hooked Weight**

Brass with hooks on both sides. Recessed bottoms to enable the weights to be hooked together. The bottom is flat when placed on a flat surface. Set of 9 weights. 10 - 1000g in wooden block.

**ESP60082**



**Weight Set Primary Weight**

These weights are polished and lacquered Brass weight sets fitted in a durable hardwood storage box as illustrated. 1 each of 1gm, 5gm, 20gm, 100gm and two each of 2gm and 10gm

**ESP60083**



**Slotted Masses And Hanger**

Slotted Masses and Hanger, EduScience Nickel plated Brass, mass in disc shape Material: EduScience Plated Brass

**Consists of:**

- 1 x Masses hanger
- 9 x Slotted Load

<b>ESP60085</b>	Total Weight 100 GR	9 x 10 g + hanger
<b>ESP60086</b>	Total Weight 200 GR	9 x 20 g + hanger
<b>ESP60087</b>	Total Weight 500 GR	9 x 50 g + hanger
<b>ESP60088</b>	Total Weight 1000 GR	9 x 100 g + hanger

**Slotted Weight Set Of Masses And Hanger,**

Set of 9 slotted masses, one hanger

This improved set comprises masses of Brass with slots, brass hangers with hook. The design of the slots ensures that the masses may be easily removed and replaced but will not fall off accidentally.



<b>ESP60089</b>	Total 100gm	Each of 10gm
<b>ESP60090</b>	Total 250gm	Each of 25gm
<b>ESP60091</b>	Total 1000gm	Each of 100gm
<b>ESP60092</b>	Total 250gm	Each of 50gm
<b>ESP60093</b>	Total 100gm	Set of one hanger 20gm, three slotted masses 20g one mass 10gm and two masses 5gm, Total 100gm
<b>ESP60094</b>	Total 250gm.	"Set of one hanger 50gm, nine slotted masses 20gm, one mass of 10gm and two masses of 5gm Total 250gm.





**Hooked Masses Cylindrical**

HOOKED MASSES CYLINDRICAL, Chromium plated with cylindrical weight with long hook. Loose or in wooden box.

- ESP60095 10Gm each weight
- ESP60096 20Gm each weight
- ESP60097 50Gm each weight
- ESP60098 100Gm each weight
- ESP60099 500Gm each weight
- ESP60100 1000Gm each weight
- ESP60101 200Gm each weight



**Weights Hooked Flat**

Weights, Brass, with hooks on both sides. Set of 9 Pcs ,Capacity 500 gm ,comprises of 1 x 200gm, 2 x 100gm, 1 x 50gm, 1 x 20gm, 2 x 10gm and 2 x 5gm

ESP60106



**Density Ball Specimen Set**

Balls, metal with hook, 25 mm diameter, set of 6, comprising Aluminium, Brass, Copper, Steel, Lead and Zinc. Packed in Plastic Box.

ESP60113



**Weight Masses Hexagonal With Lifting Ring**

Hexagonal with lifting ring. Within international tolerance. Set of 6 (50gm, 100gm, 200gm, 500gm, 1kg 2kg)

ESP60103



**Young's Modulus Apparatus**

Consist of :  
 Stand Base and Rod, Steel plate 1 pc, Boss-head, Universal 1 pc, Bearing Pin 1 pc, Helical Spring 10 N/m 1 pc  
 Comprises a scale plate carrying a 0 to 30mm scale, and a moveable vernier readable to 0.1mm. Both have bars with clamping screws for the wires and hooks for the tension weight and loading masses. A ceiling clamp is provided for the upper ends of the wires, together with a pair of large wood screws for attaching it to a convenient overhead beam, door frame etc.  
 A tension weight, mass 1.3kg approx, for the comparison wire is also included.  
 Supplied WITHOUT load masses or wires.

ESP60108



**Metal Cubes Set Of 6**

CUBES Set of 6 comprising Brass, Lead, Iron, Copper, Aluminium and Zinc. Supplied in Plastic Case.

- ESP60110 Side Size 10 Mm
- ESP60111 Side Size 20 Mm





**Density Cube Set Specimen**

Cubes for density investigation, 25 mm side. Set of 9 comprising brass, iron, copper, aluminium, hardwood, softwood, nylon, PVC and acrylic. Supplied in plastic box.

ESP60114



**Specific Gravity Metal Cylinder Set With Hooks**

For specific gravity determinations. Each cylinder is 5 cm long and 13 mm diameter with hook at top. Metals included are of Aluminium, Steel, Brass and Copper.

Available in set or individually.

ESP60116



**Pendulum Ball Drilled Ball Set, St/6**

Set of 6 One each of Steel, Brass, Aluminium, Lead, Copper, Wood. These 1" (25mm) drilled physics balls are great for doing Newtonian physics experiments such as collisions or for use in mass/volume experiments. A 3mm hole has been exactly drilled in the centre of each sphere in such a way as to allow for the recessing of a knot. This allows the set to also be used as pendulums. These crafted balls come in pairs which makes them ideal for comparing how different materials affect your experiment. Packed in Plastic Case.

ESP60119



**Pendulum Ball Drilled Ball Set, St/12**

Set of 12 Two each of Steel, Brass, Aluminium, Lead, Copper, Wood. These 1" (25mm) drilled physics balls are great for doing Newtonian physics experiments such as collisions or for use in mass/volume experiments. A 3mm hole has been exactly drilled in the centre of each sphere in such a way as to allow for the recessing of a knot. This allows the set to also be used as pendulums. These crafted balls come in pairs which makes them ideal for comparing how different materials affect your experiment. Packed in Plastic Case.

ESP60120



**Displacement Vessel (Overflow Can )**

Designed to determine the volume of a body to calculate density, specific gravity, or for proving Archimedes' Principle

ESP60131

Aluminium

75 mm dia. With flared top edge and angled spout.



ESP60132

Clear Acrylic

For determining the volume of the solid bodies and experiments on Archimedes principle.

**Dimensions :** 60 X 160 mm, Material : TRANSPARENT plastic (SAN)

Used with Measuring Cylinder 100 ml, Plastic for measures the spilled water volume in Archimedes experiment.

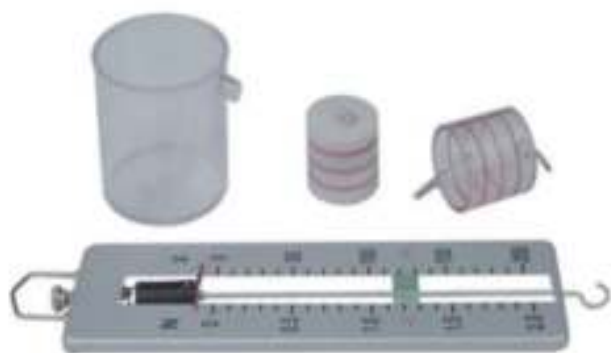
**Part of :**

Hydrostatics and Heat Kit for Junior High School - Hydrostatics and Heat Kit for Junior High School with Aluminium Case - Hydrostatics and Heat Kit for Junior High School (35 items) - Hydrostatics and Heat Kit for Junior High School - Archimedes Apparatus

**Dimensions :** (L) 8.00 x (W) 6.00 x (H) 16.00 cm

**Weight :** 0.060 kg





**Archimedes Law Apparatus**

Kit consist of Dynamometer , Overflow Vessel , and Cylindrical vessel with Archimedes Bucket and Cylinder , it enables teacher to demonstrate the value of Buoyancy force which act on the object is equal to the weight of the liquid displaced by this object

ESP60127



**Vacuum Pump Hand Operated**

Experiment with air pressure and atmosphere, vacuum filtering and check for leaks. This economical pump features a gauge in cm and inches, Hg displaces 725ml of air. Pump rate of 15ml. Clear tubing is 60cm with 6mm inner diameter.

ESP60143



**Bourdon Gauge**

Comprises a circular gauge on a pillar fitted on a heavy base, with a tubule to provide connection to the pressure system.

ESP60147



**Capillary Apparatus**

For demonstrating the relationship between capillary pressure and the bore diameter of the capillary tube. The apparatus comprises of a metal frame arrangement whose base is like a trough and the upper part of the frame supports six capillary tubes of different box. The trough is filled with water and the difference in heights of the resulting columns of water in the tubes is readily apparent. Overall height of frame 90 mm length of capillary tubes 150 mm

ESP60134



**Venturi's Tube**

To demonstrate Venturi effect. Made of glass with three side tubes for attaching an included three-leg manometer. The manometer is filled with coloured water to show the relative pressure at significant points of the tube when gas is flowing through it.

ESP60145



**Magdeburg Hemisphere Brass**

To demonstrate pressure of atmosphere fitted with stopcock and handle. Made of brass and diameter 75mm.

ESP60149



**Magdeburg Hemisphere Rubber**

To demonstrate pressure of atmosphere fitted with handle. Made of rubber .

ESP60150







ESP60136



ESP60137



ESP60138



ESP60139



ESP60140

**Boyle's Law Apparatus**

Use this apparatus to experiment with the elastic properties of a measured quantity of gas. This unit makes the understanding of Boyle's Gas Law easy and helps to show the relationship between the pressure, temperature, and volume of a gas that is constant

ESP60136	Simple form	Consists an air tight plastic syringe supported between two wood blocks. Placing various weights on the upper block compresses the gas, allowing pressure and volume measurements to be made to verify Boyle's Law.
ESP60137	Boyle-Marriott	A 50ml plastic syringe is connected to a pressure gauge with a connecting tube to measure the pressure. Mounted on a plastic base.
ESP60138	With temp .Gauge	Simply twist the handles to compress the air and read the volume, temperature, and pressure from the scales. Repeat the process to confirm that the relationship stays the same. Requires one AA battery (not included). Grades 9-12.
ESP60139	Standard	For the investigation of the relation between capillary rise of liquid and the bore diameter of the capillarity tubes constructed in the form of communicating vessels in which the liquid is contained. Overall <b>Dimentions</b> : 135 x 60 x 110 mm Material : Borosilicate glass, Tube mounted on a metal plate holder <b>Dimensions</b> : (L) 17.50 x (W) 6.00 x (H) 13.00 cm, <b>Weight</b> : 0.105 kg
ESP60140	Demonstration type	For demonstration of Boyle's Law to group of students. With glass tube protected by a safety screen, Volume of air is read from a scale visible behind the tube and pressure is measured by a bourdon gauge. Mounted on a metal base. Supplied with oil.





**Boyle's Law Apparatus Advance**

It is a device that can test the Boyle's law that the pressure of a gas at a certain temperature and its volume are inversely proportional to each other.

A piston with a graduated cylinder mounted on it and a low friction piston mounted on it. It is designed to increase the weight one by one on the plate and to measure the volume of the cylinder.

the valve used to set the cylinder volume and the auxiliary valve used to measure the cylinder pressure in the external device are installed.

**Dimensions :** 160x110x215mm

Configuration : Body (cylinder, piston, twin valve),

Weight 250g6, open valve 2, Cylinder capacity 20 ml, piston mass 41g

ESP60141



**Barometer Demo Set**

For a simple and fast explanation of air pressure and the movement of the pointer on a barometer. The barometer is placed in an air-tight, transparent plastic container. The air pressure changes by compressing and expanding the container, and the pointer indicates these changes.

Barometer 980 - 1040 hPa and plastic container with lid and suction pad.

ESP60142



**Absolute Zero Apparatus (Gay Lussac - Apparatus, Complete )**

For determining the relationship between pressure and temperature in a gas at a constant volume as well as determining the point of absolute zero.

Hollow metal ball with attached high-quality manometer; the metal adapter piece enables it to be mounted on the lid via 4 holes .

Metal ball: D = 60 mm

Manometer range: 840 - 1240 hPa

ESP60148



**Bell Jar Plastic With Vacuum Plate. Supplied With Buzzer And Foam**

Made of high-impact plastic with rubber gasket for sealing the vacuum and measures about 35cm high and 20cm in diameter at the base. Hand operated vacuum pump manometer mounted on bell jar to show the degree of vacuum inside the jar. The apparatus also has vacuum release valve built into the handle of the pump.

ESP60152



**Pascal's Law Apparatus Superior**

For demonstrating the hydrostatic paradox, by means of a membrane deforming under pressure, downward hydrostatic pressure in the vessel is transferred to a 200 mm lever and displayed on a large scale, 4 glass vessels of various shapes, height: 220 mm each, internal Diameter at mouth = 23 mm, adjustable pointer for marking height to which filled,

**Dimensions :** 260x100x100(360) mm

ESP60158





### Air Pressure Student Kit

Kit consisting of:

- 1x Signaler
- 1x Sound-absorbing pad
- 1x Magdeburg circle
- 1x Balloons, set of 2
- 1x Clamp for balloons
- 1x Bubble burster,
- 1x Plastic film for bubble burster
- 1x Capsule plastics with cover, D=75 mm

- 1x Free fall tube SE, L=35 cm,
- 1x Vacuum chamber complete, 1000 ml, with manometer
- 1x Syringe plastics, 120 ml, for vacuum-experiments
- 1x Vacuum hose plastics, 300 x 6 mm
- 1x Manometer ES, for Boyle-Mariotte experiment

#### Storage:

- 1x Box insert Air pressure
- 1x Storage box II small, with cover
- Box -insert plan with 2 labels

ESP60153



### Spouting Cylinder

To show liquid pressure increases with depth. A sheet metal cylinder with three orifices of same size but at different heights.

ESP60155



### Spouting Cylinder Perspex

This new spouting cylinder is made of Perspex which gives a clear view of variation of level of liquid and pressure. Spouting cylinder is 16" tall with a 1.75" diameter mouth mounted on a 4" x 4" base. There are no graduations on the spouting cylinder.

ESP60157



### Pascal's Law Apparatus - New

Pascal's Apparatus has been designed to easily demonstrate that the pressure in a vessel is the same in every direction. The apparatus is mounted in a strong shock resistant plastic base.

ESP60159





**Liquid Level Apparatus**

Four glass tubes of different shapes and cross sectional areas are connected to a common horizontal tube.

- ESP60160 Standard
- ESP60161 On wooden stand
- ESP60162 On plastic base



ESP60164



ESP60165

**Manometer**

ESP60164 Student type

For the use at moderate pressures, fabricated from glass tubing 6mm bore, 8mm outside diameter. The apparatus is open at both ends and is supplied unfilled.

ESP60165 Demonstration type

Glass manometer with built-in stopcock mounted on back plate. Scale 80-0-80 with 2mm subdivisions. Back plate dimension 40x8cm.

**Hydraulic Press, Working Model With Round Tank**

Acrylic model for demonstrating how hydraulic force is transferred, this model can be used not only to show the movement of the pressure and press pistons and the valve clearance, even practical examples of use in real life can be demonstrated. The ratio of the surface areas of the two pistons is 1:12, while the sturdy manner in which the press is built allows it to exert up to 500 N of press force!

- Piston D=16 mm and 56 mm
- Free working height: 60 mm
- Dimensions :** 200x70x285 mm
- Accessories included:**
- Metal bracket with notches,
- Dimensions :** 40x40x20 mm
- Iron nails, L=80 mm, set of 20
- Styrofoam ball, D=30 mm
- Vat with drain connector
- Acrylic, D=200 mm, H=65 mm



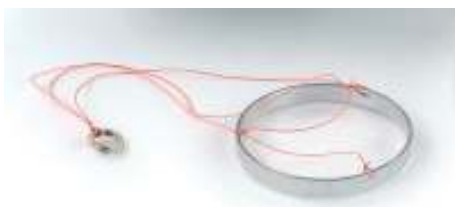
ESP60168



**Surface Tension Apparatus**

Ring for measuring surface tension

ESP60179



**Surface Tension Apparatus Superior**

Ring for measuring surface tension, Newton meter sensitive Digital 20 N / 2000 g



ESP60180





**Hydraulic Press**

To show transmissibility of pressure. Two graduated syringes 20ml and 5ml are joined at bottom through a 3-way stopcock, the upper ends having strong platforms. On metal stand.

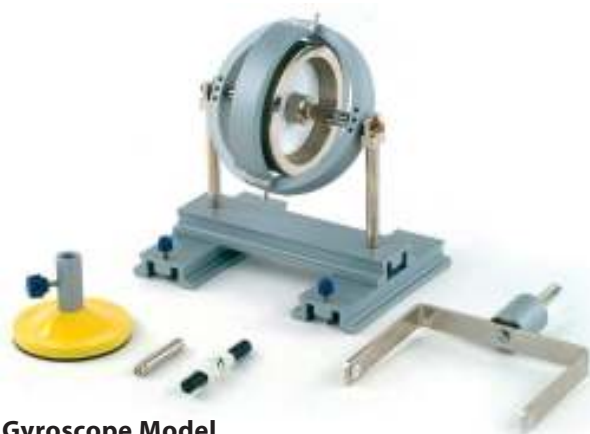
ESP60167



**Spheres Steel**

Spheres steel (Pk of 100). High quality steel ball bearings.

- ESP60170 Dia 3mm
- ESP60171 Dia 6mm
- ESP60172 Dia 10mm
- ESP60173 Dia 13mm
- ESP60174 Dia 16mm
- ESP60175 Dia 19mm
- ESP60176 Dia 25mm



**Gyroscope Model**

For demonstrating the characteristics of a freely moving gyroscope as well as its processional motion; massive, cylindrical gyroscope suspended from gimbals; long duration of rotation due to beryllium-bronze axis bearings; supplied with permanently mounted fork on small H-shaped base with levelling screws (for mounting when spun with cord); flexible metal fork on support rod with double ball bearings; round base; support rod with bearing cup and cone; cord for spinning with handle;

**Gyroscope** : 100 x 30 mm,

**Approx. Weight** : 1400g;

**Total Dimensions** : 195 x 140 x 210 mm

ESP60183



**Gyroscope Model Metal**

For demonstrating the characteristics of a freely moving gyroscope as well as its processional motion;

ESP60184



**Osmometer - Membrane, 5 Pcs. (Spare)**

Set of 5 semi-permeable membranes; can be clamped to the osmometer Demo; **Dimensions** : D = 100 mm

ESP60188



**Osmometer**

For measuring osmotic pressure; capillary tube with measuring scale mounted on an acrylic panel; two glass bulbs mounted on the capillary tube; one of the bulbs fitted with removable pig-bladder membrane and rubber ring.

Total height : 480 mm

ESP60187





**Aerodynamics Kit**

The following experiments can be run

Using the aerodynamics set:

Dynamic pressure in an air stream, Pressure in a flow – Venturi tube, Aerodynamic paradox, Aerodynamic paradox – examples, Lift in an air stream, Aerodynamic experiments on various objects, Air resistance and cross-sectional area, Air resistance, shape and cross-section of a model car, Air resistance and the shape of an object, Air resistance and type of surface, Flow patterns over a house roof, Blowing the roof off a house

ESP60193

**Fixed Voltage Transformer**

12V DC/10 A

This transformer used for the air blower in the aerodynamic kit only.



ESP60194

**Bases For Aerodynamics Kit**

Sturdy metal stand base with large surface area; special aluminium profile anodised with clamp socket, for stable support of round or square rods and for holding sliders; laterally positioned claws made of fibre glass reinforced plastic, with rubber pads; clamp socket for holding round rods of 3-14 mm in diameter or square rods of up to  $s = 12.5$  mm; with M8 wing screw; surface area: 265 x 220 mm (583 cm<sup>2</sup>); **Weight** : 383 g approx.



ESP60195

**Manometer Sensitive, Krell Type**

For Aerodynamics Kit

For displaying very fine differences in pressure; inclined tube glass manometer; angle of inclination of vessel and riser pipe can be adjusted; metallic base plate; powder-coated; with scale; pressure-hose connection: D = 5 mm; riser pipe: L = 250 mm;

**Dimensions** : 385 x 50 x 90 mm



ESP60196





### Lever, Single Kit

The lever kit teaches students through hands-on design, construction, testing, and design iterations. Create the structure with the highest strength to weight

ratio to win this engineering competition! A great way to teach middle school students basic engineering and to learn iteration by studying failure, or teach high school students basic statics, free body diagrams, failure modes, and member sizing calculations while complying with STEM education standards. Includes materials and tools for constructing levers; instruction manual with sample calculations, basswood members, balsa members, adhesive, adjustable cutters, and base material. An ideal training kit for Science Olympiad and other building competitions. Required: electric drill and bit. Grades 6-12

ESP59613



### Boomilever Class Challenge Kit

The boomilever kit teaches engineering through hands-on design, construction, testing, and design iterations. Create the structure with the highest strength to weight ratio to win this engineering competition! A great way to teach middle school students basic engineering and to learn iteration by studying failure, or teach high school students basic statics, free body diagrams, failure modes, and member sizing calculations while complying with STEM education standards. Includes materials and tools for constructing boomilevers; instruction manual with sample calculations, basswood members, balsa members, adhesive, adjustable cutters, and base material. An ideal training kit for Science Olympiad and other building competitions. Required: electric drill and bit. Grades 6-12

ESP59617



### Lever, Single Kit Refill

ESP59614



### Lever Test Kit

The test kit includes everything required to test your levers for competition, except for the ballast (sand), including a test stand that can fit on any table with a lip, a loading block, a boomilever scale, a ballast scale, a scoring sheet, chain, S-hook, bucket, beaker with handle, and plastic trap. Grades 6-12

ESP59615



### Boomilever Class Challenge Kit Refill

ESP59618

### Structure And Bridges Classroom Kit

Gain a comprehensive understanding of structural engineering and learn how engineering concepts are applied in supporting or resisting loads. The class will study different types of bridges and the STEM principles that support their designs. During the unit, students will construct six working models including a house, a suspension bridge, a cable-stayed bridge, an arch bridge and two different truss bridges. They will also be challenged to build the largest free standing tower possible using the Engino Components included in the kit. Finally, the students will apply their new knowledge to design and build a straw bridge that spans 70 cm and will support a minimum 2 kg distributed static load using only 100 plastic straws and a limited amount of masking tape. Includes all building and testing materials, instructor's manual, lesson plans, Engino hands-on activity books, building instructions, and student worksheets. Grades 7-12

ESP59620





**Luxmeter**

Display: 3 inches digits, big LCD, Max display 1999. Wide Range: from 0.1 Lux to 200,000 Lux, Accurate test, fast response, and auto zero-adjustment.

Data hold : hold the current test result. Symbol and unit display, easy to read.

Low battery indicator and auto power off.

Range : 0-200,000 Lux

Basic Accuracy : app 4%

Repeatability : app 2%

Temp characteristic : 0.1%/C

Max. Display : 1999

**LCD Dimentions** : 67x40mm

**Battery** : 9V (6F22)

**Dimensions** : 130x95x30mm

ESP60238



**Micrometer Digital**

Measuring range : 0-25mm , Readability : 0.001mm

ESL57786



**Vernier Calliper - Model Transparent**

Overhead functioning model (OFM), consisting of an acrylic plate and a sliding vernier scale

**Dimensions** : 200x100 mm

ESP60246



**Vernier Calliper Digital**

Measuring range : 0-150mm , Readability : 0.01mm

ESL57781



**Newtonmeter Demo Digital 20 N / 2000 g**

Featuring force measurement over a minimum of distance, yet with a high degree of precision, and a 26 mm digital display, making this device especially "simple, easy and safe" to use. Demonstration instrument with magnetic holder for measuring force (in newtons) or mass (in grams). The easy-to-read LED display (H = 26 mm) and the external sensor in a rugged case of rectangular tubing make it an ideal instrument for mechanics experiments, particularly when used with a magnetic panel. Both tension and pressure can be measured. By means of a support rod (D = 10 mm) the sensor can be fastened to common stands.

**TECHNICAL DATA :**

Measuring range „N“: ± 20 N, resolution: 0,01 N

Measuring range „mN“: ± 2000 mN, resolution: 1 mN

Measuring range „kg“: ± 2 kg, resolution: 1 g

Measuring range „g“: ± 200 g, resolution: 0,1 g

Zero compensation (tare): manual, by means of adjustment knob

Accuracy: better than 0.5 %

Power supply: 4 x 1.5 V Mignon cells (included) or external power supply 6 V / 500 mA

**Dimensions** : approx. 160 x 120 mm

ESP60240



**Hygrometer Demo Unit**

For a simple and fast explanation of humidity and and pointer deflection in a hygrometer.

The hygrometer is placed in an air-tight, transparent plastic box, with a small container of hot water.

Once the box is closed the humidity increases, as is indicated by the pointer deflection.

Hygrometer (0 - 100%) plus large and small plastic boxes

ESP60267







**Universal Multimeter Demo II**

Durable servo-controlled measuring instrument to measure current and voltage with high precision; can be used in any position, for example vertically or horizontally for projection.

The large scale with an arc length of approx. 200 mm, the wide signal-coloured pointer and the 26 mm high digits guarantee a hassle-free reading of the measured values even from greater distances. The LED display indicates the unit of measurement and current type and is also clearly visible from the distance. An internal electronic overload protection eliminates the annoying and time-consuming change of fuses. The meter can also be used as a sensitive galvanometer (measuring range 1 mV-) thanks to the built-in amplifier. Pointer setting: Zero at left or at midpoint Four insertable double scales: 1/3 - 10/30 - 100/300 - -5 to +5/-15 to +15 (included) Measuring ranges:

DC voltage: 1 mV, 1 to 30 V

AC voltage: 1 to 30 V

DC and AC amperage: 100 µA to 10 A

Rear panel with neodymium magnets for a stable magnetic mounting; Battery compartment for easy replacement of batteries.

**Technical data :**

Type of instrument : Moving-coil instrument

Internal resistance :  $R = 100 \text{ k}\Omega / \text{V}$

Working position : vertically or horizontally

Measuring inputs : 4 mm safety socket

Fuses: internal electronic overload protection

Power supply : four 1.5 V batteries (included)

or 2.5 mm hollow DC jack for 6 V external power supply

Housing : ABS plastics

**Dimensions :** 268 x 92 x 226 mm

ESP60249



**Multimeter Analogue**

Electronic overload protection with indicator light in all measuring ranges (no more melting fuses!) Large, robust design with holster Easy-to-read thanks to being inclined Transparent base with recessed handle to hold the device with one hand

Portable measuring device for voltage and current, DC and AC; also usable as a galvanometer.

AC/DC voltage ranges: 1 mV, 100 mV - 30 V

AC/DC current ranges: 100 µA - 3 A and 10 A

Arc scale length approx. 90 mm

- 1 mV upper value range for measuring thermal voltage or induction without a pre-amplifier

- All measuring ranges (even low current) available in AC

- Exceptional frequency response (typically -1.5 db at 20 kHz) allowing direct measurement of resonant circuits

- Large, easy-to-read mirrored scale with clear marking

- Extremely accurate, typically 1.5 %

- Durable selection switch

- 10 A range with separate input socket

- Zero at midpoint may be selected by switch

**Dimensions :** approx. 200 x 140 x 100 mm

**Weight :** approx. 675 g

ESP60251



**Scales For Multimeter Demo II, Transparent,**

Set Of 8

Transparent inserting-scales; acrylic;

For universal multimeter demo II ESP60249

Ranges: 0-1, 0-3, 0-10, 0-30, 0-100, 0-300, -5 to +5, -15 to +15

ESP60250





**Ohmmeter Demo Unit**

Demonstration meter for measuring resistance and for testing diodes, the component to be measured is connected to the two 4-mm safety jacks, this instrument is easy to transport and can be mounted magnetically, the 26-mm LED display showing the measured value and the 20-mm LED display for the measurement unit allow readings to be taken easily even at a distance

Technical data :

Display: 3 1/2-digit LED display, digit height 26 mm

Measuring ranges: 200 Ohms, 2, 20, 200, kOhms, 2 MOhms, 2 V (diode testing)

Accuracy:  $\pm 0.2\% \pm 1$  digit for all ohmage ranges up to 200 kOhms, beyond that

ESP60253



**Wattmeter Demo Unit**

Demonstration instrument for measuring power in low-voltage circuits, very easy to transport and magnetically mountable, the 26-mm LED display showing the measured value and the 20-mm LED display for the measurement unit allow precise readings to be taken even at a distance

**TECHNICAL DATA :**

Display: 3 1/2-digit LED display, digit height 26 mm

Input: 4-mm safety jacks (pair)

Types of measurement: true power (W), work/energy (Ws)

Measurement limits: 20 Veff, 2 Aeff

ESP60256



**Coulomb Meter Demo Unit**

Demonstration meter used in electrostatics for measuring charges, this instrument is easy to transport and can be mounted magnetically, the 26-mm LED display allows readings to be taken even from a distance

Display: 3 1/2-digit LED display, digit height 26 mm

4-mm safety jacks: measurement input (IN) and common ground (COM)

Measuring range: +/-1999 nC, reset button for resetting instrument to zero

Accuracy: better than 1 %, droop rate: better than 5 digits/min

Throw switch: ON/OFF

Power supply: 4 x 1.5 V Mignon cells (included) or 5.5-mm hollow DC jack for 6V/500 mA external power supply (Not included)

Case: green ABS plastic with yellow labelling

ESP60259



**Electroscope Digital Demo Unit**

Demonstration meter for measuring high electrostatic voltages, unlike mechanical electroscopes, this instrument delivers exact and clear quantitative readings as well as the polarity of the charge, the value measured can be frozen using the hold switch, this instrument is easy to transport and can be mounted magnetically, the 26-mm LED display allows readings to be taken from a distance

**TECHNICAL DATA:**

Display: 2 1/2-digit LED display, digit height 26 mm

Measurement input provided by means of specially insulated 4-mm safety jacks

4-mm safety jack for ground connection

Measuring range: 0 ... 18.0 kV

Reset button for resetting instrument to zero

Accuracy: better than 2 % for 0 ... 10 kV

Throw switch: ON/OFF

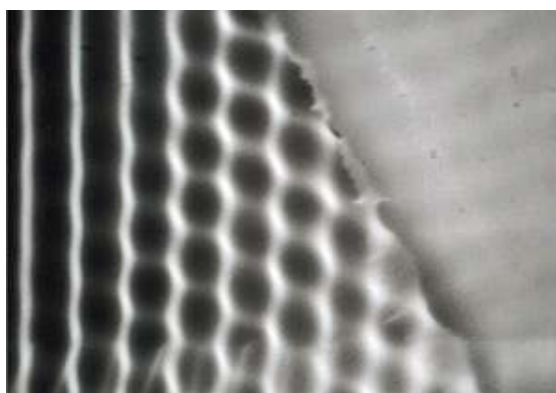
Throw switch: measure sample - freeze measured value (hold)

Power supply: 4 x 1.5 V Mignon cells (included) or 5.5-mm hollow DC jack for 6V/500 mA external power supply (not included)

Case: green ABS plastic with yellow labelling

ESP60262





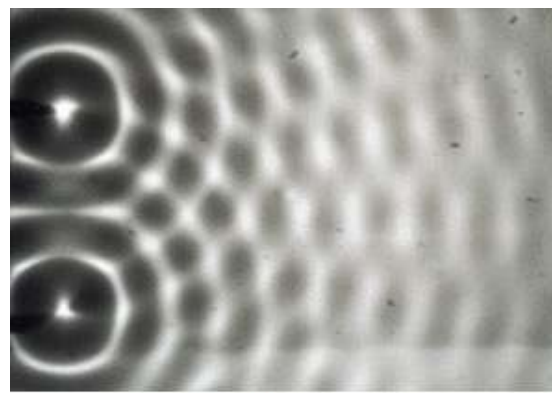
Wave Reflection on Flat Field



Wave Diffraction I



Wave Diffraction II



Wave Interference

**Thermodynamics And Wave Kit 1**

**Experiment Topics :**

GU 1 Wave Reflection on Flat Field, GU 2 Wave Reflection on Curves Field, GU 3 Wave Refraction, GU 4 Wave Diffraction I, GU 5 Wave Diffraction II, GU 6 Wave Interference, GU 7 Wave on a String, Part I, GU 8 Wave on a String, Part II  
 PU 1 Heat Capacity, PU 2 Specific Heat, PU 3 Heat of Fusion  
 Corrugated Box Thermodynamics Kit ESP60268 (English) 1 pc  
 Experiment Manual Book 1

**Additional tool (sold separately) :**

- Audio Frequency Generator (ESP60296)
  - Power Supply 3A, 36W (ESP60751)
  - G Clamp 4 inch
  - Balance 311 gr
  - Steel Ruler 50 cm
- Dimensions :** (L) 66.00 x (W) 38.00 x (H) 32.00 cm  
**Weight :** 13.400 kg

ESP60268





**Ripple Tank Kit**

Specifically designed by Irwin to demonstrate wave theory to secondary and tertiary education. The Irwin Ripple Tank is a shallow perspex tank of water used in school and colleges to demonstrate the basic properties of waves. It is illuminated from above; the light transmits through the water. The water's ripples show up as shadows on the screen underneath the tank, providing a visual depiction of all the basic properties of waves: Light, electromagnetic, sound, reflection, refraction, interference and diffraction are clearly observed and enhance the students understanding of the phenomenon.

The Irwin Ripple Tank comprises the following individual parts:

- 1 x Water Tank
- 3 x Detachable legs
- 2 x Angular holders
- 1 x Plate fitting
- 2 x Fixing rods for Strobe-unit and vibration Generator
- 1 x Perspex Mirror
- 1 x Frosted glass plate
- 1 x Strobe-unit
- 1 x Vibration-Generator
- 1 x Frequency Controlling-Unit
- 1 x Single dipper
- 1 x Double dipper
- 1 x Triple dipper
- 1 x Dipper for parallel waves
- 1 x Acrylic block, concave
- 1 x Acrylic block, rectangle Semi circle
- 1 x Connection wire for Strobe unit
- 1 x Connection wire for Vibration-Generator
- 1 x TRANSPARENT Ruler for measuring
- 1 x Set of instructions
- 1 x Aluminium carry case

ESP60271



**Digital Stroboscope**

Device tool to make moving object becomes visible like a silent. Stroboscope consists of plexiglass disc with adjustable frequency and mounted on

Aluminium box. Stroboscope is using light from halogen lamp.

**Dimensions :**

- Stroboscope box : 180 x 76 x 76 mm
- Cable length : 130 cm, with plug 4 mm
- Plexiglass disc : 118 mm

Material : Casing box made from aluminium

Input voltage 12 V, 5 A

Halogen light source 12 V, 25 Watt

**Consist of :**

- Digital indicator (a) show wave frequency
- Light and wave synchronization mode (b)
- In synchronous mode, the frequency of strobe light and the water ripple are synchronized so that it seems still. In non-synchronized mode, the wave moves
- Wave frequency (c) and wave amplitude adjuster (d)
- Stroboscope disc (e)
- Manual trigger function (f) to produce wave one by one

Part of Ripple Tank with Digital Stroboscope.

**Dimensions :** (L) 15.00 x (W) 8.00 x (H) 13.00 cm

**Weight :** 0.450 kg

ESP60275





**Ripple Tank 1**

- Dimensions :**  
 - Height : 35 cm  
 - Base : 30 x 20 cm
- Material :**  
 Tank : Plastic  
 Base : Glass, TRANSPARENT
- Consist of :**  
 - Digital Ripple Generator 1 pc  
 - Tank 1 pc  
 - LED lamp 1 pc

- Mechanical Vibrator 1 pc
- Plane Wave Generator 1 pc
- Circular Wave Generator ripple tank 1 pc
- Circular Wave Generator ripple tank 1 pc
- Long Barrier 2 pcs
- Short Barrier 1 pc
- Curved Barrier 1 pc
- Glass/plastic Trapezoid for refraction experiment 1 pc
- Manual Book of Wave Tank 1 exp

ESP60273



**Ripple Tank 2**

For use in demonstration or experiment on basic properties of waves in general such as reflection, refraction, diffraction and interference, by simulation with water surface waves. The water surface waves are generated in a ripple tank. The system has a reflector and translucent screen on which the waves shadow can be observed. The ripples are produced by Ripple Generator (ESP60277 11) producing periodic variation of air pressure the Plane Wave Generator (ESP60277 13) or Circular Wave Generator ESP60277 17).

- Dimensions :**  
 Overall : 500 x 320 x 355 mm  
 Wave field : 450 x 270 mm  
 Projection screen : 480 x 285  
 Supported by a demountable four-leg frame, height 300 mm  
 Material : Plastic, glass, aluminium and steel

- Consist of :**  
 Wave Tray 1pc  
 Foot for Ripple Tank 1set, Side Bar 2pcs, Mirror Rod Holder 1pc, Support Rod 2pcs, Side Cover 2pcs, Refraction Plate 1pc, Ripple Generator 1pc, T Joint 1 pc, Plane Wave Generator 1pc, Short Barrier 1pc, Long Barrier 2pcs, Curved Barrier 1pc, Circular Wave Generator 1pc, Ripple Pipe Holder 1pc, Lamp Rod 1pc, Lamp Housing 1set, Lamp Bulb SBC 12V, 24W 1pc, Reflection Mirror 1pc, Translucent Screen 1pc, Multi-angle Clamp 1pc, Multifunction Bolt M6 x 15 mm 6pcs, Multifunction Bolt M8 x 35 mm 2pcs, Plastic Hose 40 cm 2pcs, Plastic Hose 100 cm 1pc, Disposal Hose 40 cm 1pc, Rubber Stopper without Hole, 6/9 mm 1pc, Manual Book 1exp,  
**Additional tool (sold separately) :** Power Supply 3A, (ESP60751), Part of Thermodynamics and Wave Kit for Senior High School (ESP60268).  
**Dimensions :** (L) 85.00 x (W) 39.00 x (H) 20.00 cm  
**Weight :** 8.800 kg

ESP60277



**Ripple Tank With Digital Stroboscope**

Ripple tank development of the previous version, with Digital stroboscope technology. This Ripple tank has capable of displaying the benefits of the wave of impressions on Translucent screen mounted upright that can be observed directly by the students with easy. Waves can be made silent upright or walk and can be identified directly from the frequency stroboscope. Stroboscope using halogen lamps so that the image on the screen display can be seen clearly.

- Consist of :**  
 Wave Tray 1pc, Foot for Ripple Tank 4pcs, Side Bar 2pcs, Mirror Rod Holder 1pc, Support Rod 2pcs, Reflector Mirror 1pc, Translucent Screen 1pc, Side Cover 2pcs, Supporting Bolts 4pcs, Refraction Plate 1pc, T Joint 1pc, Plane Wave Generator 1pc , Short Barrier 1pc, Long Barrier 2pcs, Curve Barrier 1pc, Circular Wave Generator 2pc, Plastic Hose 100 cm 1pc, Plastic Hose 40 cm 2pcs, Disposal Hose 40 cm 1pc, Ring Plate 10pcs, Butterfly Nut 6pcs, Support Rubber 4pcs, Rubber Stopper Without Hole, 6/9 mm 1pc  
**Additional Tools (sold separately) :** Power Supply 5A, 12V (ESP60751/5A)  
**Dimensions :** (L) 66.00 x (W) 37.00 x (H) 20.00 cm  
**Weight :** 9.000 kg

ESP60279





**Ripple Tank - Simple**

This economy Ripple Tank System comes as a ready-to-use unit with no external power source required. Comprised of a tough, moulded frame with a large transparent viewing surface. The Ripple Tank light source is a 6V halogen lamp which gives excellent illumination. The tank has sloping sides which minimise noise. This Ripple Tank System comes complete with :

- A. Ripple tank
- B. 4 Push-fit legs
- C. Rippler motor, eccentric cam mounted on ripple bar
- D. 3 Support pillars for supporting the light source and ripplier bar
- E. 2 Motor support springs
- F. Lamp unit with adjustable arm
- G. 2 Ripplier bar hanging hooks
- H. Power source for ripple tank
- I. Hand stroboscope
- J. Concave perspex plate
- K. Rectangular perspex plate
- L. Curved reflector
- M. 2 Barriers
- N. Roller Bar
- O. Neatly compartmentalized box

ESP60280



**Ripple Tank Standard**

Metal uprights are provided to carry a horizontal ripplier support and which can be adjusted in height with the help of screws, easily and precisely. The ripplier Assembly elastically suspended from the horizontal support rod, consists of a low voltage DC motor mounted on a wooden / plastic beam. The motor is fitted with an Eccentric mass, which causes beam to oscillate. Additional point contact sources are provided by two plastic spheres each mounted on a right angled metal shafts which when fitted to the beam, may be adjusted to required separation. An adjustable rod fixes centrally into a socket in one side of the Frame and affords support for the illuminant.

- A. Ripple Tank
- B. Ripple Generator
- C. Plane Wave Actuator Bar
- D. Light Source and Cord
- E. Ripple Tank Optics: Large and 2 small rectangular barriers of Glass
- F. 1 each of Concave Lens, Convex Lens, Triangular Prism and Curve Stainless Steel
- G. 1 Hand Stroboscope, black disc with plastic handle.
- H. Power supply for Ripple Motor and Light Source
- I. 1 sets of Metallic Rods and side screws for suspension of wave generator
- J. Roll for production of straight vibrators
- K. 20pcs of Rubber Bands
- L. 1 Foam piece.

ESP60284



**Ripple Tank Controller**

The unit provides two fully independent, continuously variable DC outputs 0 to 5V for the ripple tank motor, together with a fixed AC output to operate 6V, 20W bulb. Supplied with a detachable 1.5m main lead.

ESP60282





**Ripple Tank Small Led**

- This instrument provides a method to prove the basic phenomenon of wave, reflection, diffraction and refraction. LED strobes are installed at the lower part, and a 13x13cm rectangular water tank installed in the middle causes a water wave. It can be projected on the installed screen to clearly see the surface wave.
  - To overcome the small size limit, increase the SYNC frequency by four times and you will not notice a difference between the normal ripple tank and the visual effect.
- The LED strobe uses a high-power 3W class to provide a sharp image of the surface wave projection.
- The power supply is provided with a power supply with an input of 220V AC and an output of 12VDC. It is provided with single-wave, double-wave, and vibrator causing interference and reflection.

**Dimensions :** 150x200x160mm  
 Configuration: Body (SYNC Strobe, Wave source generator, Built-in screen) Power supply, single-wave double-wave source - Linear wave vibrator, Interference refraction object 4 pieces, Reflective object 1 piece 1 water tank 130x130mm

ESP60285



**Digital Stroboscope Integrated Type**

- It is used for proportional observation of fast movements such as falling motion and constant velocity motion, and for measuring the speed of a still picture or rotating body.
  - It is classified as a combined type of light source and main body and a separated type. B type light source Integrated specification: External synchronization 4 ~ 10Vpp, output 20W, 60 ~ 15,120rpm AC220V
- Dimensions :** 330\*330\*210mm  
**Weight :** 4Kg.

ESP60288



**Stroboscope - Motorised**

Motorised Stroboscope is a useful device for the teaching of the stroboscopic. The hand driven discs are difficult to keep at a constant speed. The motor driven stroboscope has an inbuilt speed control and maintains constant speed reasonably well. Supplied with a set of 3x discs with 4, 8 and 12 slots. A blank disc permits the creation of a disc in the classroom. The unit can be supported on a retort stand with a boss head. Runs from either AC or DC up to 12V. Maximum.

ESP60286



**Stroboscope Digital , Xenon, Hand Held**

- Operating Temperature : 0 to 50 deg C
- Accuracy : 100 to 5,000 (FPM/RPM) +/- 1 digit
- Display 0.3" LED, 4 digits.
- Stroboscopic Flash rate : 100 to 10,000 flashes per minute (FPM).
- Resolution : Less than 10,000 FPM/RPM
- Sampling Time 1 second.
- Range Select Automation.
- Circuit : This stroboscope/tachometer employs a custom one-chip of microcomputer LSI circuit & crystal control time base which results in extraordinary accuracy over a wide, dynamic range.
- Power Supply 110 Vac 10%, 50/60 Hz. or 220 Vac 10%, 50/60 Hz. or 230 Vac 10%, 50/60 Hz.
- Power Consumption : Less than 30 Watt.
- Operating Humidity : Less than 80% R.H.
- Housing : Compact and impact plastic injection case with plastic mirror type reflector.
- Calibration : Crystal time base and microprocessor circuit, don't necessary take any external calibration process.
- Accessories included : Operation manual.

ESP60287





**Signal Generator Irwin Power Signal Generator**

The popular Irwin EA0030 Power Signal Generator comes with an output frequency from 0.1Hz to 100 KHz available through 6 switched ranges. Switchable outputs of Sine, Square, Triangle and Pulse. The output frequency ranges from 0.1Hz to 100kHz and is adjusted using both the six-position Range Hz switch and the multi-turn rotary Frequency control. The actual output frequency is continuously monitored and shown on the blue LED Display.

The output amplitude of the waveform ranges from zero to a maximum of 10V peak to peak using the rotary Gain control.

It can also be used as a stand-alone Amplifier with a Voltage Gain (Av) ranging from zero to 100 ( 40dB) via the rotary Gain control and a frequency response of 1Hz to 100kHz (-3dB bandwidth). Note: the Amplifier has an input impedance of 1MW and a maximum input voltage of 200mV peak to peak (irrespective of the Gain setting).

**Specification**

- Input Voltage 230V 50Hz
- Output 4W into 8 ohms
- Manufactured in the UK

ESP60295



**Vibration Generator**

Generates the mechanical vibrations with alternating voltage input max. 3V AC, 10KHz from Audio Frequency Generator (ESP60296).

- Dimensions :** 110x110x65mm.
- Displacement:6mm
- Power: 3 watt
- Impedance: 8 ohm
- Input terminal: 4mm socket screw

ESP60299



**Signal Generator Irwin Sound-base A1**

The Irwin microprocessor controlled Signal Generator offers frequencies from 1Hz to 35Khz. Sine, triangle, square and sawtooth waveforms are available. Complete with built-in loudspeaker. Supplied complete with a plug top power supply.

A Signal Generator with output frequency from 1Hz to 35KHz. Digital circuitry for accurate waveform shape.

Built in loudspeaker with amplitude control and on/off switch, Selectable outputs of Sine, Square, Triangle and Sawtooth.

Waveform shape and frequency are selected by push buttons, Function output for oscilloscope display.

Supplied complete with plug top power supply.

Manufactured in the UK

ESP60294



**Vibration And Audio Frequency Generator**

A wave signal generator which produce wave in the form of rectangular, sinusoidal, triangle, sawtooth and pulse. It has strong enough to run Vibration Generator (ESP60299) and Loud Speaker . Maximum output power 3 watt at 8 ohm load. There is an 600 ohm output for the input of Audio Frequency Amplifier .

Frequency range: 0.1 Hz - 110 kHz. Sinus wave distortion less than 2% (1 kHz). Maximum output power of 3watts at 8 ohm load. Input power 110 / 220 VAC with a fuse protector.

ESP60296







### Function Generator DDS

#### Features:

- Max. Output frequency 5MHz
- 2 output channels
- Direct Digital Synthesis technology (DDS)
- Sampling rate 100MSa/s, vertical resolution 8 bits, waveform length 1024 points
- Min. 1mV (50) Waveform output with good stability
- 32 built-in waveforms
- 40 sets panel setting save recall
- Modulations: FM, FSK, ASK, PSK
- Frequency sweep, amplitude sweep, burst and TTL output functions
- Over voltage protection, over current protection, short circuit protection, reverse voltage protection
- Standard parts: 200MHz frequency counter
- Optional parts: RS-232 interface, power amplifier

#### Specifications:

Frequency range: 1 $\mu$ Hz~5MHz, Waveform (CHA), Type: 32 built-in waveforms, including Sine, Square, Triangle, Ramp, Pulse, etc.  
 Length : 1024 points, Vertical resolution : 8 bits, Sampling rate: 100MSa/s, Harmonic distortion of sine: 40dBc (1MHz); 35dBc (1MHz~20MHz)  
 Total distortion of sine: 1% (20Hz~200kHz) Rise/fall time of square: 35ns Overshoot of square: 10% Duty cycle of square: 1%~99%  
 Frequency (CHA) Range Sine: 1Hz~5MHz Range Square: 1Hz~5MHz Range Other: 1Hz~1MHz Resolution: 1Hz Accuracy : 5x10<sup>-5</sup> Stability : 5x10<sup>-6</sup>/3hours Amplitude (CHA) Range: 2mVpp~20Vpp, 1Hz~10MHz (high impedance) 2mVpp~15Vpp, 10MHz~15MHz (high impedance) 2mVpp~8Vpp, 15MHz~20MHz (high impedance) Resolution: 20mVpp (2Vpp); 2mVpp (2Vpp), Accuracy : (1% 2mVrms)(high impedance, RMS, frequency 1kHz), Stability: 0.5% /3hours, Flatness: 5% (frequency 10MHz); ~10% (frequency 10MHz), Output impedance: 50, DC Offset (CHA), Range: 10V (high impedance, attenuation 0 dB), Resolution: 20mVdc, Accuracy: (1% 20mVdc), TTL output, Waveform : Square, rise/fall time 20ns, Frequency: 10MHz~1MHz, Amplitude: TTL, CMOS compatible, low <math>\leq 0.3V</math>, high <math>\geq 4V</math>, Frequency counter, Testing frequency range : 1Hz~200MHz, Input signal amplitude: 100mVpp~20Vpp,

#### Common characteristics

Operation characteristics : Key operation for all functions, Menu display, Rotary dial adjustment  
 Display : Mono LCD  
 Language : English, Chinese (simplified), Chinese (traditional)  
 Power source: AC 110V/220V 10% selectable, 50/60Hz, Max. 45VA  
 Environmental condition: 0~40 $\circ$ C, <math>\leq 80\%</math>RH  
 Standard accessories : Power cord x1, Operation manual x1, BNC-BNC cable x1, Test lead x1

**Dimensions :** 385x260x110mm

**Weight :** 3.5kg

ESP60290



### Function Generator Arbitrary Wave Form

#### Features:

- Frequency range 1Hz~25MHz
- 2 independent output channels at same frequency range for main waveforms
- 4.5-inch TFT LCD display
- Min. Output amplitude 1mVpp (50 $\circ$ ), Total distortion 0.2%
- Sampling rate 150MSa/s, vertical resolution 14 bits, waveform length 16k points
- 6 standard waveforms, 50 built-in wave forms and 12 user-defined arbitrary waveforms
- 10 sets save recall for operating parameters
- Modulations: AM, DSSC AM, FM, PM, ASK, FSK, BPSK
- Synchronous output, external modulation input, trigger input, external reference input and count input
- Linearity/Logarithmic sweep signal and Burst signal
- Channel coupling, parameter (frequency, amplitude, offset, phase) coupling, point frequency replication tracking
- Strong arbitrary waveform building software, support SCPI commands
- Over voltage, over current, short circuit and reverse voltage protections
- Standard interface: RS232, USB device, USB Host
- 250MHz external frequency counter
- Optional power amplifier

#### Specifications:

Output frequency range:  
 Sine: 1  $\mu$ Hz ~ 25MHz  
 Square: 1  $\mu$ Hz ~ 5MHz  
 Ramp: 1  $\mu$ Hz ~ 500kHz  
 Pulse: 1  $\mu$ Hz ~ 5MHz  
 Noise: 30MHz white noise (-3dBm)  
 Arbitrary: 1  $\mu$ Hz ~ 6.5MHz  
 Resolution: 1  $\mu$ Hz  
 Accuracy: app 5 to 10<sup>-5</sup>  
 Output waveform : Sine, Square, Ramp, Pulse, Noise, Arb, DC  
 Waveform length : 8~16384 points (CHA), 8~2048 point (CHB)  
 Vertical resolution: 14 bits  
 Sampling rate: 150MSa/s  
 Interface: USB Device, USB Host, RS232  
 Power source: AC 100~240V, 47~63Hz, Max. 30VA  
 Accessories; Power cord x1, Operation manual x1, Software CD x1, USB cable x1, RS-232 cable x1, BNC-BNC cable x1, Test lead x1

#### Dimensions :

Chassis : 260Wx110Hx385D mm  
 Instrument : 295Wx195Hx415D mm

**Weight :** 4kg

ESP60291





**Vibration Generator Accessories**

A vibration generator for exciting oscillating and waves mechanically, e.g. in coil springs, a rubber cord, a wire ring or a Chladni plate. In robust plastic housing including mounting pin with 4mm socket for attaching accessories (Chladni plates, resonance wire, rubber band etc.). Including holder for stand rod (up to 8 mm diam.) on the rear side of the apparatus for the demonstration of standing waves in a coil spring. The generator is equipped with overload protection and is driven by a loudspeaker for smooth oscillations and fine travel stepping.

Spring and Resonance strips can be found here

**Specifications:**

Connection: via 4-mm safety sockets

Impedance: 8 ohm

Maximum amplitude: 5 mm

Frequency range: 0 up to 20 kHz

Minimum operating current: 10 mA

Overload protection: 1 A fuse

Required : Function Generator FG

**Dimensions :** approx. 200x160x70 mm?

**Weight :** approx. 1.4 kg

ESP60301



**Vibration Generator Spring Kit**

Steel strips giving six vibrating lengths. For use with our vibration generator. Fundamental frequencies at 11, 15, 21, 36 and 50 Hz can be readily observed. Interesting standing waves can be seen up to 300 Hz and heard up to 900 Hz. Also supplied is a quality steel spring ideal for producing longitudinal waves with a vibration generator connected to a signal generator. Spring constant 4.7 N/m.

**Dimensions :** (L x Dia.): 155mm x 27mm.

ESP60302



**Slinky Spring 80 mm**

Slinky Dia 80mm

Used for teaching the concept of wave motion and its properties

Diameter : 80mm

Length : Approx 120mm

Material : Steel with the helix

**Dimensions :** 8.70cm (L) x 8.70 (W) x 13.50cm (H)

**Weight :** 0.500 Kg

ESP60308



**Loudspeaker Unit**

The Irwin compact loudspeaker unit is fitted with a 10 watt, 8 Ω Driver. Connection is via colour coded 4mm sockets. Fitted into a durable ABS case.

ESP60305



**Melds Apparatus**

Apparatus for Meld's Experiment

Used to demonstrate the phenomena of wave standing on the rope and learn quantities that affects the speed of a wave on a rope

**Consists of:**

- Vibration generator 1pc - Table clamp with plastic pulley 1pc - Slotted Masses and Hanger - Ruler 50cm, stainless steel 1 pc - G Clamp 2 inch - Stand Base 1 pc - Stand Foot 1 pc - Stand Rod 500mm 2 pc - Stand Rod 250mm 1 pc - Universal Boss-head 1 pc

- Bearing Pin 1 pc - Nylon Thread 1 roll - Connecting lead 50cm, Red 1pc - Connecting Lead 50cm, Black 1pc - Rod coupling 1pc

Additional tool (not included, sold separately): Audio frequency Generator

ESP60310





**Melds Apparatus Demo Magnetic**

Magnetic panel assembly – equipment set for generating transverse standing waves,

Allowing nodes and anti-nodes as well as changes in their number at different excitation frequencies to be easily recognised.

Consisting of:

- 1x Motor with toggle for oscillation test , 1x Magnetic base, D = 43 mm, with tube and pin, 1x Magnetic base, D = 66 mm, with tube and pin, 1x Elastic string, white, L = 300 cm, 1x Rubber string, red, L = 300 cm

ESP60311



**Microwave Apparatus Kit**

Microwave apparatus is a set of tools which are used to learn the electromagnetic wave.

Diffraction and interference experiment on the electromagnetic wave are very difficult to perform on the

Visible light wave length. With this apparatus, those characteristics can be easily observed.

Reflection law experiment, diffraction on single slit, interference on double slits, polarization and Michelson

Interferometer can be performed by this apparatus , Experiment Topics : Reflection, Interference, Diffraction, Polarization

ESP60312



**Ultrasonic Student Kit**

**Kit consisting of:** 1x Ultrasonic control unit, 2x Ultrasonic transmitter, 1x Ultrasonic receiver, 1x Ultrasonic goniometer, 3x Slider with clamping post 40 mm, 1x Ultrasonic apertures, set of, with angle bracket, 1x Ultrasonic frame aperture for absorption experiments, 1x Ultrasonic parabolic mirror

**Storage:** 1x Box insert Ultrasonic, 1x Storage box II big, with cover, Box -insert plan with 2 labels

ESP60315



**Ultrasonic Student Budget Kit**

KIT Consist of the following :

Ultrasonic control unit, Ultrasonic transmitter, Ultrasonic receiver, Ultrasonic apertures, set of, with angle bracket, Kit of material

ESP60316





**Oscillation Module 1 With Brake**

21 double pendulums, 21.5 cm long each, mounted on a special aluminium profile.

The aluminium pendulum weights are cylindrical and mounted 1.8 cm apart so as to be able to rotate horizontally.

Adjacent pendulums are joined using two coil springs, allowing waves to be propagated.

Built-in brake pads allow the wave motion to be stopped immediately, so that, for example, wavelength may be measured.

Supplied with two padded aluminium feet and a clamp for creating a fixed end.

**Total length :** approx. 41.5 cm

ESP60317



**Drive Unit For Wave Demonstrator**

While waves or pulses can be generated manually, an electric motor produces constant motion,

Generating waves that are easier to observe and compare.

A DC motor, attached to a cam, controls the speed of the exciter plate, which in turn causes the pendulum motion.

Increasing or decreasing the amount of DC input voltage likewise affects the pendulum frequency of the exciter plate.

Aluminium case, 14 cm long, mounted on special aluminium profile with two 4-mm safety jacks,

Supplied with two coupling springs

**Required accessories:**

Power supply able to set variably from 0 to 6 V DC, 0.5 A min.

ESP60318



**Oscillation Module 2A With Brake**

Used to extend module 1, resulting in a unit with 42 double pendulums, which allows experiments to be observed more easily;

technical data similar to model no ESP60316;

Supplied with a rail connector and two coupling springs;

**Total length :** approx. 41.5 cm

ESP60319



**Damping Unit**

This unit is mounted at the end of the wave demonstrator and serves by means of a damping plate submerged in water to prevent undesired reflection of waves.

The unit consists of one pendulum mounted rotatably, a water tub and two coupling springs.

ESP60320



**Oscillation Module 2B With Brake**

Used to extend modules I. Technical data similar to modules 1 and 2a, except that the pendulums are lighter (made of plastic), making it possible to achieve other wave velocities.

Supplied with a rail connector and two coupling springs;

Total length: approx. 41.5 cm

ESP60321



**Wave Apparatus Plastic**

Made of plastic. The rotating handle is fitted with a circular scale marked in degrees to indicate the indication. The plastic highlighted tips make easy observation of wave motion.

ESP60314





### Vibrations And Waves Student Kit

Kit consisting of:

- 1x Rubber string, 3 m
- 1x Flat spring steel, 0.6mm, L=300 mm
- 1x Holder for pencil
- 1x Threaded rod with butterfly nut
- 2x Pendulum ball with hook, wooden,
- 1x Pendulum ball with hook, plastics,
- 1x Motor with toggle for oscillation tests,

Storage:

- 1x Box insert Vibrations and waves, SE
- 1x Storage box II mini with cover,
- Box -insert plan with 2 labels

ESP60323



### Bell Jar Kit

Vacuum chamber complete, 1000 ml, with manometer, Syringe plastics, 120 ml, for vacuum-experiments, Vacuum hose plastics, SE, 300 x 6 mm, Signaller (alarm annunciator), Alarm with LED, Hand Pump

ESP60326





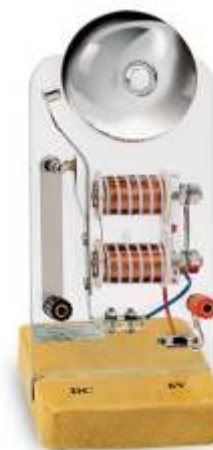
**Electric Bell**

- Electromagnetic bell with plastic base, for 3-6 V DC
- Complete with transparency cover to observe the way bell worked
- Terminal 4mm socket

**Dimensions :** (L) 16.00 x (W) 8.00 x (H) 4.00cm

**Weight :** 0.211 kg

ESP60329



**Electric Bell Kit**

'Teach students how circuits work with this fully exposed bell! This device rings out when an electrical circuit is completed. Includes: wood stand, banana plug jacks, adjustable hammer, and instructions. Requires an energy source such as a hand generator or a 6V battery kit. Grade 6 and up.

ESP60330



**Sonometer 30 Cm**

Ideal for use by Primary School students aged 6-12 years. The student will be able to understand the basic concepts of sound and the vibration of an objects that produce sound.

**Experiment topics:**

- Generation of sound.
- Strong and weak sound.

ESP60332

**Sonometer 1 M**

Used to demonstrates the relationship between the frequency of the sound produced by a plucked string, and the tension, length and mass per unit length of the string.

**Dimensions :**

- Overall sonometer : 1200 x 130 x 80 mm, with bridges at 1000 mm
- Scale : 0-100 cm (1 m), on both sides
- String : 0.5 and 0.7 mm

**Material :**

- Sonometer box : Wood
- String : Brass and Stainless Steel

On the surface of the box can be stretched three strings wire Complete with 2 stress string regulator, pulley for drape the load, three removable bridges and 1 set of strings

Used with Slotted Masses and Hanger 6 kg (5 Loads), Steel that are sold separately.

**Dimensions :** (L) 115.00 x (W) 12.00 x (H) 9.00 cm

**Weight :** 3.000 kg



ESP60334

**Sonometer Spare String (Wires) 1M**

These strings are used together with Sonometer.

**Dimensions :**

Brass string : 0.5 mm, ,Stainless steel string : 0.7 mm, Length : 1.5 m, Material : Brass and stainless steel, Set consist of 2 brass string and 2 stainless steel string, Part of Sonometer 1 m (ESP60334),.

**Dimensions :** (L) 9.00 x (W) 9.00 x (H) 0.50 cm

**Weight :** 0.025 kg

ESP60335





**Resonance Apparatus 1**

Consists of a chrome plated metal resonance tube 100 cm long, metal reservoir 250 ml and a meter scale mounted on a metallic stand. With rubber tubing.

ESP60338



**Resonance Apparatus 2**

The main part of the apparatus is a borosilicate glass tube which is connected to a bulb using a hose to enable to length of the air column in the tube to be varied.

The apparatus is mounted on a stand. It is used to determine the velocity of sound in air by resonance method.

**Dimensions :**

Tube **Dimensions :** dia. 30 X 850 mm

Tendon volume : 500 ml

**Dimensions :** (L) 123.00 x (W) 15.00 x (H) 18.00 cm

**Weight :** 9.000 kg

ESP60339



**Resonance Tube, Set**

Resonance tube gives the easy of experiment about sound. Loudspeaker which is connected to the audio generator produces stable wave pattern with changeable sound frequency.

**Dimensions :** Overall 1185 x 100 x 150 mm

**Material :** Flexiglass

**Consist of :**

Resonance Tube 1 pc, Microphone 1 pc, Sound Level Meter 1 pc

**Additional tools (sold separately) :**

- Audio Frequency Generator (ESP60296) - Oscilloscope

**Dimensions :** (L) 122.00 x (W) 16.00 x (H) 14.50 cm

**Weight :** 2.475 kg

ESP60340



**Resonance Tube Set With Aluminium Case**

Resonance tube gives the easy of experiment about sound. Loudspeaker which is connected to the audio generator produces stable wave pattern with changeable sound frequency.

**Dimensions :** Overall 1185 x 100 x 150 mm

**Material :** Flexiglass

**Consist of :**

Resonance Tube 1 pc

Microphone 1 pc

Sound Level Meter 1 pc

Aluminium Case 1 pc

**Additional tools (sold separately) :**

Audio Frequency Generator (ESP60296)

Oscilloscope

**Dimensions :**(L) 0.00 x (W) 0.00 x (H) 0.00 cm

**Weight :**0.000 kg

ESP60341



**Resonance Tube**

**Dimensions :**

Resonance tube : 56 x 995 mm

Foot tube holder : 80 x 110 mm, thickness 10 mm

**Material :** Flexiglass

Loudspeakers mounted on the base leg tubes and slides

There is a scale and a pair of holes on the surface of the resonance tube

At the end of the position adjuster rod there is a microphone

Part of Resonance Tube, Set (ESP60341).

**Dimensions :** (L) 122.00 x (W) 14.00 x (H) 17.00 cm

**Weight :** 2.300 kg

ESP60342



**Sound Level Meter**

Hand Held small Sound meter analogue type to be used for resonance tube.

ESP60347



**Resonance Tube And Complements, Set**

Resonance Tube and Complements, Set

**Consists of:**

- (ESP60340) Resonance Tube Set 1 pc
- (ESP60296) Audio Frequency Generator 1 pc
- Oscilloscope 1 pc
- Connecting Lead DC 50 cm, Black 2 pcs
- Connecting Lead DC 50 cm, Red 2 pcs
- Manual Book 1 exp



Resonance tube gives the easy of experiment about sound. Loudspeaker which is connected to the audio generator produces stable wave pattern with changeable sound frequency.

**Dimentionis :** Overall 1185 x 100 x 150 mm, Material : Flexiglass

**Set Consist of :**

- Resonance Tube 1 pc, Microphone 1 pc, Sound Level Meter 1 pc,

**Dimensions :** (L) 122.00 x (W) 16.00 x (H) 14.50 cm, **Weight :** 2.475 kg

**AUDIO FREQUENCY GENERATOR (ESP60296)**

A tool wave signal generator, which produces a square wave, sinusoidal, triangle, saw, and pulse. 8 output impedance with enough power to drive the Vibration Generator (ESP60299) and Loudspeaker with Wood Holder , output to input to the Audio Frequency Amplifiers . Frequency Range : 0.1 Hz - 110 kHz, Distortion sinus wave is less than 2% (1kHz), Maximum output power : 3 watts at 8 load, Input Voltage 110/220 VAC, Protection fuse (fuse) : 0.5 A (him. 5 x 20 mm),

**OSCILLOSCOPE 30 MHZ**

Measuring limit : 30 MHz, The number of canals : 2, The rate of footage : 250 MS/s and 10.000 point recording data, Screen : Coloured TFT LCD 8 inch, Resolution : 800 x 600 pixels, Operating X-Y, Input voltage : 220V, Equipped with VGA terminal to connect oscilloscope with a projector as well as USB terminal communication and LAN to be connected to a computer Result of measurement/waveform can be stored in internal memory or flash disk Oscilloscope can also record the signals and replay the record. There are auto-scale function, FFT function , mathematical function to operate a signal of the two canals and 20 variable automatic measurements function Equipped with guidelines on menu "Help" Complete with probe intensity and manual book

ESP60343



**Sound Velocity Meter**

For measuring sound velocity through solids, liquids or gases; 4-digit, 26-mm LED display; signal is launched manually; stop signal detected by encapsulated electric microphone with waterproof membrane.

**TECHNICAL DATA :**

Measuring range: 99.99 ms, Accuracy: 10 μs, Dial for adjusting sensitivity, Reset switch, Power supply: 4 x 1.5V Mignon cells (included), rechargeable cells or external power supply 6 V / 500 mA, P3120-6N, Case: plastic, ABS, Case **Dimensions :** approx. 160 x 120 x 45 mm, Length of probe leads: approx. 150 cm each

ESP60345



**Tuning Fork Pair With Resonance Box**

The forks have threaded shanks and will screw in the box tops. Frequency of each is A (426). One fork is fitted with a sliding mass to alter its frequency. On sounding both forks, a clear 'beat' is produced. Supplied with one hammer.

Size of box 180 x 88 x 53 mm approx.

ESP60350



**Sound Level Meter Mini**

Mini Analogue sound level meter range up to 130 dp

ESP60348







### Tuning Fork On Resonance Box

Turning Fork on Resonance Box Used in sound resonance experiment

Size of resonance box: 180 x 90 x 50mm

Material of resonance box: Wood

Material of tuning fork: Metal

Material of beater: Rubber

Tuning fork frequency: 426.6Hz (pair)

Equipped with Tuning Fork Hammer

ESP60351



### Tuning Fork (4 Pcs/Set)

Turning Fork (4 pcs/set)

Used in some experiments about sound, waves or other physical experiments

Overall **Dimensions** : 160 x 95 x 25mm

Material: Steel

Equipped with a wooden box for storage of tuning fork

**The set consists of:** - C 512 Hz - A 426.6 Hz - F 341.3 Hz - D 288 Hz

**Dimension:** 18.00 (L) x 17.00 (W) x 5.00cm (H)

**Weight:** 0.500kg

ESP60352



### Colour Mixing Apparatus

This self contained unit ideal for demonstration color mixing with the addition of the three primary colours : red, blue, and green. The brightness of the three colours can be controlled by individual switches. Hundred of color combinations are possible, 3 inch screen, require AA batteries ( not included ) or connect to power supply.

ESP60357



### Colour Mixing Apparatus Demo

The Irwin Colour Mixing kit is designed to demonstrate primary and secondary colour mixing.

The kit comprises, essentially, a scaled up version of our small colour mixing apparatus. A robust, upright case contains three, high powered accurately colour matched LEDs, each of which has infinitely adjustable brightness. Also supplied is a large, free-standing, primary colour shadow mask, a hand held secondary colour mask and a 12V plug top power supply.

The system allows the teacher to project large primary and secondary colour mixing disks onto any vertical surface and to adjust the colour saturation to mix virtually any colour (How do you produce brown?). Unlike other systems the purity of the resulting white is outstanding. The unit is extremely easy to use, is easily transportable and comes with full instructions. The only other requirements are a white wall and a darkened/blacked out room.

The system may be used to demonstrate both secondary and primary colour mixing, colour shadows and colour reflection/absorption.

ESP60358



### Colour Mixing Demonstration Projection

A low voltage projection colour mixing apparatus. The unit comprises three individually moveable light heads, red, blue and green, which use individual lenses to project three coloured spots of light. By adjusting the heads the spots may be overlapped to produce the classic colour mixing pattern or superimposed to give a white disc that may be used for colour shadow work and secondary colour mixing determination. All three colours may be individually adjusted from 0% to 100% giving an almost limitless number of possible colours. Comes supplied with low voltage power supply.

ESP60359





**Newton Colour Disc With Motor ,Demonstration.**

Large size, mounted on moulded ABS base. Operates on 4 to 6 Volts DC with Newton's Color Disc.

ESP60362



**Newton's Colour Disc Motor Driven**

Newton disc 75mm dia. Mounted on the axle of the small motor, which is fitted on a plastic base-plate with connection sockets. Operates on 4-6 Volts DC.

ESP60361



**Newton Colour Disc**

To show that mixing of spectrum colours produces (nearly) white colour.

**Dimensions ::**

- Colour Disc: 250mm dia - Pulley: 25mm dia and 108mm dia

**Material:**

- Disc and Pulley: Plastic - Support Rod: Steel

Disc divided into 2 sector each with 7 different colours Mounted on a rotator and stand base A-shaped Producing nearly white colour when the disc is rotated Used with Pulley 100mm dia, Plastic

ESP60363



**Spectrum Tube Power Supply I**

Specially designed box holds the tube firmly and prevents the student from touching the electrodes. A black panel behind the Spectrum tube eliminates distracting ambient light and protects the tube from breakage. Operates on 220V A/C at 50Hz and is suitable for 20/26 cm tubes.

ESP60377



**Optics Kit,Eduscience Prim (Set Of 1)**

Ideal for use by Primary School students. The students can design their own experiments. This kit is used in learning the basic concepts and characteristics of prism and magnifying effect of a magnifying glass.

Experiment topics:Decomposition of light., Magnifying effect of glasses. Prism behaviour.

Specification:The kit contains 1pc x prism and 1pc x magnifying glass.

**Dimensions :** (L) 5.50 x 9W) 14.00 x (H) 1.50cm

ESP60391



**Spectrum Tube Power Supply II**

High voltage power supply for spectrum tube. Equipped with spectrum tube holder,

Input voltage: 110/220VAC

Voltage output: 3 kV, 5mA (The output is continuously variable and is properly insulated)

**Dimensions :** 24.00 (L) x 18.00 (W) x 31.00 (H) cm

**Weight :** 3 kg

ESP60379

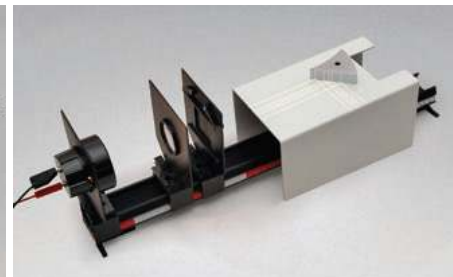
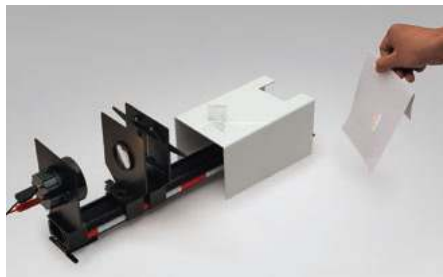




### Spectrum Tubes

Made of glass, 26cm long overall, narrowed to capillary width for 8.5 to 10cm of the length. Metal wires holding the electrodes are sealed through the ends and welded to metal caps, which have loops for connecting wires.

ESP60366	Oxygen
ESP60367	Neon
ESP60368	Helium
ESP60369	Nitrogen
ESP60370	Argon
ESP60371	Carbon Di Oxide
ESP60372	Hydrogen
ESP60373	Iodine Vapour
ESP60374	Sulphur
ESP60375	Xenon
ESP60376	Krypton



### Optics Kit U3 (22 Items)

Experiment Topics

Reflection

Reflection of Light on Plane Surface

Reflection of Light on a Curved Surface

Refraction

Refraction of Light on Plan-Parallel Surface

Refraction Through a Prism

Refraction by a Lens

Image by Convex Lens

Object Distance, Image Distance, and Focal

Length

Dispersion

Dispersion of Light

Optic instrument

Astronomical Telescope

Box and Tray Optic Kit 1 set

Manual Book Optic Kit 1 exp

**Additional required tool (sold separately) :**

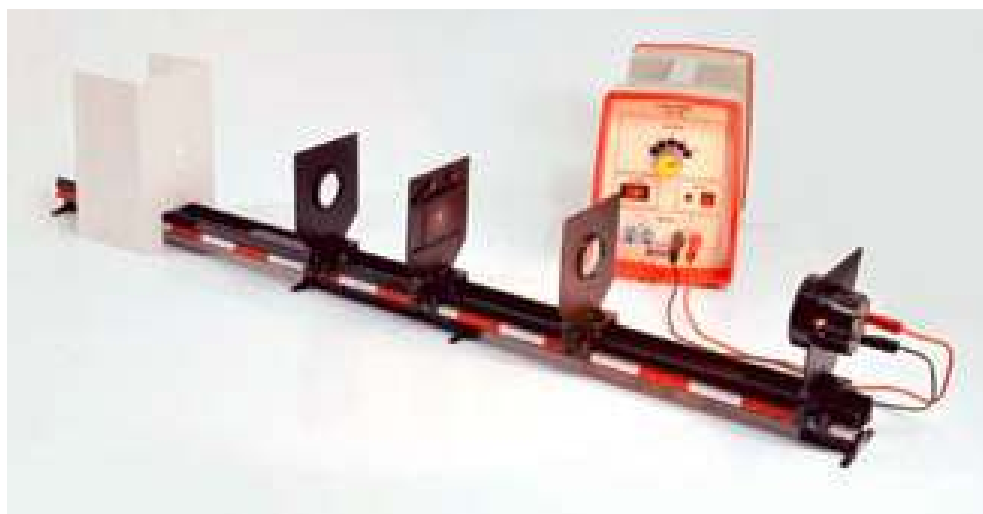
Power Supply 3A, 36W (ESP60751)

**Dimensions :** (L) 60.00 x (W) 28.00 x (H) 16.00 cm

**Weight :** 3.350 kg

ESP60392





### Optics Kit 103

Used for propagation, reflection, shadow object, decomposition of light, microscope principles and another optical experiments.

#### Consist of :

- Optic Table 1 pc
- Precision Rail 50 cm 3 pcs
- Rail Connector 2 pcs
- Foot for Rail 2 pcs
- Lamp Housing with Festoon Bulb 1 pc
- Festoon Bulb 12V, 18W 4 pcs
- Diaphragm Slide Holder 1 pc
- Diaphragm 5 Slit 1 pc
- Diaphragm 1 Slit 1 pc
- Diaphragm 4 Holes, thickness 1.5 mm 1 pc
- Diaphragm Arrow 1 pc
- Translucent Screen, 110 x 100 mm 1 pc
- Convex Lens with Holder,  $f = 50$  mm 1 pc
- Convex Lens with Holder,  $f = 100$  mm 1 pc
- Convex Lens with Holder,  $f = 200$  mm 1 pc

- Concave Lens with Holder,  $f = -100$  mm 1 pc
- Clamp Rider 4 pcs
- Semi Circular Lens 60 mm 1 pc
- Prism Right Angle 30 x 30 x 40 mm 1 pc
- Biconvex Lens, Glass 1 pc
- Combination Mirror 1 pc
- Biconcave Lens, Glass 1 pc
- Glass Block 60 x 40 x 20 mm 1 pc
- Candle Holder 1 pc
- Rectangle Plastic Tank 1 pc
- Square Plastic Tank 1 pc
- Slide Cover 2 pcs
- Experiments manual book 1 pc
- Box and Tray 1 set

#### Support Tools (sold separately) :

- Power Supply 3A, 36W (ESP60751) 1 pc
- Folding Flat Mirror 1 pc

**Dimensions :** (L) 61.00 x (W) 26.00 x (H) 17.00 cm

**Weight :** 3.200 kg

ESP60393





### Optics Kit 3

#### Consist of:

Optic Table 1 pc  
 Precision Rail 50 cm 2 pcs  
 Rail Connector 1 pc  
 Foot for Rail 2 pcs  
 Lamp Housing with Festoon Bulb 1 pc  
 Festoon Bulb 12V, 18W 4 pcs  
 Diaphragm Slide Holder 1 pc  
 Diaphragm 5 Slit 1 pc  
 Diaphragm 1 Slit 1 pc  
 Diaphragm Arrow 1 pc  
 Translucent Screen, 110 x 100 mm 1 pc  
 Convex Lens with Holder,  $f = 50$  mm 1 pc  
 Convex Lens with Holder,  $f = 100$  mm 1 pc  
 Convex Lens with Holder,  $f = 200$  mm 1 pc  
 Concave Lens with Holder,  $f = -100$  mm 1 pc  
 Clamp Rider 4 pcs  
 Semi Circular Lens 60 mm 1 pc  
 Prism Right Angle 30 x 30 x 40 mm 1 pc  
 Biconvex Lens, Glass 1 pc  
 Combination Mirror 1 pc  
 Biconcave Lens, Glass 1 pc  
 Glass Block 60 x 40 x 20 mm 1 pc  
 Candle Holder 1 pc  
 Colour Filter Set, RGB 1 set  
 Slide Cover 2 pcs  
 Student Experiments book 1 pc  
 Box and Tray 1 pc

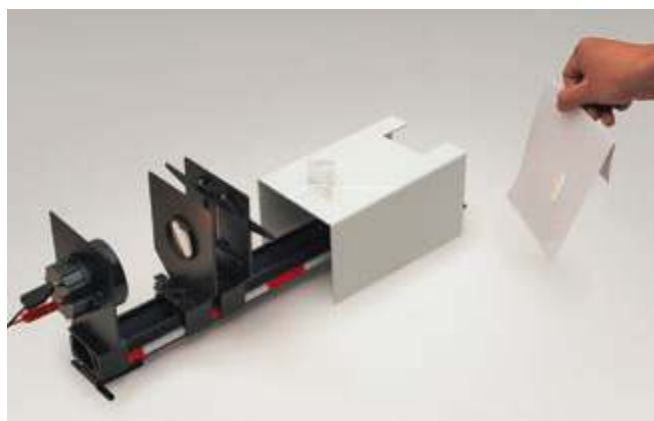
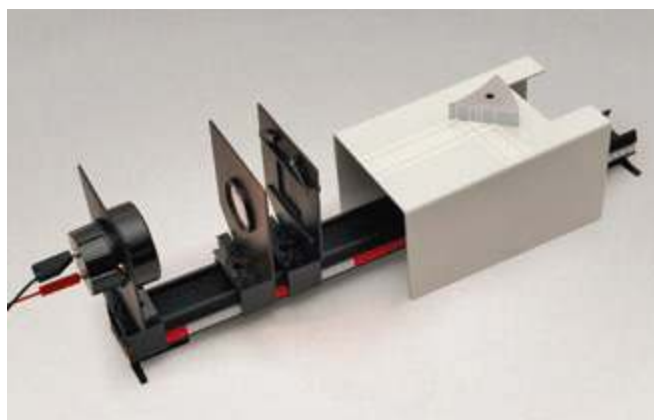
#### Support Tools (sold separately):

Power Supply 3A, 36W (ESP60751) 1 pc

**Dimensions:** (L) 61.00 x (W) 26.00 x (H) 17.00 cm

**Weight:** 3.000 kg

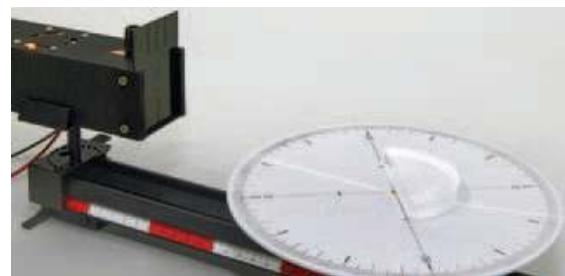
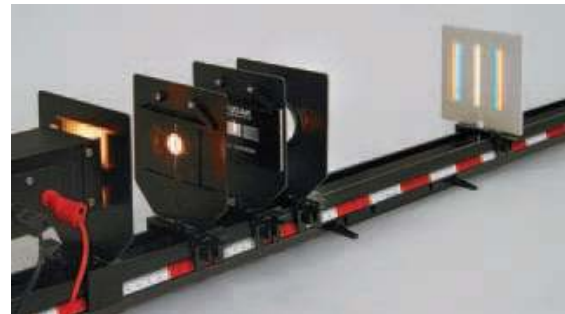
ESP60394





**Optics Kit 5**

- Experiment Topics
- Propagation of Light
- Light Propagates Rectilinearly
- Shadow
- Core Shadow and Half Shadow
- Lunar Phases
- Solar and Lunar Eclipses
- Pinhole Camera
- Mirrors
- Reflection of Light on a Plane Mirror
- Reflection of Light on a Curved Mirror
- Object and Image on a Plane Mirror
- Reflection of Parallel Rays on a Concave Mirror
- Image of a Point Object Formed by a Concave Mirror
- Three Special? Rays for Image Construction in a Concave Mirror
- Locating the image of an object formed by concave mirror
- Reflection of Parallel Rays on a Convex Mirror
- Image of a Point Object Formed by Convex Mirror
- Three Special? Rays for Image Construction in a Convex Mirror
- Image on a Convex Mirror Optical Illusions
- Optical Instruments
- Magnifying Glass
- Slide Projector
- Microscope
- Astronomical Telescope
- Camera
- Wave Optics
- Diffraction by Grating
- Determination of the Wave Length of Light
- Polarization of Light
- Rotating of the Plane of Polarization by inserting Solid Materials
- Model of a Saccharimeter
- Photoelasticity
- Plastic Box and Tray Optics Kit 1 set



**Support tools (sold separately) :**

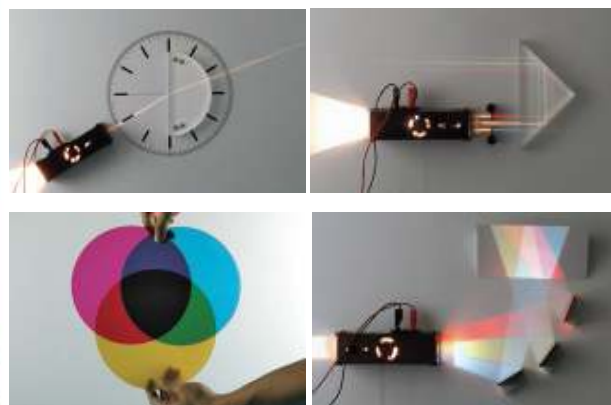
- Bosshead, Round 1 pc
- Stand Rod 10 x 100 mm, Stainless Steel 1 pc
- Connecting Lead DC 50 cm, Black 1 pc
- Connecting Lead DC 50 cm, Red 1 pc
- Power Supply 5A, 12V 1 pc

**Dimensions :** (L) 61.00 x (W) 44.00 x (H) 16.00 cm

**Weight :** 5.640 kg

ESP60396





### Optics Kit Panel Type

Set of device and items needed to carry out simple experiments and observation on the basic properties of light when it falls on a surface or when it passes through some optical TRANSPARENT block or slabs of various shapes and some reflecting surfaces or mirror.

#### Experiment Topics :

Diffusion of Light

P 31 01 Propagation of Light

P 31 02 Shadow

P 31 03 Lunar Eclipse (Model)

P 31 04 Solar Eclipse (Model)

Reflection

P 32 01 The Law of Reflection

P 32 02 Rotating Mirror

P 32 03 Regular Reflection

P 32 04 Diffuse Reflection

P 32 05 Image Point on a Plane Mirror

P 32 06 Virtual Image on a Smooth Mirror

P 32 07 Concave Mirror

P 32 08 Path of Rays in a Concave Mirror

P 32 09 Images in a Concave Mirror

P 32 10 Movement of Rays in a Convex Mirror

P 32 11 Path of Rays in a Convex Mirror

P 32 12 Path of Rays when Forming an Image in a

Convex Mirror

Refraction

P 33 01 Refraction of Light

P 33 02 Total Reflection in Water

P 33 03 Calculating the Index of Refraction

P 33 04 Total Reflection in Glass

P 33 05 Total Reflection in a Semi-Circular Body

P 33 06 Basic Principle of a Photoconductor

P 33 07 Photoconductor, Flexible

P 33 08 The Plane Parallel Plate

P 33 09 Refraction of Light in a Prism

P 33 10 Deviating Prism

P 33 11 Inverting Prism

P 33 12 Torricelli's Prism Lenses

P 34 01 Refraction at Convex Lens

P 34 02 Refraction at Concave Lens

P 34 03 Position of The Focal Point of a Biconvex Lens

P 34 04 Position of The Focal Point of a Thin Planoconvex

Lens

P 34 05 Position of The Focal Point of a Thick Planoconvex

Lens

P 34 06 Refractive Effect of Convergent and Divergent

Lenses on Diverging

P 34 07 Lens Systems

P 34 08 Special Rays on a Convergent Lens

P 34 09 Special Ray Paths on a Plano-Convex Lens

P 34 10 Special Ray Paths on a Concave Lens

P 34 11 Path of Rays When Forming an Image on a

Convergent Lens

P 34 12 Path of Rays When Forming an Image on a

Divergent Lens

The Eye

P 35 01 Ocular Accommodation

P 35 02 Faulty Vision and Its Correction Near-

Sightedness

P 35 03 Faulty Vision and Its Correction Far-

Sightedness

Optical Instruments

P 36 01 Path of Rays in a Single Lens Reflex Camera

P 36 02 Path of Rays in a Slide Projector

P 36 03 Model of a Microscope

P 36 04 Model of an Astronomical Telescope

P 36 05 Model of a Galilean Telescope

Color

P 38 01 Dispersion of Color

P 38 02 Spectral Colors Cannot Be Further Dispersed

P 38 03 Converging Spectral Colors To Make White

P 38 04 Mixed Color of a Partial Spectrum

P 38 05 Complementary Colors Color Theory

P 38 06 Subtractive Mixing Colors

P 38 07 Additive Mixing Colors Magnetic Mounting System for Fast and

Easy Setup

A Large optical objects model which are more clearly visible

A very sharp resolution xenon lamp

More than 50 experiments with fully photographed manual experiment

#### Additional tool (sold separately) :

-Power Supply 5A, 12V (ESP60751/5A)

-Connecting Lead DC 100 cm, Black

-Connecting Lead DC 100 cm, Red

**Dimensions :** (L) 0.00 x (W) 0.00 x (H) 0.00 cm

**Weight :** 23.400 kg

ESP60398





### Geometric Optics Kit

Geometric Optic Kit can be used to do simple observations and experiments concerning the geometric optic. Light reflection and refraction can be observe easily, especially with the presence of the special light print out on a mirror or lens. Consisting of laser box with accessories and several transparent objects in several shapes ( square, semi circular, prism and lens model ), and combination mirror.

#### Consist of :

- Laser Source, 3 beams 1 pc
- Combination Mirror 1 pc
- Semi Circular Perspex Block 1 pc
- Rectangular Perspex Block 1 pc
- Equal Side Triangular Prism Block 1 pc
- Biconcave Lens 1 pc
- Biconvex Lens 1 pc
- Plan Convex Lens 1 pc
- Biconvex Thick Lens 1 pc
- Special Ray Template 1 set
- Disability Eyes Template 1 set

**Dimensions :** (L) 35.00 x (W) 20.50 x (H) 8.50 cm

**Weight :** 1.000 kg

ESP60399



### Light Kit (Set Of 1)

Ideal for use by Primary School students aged 6 - 12 years. Designed for teaching the basic concepts of light. The student will be able to understand the characteristics of light and they can perform experiments with their own ideas. Manufactured with high quality standard.

**Dimension:** 12.50 (L) x 8.00(W) x 4.50(H) cm

#### The kit contains:

- 1pc x Right Angle Prism 90° 12x21.2x42.4mm
- 1pc x Mirror
- 1pc x Light Box Complete

ESP60402



### Optics Experiment Kit

#### Consist of :

- Precision Rail 50 cm 2 pcs, Rail Connector 1 pc, Foot for Rail 2 pcs
- Lamp Housing with Festoon Bulb 1 pc
- Clamp Rider 4 pcs
- Convex Lens with Holder,  $f = 50$  mm 1 pc
- Convex Lens with Holder,  $f = 100$  mm 1 pc
- Convex Lens with Holder,  $f = 200$  mm 1 pc
- Optic Table 1 pc
- Diaphragm Slide Holder 1 pc, Diaphragm Arrow 1 pc, Manual Book 1 exp

#### Support Tools (sold separately) :

- Power Supply AC/DC, 50 HZ 1 pc

**Dimensions :** (L) 62.00 x (W) 30.00 x (H) 9.00 cm

**Weight :** 2.300 kg

ESP60400



### Light Box And Optical Set

A Robust light box in matt black finish with a 12 V 24 W axial filament lamp with flexible leads. One end of the box takes a cylindrical convex lens in an adjustable sliding mount to enable production of convergent, parallel or divergent beams. Complete with accessories which consist of: 5 Plastic blocks, one rectangular, one semicircular, one equilateral prism 60 x 60 x 60 , one right angle prism 90 x 60 x 30 and one right angle prism 90 x 45 x 45 . 3 Cylindrical acrylic lenses: one double convex, one double concave, both having the same radius of curvature and one thick convex lens. 3 Mirrors, one plane glass, one curved parabolic and one curved semi-circular. 2 Slit plates, one with three narrow and one narrow slits, the other with four narrow and one wide slits 1 Set of eight colour filters, Red, Green, Blue, Cyan, Violet, Yellow, Orange and Magenta. 1 Set of coloured cards, Red, Green, Blue, Violet, Orange, Cyan, Yellow and Pink. Complete with one spare lamp, in Styrofoam box.

ESP60405







### Ray Box Kit

Ray Box KIT is a set of tools that can be used to make observations and simple experiments about the properties of light, when it falls to the surface or when light propagates through TRANSPARENT objects such as glass, water or plastic.

#### Consist of :

Ray Box 1 pc, Semi Circular Mirror with Holder 1 pc, Parabolic Mirror with Holder 1 pc, Wide Slit and 4 Slits Diaphragm 1 pc, Lamp Bulb SBC 12V, 24W 1 pc, Rectangular Prism with Holder 1 pc, Biconvex Lens Thick with Holder 1 pc, Biconvex Lens with Holder 1 pc, Biconcave Lens with Holder 1 pc, Semi Circular Lens with Holder 1 pc, Semi Circular Lens with Holder 1 pc, Prism Equilateral Triangular with Holder 1 pc, Diaphragm 1 and 3 Slits 1 pc, Colour Filter, RGB-CMY 1 set, Tray 1 pc, Tray cap 1 pc, Carton box 1 pc

**Dimensions :** (L) 46.00 x (W) 26.00 x (H) 11.00 cm

ESP60407



### Ray Box With Magnetic Base

Ray box with magnetic base, variable focus. Designed to be placed on a metal support like table, board, bench. Equipped with 12V 21W bulb. Supplied with two slits.

ESP60409



### Laser Ray Box Red Laser

The Battery Laser Ray Box has many advantages over a standard ray box. These include:

- Battery operated - technicians do not need to move power supplies from lab to lab
  - No more broken (and expensive) ray box lamps
  - No more burned fingers - the laser ray box runs cold
  - No need to blackout the lab - just switch off the lights
  - Class II laser - safe for class use
  - Push switch operated (latching). Batteries last about a year and are easily replaced (2 x AAA)
- Pk of 10

ESP60413



### Ray Box Raymond

An inexpensive ray box designed specifically for primary and lower secondary use. The raybox is housed in an ABS case with fixed slits - one single slit and one set of triple slits allowing two groups to work simultaneously. Raymond also has in-built primary colour filters which, with the use of two plane mirrors, allow the overlapping colour mixing discs to be projected. Operates on 6 V AC or DC Comes complete with two plane mirrors and a spare lamp.

ESP60408



### Ray Box

The front end of the box produce wide, narrow, parallel, convergent, divergent beams. The rear end of the box produce light source for colour mixing.

**Overall Dimensions :** 17 x 9 x 9 cm

**Material :** Plastic

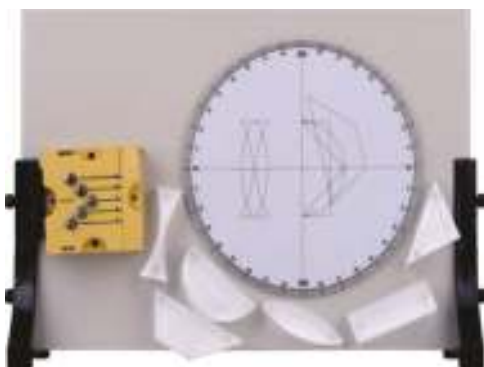
This component is part of Ray box Kit.

**Dimensions :** (L) 17.00 x (W) 9.00 x (H) 9.00 cm

**Weight :** 0.280 kg

ESP60410





**Laser Optic Set**

- 1) Metal Board 40x28x2cm, with 2 Black side stands
- 2) 5 Line Laser Light Source, each line has a switch, operated with 2pcs of battery. The laser light source is attached with magnets. So it can be attached to the metal board.
- 3) White Graduated Turn Table, Diameter 21cm, printed with 4 quadrants and the angle.
- 4) Plexiglass Lens: Double Concave, Double Convex, Trapezoid, Right Angle Isosceles, Rectangle, Semicircle, total 6pcs.

ESP60414



**Laser Optical Bench**

- Three carriers, one mirror, three brown observations, one prism fixture
- Two slit mirror holders, two concave / convex lenses
- One wrist and triangular prism, three film mounts (laser generator sold separately), Size 480\*310\*140mm 4.5Kg
- Diffraction experiments with a single slit.
- Experiment of diffraction interference by double slit.
- Diffusion of light by convex and concave lenses.
- Refraction experiment by prism.
- Reflection of light by mirrors. 3 carriers, 1 mirror, 1 prism fixture
- Two slit mirror fixtures, two concave / convex lenses
- One wrist and triangular prism, three film mounts
- 1 optical bench (laser generator optional selling).

ESP60415



**Laser Source 2 MW**

- laser beam generation using He-Ne gas.
- A device that generates a laser beam for training purposes.
- Straightness, refraction, reflection experiment of light, diffraction interference experiment of monochromatic light. Type A: 2mW He-Ne Laser

ESP60417

**Laser Source 0.5 MW**

- It is a device that generates laser beam for educational purpose.
- Experiment of diffracted light of direct light, refraction, reflection experiment of monochromatic light Type B: 0.5 mW semiconductor laser

ESP60419



**Transmitting Sound Via Laser Kit**

- kit consist of the following :
- Laser 0.2/1.0 mW, linearly polarized, modulate, magnetic, Laser receiver unit, set Mains transformer 12V DC / 2A, Connecting cable for modulation, Round base with stand tube, uni, Holder for "compact" components, L-shaped assembly platform.

ESP60422



**Reflection Of Light Kit**

Have you ever looked at your reflection in a mirror and been confused which side of your body you were looking at? Have you wondered how a periscope works? Using this kit, students will study how light rays are reflected to give images back to our eyes. Rectilinear propagation of light, formation of images by plane mirrors, reflected image, virtual image, angle of incidence, and angle of reflection are all investigated using protractors, mirrors, diagramming, measurement, and construction of a simple periscope. Kit includes instructor's manual, student guides, assessment questions and all required materials. Appropriate for any level physics course (including AP) as well as general science courses. Designed for 12 students working in groups of two. Meets national standards for grades 9-12.

ESP60424





**Lamp Brightness Experiment**

Students often think that the brightness of a lamp is only dependent on the current flowing through it. The unit allows the teacher to safely switch a 12V lamp in series with a mains lamp and study the current flow through them.

This kit includes the use of a safety mains lamp socket, which has a built in a switching system that only allows it to be switched on when a lamp is inserted. We have also included two switches, which must be pressed simultaneously to route the mains current through the low voltage lamp. Furthermore, the switches are sited at opposite ends of the case, requiring two hands to operate them. However, it must be appreciated that you are working with potentially lethal voltages and currents and therefore extra care should be taken.

Supplied with 1 x 240V 100W lamp and 1 x 12V 5W lamp and mains power lead.

ESP60427



**Blocks Set Of 7 Acrylic Blocks**

Made of Polished Acrylic 15mm thick, the set is provided in a convenient storage box. Set consists of:

- Rectangle 75 x 50mm
- Semi Circular 75mm dia.
- Triangle 60 x 60 x 60 Degree, 58mm side
- Triangle 90 x 45 x 45 Degree, 75mm hypotenuse
- Triangle 90 x 60 x 30 Degree, 75mm hypotenuse
- Bi-Convex 75mm long, curved faces 100mm radius
- Bi-Concave 75mm long, curved faces 100mm radius.

ESP60447



**Glass Block, Rectangular**

Block, rectangular, clear glass, free from air bubbles, all sides polished.

ESP60431	75 x 50 x 12mm	Block, rectangular, size 75 x 50 x 12mm. Clear glass, free from air bubbles, all sides polished.
ESP60432	75 x 50 x 18mm	Block, rectangular, size 75 x 50 x 18mm. Clear glass, free from air bubbles, all sides polished.
ESP60433	100 x 50 x 18mm	Block, rectangular, size 100 x 50 x 18mm. Clear glass, free from air bubbles, all sides polished.
ESP60434	100 x 60 x 18mm	Block, rectangular, size 100 x 60 x 18mm. Clear glass, free from air bubbles, all sides polished.
ESP60435	115 x 65 x 18mm	Block, rectangular, size 115 x 65 x 18mm. Clear glass, free from air bubbles, all sides polished.



**Prism - Equilateral**

Prism - equilateral, glass, polished faces, edges slightly bevelled, 60 x 60 x 60 degree.

ESP60437	25mm x 25mm (length x face)
ESP60438	38mm x 38mm (length x face)
ESP60439	50mm x 50mm (length x face)
ESP60440	38mm x 38mm (length x face)
ESP60441	50mm x 50mm (length x face)



**Prism, Glass, Hollow**

Prism, glass, hollow, from glass plates properly cemented, with hole and stopper at top.

ESP60443	<b>Dimensions:</b> 38 X 38Mm (Hollow Prism Only)
ESP60444	<b>Dimensions:</b> 50 X 50Mm (Hollow Prism Only)
ESP60445	<b>Dimensions:</b> 50 X 50 X 50Mm (Cube Only)





**Spectroscope Simple Hand Held**

Plastic lens cone size 100 length x 25 mm Diameter , it can be used to demonstrate the phenomenon of the chromatic dispersion of white light by qualitative analysis

ESP60449



**Michelson interferometer**

Precision device for measuring phenomena such as light wavelength, index of refraction etc.;

Apparatus consists of a metal base plate (120 x 120 mm, 2 cm thick) with two full mirrors (30 x 30 mm each) and a half-silvered mirror (50 x 30 mm) mounted on it according to the Michelson configuration.

The position of one of the full mirrors can be adjusted by means of a micrometer screw (micrometer 0 - 10 mm, vernier 1 / 100 mm) and a lever arm (step-down gear ratio of 1:10), while the other full mirror, which is fixed, can be inclined by means of two screws; the half-silvered mirror is fixed in place; the base plate has a hole for mounting round cell DL408-3K in order to measure the index of refraction of gases. The underside of the base plate has a tapped hole taking a 10-mm threaded support for mounting the device on the optics bench; supplied with a solid plastic hood in order to protect all optical parts.

ESP60475



**Spectrometer Precision**

Vernier reading to 30 seconds of arc. The 175 mm diam. scale is fixed. The table and telescope movements are completely independent of each other and read to 30 seconds of arc by means of double ended verniers and magnifiers. Both rotations have fine adjustment screws. Coarse adjustments can also be made by release of clamping screw. Collimator is mounted on a fixed pillar and is fitted with 175 mm fl. Achromatic objective with 32 mm clear aperture and a laterally adjustable slit 6 mm long. Telescope is mounted on a movable pillar fitted with 175 mm fl. Achromatic objective of 32 mm clear aperture and x 10 Ramsden eyepiece with a glass cross line graticule. Both the telescope and collimator have rack and pinion focusing and can be adjusted for levelling the axes of both units as well as for adjusting to the axis of rotation. Prism table is marked with lines to assist prism placement and has three table levelling screws. It also has an interchangeable clamping unit for the prism and diffraction grating. Complete with prism clamp, diffraction grating holder and a Tommy bar for adjusting optical axis. In case.

ESP60450



**Diffraction Grating**

Diffraction grating, transmission type, 30 x 25 mm. With protective glass cover.

- ESP60452 100 lines/mm
- ESP60453 600 lines/mm
- ESP60454 1000 lines/mm



**Diffraction Grating Educational 3 In One Slide**

For demonstrating the principle of the diffraction grating and the way in which its properties are dependent upon the number of lines per unit length. Comprises a card mount 90x40mm approximately with three 16x9mm apertures, each containing a diffraction grating replica. The gratings are of 100lines/mm, 300lines/mm and 600lines/mm, respectively and are protected by cover glasses.

ESP60456



**Periscope**

Diameter 30 mm Length of canister : 210 mm , total length 300 mm.

ESP60460





**Optical Bench 1.5 Meter Complete With Accessories**

On wooden base, with 1.5 meter scale, with six sliding bases. Each sliding base is with an index mark, a pillar and locking screw, with following accessories:  
 One lamp house with 230 V lamp.  
 One object screen, metal, white.  
 One lens holder for 38 mm diam. Lenses.  
 One receiving screen, metal, white, with slot for squared paper on reverse.  
 One object needle.  
 One plane mirror in metal frame.  
 Each of these accessories is mounted on a 6 mm rod which fits into the pillars and is adjustable for height.

ESP60465



**Magic illusion**

Diameter 24 cm

ESP60462



**Oscilloscope Digital**

dual-channel universal digital oscilloscope band width 50 MHz It includes a 2 Mpts memory depth that helps to ensure accurate waveform resolution and to capture longer signal lengths. With its 7 inch TFT-LCD (800\*480) screen, there is adequate screen space to help better see and analyze waveform  
 Sampling Rate (Max.) 500 MSa/s 1 GSa/s  
 Channels 2+EXT  
 Memory Depth (Max.) 32 Kpts 2 Mpts  
 Trigger Types Edge, Pulse, Video, Slope, Alternate  
 I/O USB Host, USB Device, LAN, Pass/Fail  
 Probe (Std) 2 pcs passive probe, 2 pcs passive probe, 2 pcs passive probe, Display 7 inch TFT LCD (800x480)  
 Net Weight 2.5 Kg  
 details. Along with a 1 GSa/s sampling rate, It supports 32 parameters measurements and common mathematical operations to speed up complex / repetitive measurements. Multiple interfaces: USB Host, USB Device (USBTMC), LAN (VXI-11), Pass / Fail

- ESP60611 Band width -50 MHz
- ESP60612 Band width -70 MHz
- ESP60613 Band width -100 MHz
- ESP60614 Band width -150 MHz



## OSCILLOSCOPE ANALOG DUAL CHANNEL, 50MHZ



Model	ESP60600	ESP60601	ESP60602
<b>vertical system</b>			
Sensitivity	5mV~5V/DIV, 10 steps in 1-2-5 sequence		
Sensitivity accuracy	≤3%		
Vernier sensitivity	1/2.5 or less than panel indicated value		
Bandwidth	DC (AC 10Hz)~20MHz	DC (AC 10Hz)~40MHz	DC (AC 10Hz)~50MHz
AC coupling			
Rise time	Approx. 17.5ns	Approx. 8.75ns	Approx. 7ns
Input impedance	Approx. 1MΩ//Approx. 25pF		
DC balance shift	5mV~5V/DIV: ±0.5DIV		
Vertical mode	CH1, CH2, DUAL (ALT/CHOP), ADD, CH2 INV		
Chopping repetition frequency	Approx. 250kHz		
Input coupling	AC, GND, DC		
Max. Input voltage	400V peak-peak, AC frequency ≤1kHz		
Common mode rejection ratio	>50:1 at 50kHz sine wave (set CH1 and CH2 at same sensitivity)		
CH2 INV BAL	Balanced point variation ≤1DIV (referred to graticule center)		
<b>Horizontal system</b>			
Sweep time base	0.2μs~0.5s/DIV, 20 steps in 1-2-5 sequence		
Sweep time base accuracy	±3%, X10MAG: ±5% (20ns~50ns/DIV uncalibrated)		
Vernier sweep timebase	≤1/2.5 of panel indicated value		
Sweep magnification	X10 (Max. sweep time base 20ns/DIV)		
Position shift caused by X10MAG	Within 2DIV at CRT screen center		
Linearity	±5%, X10MAG: ±10% (0.2s~1μs)		



Trigger system			
Trigger mode	AUTO, NORM, TV-V, TV-H		
Trigger level lock	Not provided		
Trigger source	CH1, CH2, LINE, EXT		
Trigger coupling	AC: 20Hz to full bandwidth		
Polarity	"+" or "-" polarity		
Sensitivity	Frequency	20Hz~2MHz	2MHz~20MHz
	CH1, CH2	1DIV	1.5DIV
	ALT	2DIV	3DIV
	EXT	200mV	800mV
	TV: Sync pulse>1DIV (EXT: 1V)		
External trigger input	Input impedance: Approx. 1M $\Omega$ //Approx. 25pF		
	Max.input voltage: 400V (DC+AC peak), AC frequency $\leq$ 1kHz		
X-Y mode			
Sensitivity	5mV~5V/DIV, $\pm$ 3%		
X-axis bandwidth	DC~500kHz (-3dB)		
X-Y phase error	$\leq$ 3 $^\circ$ at DC~50kHz		
Output signal			
Calibration signal	Waveform	Positive-going square wave	
	Frequency	Approx. 1kHz	
	Duty ratio	<48:52	
	Output voltage	2Vpp $\pm$ 2%	
	Output impedance	Approx. 1k $\Omega$	
CRT			
Display	6" rectangle, internal graticule, 8x10DIV (1DIV=1cm)		
Phosphor	P31		
Accelerating voltage	Approx. 2kV (20MHz); Approx. 12kV (40MHz)		
Trace rotation	Adjustable at front panel		
General			
Power source	AC110V/220V $\pm$ 10% selectable, 50/60Hz, Max.35VA		
Accessories	Power cord x1, Operation manual x1, Probe x2		
	Component test lead x1 (only for TOS-2020CT, TOS-2040CT, TOS-2050CT)		
Dimension	310x150x455mm		
Weight	Approx.8kg		
General			
Power source	AC110V/220V $\pm$ 10% selectable, 50/60Hz, Max.35VA		
Accessories	Power cord x1, Operation manual x1, Probe x2		
	Component test lead x1 (only for TOS-2020CT, TOS-2040CT, TOS-2050CT)		
Dimension	310x150x455mm		
Weight	Approx.8kg		





**Mirror, Plane - Unmounted**

Mirror, Plane - Unmounted - Rectangular, Glass, Back Silvered, With Protective Coating, Pack Of 10.

- ESP60497**      **Dimensions :** 75 x 25mm.
- ESP60498**      **Dimensions :** 75 x 50mm.
- ESP60499**      **Dimensions :** 75 x 75mm.
- ESP60500**      **Dimensions :** 100 x 25mm.
- ESP60501**      **Dimensions :** 100 x 50mm.
- ESP60502**      **Dimensions :** 100 x 75mm.
- ESP60503**      **Dimensions :** 150 x 25mm.
- ESP60504**      **Dimensions :** 150 x 50mm.



**Lens Holder - Wooden**

Wooden, with V shaped slot to take spherical lens or mirror up to 75mm dia., with index mark.

**ESP60577**



**Concave Mirror, Spherical**

Concave mirror, spherical - optically worked, back silvered, with protective coating.

- |                 |           |              |
|-----------------|-----------|--------------|
| <b>ESP60505</b> | FL 5 CM   | Dia. 50mm    |
| <b>ESP60506</b> | FL 7.5 CM | Dia. 50mm    |
| <b>ESP60507</b> | FL 10 CM  | Dia. 50mm    |
| <b>ESP60508</b> | FL 15 CM  | Dia. 50mm    |
| <b>ESP60509</b> | FL 20 CM  | Dia. 50mm    |
| <b>ESP60510</b> | FL 30 CM  | Dia. 50mm    |
| <b>ESP60511</b> | FL 7.5 CM | Dia. 75mm    |
| <b>ESP60512</b> | FL 10 CM  | Dia. 75mm    |
| <b>ESP60513</b> | FL 15 CM  | Dia. 75mm    |
| <b>ESP60514</b> | FL 20 CM  | Dia. 75mm    |
| <b>ESP60515</b> | FL 30 CM  | Dia. 75mm    |
| <b>ESP60516</b> | FL 10 CM  | Dia. 100mm . |
| <b>ESP60517</b> | FL 15 CM  | Dia. 100mm . |
| <b>ESP60518</b> | FL 15 CM  | Dia. 150mm   |
| <b>ESP60519</b> | FL 30 CM  | Dia. 150mm   |



**Convex Mirror, Spherical**

Convex mirror, spherical - optically worked, back silvered, with protective coating.

- |                 |           |              |
|-----------------|-----------|--------------|
| <b>ESP60520</b> | FL 5 CM   | Dia. 50mm    |
| <b>ESP60521</b> | FL 7.5 CM | Dia. 50mm    |
| <b>ESP60522</b> | FL 10 CM  | Dia. 50mm    |
| <b>ESP60523</b> | FL 15 CM  | Dia. 50mm    |
| <b>ESP60524</b> | FL 20 CM  | Dia. 50mm    |
| <b>ESP60525</b> | FL 30 CM  | Dia. 50mm    |
| <b>ESP60526</b> | FL 7.5 CM | Dia. 75mm    |
| <b>ESP60527</b> | FL 10 CM  | Dia. 75mm    |
| <b>ESP60528</b> | FL 15 CM  | Dia. 75mm    |
| <b>ESP60529</b> | FL 20 CM  | Dia. 75mm    |
| <b>ESP60530</b> | FL 30 CM  | Dia. 75mm    |
| <b>ESP60531</b> | FL 10 CM  | Dia. 100mm . |
| <b>ESP60532</b> | FL 15 CM  | Dia. 100mm . |
| <b>ESP60533</b> | FL 15 CM  | Dia. 150mm   |
| <b>ESP60534</b> | FL 30 CM  | Dia. 150mm   |





**Biconvex Lens, Spherical,**

Lens, double convex spherical, optically worked glass, with ground edges, highly polished.

ESP60535	FL 5CM	Dia. 38mm
ESP60536	FL 10CM	Dia. 38mm
ESP60537	FL 15CM	Dia. 38mm
ESP60538	FL 20CM	Dia. 38mm
ESP60539	FL 25CM	Dia. 38mm
ESP60540	FL 30CM	Dia. 38mm
ESP60541	FL 5CM	Dia. 50mm
ESP60542	FL 10CM	Dia. 50mm
ESP60543	FL 15CM	Dia. 50mm
ESP60544	FL 20CM	Dia. 50mm
ESP60545	FL 25CM	Dia. 50mm
ESP60546	FL 30CM	Dia. 50mm
ESP60547	FL 10CM	Dia. 75mm.
ESP60548	FL 15CM	Dia. 75mm.
ESP60549	FL 20CM	Dia. 75mm.
ESP60550	FL 25CM	Dia. 75mm.
ESP60551	FL 30CM	Dia. 75mm.

**Biconcave Lens, Spherical,**

Lens, double concave spherical, optically worked glass, with ground edges, highly polished.

ESP60552	FL 5CM	Dia. 38mm
ESP60553	FL 10CM	Dia. 38mm
ESP60554	FL 15CM	Dia. 38mm
ESP60555	FL 20CM	Dia. 38mm
ESP60556	FL 25CM	Dia. 38mm
ESP60557	FL 30CM	Dia. 38mm
ESP60558	FL 5CM	Dia. 50mm
ESP60559	FL 10CM	Dia. 50mm
ESP60560	FL 15CM	Dia. 50mm
ESP60561	FL 20CM	Dia. 50mm
ESP60562	FL 25CM	Dia. 50mm
ESP60563	FL 30CM	Dia. 50mm
ESP60564	FL 10CM	Dia. 75mm.
ESP60565	FL 15CM	Dia. 75mm.
ESP60566	FL 20CM	Dia. 75mm.
ESP60567	FL 25CM	Dia. 75mm.
ESP60568	FL 30CM	Dia. 75mm.

**Magnifier, Linen Tester**

These are collapsible pocket magnifiers. The optical system is a single element, glass Double Convex Lens. The housing is of machined, black high grade plastic for a high finish look. These magnifier fold flat to fit in your pocket. Scales are etched on the inner faces of the viewers base.

ESP60584

**Magnifier, Reading Glass,**

Magnifier, reading glass, in unbreakable plastic mount with handle.

ESP60580	Dia. 50Mm
ESP60581	Dia. 75Mm
ESP60582	Dia. 100Mm
ESP60583	Dia. 63Mm





### Geiger Muller Counter

Demonstration instrument for measuring ionizing radiation; very easy to transport and magnetically mountable; the 26-mm LED display allows precise readings to be taken even at a great distance

#### Technical Data:

Display: 4-digit LED display; digit height 26 mm

Switch: ON / OFF

MODE switch:

- IMP setting: manual start and manual stop
- MAN setting: manual start, one measurement is taken during the interval set on the TIME switch
- AUTO setting: measurement cycle is repeated for the interval set on the TIME switch

TIME switch: for the MAN and AUTO modes a valid measurement interval of 1, 10 or 100 seconds may be selected

SPEAKER switch: switches the speaker on or off

START switch: starts and stops measurement in IMP mode and starts it in MAN mode

GATE LED: indicates counter gate state

Analogue output through a 3.5 mm phone jack (10 mV / Hz)

BNC jack for connecting tube DR291-1Z

Power supply: 4 x 1.5 V Mignon cells (included) or 5.5-mm hollow DC jack for 6 V / 500 mA

external power supply

Case: green ABS plastic with yellow labelling

**Dimensions** : approx. 160 x 120 x 45 mm; **Weight** : approx. 475 g

Geiger-Muller tube specs: For registering the presence of alpha, beta and gamma rays;

tube in a red acrylic case (28 x 28 x 60 mm) and mounted on a support rod with a magnetic base (60 x 30 mm);

line marking centre; cord with BNC plug permanently attached; plastic lid to protect the end window.

Gas filling: Ne & halogen

End window made of mica, 9.1 mm in diameter

Plateau voltage: approx. 500 V

**Dimensions** : 30 x 60 x 49 mm

**Axis height** : 35 mm

ESP60663



### Spark Counter

The Irwin Spark counter is a versatile unit designed to detect the presence of alpha particles or other ionising radiations or events, such as cosmic rays. The unit comes supplied with an Americium 241 alpha source (0.9 micro Curies, 33.3KBq) mounted on a Perspex rod, which may be held in the hand or in a retort stand, supplied with full instructions for use. A power supply is needed to operate this unit.

ESP60664



### Planck's Constant Led Threshold

A multi-purpose unit that allows the user to easily calculate Planck's constant, to measure the wavelength of coloured light, demonstrate colour light transmission through colour filters and show the diffraction patterns for various wavelengths of coloured light.

ESP60667





### Planck's Constant Apparatus

A photoelectric device can be used to test the photoelectric effect, and a three-colour filter is built-in that can detect the light transmittance by the color filter.

**Dimensions :** 330x160x180mm

Power: AC220V 0.5A

Configuration: Photoelectric element, Galvanometer (⊗), Incandescent light source, Tricolour filter, Photoelectric amplifier, Visible light band,

ESP60668



### Planck's Constant Compact Apparatus

With this device, Planck's constant can be easily determined to an error level around or better than 5 %.

Electron affinity can be calculated as well.

The phenomenon is termed the outer photoelectric effect

Electromagnetic radiation results in the release of electrons from a metal surface.

ESP60669



### Po-210 Preparation (Alpha Radiation)

Radioactive substance for investigating the properties of alpha radiation  
Emits alpha radiation (polonium-210) with activity (A) = 3.7 kBq; half-life: 138.40 days;

emits alpha particles with a maximum energy level of 5.305 MeV

ESP60674



### Storage - Case For Radioactive Sources, Metal

Steel cabinet for safe storage of radioactive preparations in the lab storage room

Steel cabinet, painted yellow, with a cylinder lock, one (fixed) shelf, labelled with the warning symbol.

**Dimensions :** 215 x 85 x 287 mm

ESP60677



### Co-60 Preparation (Gamma Radiation)

Radioactive substance for investigating the properties of gamma radiation

Emits gamma and beta radiation (cobalt-60) with activity (A) = 37 kBq; half-life: 5.258 years;

in addition to beta radiation, which is absorbed by the radiation window, it emits gamma rays with an energy level of 1.17 and 1.33 MeV; this source is supplied with two lead-cylinders for protection of gamma radiation.

ESP60676



### Sr-90 Preparation (Beta Radiation)

Radioactive substance for investigating the properties of beta radiation

Emits beta radiation (strontium-90) with activity (A) = 3.7 kBq; nuclide decays to its daughter particle yttrium-90, which emits beta particles with a maximum energy level of 2.27 MeV; the half-life of Sr-90 is 28.9 years, and the Sr-90-Y-90 system also decays at this rate

ESP60675





### Radioactivity, Set

Box with device – shaped storage, consisting of:

1) Potassium chloride, 250 g

The naturally occurring substance is the primordial radionuclide  $^{40}\text{K}$ , which is available to 0.0117 atomic percent in the element potassium; specific activity of 16.2 Bq / g at  $^{40}\text{K}$ ; 250 g in plastic box with screw cap

2) Columbit

Naturally occurring, slightly radioactive solid solution, also called Niobit, contains the elements niobium and tantalum; is NOT notifiable in accordance with the Radiation Protection Ordinance! **Dimensions** : L = 20 mm

3) Radiation absorption plates, set

Plates of various materials to the absorption of radiation;

materials: 10 x lead, 5 x steel, 5 x aluminum, 5 x acrylic;

plate **Dimensions** : each 80 x 50 x 2 mm

4) Holder for absorption panels, magnetic

For vertical mounting of up to 10 absorption panels, magnetic to metal panels or directly on the laboratory bench;

robust, variable clamping metal holder with 4 clamping springs, max. wingspan: 23 mm;

bottom side 4 built-in neodymium magnets; window opening : 50 x 50 mm;

**Dimensions** : width = 94 mm, height = 70 mm, depth = 54 mm

5) Radioactive preparation mount, magnetic

For vertical mounting of the radiation sources

aluminum bracket with magnets and steel bolt in axle height;

H (total) = 50 mm, axle height = 35 mm

6) Reagent tube, graduated

For tests for level measurement with a radiation source and lead shot;

thick-walled test tube with graduation, for clamping it into holder

content: 25 ml; D (outer) = 20 mm, H = 160 mm

7) Lead (tare) shot, 250 g

Lead shot used as absorption or as weights for taring;

ball D = 2 mm; in plastic bottle; capacity 250 g

8) Adapter for deflection in radioactive substances

To examine the behavior of radioactive radiation into a magnetic field;

metal holder for positioning the button magnets in front of sources

the holder is on the cover of preparations plugged directly; **Dimensions** : D = 35 mm, L = 28 mm

9) Magnets, button type, pair of

Material: Neodymium; embedded in plastic trays; D = 13 mm, H = 5 mm

10) Container with lid, 80 ml, plastics, 50 x 50 x 40 mm

Transparent, impact-resistant plastic container with lockable lid firmly

11) Knife for laboratory use, steel

To cut off meat or meat slices as a substitute for human soft tissue;

for determining the surface dose; handy stainless blade with plastic handle, L = 150 mm

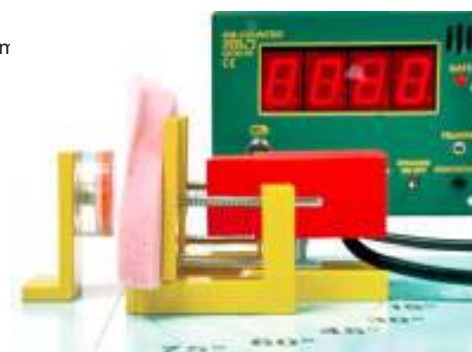
12) Crucible tong

For low-contamination handling of radioactive sources

curved forceps made of steel and nickel-plated; L = 200 mm

Box-insert Radioactivity, plastics

Storage box II small, with cover



ESP60672





### Deflection E/M Tube

For determining  $e/m$  by balanced electrostatic deflections or by magnetic deflection using the Helmholtz coils.

Simple electrostatic and magnetic deflection may be demonstrated and the relationships shown between the plate potentials or coil currents and the degree of deflection. The 'electron mirror' effect producing trochoidal spirals is easily shown and also the magnetic focusing at points along the trochoid.

The tube is the standard glass sphere with cylindrical neck and has a diode electron gun with filament and cylindrical anode. In the centre of the sphere and angled at  $15^\circ$  across the axis is a mica screen 90mm long x 60mm high approximately, divided 2 to 10cm along its horizontal axis and 2-0-2cm vertically. The undivided side is coated with phosphor and produces a clear fluorescent trace when irradiated by the electron beam. The top and bottom edges of the mica plate are supported by horizontal metal plates which are connected to 4mm plugs in the side caps and provide the electrostatic deflection field when connected to an E.H.T. supply.

- Maximum filament voltage: 7.5V.
  - Anode voltage: 1500 to 5000V.
  - Typical operation: 2000 to 4500V.
  - Anode current: 1mA.
- Supplied complete with instructions.

ESP60680



### Electron Diffraction Tube

The tube uses an electron gun with an indirectly heated cathode to project a narrow converging beam of electrons through a thin layer of graphiticised carbon, supported on a fine mesh grid over the exit aperture of the gun. The cathode rays are diffracted in passing through the carbon layer and produce a ring pattern on the phosphor coated end of the tube. Study of the ring pattern and its variation with different anode voltages permits the study and verification of the de Broglie hypothesis, shows the dual nature of the electron, permits the calculation of the spacing of diffracting planes and suggests the probable arrangement of carbon atoms.

- Filament voltage: Nominal 6.3V a.c./ d.c, Maximum 9V a.c./ d.c.
- Anode voltage: 500 to 5000V d.c.
- Anode current: 0.2 to 0.4mA.

Supplied complete with instructions.

The tube uses an electron gun with an indirectly heated cathode to project a narrow converging beam of electrons through a thin layer of graphiticised carbon, supported on a fine mesh grid over the exit aperture of the gun. The cathode rays are diffracted in passing through the carbon layer and produce a ring pattern on the phosphor coated end of the tube. Study of the ring pattern and its variation with different anode voltages permits the study and verification of the de Broglie hypothesis, shows the dual nature of the electron, permits the calculation of the spacing of diffracting planes and suggests the probable arrangement of carbon atoms.

- Filament voltage: Nominal 6.3V a.c./ d.c, Maximum 9V a.c./ d.c.
- Anode voltage: 500 to 5000V d.c.
- Anode current: 0.2 to 0.4mA.

Supplied complete with instructions.

ESP60686



### Helmholtz Coil Pair

When connected to a suitable d.c. Supply, the coils provide a substantially uniform field in the central space. Each coil has a moulded plastic former 152mm diameter with 320 turns of 22 s.w.g. enamelled wire giving a mean diameter of 136mm. The former is mounted on a boss provided with two 4mm sockets and is fitted with a support rod. The rod has a sliding boss which locks into the tapered hole in the base of the Universal Stand.

Dimensions of coil and support rod 305mm x 152mm x 25mm.  
Supplied as a pack of 2, complete with instructions. PAIR

ESP60682





### Perrin Tube

The Perrin tube may be used to show that charge can be accumulated in the Faraday pail incorporated, that the charge does not disappear when the filament is switched off and therefore that the cathode rays must consist of charged particles. Electron deflection sensitivity may be measured using Helmholtz coils to deflect the beam.

Cathode ray tube operation may also be demonstrated, using a 'secondary coil' for the transverse field. The tube comprises a standard spherical glass body with a cylindrical neck containing a diode electron gun with filament and cylindrical anode, and a Faraday's pail in the sphere, at 45° to the axis. Connections to the diode electron gun are via 4mm sockets in the moulded cap and the Faraday's pail connection is via a 4mm plug in one of the side caps. The end of the sphere has an internal phosphor coating providing a luminescent screen.

- Maximum filament voltage: 7.5V.
  - Anode voltage: 2000 to 5000V.
  - Typical operation at 4000V: anode current 1.8mA beam current 4μA.
- Supplied complete with instructions.

ESP60688



### Maltese Cross Tube

For showing the linear propagation of cathode rays, magnetic deflection of cathode rays, image distortion due to electrostatic charging, comparison of cathodic stream and electromagnetic radiation and an introduction to electron optics using a single Helmholtz coil.

The tube comprises the standard spherical glass body with cylindrical neck, a diode electron gun with a filament and cylindrical anode connected to 4mm sockets in the plastic cap, a metal Maltese cross mounted in the centre of the sphere, (connected via a 4mm plug in one of the side caps) and a phosphor coated screen.

- Maximum filament voltage: 7.5V
  - Anode voltage: 2000 to 5000V
  - Anode current: 4000V 1.8mA
- Supplied complete with instructions.

ESP60684



### Double Fine Beam Tube

Helium filled, partly evacuated electron tube with axial and perpendicular electron guns. The electron beam may be observed as a fine, green beam appearing due to the the impact excitation of the helium/electron collisions. The tangential beam can be deflected by use of Helmholtz coils to produce a completely circular path permitting e/m measurements to be made. Clear free path studies may be made and phenomena such as screen blanking due to charge build up on the screen may be observed. Within the tube are mounted two electron guns perpendicular to one another, with indirectly heated oxide cathodes. The angle of projection from the guns is adjustable by means of miniature deflection plates near the gun outlets, a small potential being applied via 4mm connections at the side of the cylindrical neck. The end of the body has a phosphor coated screen for use with the axial gun. Supplied complete with instructions.

- Anode voltage: max. 100V DC
- Anode current: max. 30mA
- Filament voltage: 7.5V AC/DC
- Deflector voltage: max. 50V DC
- Total length: 260mm approx.
- Glass bulb: 130mm diameter approx.
- Gas filling: Helium at 0.1 torr pressure

ESP60690



### Heat Radiometer

Ball dia 90 mm , hight 215 mm

ESP60731



### Experiment Lead Safety Plug And Socket

Safety lead for use with EHT and HT power supplies ending in a 4mm safety-plug. Length: 750mm , Wire cross-section: 1 mm<sup>2</sup> , Continuous current: max. 19 A

ESP60691





### Planar Diode

The diode is used to show the basic thermionic effects in vacuum tubes, including:

Current flow between an incandescent filament and a cold electrode (the Edison effect). Determination of  $e/m$  by the displacement method using Helmholtz coils.

Characteristic anode current/anode voltage curves for different filament temperatures.

Application of a diode as a rectifier.

The diode consists of a basic glass spherical body with a cylindrical neck, containing a tungsten filament with 4mm connections sockets in the plastic cap on the neck and a circular anode plate connected to a 4mm plug connection on the sphere.

- Optimum anode voltage: 500V.
- Maximum anode current: 5mA.
- Maximum filament voltage: 7.5V

ESP60692



### Universal Stand

Designed to accommodate the whole range of Teltron tubes and accessories. The base, 240mm x 180mm x 50mm, and a vertical arm of the stand, 280mm high, are cast in light alloy and stove enamelled. The three rubber feet ensure maximum stability.

Tube mounting jaws are provided, moulded in a material with very high electrical insulation properties. The jaws are split lengthways to admit the side caps of the tubes, and clamps sliding on the jaws lock them securely in position. The jaws, 160mm long x 140mm separation, have an integral hollow boss which is secured in the stand by a rubber 'O' ring at a centre height of 263mm, permitting a full 360° rotation so that the tube may be displayed to the best advantage.

Sockets in the base accommodate the Helmholtz coil supports and locate the coils accurately either side of the tubes.

A 4mm earthing socket is drilled into the pillar base.

Supplied complete with instructions.

ESP60694



### Tel - X - Ometer

The Tel-X-Ometer enables investigations to be carried out in the normal school laboratory. Extensive safety precautions are built into the apparatus, which conforms completely to the recommendations of the International Commission on Radiological Protection, 1968.

Schools should check CLEAPSS guide L93 Ionising Radiations and Radioactive Substances before purchase.

The radiation level at 50mm from any part of the surface of the instrument does not exceed 0.5mR per hour. Also, in accordance with the recommendations laid down, a warning card is supplied with each instrument for affixing to the door of the room where the experiments are to be conducted.

The apparatus is in effect an X-ray spectrometer which, by means of simple adaptations, will fulfil a range of requirements as follows:

- A broad beam of X-rays for analysis of their general properties
- Single crystal Bragg Diffractometer having a scale accuracy of 5 minutes of arc
- Powder Camera for Debye/Scherrer experiments to an accuracy of 30 minutes of arc
- Fluorescent radiation emitter for a study of the Moseley Theory
- An experimental region for the mounting of innovative studies of the teachers choice.

#### Specification:

A specially designed miniature X-ray tube is used which protrudes through the cast aluminium base of the spectrometer table and is enclosed within a thick walled lead glass dome.

The apparatus is supplied with the X-ray tube installed and aligned for immediate use. Every instrument is carefully checked under working conditions before dispatch, in addition to thorough testing of the X-ray tube itself.

Mains power is supplied via 2m of 3-core cable and a sector enables the instrument to operate on voltages between 110 and 240, at 50 to 60Hz.

A detailed instruction book is provided giving set-up details, notes for twenty-five experiments (using the accessory set) and teacher's notes.

Height 250mm, diameter 370mm. Mass 9kg. Supplied complete with X-ray tube.

ESP60698





**Power Supply AC/DC, 50 Hz**

**Dimensions :**

- Overall 265 x 155 x 214 mm - Input Voltage : 110/220 VAC, 50 HZ - Output voltage : 3/6/9/12 V

Materials entire frame (body) : Plastic

Complete with manual book

**Part of :**

Physics Laboratory Package for Senior High School/Vocational School - Physics Laboratory Package for Senior High School/Vocational School - Ohm Law Experiment Kit

**Dimensions :** (L) 28.00 x (W) 18.00 x (H) 23.50 cm

**Weight :** 4.000 kg

ESP60749



**Power Supply 5A, 12V**

Output voltage 0 - 2 - 4 - 6 - 8 - 10 - 12V

Maximum power 5A, 60W

Low voltage power supply, AC / DC output for general use

Complete with automatic fuse to protect this unit against overloading with a push button to reset

Output with 4mm screwed socket terminals, 19mm distance. Main switch (on/off) with pilot lamp

Input voltage 110V/220V, protected by main fuse, equipped with 2m power cord, three way plug including ground (DIN 49441/CEE7 10A)

Complete with instruction manual and circuit diagram

ESP60750

**Power Supply 2A, 5V & 15V, Regulated**

Regulated variable power supply. Serves to provide / supply a stable voltage to the circuit or device must be operated with a certain power supply.

**Dimensions :**

- 297 x 114 mm, thickness 5 mm

- Back cover 267 x 113 x 100 mm

Material : Panel phenolic

Line voltage : 220V AC / 50 Hz

Output voltage : Variable voltage 0-15 V DC and 0-5 V DC with panel meter display

Voltage control : Adjustable Fine and Coarse tuning

Maximum current 2A

2 pairs of 4 mm output

Equipped with safety fuse

ESP60754

**Power Supply 3A, 12V, Regulated**

**Dimensions :** 234 x 170 x 134 mm

Low-voltage power supply with AC/DC output.

Complete with automatic safety fuse.

DC Regulated

4 mm socket terminal, spacing 19 mm between terminals. Main switch equipped with indicator lamp.

Input voltage 100V/220V, with safety fuse and 2 cables and plug with grounding (DIN 49441/CEE7 10A).

Maximum load capacity : 3 A

Power consumption : 36 W

Output voltage : 0 - 3 - 6 - 9 - 12V. Can be choose by the rotating switch.

With bilingual manual book and circuit schematic diagram.

**Dimensions :** (L) 22.00 x (W) 26.00 x (H) 18.00 cm

ESP60752

**Power Supply 3A, 36W**

Output voltage : 0 - 3 - 6 - 9 - 12V, can be choose by the rotating switch

Maximum load capacity : 36W, 3A

Input voltage 100V / 220V with grounding (DIN 49441/CEE7 10A)

4 mm socket terminal, spacing 19 mm between terminals

Main switch complete with indicator lamp

Low-voltage power supply with AC/DC output

Complete with automatic safety fuse, safety fuse and 2 cables, manual book and circuit schematic diagram

**Dimensions :** (L) 23.00 x (W) 17.50 x (H) 13.00 cm

**Weight :** 3.000 kg

ESP60751







### Power Switch

A compact power supply offering 2, 4, 6, 8, 10, and 12 volts at currents of up to 5A. Both dc and ac outputs may be used simultaneously up to the rated output. The output is protected by a push button cut-out. The unit is 2A fused on the back panel and comes complete with a moulded mains lead and plug. 4 units are designed to fit in a shallow Gratnell tray.

#### Specification

Input Supply voltage 230V dc

Supply frequency 50Hz

Mains fuse Rear panel 2A, 20mm quick blow Mains plug 3A

Output Voltage 2, 4, 6, 8, 10, 12V ac nominal 1, 3, 5, 7, 9, 11V full wave rectified dc nominal

Maximum output current 5A ac or dc

Manufactured in the UK

**ESP60756** Single Unit

**ESP60757** Best Value Pk Of 4 In Gratnells Tray



### Powerbase V8 With V/I Meter Blue Case

Essentially the same as the Irwin Powerbase V8 but with an ammeter and VOLTMETER digital display. The unit supplies 0-20V smoothed dc and 0-16V AC at 8 amps. The output is continuously variable and protected by a panel mounted thermal cut out. An output limiter is fitted which allows the user to preset the maximum voltage available.

**ESP60767**



### Powerbase V8

The updated version of the Irwin Powerbase 32. Essentially it is the same as the 32 but has a higher power rotary transformer and a high specification toroid transformer replaces the original chassis transformer. The unit supplies 0-20V smoothed dc and 0-16V AC at 8 amps. The output is continuously variable and protected by a panel mounted thermal cut out. An output limiter is fitted which allows the user to preset the maximum voltage available.

**ESP60760** Blue casing

**ESP60761** Clear casing



### Powerbase S8

The Irwin Powerbase S8 offers 0 to 12V at 8 amps via a relay switching system that provides the voltages in 1V steps. ac and dc are available simultaneously in any combination up to a combined output of 8 amps. Output is protected by a panel mounted thermal cut out. An output limiter is fitted which allows the user to preset the maximum voltage available. 0 to 12V AC/DC in 1V steps 8A combined simultaneous output Re-settable Thermal Trip Switch Protection Voltage Lockable via an Allen Key. Relay switching means that the output voltage may be changed at full loading.

**ESP60764** Blue casing

**ESP60765** Clear casing



### Powerbase S5

Irwin Powerbase S5 switched 5A Bench PSU. A heavy duty power supply for powering laboratory experiments.

DC Output Voltages 3, 7, 10, 13, 17, 20V (capacitor smoothed)

AC Output Voltages 3, 6, 8, 11, 13, 15V

Output Current 5A

Output limited via Allen key operated voltage lock

Push button thermal cut-out protection

Mains Input 230/240V AC, 50Hz

PDF

**ESP60769** Blue casing

**ESP60770** Clear casing





**Powerbase S10**

Irwin Powerbase S10 2-12V AC/DC switched 5A Bench PSU. A heavy duty power supply for powering laboratory experiments. DC and AC Output Voltages 2, 4, 6, 8, 10, 12V.

Specification:

AC DC Output: Voltages

2,4,6,8,10,12 voltage range in AC and DC

Current 5A

Supplied with Allen key to control output

Voltage type - Stepped

Output type - Full wave rectified, non-regulated

Push button trip reset

Mains input 230/240V AC, 50Hz

ESP60772 Blue casing

ESP60773 Clear casing



**High Voltage Ej0127 2.5Kv Eht Unit**

An EHT power unit supplying up to 5KV for experiments with Teltron tubes. The 5KV voltage allows the user to demonstrate high voltage experiments such as the shuttling ball. The outputs are arranged as 2.5KV 0 - 2.5KV The outputs are terminated through colour coded shrouded 4mm sockets. The EHT output is current limited to 2mA for safety. A separate heater output of approx. 6.3V @ 2A is also available as well as an earth terminal to allow any of the EHT outputs to be grounded for extra safety.

ESP60775

Blue casing

ESP60776

Clear casing



**High Voltage Blue Case**

The Irwin Powerbase HT unit supplies a constantly variable 0-300V d.c. at 60mA and a separate constantly, variable 0-30V d.c. Also at 60mA. In addition, it has a heater supply of 6.3V a.c at 2A to power up Teltron tube heater filaments. Both variable outputs are fully smoothed.

Useful for powering valves, Teltron diodes, Millikan's oil drop experiment etc.

All outputs are short circuit protected.

ESP60778



**Electrosound Powerbase**

The Electrosound Powerbase is our alternative to the popular Irwin Powerbase 32. This Powerbase is ideal for use in Physics, Biology and Chemistry experiments in secondary and sixth form schools. It has the same electrical specifications as the old Irwin model but comes with a sturdy, powder-coated steel case with fold flat carry handle making it easily stackable.

A very popular power supply that has proven to last the rigours of daily use within schools with its tough construction and tamper proof fixings. 0-15V a.c. and 0-20V smoothed d.c. at up to 8A, Combined Continuously variable output, Maximum voltage lock Push button reset Short circuit protection, Designed and manufactured in the UK, 5 Year Warranty, Tough steel powder coated casing, Stackable Supplied with power lead, Heavy-duty screw-in rubber feet

ESP60782

Single Unit

ESP60783

Best Value Pack 15



**Power Supply Spider 1.5 3 4.5 6V 1A DC**

The Spider power supply has been specifically designed for Primary, Middle and Lower Secondary school use. Offering 1.5, 3, 4.5 or 6V smoothed and regulated DC at up to 1A, it is the ideal next step from using cells and batteries.

Four sets of terminals mean it can be used by four groups simultaneously enabling children to connect a multitude of low voltage electrical devices with the spider's bright LED's act as power output monitors. Manufactured in the UK

No batteries needed, 4 x 4mm output terminals, Compact and safe design

Fun to use

ESP60792





### Power Lock

The Powerlock power supply has both a lockable AC and DC outputs ranges by a simple key making it impossible for students to change the voltage. The Powerlock offers 2,4,6,8,10 and 12 in both DC and AC. Outputs may also be used simultaneously up to the rated output required. For safety, the output is also protected by a simple push button cut-out. Each unit is supplied with 2 that can be used on all Powerlock units if needed. Supplied with 2 keys.

Output voltages AC DC, 2,4,6,8,10,12 voltage range in AC and DC, Current 5A, Voltage type - Stepped, Output type - Full wave rectified, non-regulated, Push button trip reset, Mains input 230/240V AC, 50Hz, Supplied with mains plug and lead, Manufactured in the UK.

**ESP60786** Single Unit

**ESP60787** Best Value Pk Of 4 In Gratnells Tray



### Westminster

A very popular and compact Westminster power supply is ideal for school use with its tough steel case protected by a tough powder coated finish that will last years of use. The unit will deliver up to 16A AC or DC through its colour coded terminal posts. This power supply is very popular for use in electromagnet experiments.

AC DC Output: Voltages 1-2V, Current 16A, Voltage type - Fixed, Output type - Full wave rectified DC AC, Mains input 230/240V AC, 50Hz, Supplied with mains plug and lead, Manufactured in the UK.

**ESP60789** Single unit

**ESP60790** Best value pk of 4 in gratnells tray



ESP60801



ESP60802

### Case Repair Kit

If you damage your case on one of our Irwin Power Supplies this can easily be repaired quite easily with our simple to install replacement cover kits available in a choice of 3 colour options.

The kit comprises of Original Irwin blue, gloss black or crystal clear case

Three "mushrooms", which fit on the back of the case and act as a cable tidy, New cable clamp and fitting instructions.

Strain relief bush If you have difficulties removing the old cable clamp and cable, a specially designed tool to make the job easier is also available.

PDF

**ESP60801** Blue Case

**ESP60802** Clear Case



### Cable Clamp Tool

Specifically designed for aiding the removal of the cable gland on Irwin casing.

ESP60803



## Power Supply Single Output Linear DC

Single Output Linear DC Power Supply

### Features:

- Constant voltage and constant current operations
- Auto CV/CC switch
- Coarse and Fine control for voltage and current
- Over current protection (OCP) and Over temperature protection (OTP)
- Intelligent cooling fan

### Constant voltage operation

- Line regulation 0.01% 5mV
- Load regulation 0.01% 5mV
- Noise 10mVrms

### Constant current operation

- Line regulation 0.01% 5mA
- Load regulation 0.01% 5mA
- Noise 10mA rms

### Display

- VOLTMETER 3 digits LED display
- Ammeter 3 digits LED display
- Accuracy (1% reading 1 digit)
- Protection: Over current protection, OCP limit is adjustable from 0 to rated current.
- Over temperature protection: when internal temperature reaches  $100 \pm 10^\circ$ , OTP is activated and the output will be shut down.
- Operating environment :  $0^\circ \sim 40^\circ$ , 80%RH
- Storage environment :  $-10^\circ \sim 70^\circ$ , 70%RH
- Power source : AC115V/230V 10% Selectable, 50/60Hz
- Accessories : Power cord x1, Operation manual x1, Short circuit plate x1

**Dimensions :** 125Wx155Hx170D mm

<b>ESP60805</b>	Range : 0-15V 0-2A	Voltage display:0.00-9.99-10.0-16.0V, Current display: 000.-999.mA 1.00-2.10A, W: 2.6 KG
<b>ESP60806</b>	Range : 0-15V 0-3A	Voltage display:0.00-9.99-10.0-16.0V, Current display: 000.-999.mA 1.00-3.10A, W : 2.6 KG
<b>ESP60807</b>	Range : 0-30V 0-1A	Voltage display:0.00-9.99-10.0-32.0V, Current display: 000.-999.mA 1.00-3.10A, W : 2.6 KG



## Power Supply Single Output Switching DC

Single Output Switching DC Power Supply

### Features:

- Adopts PWM pre-regulation and linear adjustment
- Constant voltage and constant current operations
- Auto CV/CC switch
- Coarse and Fine control for voltage and current
- Over current protection, Over voltage protection and Over temperature protection
- Intelligent cooling fan

### Specifications :

- Constant voltage operation, Line regulation 0.05% 1mV, Load regulation 0.1% 5mV, Ripple Noise 10mVrms, Constant current operation, Line regulation 0.05% 10mA, Load regulation 0.1% 10mA, Ripple Noise 20mArms

### Display

- VOLTMETER 3 digits LED display, Ammeter 3 digits LED display, Resolution 100mV/10mA, Accuracy (1% reading 1 digit)

### Protection

- Over current protection, OCP limit is adjustable from 0 to rated current.
- Over voltage protection
- Over temperature protection: when internal temperature reaches 65, OTP is Activated and the output will be shut down.
- Operating environment  $0 \sim 40$ , 80%RH
- Storage environment  $-10 \sim 70$ , 70%RH
- Power source AC115V/230V 10% selectable, 50/60Hz
- Accessories Power cord x1, Operation manual x1

**Dimensions :** 125Wx160Hx260D mm

<b>ESP60808</b>	Range : 0-15V 0-5A	Voltage display: 0.00-9.99-10.0-16.0V, , Current display: 000.-999.mA 1.00-5.10A W : 2 KG
<b>ESP60809</b>	Range : 0-15V 0-10A	Voltage display: 0.00-9.99-10.0-16.0V, Current display: 000.-999.mA 1.00-10.1A W : 2 KG





### Power Supply Multiple Output Linear DC

Multiple Output Linear DC Power Supply

#### Features:

Two independent adjustable outputs 0~30V/0~3A x2, 0~30V/0~5A x2, one fixed output 5V/3A x1, Constant voltage and constant current operations, auto CV and CC switch, Low ripple and noise, low temperature drift, Auto Series and Parallel tracking operations, Output ON/OFF control, High efficiency, high power density, Over load and reverse polarity protections, Dual- colour four digital panel meters

#### Specifications:

Constant voltage operation, Line regulation 0.01% 3mV, oad regulation 0.01% 3mV (I?3A); 0.02% 5mV (I&gt;3A), Ripple Noise (5Hz~1MHz) 1mVrms (I3A); 2 I806Vrms (I&gt;3A), Constant current operation, Line regulation 0.2% 3mA, Load regulation 0.2% 3mA (I?3A); 0.2% 5mA (I&gt;3A), Ripple Noise 3mArms (I?3A); 6mArms (I&gt;3A)

#### Tracking operation

Parallel Line regulation: 0.01% 3mV, Parallel Load regulation:0.01% 3mV (I3A); 0.02% 5mV (I&gt;3A), Series Line regulation:0.01% 5mV, Series Load regulation:300mV, Series Tracking error: 0.5% 10mV of the master, no load (with load, add load regulation 300mV)

Auxiliary output (fixed), Output voltage 5V 0.25V, Output current 3A, Load regulation 25mV @110/220VAC rated input, Ripple noise (5Hz~1MHz) 2mVrm

#### Display

VOLTMETER 3 digits LED display, Ammeter 3 digits LED display, Resolution 100mV/10mA

Accuracy Real voltage and current output: (1% reading 2 digits); Preset voltage and current: (1% reading 8 digits)

#### Insulation

Between base and output terminal: 20M/500VDC, Between base and AC power cord: 300M/500VDC, Operating environment 0~40, 80%RH, Storage environment -10~70, 70%RH, Power source AC110V/220V10%, 50/60Hz, Accessories Power cord x1, Operation manual x1, Test lead x1

<b>ESP60811</b>	Range : 0~30V X2, 0~3A X2	Output watt: 195 watt, Output voltage: 0~30V x2, Output current: 0~3A x2, Fixed output: 5V/3A, Output On/Off: Yes, Tracking Operation: Yes, Dimension (WxHxD): 255x155x370mm, <b>Weight : 8kg</b>
<b>ESP60812</b>	Range : 0~30V X2, 0~5A X2	Output watt: 315 watt, Output voltage: 0~30V x2, Output current: 0~5A x2, Fixed output: 5V/3A, Output On/Off: Yes, Tracking Operation: Yes, Dimension (WxHxD): 255x155x370mm, <b>Weight : 10kg</b>
<b>ESP60813</b>	Range : 0~30V X2, 0~3A X2	Output watt: 195 watt, Output voltage: 0~30V x2, Output current: 0~3A x2, Fixed output: 5V/3A, Output On/Off: Yes, Tracking Operation: Yes, Dimension (WxHxD): 260x160x330mm, <b>Weight : 7kg</b>
<b>ESP60814</b>	Range : 0~30V X2, 0~5A X2	Output watt: 195 watt, Output voltage: 0~30V x2, Output current: 0~5A x2, Fixed output: 5V/3A, Output On/Off: Yes, Tracking Operation: Yes, Dimension (WxHxD): 260x160x330mm, <b>Weight : 9kg</b>
<b>ESP60815</b>	Range : 0~30V X2, 0~3A X2	





EduScience UK



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## LAB WARE

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- Lab Essentials
- Measuring Instruments
- Electronic & Electrical  
Equipment
- Appliances





**Test Tube**

Manufactured from boro 3.3 glass with fire polished rim , (pack of 100)

- ESL56324      Size : 10 X 75MM
- ESL56325      Size : 12 X 75MM
- ESL56326      Size : 15 X 125MM
- ESL56327      Size : 18 X 150MM
- ESL56328      Size : 25 X 150MM



**Test Tube**

Manufactured from boro 3.3 glass with rim , (pack of 100)

- ESL56332      Size : 10 X 75MM
- ESL56333      Size : 12 X 75MM
- ESL56334      Size : 16 X 125MM
- ESL56335      Size : 18 X 150MM
- ESL56336      Size : 25 X 150MM



**Test Tube Without Rim**

Manufactured from boro 3.3 glass without rim , (pack of 100)

- ESL56339      Size : 10 X 75MM
- ESL56340      Size : 12 X 75MM
- ESL56341      Size : 16 X 125MM
- ESL56342      Size : 18 X 150MM
- ESL56343      Size : 25 X 150MM



**Burette Class B With PTFE Key Stopcock**

With amber graduation (economy model) with detachable PTFE key stopcock

- ESL56346      Capacity: 25 ML
- ESL56347      Capacity: 50 ML



**Burette Class AS With PTFE Key Stopcock**

Clear glass ,with lot. Certificate ,tolerance: 0.05(ML) division: 0.1

- ESL56348      Capacity: 25 ML
- ESL56349      Capacity: 50 ML



**Burette Class B With Detachable PTFE Key Stopcock**

With Amber graduation DIN ISO 385.

- ESL56351      Capacity: 25 ML
- ESL56352      Capacity: 50 ML





**Burette Class B**

With Glass Key Stopcock  
Clear glass with amber graduation din ISO 385.

ESL56359	Capacity: 25 ML
ESL56360	Capacity: 50 ML

**Burette Class B**

With Needle Valve PTFE Stopcock  
With amber graduation DIN ISO 385.

ESL56353	Capacity: 25 ML
ESL56354	Capacity: 50 ML

**Burette Class As**

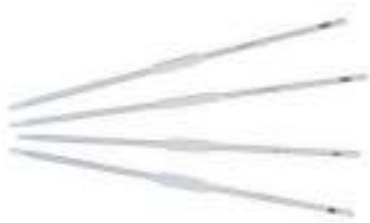
With PTFE Key Stopcock  
Un serialized, graduation interval 0.2ML, tolerance  $\pm 0.1$ ML

ESL56362	Capacity: 25 ML
ESL56363	Capacity: 50 ML
ESL56364	Capacity: 100ML

**Burette Class As**

With Glass Key Stopcock  
Clear glass with amber graduation , with lot certificate , division 0.1,  
Tolerance 0.05(Ml)

ESL56357	Capacity: 25 ML
ESL56358	Capacity: 50 ML

**Pipette Volumetric Class AS**

One mark,with Lot. Certificate

ESL56365	Capacity : 5 ML
ESL56366	Capacity : 10 ML
ESL56367	Capacity : 20 ML
ESL56368	Capacity : 25 ML

**Pipette Volumetric**

Pipette bulb small, 5ml, (pack of 10)

ESL56371

**Pipette Graduated (Serological), Class B**

	Capacity	Subdivision	Tolerance	colour
ESL56373	2 ML,	0.1ML,	- 0.02ML	green
ESL56374	5 ML,	0.1ML,	- 0.02ML	Blue
ESL56375	10 ML,	0.1ML,	- 0.02ML	orange
ESL56376	25 ML,	0.1ML,	- 0.01ML	white





**Pipette Transfer**

Disposable Graduated Transfer Pipette Non Sterile

- ESL56378 Capacity : 1 ML,
- ESL56379 Capacity : 2 ML,
- ESL56380 Capacity : 3 ML,



**Pipette Transfer**

Disposable Graduated Transfer Pipette Individually Wrapped in a peel off pouch-Sterile.

- ESL56383 Capacity : 1 ML,
- ESL56384 Capacity : 2 ML,
- ESL56385 Capacity : 3 ML,



**Pipette Aid**

Pipette aid mad of polypropylene and silicon

- ESL56392 Capacity : 10 ML,
- ESL56393 Capacity : 25 ML,



**Pipette Stand Rotary Vertical**

Pipette stand rotary vertical pp, 94 places

ESL56395



**Pipette Washer PP**

Pipette washer PP

ESL56398



**Flask Volumetric, Class B**

Volumetric flask , White Polypropylene stopper

- ESL56401 Capacity : 10 ML NS 10/19
- ESL56402 Capacity : 25 ML NS 10/19
- ESL56403 Capacity : 50 ML NS 12/21
- ESL56404 Capacity : 100 ML NS 14/23
- ESL56405 Capacity : 250 ML NS 14/23
- ESL56406 Capacity : 500 ML NS 19/26
- ESL56407 Capacity : 1000 ML NS 24/29
- ESL56408 Capacity : 2000 ML NS 29/32



**Flask Erlenmeyer Narrow Neck**

Erlenmeyer Flasks, Narrow Neck with graduation DIN ISO 1773 with Reinforced thick Rim to reduce chipping & breakage.

- ESL56412 Capacity : 50 ML
- ESL56413 Capacity : 100 ML
- ESL56414 Capacity : 250 ML
- ESL56415 Capacity : 500 ML
- ESL56416 Capacity : 1000 ML





**Flask Erlenmeyer Narrow Neck**

Flask Erlenmeyer, Narrow neck These flasks are made from thick wall and have reinforced thick beaded rim. The flasks are produced to meet ASTM E 1404 TYPE 1 specifications. All the flasks are printed in white enamel.

	Capacity	Subdivision	graduation range
ESL56420	50 ML	10ML	20-50ML
ESL56421	100 ML	0M	20-100ML
ESL56422	250 ML	5ML	50-225ML
ESL56423	500 ML	50ML	100-500ML
ESL56424	1000 ML	50ML	250-1000ML



**Flask Erlenmeyer Wide Neck**

Flask Erlenmeyer, wide neck , These flasks are made from thick wall and have reinforced thick beaded rim. The flasks are produced to meet ASTM E 1404 TYPE 1 specifications. All the flasks are printed in white enamel.

ESL56427	Capacity : 50 ML
ESL56428	Capacity : 100 ML
ESL56429	Capacity : 250 ML
ESL56430	Capacity : 500 ML
ESL56431	Capacity : 1000 ML



**Flask Round Bottom Narrow Neck**

Flask Round Bottom narrow neck, with beaded rim DIN 12347, DIN ISO 1773.

ESL56433	Capacity : 100 ML
ESL56434	Capacity : 250 ML
ESL56435	Capacity : 500 ML
ESL56436	Capacity : 1000 ML
ESL56437	Capacity : 2000 ML



**Flask Flat Bottom Narrow Neck**

Flask Flat Bottom, narrow neck, with beaded rim DIN ISO 1773.

ESL56440	Capacity : 100 ML
ESL56441	Capacity : 250 ML
ESL56442	Capacity : 500 ML
ESL56443	Capacity : 1000 ML
ESL56444	Capacity : 2000 ML



**Flask Volumetric Class A**

Volumetric Flask Class A , With Polypropylene stopper and Lot Certificate

ESL56448	Capacity : 50 ML	NS 12/21
ESL56449	Capacity : 100 ML	NS 14/23
ESL56450	Capacity : 250 ML	NS 14/23
ESL56451	Capacity : 500 ML	NS 19/26
ESL56452	Capacity : 1000 ML	NS 24/29
ESL56453	Capacity : 2000 ML	NS 29/32



**Flask Distillation With Side Arm**

Distillation flask made of Boro silicate glass 3.3

ESL56456	Capacity : 250 ML
ESL56457	Capacity : 500 ML
ESL56458	Capacity : 1000 ML



**Measuring Cylinder , Class B, Hex Base**

Measuring Cylinder , Glass hexagonal base ,Class B,To contain (TC), Double metric , with protection collar.

ESL56500	Capacity : 25 ML	Graduation Interval 1MI, Tolerance +/- 0.25MI
ESL56501	Capacity : 50 ML	Graduation Interval 1MI, Tolerance +/- 0.25MI
ESL56502	Capacity : 100 ML	Graduation Interval 1MI, Tolerance +/- 0.5MI
ESL56503	Capacity : 250 ML	Graduation Interval 1MI, Tolerance +/- 1MI
ESL56504	Capacity : 500 ML	Graduation Interval 5MI, Tolerance +/- 2MI

**Measuring Cylinder ,Class A, Round Base**

Measuring Cylinder , Round base ,Class A, With LOT certificate.

ESL56480	Capacity : 5 ML
ESL56481	Capacity : 10 ML
ESL56482	Capacity : 25 ML
ESL56483	Capacity : 50 ML
ESL56484	Capacity : 100 ML
ESL56485	Capacity : 250 ML
ESL56486	Capacity : 500 ML

**Measuring Cylinder, , Class B, Hex Base**

Measuring Cylinder Graduated Class B, Hex Base, with Double Metric Scale, Cylinders are made to meet ASTM E 1272 norms and are printed in double scale with white enamel. All the cylinders from 10ml to 2000ml comes with the bumper guard.

ESL56492	Capacity : 10 ML
ESL56493	Capacity : 25 ML
ESL56494	Capacity : 50 ML
ESL56495	Capacity : 100 ML
ESL56496	Capacity : 250 ML
ESL56497	Capacity : 500 ML

**Measuring Cylinder, Class B, Hex Base**

Measuring Cylinder , Hexagonal base ,Class B,To contain (TC), Single metric , Low form .

ESL56470	Capacity : 10 ML
ESL56471	Capacity : 25 ML
ESL56472	Capacity : 50 ML
ESL56473	Capacity : 100 ML
ESL56474	Capacity : 250 ML
ESL56475	Capacity : 500 ML
ESL56476	Capacity : 1000 ML

**Measuring Cylinder, Class B , Plastic Base.**

Measuring Cylinder , Plastic base ,Class B,To contain (TC), Single metric , with protection collar.

ESL56461	Capacity : 10 ML
ESL56462	Capacity : 25 ML
ESL56463	Capacity : 50 ML
ESL56464	Capacity : 100 ML
ESL56465	Capacity : 250 ML





**Measuring Cylinder PP Class B**

measuring cylinders - Class B, Material : Polypropylene

ESL56516	Capacity : 10 ML
ESL56517	Capacity : 25 ML
ESL56518	Capacity : 50 ML
ESL56519	Capacity : 100 ML
ESL56520	Capacity : 250 ML
ESL56521	Capacity : 500 ML
ESL56522	Capacity : 1000 ML
ESL56523	Capacity : 2000 ML



**Measuring Cylinders- PP**

Measuring Cylinders - Autoclavable Graduations, Material : Polypropylene

ESL56509	Capacity : 25 ML
ESL56510	Capacity : 50 ML
ESL56511	Capacity : 100 ML
ESL56512	Capacity : 250 ML
ESL56513	Capacity : 500 ML



**Measuring Cylinder PMP, Class A**

Measuring Cylinder Class A, Material : Polymethylpentene

ESL56536	Capacity : 10 ML
ESL56537	Capacity : 25 ML
ESL56538	Capacity : 50 ML
ESL56539	Capacity : 100 ML
ESL56540	Capacity : 250 ML
ESL56541	Capacity : 500 ML
ESL56542	Capacity : 1000 ML
ESL56543	Capacity : 2000 ML



**Measuring Cylinder PMP, Class B**

Measuring Cylinder Class B, Material : Polymethylpentene

ESL56526	Capacity : 10 ML
ESL56527	Capacity : 25 ML
ESL56528	Capacity : 50 ML
ESL56529	Capacity : 100 ML
ESL56530	Capacity : 250 ML
ESL56531	Capacity : 500 ML
ESL56532	Capacity : 1000 ML
ESL56533	Capacity : 2000 ML



**Beaker Low Form**

Beaker low form, With graduation and spot , Made of borosilicate glass 3.3 .

ESL56546	Capacity : 50 ml
ESL56547	Capacity : 100 ml
ESL56548	Capacity : 250 ml
ESL56549	Capacity : 400 ml
ESL56550	Capacity : 600 ml
ESL56551	Capacity : 1000 ml
ESL56552	Capacity : 2000 ml

**Beaker Tall Form**

Beaker Tall form, borosilicate glass 3.3 ,with graduation and spout.

ESL56561	Capacity : 50 ML
ESL56562	Capacity : 100 ML
ESL56563	Capacity : 150 ML
ESL56564	Capacity : 250 ML
ESL56565	Capacity : 400 ML
ESL56566	Capacity : 600 ML
ESL56567	Capacity : 1000 ML

**Beaker (Euro Design) PP**

Autoclavable with Graduation, Material : Polypropylene

ESL56581	Capacity : 100 ml
ESL56582	Capacity : 250 ml

**Beaker Low Form ,Heavy Duty**

Beaker low form, Heavy duty borosilicate glass 3.3 ,Tolled top rim , Double metric scales.

	Capacity	Graduation interval	graduation range
ESL56554	100 ml	10m	25-200ml
ESL56555	250 ml	25ml	25-200ml
ESL56556	400 ml	25ml	25-325ml
ESL56557	600 ml	50ml	50-500ml
ESL56558	1000 ml	100ml	100-1000ml
ESL56559	2000 ml	200ml	200-1400ml

**Beaker Low Form**

Beaker, low form, with slightly flared beaded top, double metric scale

	Capacity	Graduation interval	graduation range
ESL56572	50 ml	10ml	10-40ml
ESL56573	100 ml	10ml	20-80ml
ESL56574	250 ml	25ml	25-200ml
ESL56575	600 ml	50ml	50-500ml
ESL56576	1000 ml	50ml	100-1000ml
ESL56577	2000 ml	50ml	100-2000ml
ESL56578	5000 ml	50ml	100-5000ml





**Beaker Griffin Low Form PMP**

Beaker Griffin Low-form ,Material :Polymethylpentene sold in Packs.

<b>ESL56593</b>	Capacity : 50 ml	12 pcs/pack
<b>ESL56594</b>	Capacity : 100 ml	12 pcs/pack
<b>ESL56595</b>	Capacity : 250 ml	6 pcs/pack
<b>ESL56596</b>	Capacity : 600 ml	4 pcs/pack
<b>ESL56597</b>	Capacity : 1000 ml	3 pcs/pack
<b>ESL56598</b>	Capacity : 2000 ml	1 Pc
<b>ESL56599</b>	Capacity : 5000 ml	1 Pc
<b>ESL56600</b>	Capacity : 10 litre	1 Pc



**Beaker Griffin Low Form PP**

Beaker Griffin Low-form ,Polypropylene, supplied in Pk

<b>ESL56585</b>	Capacity : 50 ml	12 pcs/pack
<b>ESL56586</b>	Capacity : 100 ml	12 pcs/pack
<b>ESL56587</b>	Capacity : 250 ml	6 pcs/pack
<b>ESL56588</b>	Capacity : 600 ml	4 pcs/pack
<b>ESL56589</b>	Capacity : 1000 ml	3 pcs/pack
<b>ESL56590</b>	Capacity : 2000 ml	1 Pc
<b>ESL56591</b>	Capacity : 5000 ml	1 Pc
<b>ESL56592</b>	Capacity : 10 ltr	1 Pc



**Beaker With Handle Low Form PMP,**

Beaker Low-Form With Handle, Material : Polymethylpentene .

<b>ESL56612</b>	Capacity : 100 ML
<b>ESL56613</b>	Capacity : 250 ML
<b>ESL56614</b>	Capacity : 600 ML
<b>ESL56615</b>	Capacity : 1000 ML
<b>ESL56616</b>	Capacity : 2000 ML
<b>ESL56617</b>	Capacity : 5000 ML



**Pycnometer To Gay Lussac, Calibrated, Class A, 10ml**

Pycnometer to gay lussac, calibrated, class a, 10ml, without certificate, with Teflon stopper

ESL56631



**Beaker With Handle Low Form PP**

Beaker Low-Form With Handle ,Made of Polypropylene.

<b>ESL56603</b>	Capacity : 100 ml
<b>ESL56604</b>	Capacity : 250 ml
<b>ESL56605</b>	Capacity : 600 ml
<b>ESL56606</b>	Capacity : 1000 ml
<b>ESL56607</b>	Capacity : 2000 ml
<b>ESL56608</b>	Capacity : 5000 ml



**Weighing Bottle Ground Squat Form 50X25mm**

Weighing Bottles, Ground In Stopper Manufactured from ASTM 438 TYPE 1 boro 3.3 glass 50X25MM

ESL56633



**Desiccators With Lid Plain 150 Mm**

Desiccator with Lid, Plain, Die pressed, Neutral Glass with Porcelain perforated plate.

ESL56620	Diameter 150 MM
ESL56621	Diameter 200 MM
ESL56622	Diameter 250 MM
ESL56623	Diameter 300 MM

**Desiccators Vacuum With Stopcock Lid And Plate**

Complies with IS 6128 Designed for use under vacuum Sturdy construction of borosilicate glass-ground glass flanges Plates are positioned on an internal ledge within the base Comes with glass stopcock at the top Generally used for drying of moist products, and for storage of moisture sensitive substances ,

ESL56625	ID Ground Flange APP. 150 mm.
ESL56626	ID Ground Flange APP. 200 mm.
ESL56627	ID Ground Flange APP. 250 mm.
ESL56628	ID Ground Flange APP. 300 mm.

**Bottle Reagent Amber , Narrow Mouth**

Bottles Reagent narrow mouth, manufactured from ASTM E 438 TYPE 1 BORO 3.3 GLASS in compliance to DIN ISO 4796 - 2 standards with standard ground joint & PP stopper, EN ISO 4796,

ESL56638	Capacity : 50 ML	N/S 19/26
ESL56639	Capacity : 100 ML	N/S 19/26
ESL56640	Capacity : 250 ML	N/S 19/26,
ESL56641	Capacity : 500 ML	N/S 19/26
ESL56642	Capacity : 1000 ML	N/S 19/26

**Bottle Dropping Amber**

Amber glass dropping bottles with interchangeable stopper and rubber teat

ESL56649	Capacity : 30 ML
ESL56650	Capacity : 60 ML
ESL56651	Capacity : 120 ML

**Bottle Reagent Autoclavable Screw Cap And Pouring Ring**

Bottles Reagent narrow mouth, manufactured from ASTM E 438 TYPE 1 BORO 3.3 GLASS in compliance to DIN ISO 4796 - 1 standards autoclavable screw cap and pouring ring, EN ISO 479.

ESL56644	Capacity : 100 ML
ESL56645	Capacity : 250 ML
ESL56646	Capacity : 500 ML
ESL56647	Capacity : 1000 ML

**Bottle Dropping Clear**

Dropping Bottles, Manufactured from ASTM E 438 TYPE 1 BORO 3.3 GLASS fitted with ground in interchangeable stopper and rubber teat.

ESL56652	Capacity : 30 ML
ESL56653	Capacity : 60 ML
ESL56654	Capacity : 120 ML







**Bottle Dropping Glass Pipette**

Pipette dropping bottle having a three piece pipette section comprising a glass dropper, high density polythene stopper with dust- proof head and vinyl teat. Both stopper and teat are highly resistant to chemical attack by acids and alkalis.

<b>ESL56656</b>	Capacity : 30 ml
<b>ESL56657</b>	Capacity : 60 ml
<b>ESL56658</b>	Capacity : 120 ml



**Bottle Reagent, Clear Glass**

Bottles Reagent narrow mouth, manufactured from ASTM E 438 TYPE 1 boro 3.3 glass in compliance to DIN ISO 4796 - 2 standards with standard ground joint & PP stopper, EN ISO 479.

<b>ESL56660</b>	Capacity : 100 ml	N/S 14/23
<b>ESL56661</b>	Capacity : 250 ml	N/S 19/26
<b>ESL56662</b>	Capacity : 500 ml	N/S 24/29
<b>ESL56663</b>	Capacity : 1000 ml	N/S 24/29



**Bottle Round Boston HDPE**

Narrow-Mouth Boston Round Bottle- Made of High density Polyethylene ,sold in packs

<b>ESL56665</b>	Capacity : 4 ml	12pcs/pack
<b>ESL56666</b>	Capacity : 8 ml	12pcs/pack
<b>ESL56667</b>	Capacity : 15 ml	12pcs/pack
<b>ESL56668</b>	Capacity : 30 ml	12pcs/pack
<b>ESL56669</b>	Capacity : 60 ml	12pcs/pack
<b>ESL56670</b>	Capacity : 125 ml	12pcs/pack
<b>ESL56671</b>	Capacity : 250 ml	12pcs/pack
<b>ESL56672</b>	Capacity : 500 ml	12pcs/pack
<b>ESL56673</b>	Capacity : 1000 ml	6pcs/pack



**Bottle Round Boston LDPE**

Narrow-Mouth Boston Round Bottle-Made of low density polyethylene ,sold in packs.

<b>ESL56676</b>	Capacity : 8 ml	12pcs/pack
<b>ESL56677</b>	Capacity : 15 ml	12pcs/pack
<b>ESL56678</b>	Capacity : 30 ml	12pcs/pack
<b>ESL56679</b>	Capacity : 60 ml	12pcs/pack
<b>ESL56680</b>	Capacity : 125 ml	12pcs/pack
<b>ESL56681</b>	Capacity : 250 ml	12pcs/pack
<b>ESL56682</b>	Capacity : 500 ml	12pcs/pack
<b>ESL56683</b>	Capacity : 1000 ml	6pcs/pack



**Bottle Round Boston PP**

Narrow-Mouth Boston Round Bottle-Made of Polypropylene , sold in packs.

<b>ESL56697</b>	Capacity : 4 ML	12pcs/pack
<b>ESL56698</b>	Capacity : 8 ML	12pcs/pack
<b>ESL56699</b>	Capacity : 15 ML	12pcs/pack
<b>ESL56700</b>	Capacity : 30 ML	12pcs/pack
<b>ESL56701</b>	Capacity : 60 ML	12pcs/pack
<b>ESL56702</b>	Capacity : 125 ML	12pcs/pack
<b>ESL56703</b>	Capacity : 250 ML	12pcs/pack
<b>ESL56704</b>	Capacity : 500 ML	12pcs/pack
<b>ESL56705</b>	Capacity : 1000 ML	6pcs/pack





**Bottle Round Boston Amber-HDPE**

Amber Narrow-Mouth Boston Round Bottle-Made of High density Polyethylene ,sold in packs

<b>ESL56686</b>	Capacity : 4 ml	12pcs/pack
<b>ESL56687</b>	Capacity : 8 ml	12pcs/pack
<b>ESL56688</b>	Capacity : 15 ml	12pcs/pack
<b>ESL56689</b>	Capacity : 30 ml	12pcs/pack
<b>ESL56690</b>	Capacity : 60 ml	12pcs/pack
<b>ESL56691</b>	Capacity : 125 ml	12pcs/pack
<b>ESL56692</b>	Capacity : 250 ml	12pcs/pack
<b>ESL56693</b>	Capacity : 500 ml	12pcs/pack
<b>ESL56694</b>	Capacity : 1000 ml	6pcs/pack



**Bottle Round Boston HDPE**

Wide-Mouth Boston Round Bottle-Made of low density polyethylene ,sold in packs.

<b>ESL56718</b>	Capacity : 30 ML	12pcs/pack
<b>ESL56719</b>	Capacity : 60 ML	12pcs/pack
<b>ESL56720</b>	Capacity : 125 ML	12pcs/pack
<b>ESL56721</b>	Capacity : 250 ML	12pcs/pack
<b>ESL56722</b>	Capacity : 500 ML	12pcs/pack
<b>ESL56723</b>	Capacity : 1000 ML	6pcs/pack



**Bottle Round Boston LDPE**

Wide Mouth Boston Round Bottle-Made of High density Polyethylene ,sold in packs

<b>ESL56710</b>	Capacity : 30 ML	12pcs/pack
<b>ESL56711</b>	Capacity : 60 ML	12pcs/pack
<b>ESL56712</b>	Capacity : 125 ML	12pcs/pack
<b>ESL56713</b>	Capacity : 250 ML	12pcs/pack
<b>ESL56714</b>	Capacity : 500 ML	12pcs/pack
<b>ESL56715</b>	Capacity : 1000 ML	6pcs/pack



**Bottle Round Boston PP**

Wide-Mouth Boston Round Bottle-Made of Polypropylene , sold in packs.

<b>ESL56734</b>	Capacity : 30 ML	12pcs/pack
<b>ESL56735</b>	Capacity : 60 ML	12pcs/pack
<b>ESL56736</b>	Capacity : 125 ML	12pcs/pack
<b>ESL56737</b>	Capacity : 250 ML	12pcs/pack
<b>ESL56738</b>	Capacity : 500 ML	12pcs/pack
<b>ESL56739</b>	Capacity : 1000 ML	6pcs/pack



**Bottle Round Boston Amber-HDPE**

Amber Wide-Mouth Boston Round Bottle-Made of High density Polyethylene ,sold in packs

<b>ESL56726</b>	Capacity : 30 ML	12pcs/pack
<b>ESL56727</b>	Capacity : 60 ML	12pcs/pack
<b>ESL56728</b>	Capacity : 125 ML	12pcs/pack
<b>ESL56729</b>	Capacity : 250 ML	12pcs/pack
<b>ESL56730</b>	Capacity : 500 ML	12pcs/pack
<b>ESL56731</b>	Capacity : 1000 ML	6pcs/pack





**Bottle Dropping Dispensing -LDPE**

Drop-Dispenser Bottle Made of low density polyethylene,sold in packs

<b>ESL56742</b>	Capacity : 15 ML	12pcs/pack
<b>ESL56743</b>	Capacity : 30 ML	12pcs/pack
<b>ESL56744</b>	Capacity : 60 ML	12pcs/pack
<b>ESL56745</b>	Capacity : 125 ML	12pcs/pack
<b>ESL56746</b>	Capacity : 250 ML	6pcs/pack



**Carboy Rectangular With Stopcock -HDPE**

Rectangular Carboy with Stopcock-Made of High density Polyethylene.

<b>ESL56754</b>	Capacity : 5 LTR
<b>ESL56755</b>	Capacity : 10 LTR
<b>ESL56756</b>	Capacity : 20 LTR



**Carboy With Spigot LDPE**

Carboy with Spigot-Made of low density polyethylene.

<b>ESL56750</b>	Capacity : 10 LTR
<b>ESL56751</b>	Capacity : 20 LTR
<b>ESL56752</b>	Capacity : 50 LTR



**Wash Bottle**

Narrow-Mouth Wash Bottle-White Cap,sold in packs

<b>ESL56760</b>	Capacity : 125 ml	6pcs/pack
<b>ESL56761</b>	Capacity : 250 ml	6pcs/pack
<b>ESL56762</b>	Capacity : 500 ml	6pcs/pack
<b>ESL56763</b>	Capacity : 1000 ml	4pcs/pack



**Wash Bottle 500ML**

Wash bottles 500ml , Material : polyethylene

ESL56758



**Wash Bottle Integral Side Spout**

Wash Bottle-Integral Side Spout 1,sold in Packs.

<b>ESL56774</b>	Capacity : 125 ML	6pcs/pack
<b>ESL56775</b>	Capacity : 250 ML	4pcs/pack
<b>ESL56776</b>	Capacity : 500 ML	4pcs/pack
<b>ESL56777</b>	Capacity : 750 ML	4pcs/pack



**Wash Bottle WM LDPE**

Wide Mouth Wash Bottle made of low density polyethylene ,Safety Labelled -Distilled Water ,sold in packs.

<b>ESL56767</b>	Capacity : 500 ML	6pcs/pack
<b>ESL56769</b>	Capacity : 1000 ML	1 Pc





**Crystallizing Dishes**

Dishes, Crystallizing, with Spout, DIN 12337

- ESL56779 Size : 70 X 40 MM
- ESL56780 Size: 80 X 45 MM
- ESL56781 Size : 95 X 55 MM



**Evaporating Dishes Ceramic, 70 ml**

(EURO DESIGN) 75 x 30 mm( ODXH) made of porcelain, maximum temperature up-to 1150°C

ESL56783



**Petri Dish, Boro 3.3 Glass**

petri dish, manufactured from boro 3.3 glass which can withstand repeated autoclaving. od 100mm, height 17mm

ESL56785



**Mortar & Pestle**

Pestle & Mortar made of porcelain, maximum temperature up to 1150°C

- ESL56792 Size : 100 mm x 70 mm (dxh)
- ESL56793 Size : 130 mm x 80mm (dxh)
- ESL56794 Size : 160 mm x 90mm (dxh)
- ESL56795 Size : 216 mm x 114mm (dxh)

**Petri Dish**

Petri dish disposable

- ESL56788 Size : 100 mm x 14 mm Polypropylene autoclavable
- ESL56789 Size : 90 mm x 14 mm Radiation sterile vent-ps, 90mmx14mm
- ESL56790 Size : 90 mm x 14 mm Radiation sterile non vented-ps, 90mmx14mm



**Funnel Analytical PP , 100Mm -Long Stem**

Funnels- long stem 100mm, Autoclavable  
Material : Polypropylene

ESL56805



**Separating Funnel**

Separating funnel with glass stopcock and pp stopper Squibb shape

- ESL56807 Capacity : 125 ML NS : 29/32
- ESL56808 Capacity : 250 ML NS : 29/32
- ESL56809 Capacity : 500 ML NS : 29/32
- ESL56810 Capacity : 1000 ML NS : 29/32





### Funnel PP,

Funnel analytical made of polypropylene, with plain surfaces, short stem sold in packs

ESL56811	Diameter 35 mm	12 pcs/pack
ESL56812	Diameter 50 mm	13 pcs/pack
ESL56813	Diameter 55 mm	14 pcs/pack
ESL56814	Diameter 65 mm	15 pcs/pack
ESL56815	Diameter 75 mm	6 pcs/pack
ESL56816	Diameter 90 mm	7 pcs/pack
ESL56817	Diameter 100 mm	4 pcs/pack
ESL56818	Diameter 160 mm	2 pcs/pack



### Crucible Porcelain

Made of porcelain with glazed high wall supplied with lid

ESL56827	Capacity : 15 ML
ESL56828	Capacity : 20 ML
ESL56829	Capacity : 25 ML
ESL56830	Capacity : 30 ML
ESL56831	Capacity : 40 ML



### Watch Glass

Work well as lids for flasks and beakers, or holding small samples for observation under a low-power microscope.

ESL56841	DIA 50 MM
ESL56842	DIA 60 MM
ESL56843	DIA 75 MM
ESL56844	DIA 90 MM
ESL56845	DIA 100 MM
ESL56846	DIA 125 MM



### Crucible Porcelain

Made of porcelain with glazed medium wall supplied with lid

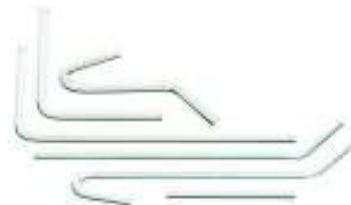
ESL56821	Capacity : 15 ml
ESL56822	Capacity : 25 ml
ESL56823	Capacity : 50 ml
ESL56824	Capacity : 70 ml
ESL56825	Capacity : 100 ml



### Crucible Porcelain

Made of porcelain with glazed low wall supplied with lid

ESL56834	Capacity : 15 ML
ESL56835	Capacity : 20 ML
ESL56836	Capacity : 25 ML
ESL56837	Capacity : 30 ML
ESL56838	Capacity : 40 ML



### Tube Delivery, Set Of 6

Different shapes tubes mad of borosilicate glass, outside dia. 6 mm Set of 6.

ESL56849



### TUBE DELIVERY, SET OF 4

Different shapes tubes mad of borosilicate glass, outside dia. 6 mm Set of 4. :1 - Short straight, 70 mm length 1 - Long straight, 170 mm length 1 - 90° bend arms, 60 mm and 160 mm length 1 - 90° bend arms, 60 mm length

ESL56850





**Tiles Porcelain With 12 Cavities**

White, with 12 cavities 22mm diameter.

ESL56852

**Brush Beaker**

- ESL56859 Nylon 400 mm long Stainless steel wire handle. Size 150 x 85 mm
- ESL56860 Bristle Standard beaker brush on a wooden handle. 325mm total length, brush approximately 150mm x 75mm



**Brush Burette**

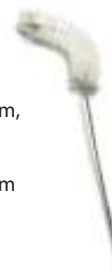
on stainless steel wire handle, for burette cap. 25ml, and 50 ML

- ESL56862 Nylon For burette cap. 25ml, head dia 16mm, length 610mm
- ESL56863 Nylon For burette cap. 50ml, head dia 19mm, length 760mm
- ESL56865 Bristle For burette cap. 25ml, head dia 16mm, length 610mm
- ESL56866 Bristle for burette cap. 50ml, head dia 19mm, length 760mm



**Brush Flask**

- ESL56868 Nylon For round bottom flask up-to 100 mm dia. on stainless steel wire handle. Overall length 330 mm,
- ESL56869 Bristle For round bottom flask up-to 100 mm dia. on stainless steel wire handle. Overall length 330 mm



**Brush Test Tube**

With fan-shaped end, on stainless steel wire handle.

- ESL56873 Nylon DIA 20 MM L 90 mm, total length 230 mm
- ESL56874 Nylon DIA 35 MM L 100 mm, total length 280 mm
- ESL56876 Bristle DIA 20 MM L 90 mm, total length 230 mm
- ESL56877 Bristle DIA 35 MM L 100 mm, total length 280 mm



**Brush Pipette**

for pipettes and tubes from 8 - 12 mm dia

- ESL56879 Nylon Head size 125 x 10 mm, overall length 650 mm
- ESL56880 Bristle Head size 125 x 10 mm, overall length 650 mm



**Brush Cylinder**

With fan-shaped end on stainless steel wire handle. Suitable for Erlenmeyer flasks, cylinders and beakers

- ESL56882 Nylon Total Length-300 mm, Brush length-110 mm, Brush dia.-40 mm
- ESL56883 Bristle Total Length-450 mm, Brush length-150 mm, Brush dia.-75 mm





### Flask Filtration

Reduced pressure these special flasks serve as collecting vessel for the filtrate. Made of borosilicate glass 3.3 very good chemical resistance minimal thermal expansion high resistance to thermal shocks autoclavable

•• Erlenmeyer shape , with Glass gorse nozzle.

ESL57004	Capacity : 100 ml
ESL57005	Capacity : 250 ml
ESL57006	Capacity : 500 ml
ESL57007	Capacity : 1000 ml
ESL57008	Capacity : 2000 ml
ESL57009	Capacity : 3000 ml



### Funnel Boro Glass

Manufactured from ASTM E 438 TYPE 1 CLASS A BORO 3.3 GLASS. These funnels comply to ISO, DIN AND USP standards.

ESL56796	Diameter 45 MM
ESL56797	Diameter 55 MM
ESL56798	Diameter 65 MM
ESL56799	Diameter 70 MM
ESL56800	Diameter 75 MM
ESL56801	Diameter 80 MM
ESL56802	Diameter 100 MM
ESL56803	Diameter 150 MM



### Filter Paper

Qualitative Analysis filter papers Low Ash content 0.07%(Acid wash treated) High wet strength Made of 100% cotton liners GRADE NO 1

ESL57020	DIA 7 CM
ESL57021	DIA 9 CM
ESL57022	DIA 11 CM
ESL57023	DIA 12.5 CM
ESL57024	DIA 15 CM
ESL57025	DIA 18 CM



### Filter Paper

Quantitative Analysis filter papers Low Ash content 0.07%(Acid wash treated) High wet strength Made of 100% cotton liners GRADE NO

ESL57031	DIA 7 CM
ESL57032	DIA 9 CM
ESL57033	DIA 11 CM
ESL57034	DIA 12.5 CM
ESL57035	DIA 15 CM
ESL57036	DIA 18 CM



### Chlorine Test Strip

ESL57040	5 TEST	0 - 0.5 - 1 - 3 - 5 mg/L Cl <sub>2</sub> 100 strips/Pk
ESL57041	20 TEST	0 - 0.5 - 1 - 3 - 5 - 10 - 20 mg/L Cl <sub>2</sub> 100 strips/Pk
ESL57042	300 TEST	0 - 25 - 50 - 100 - 200 - 300 mg/L Cl <sub>2</sub> 100 strips/pk
ESL57043	1000 TEST	0 - 50 - 100 - 250 - 500 - 1000 mg/L Cl <sub>2</sub> 100 strips/pk



### Funnel Analytical PP , 100Mm Long Stem

Funnels- long stem 100mm autoclavable material : polypropylene

ESL56805



**Stand Base A-Shaped**

Used for stand rod holder.

Hole : 10 mm, without threads

Material : Cast iron Part of Reversible Pendulum.

<b>ESL57067</b>	Side length 120 mm	<b>Dimension :</b> (L) 12.00 x (W) 12.00 x (H) 3.00 cm, <b>Weight :</b> 0.400 kg
<b>ESL57068</b>	Side length 140 mm	<b>Dimension :</b> (L) 14.00 x (W) 14.00 x (H) 3.00 cm, <b>Weight :</b> 0.500 kg
<b>ESL57069</b>	Side length 190 mm	<b>Dimension :</b> (L) 19.00 x (W) 19.00 x (H) 4.50 cm, <b>Weight :</b> 2.000 kg
<b>ESL57070</b>	Side length 240 mm	<b>Dimension :</b> (L) 24.00 x (W) 24.00 x (H) 6.00 cm, <b>Weight :</b> 4.000 kg
<b>ESL57071</b>	Side length 270 mm	<b>Dimension :</b> (L) 270.00 x (W) 26.00 x (H) 6.00 cm, <b>Weight :</b> 6.000 kg, <b>Material :</b> Cast iron



**Stand Road**

Used as pillars in some experiments. Material : Stainless steel solid Part of Mechanics Kit for Senior High School.

<b>ESL57073</b>	DIA 10 X 100 mm,	<b>Dimension :</b> (L) 10.00 x (W) 1.00 x (H) 1.00 cm, <b>Weight :</b> 1.000 kg
<b>ESL57074</b>	DIA 10 X 1500 mm	<b>Dimension :</b> (L) 150.00 x (W) 1.00 x (H) 1.00 cm, <b>Weight :</b> 0.915 kg
<b>ESL57075</b>	DIA 10 X 500 mm	<b>Dimension :</b> (L) 50.00 x (W) 1.00 x (H) 1.00 cm, <b>Weight :</b> 0.200 kg
<b>ESL57076</b>	DIA 9 X 500 mm	<b>Dimension :</b> M8 x 9 mm, Part of Stand Base and Rod, Steel plate
<b>ESL57077</b>	DIA 10 X 1500 mm	<b>Dimension :</b> (L) 1.00 x (W) 1.00 x (H) 150.00 cm, <b>Weight :</b> 0.920 kg



**Base Retort**

Brass dial head about 40mm dia., Divided and marked in 100 divisions, vertical scale 10-0-10mm, fitted on heavy brass disc, with 3 pointed legs, distance between legs 40mm.

<b>ESL57079</b>	16CM X 10CM (length x width)
<b>ESL57080</b>	20CM X 12.5CM (length x width)
<b>ESL57081</b>	25CM X 16CM (length x width)

**Steel Rod**

A range of Steel rods to suit all Stand bases.

<b>ESL57082</b>	50Cm x 11mm (length x dia.)
<b>ESL57083</b>	60Cm x 11mm (length x dia.)
<b>ESL57084</b>	75Cm x 12mm (length x dia.)
<b>ESL57085</b>	100Cm x 12mm (length x dia.)



**Stand Set Base And Road , Steel Base**

Stand Base and Rod, Steel Plate Uses as a tool for assembling laboratory equipment

Size of stand base: 210 x 140mm, thickness 4mm

Stand rod: Dia. 10 x 500mm

Material: Stand base steel plate, stand rod: stainless steel

Set **Consists of :** Square stand base Stand rod

**Dimension :** 51.60 (L) x 22.60 (W) x 3.80cm (H)

**Weight :** 1.426Kg

**ESL57087**

**Clamp Universal**

Clamp for general use.

Size :

Total length : Dia 225 mm

Jaws opening : dia. 70 mm

Material : Aluminium die casting with stainless steel bar Jaws are layered with cork sheet

Completed with spiral spring, butterfly nuts and screw

**Dimension :** (L) 22.00 x (W) 7.00 x (H) 3.00 cm

**Weight :** 0.170 kg



**ESL57107**



**Retort Ring With Boss-head**

Open ring retort support with boss-head made of Nickel chrome plated steel

<b>ESL57109</b>	Dia 60 mm
<b>eSL57110</b>	Dia 80 mm
<b>eSL57111</b>	Dia 100 mm







ESL57098

**Burette Clamp**

ESL57094	Single	Polypropylene .Suitable for all burette up-to 100ml.
ESL57095	Double	Polypropylene .Suitable for all burette up-to 100ml.
ESL57098	Advanced, single	Comprising a high strength alloy casting jaws. Suitable for all burettes upto 100ml.
ESL57099	Advanced, double	Comprising a high strength alloy casting jaws. Suitable for all burettes upto 100ml.



ESL57103

ESL57105

**Clamp Universal, Assorted**

ESL57101	4 Finger Cork Lined	Used to hold objects at stative. Size : Grip range 20 - 50 mm, Material : Steel coated with Ni/Cr and paint, Equipped with spring and bolt fasteners, <b>Dimension</b> : (L) 30.00 x (W) 10.00 x (H) 7.50 cm, <b>Weight</b> : 0.180 KG
ESL57102	4 Finger Cork Lined With Bosshead	This universal retort stand clamp is made from aluminium and has 4 jaws. The jaws allow objects from 2 - 90 mm in diameter to be clamped securely. The design of the jaws ensures a firm grip at all angles of opening. The four interlocking jaws are cork lined. Overall length is 24 cm.
ESL57103	3 Finger With Bosshead	PVC coated die-cast jaw, with clamping to my-bar screw through swivels, mounted on 13.5 cm rod of dia. 8 mm jaw. Capacity 100mm and overall length 25 cm.
ESL57104	3 Finger, Swivel	Three Finger Clamp, Swivel used to hold object at stative rod Size: Grip of 2-70mm, Material: Zinc alloy with Ni/Cr plated Without coil spring, The holder can be swivelled and fingers coated with PVC, One end is equipped with clamps and fasteners for mounting on the stative rod, <b>Dimension</b> : 30.00 (L) x 10.00 (W) x 7.50cm (H)"
ESL57105	2 Prong Single Adjustable Universal With Boss-Head	This clamp is ideal for use with straight sides glassware and apparatus such as burette, tubes flask necks. The jaws are coated with non slip vinyl sleeve. Can hold objects of 8-30 mm dia. Overall length 22 cm.



ESL57114



ESL57116



ESL57117



ESL57115

**Boss Head**

ESL57114	Cast alloy	For use with laboratory stands, this popular boss head is made of die caste alloy. It accepts rods up to 16mm in diameter at a right angle to one another. Metal thumbscrews with blue plastic heads allow for adjustment. Measures approximately 11.7 x 3 x 3 cm in size.
ESL57115	Square for rod	Threaded metal one piece clamping screws • Able to hold rods up to 15 mm in diameter • Holds rods orthogonal (90 degrees) to one another. • All metal constructions to carry heavy loads and prevent torque damage
ESL57116	Die caste	Threaded metal one piece clamping screws Able to hold rods up to 16 mm in diameter Holds rods orthogonal (90 degrees) to one another. All metal constructions to carry heavy loads and prevent torque damage
ESL57117	Heavy duty	Thicker than normal 7 mm threaded clamping screws Thicker casting to support more load Accepts up to 16 mm rods Made of high strength powder coated alloy All metal constructions to carry heavy loads and prevent torque damage





**Tong Beaker**

Made of Stainless Steel with Coated Ends Rust free with superior quality Holds beakers from 50mL to 2000mL

- ESL56891 Rubber lined jaw
- ESL56892 Silicon lined jaw



**Tong Crucible Straight**

General purpose straight tongs, with corrugated jaws, used for handling of hot apparatus. Steel Chrome Plated,

- ESL56885 Length : 150 MM St. Steel
- ESL56886 Length : 200 MM St. Steel



**Crucible Tongs With Bow**

Crucible tongs with bow, General purpose tongs with bow and corrugated jaws used for handling hot apparatus.

- ESL57118 Blackened steel 15CM length
- ESL57119 Blackened steel 20CM length
- ESL56888 St. Steel 15CM length
- ESL56889 St. Steel 20CM length



**Tong-Beaker,With Rubber Sleeves Cover**

Jaws covered with rubber sleeves,Overall length of tong 30cm approx. Made of stainless steel

ESL56895



**Tong Flask St. Steel Cork Lined Jaw**

Stainless steel flask tongs with cork lined jaws. Fits flasks of any shape from 100-2000ml

ESL56894



**Suspension Clamps**

Used to suspend a thermometer over a hot plate or a specific heat specimen. Clamp holds items at a distance of 110mm from the support rod. The hook is adjustable and locks at any angle.

ESL57090



**Test Tube Stand Z Pattern - 200 X 125 X 75mm**

Sturdy, corrosion-resistant (Z) pattern with three rows of holes. Stands can nest together for easy storage. Not suitable for use with solution containing mercury salts.

- Size: 200 x 125 x 75mm
- Five holes: 28mm diameter
- Six holes: 19mm diameter
- Eight holes: 13mm diameter

ESL57123



**Thermometer Stand**

Thermometer Stand Supports 18 mm thermometers. Metal stand with a foam rubber cushion baseplate to protect thermometer bulbs. Size 165 x 120 x 125 mm.

ESL57122





**Funnel Stand**

Wooden, polished, with clamping screws. Rods are approx. 460 mm Length

- ESL57125 Single Rod dia 17.5 mm.  
Single base size 200 x 110 mm.
- ESL57126 Double Rod dia 16 mm.  
Double base size 290 x 110 mm



**Test Tube Rack Plastic**

Test Tube Rack, Plastic  
Used for test tube storage 10mm dia. To 16mm dia.  
Material: Plastic injection, knock-down system  
Consists of 12 holes 18mm dia.  
**Dimension :** 18.00 (L) x 6.30 (W) x 10.50 cm (H)  
**Weight :** 0.100Kg

ESL57128

**Test Tube Half Rack**

Poly-wire blue re-enforced nylon

- ESL57130 Dia ,13 MM
- ESL57131 Dia ,16 MM
- ESL57132 Dia ,20 MM
- ESL57133 Dia ,25 MM
- ESL57134 Dia ,30 MM



**Test Tube Stand (Wire Pattern )**

Test tube stand (wire pattern ) - 13mm x 90 Tubes

ESL57129

**Test Tube Rack**

Poly-wire blue-Re-enforced nyl

- ESL57135 Dia ,13 MM
- ESL57136 Dia ,16 MM
- ESL57137 Dia ,20 MM
- ESL57138 Dia ,25 MM
- ESL57139 Dia ,30 MM



**Test Tube Rack Wooden,**

Test tube stand wooden, 2 tier, wooden support with dovetail joining and 12 holes in two rows.

- ESL57144 12 X 22mm.
- ESL57145 12 X 25mm.

**Test Tube Rack**

Poly-grid test tube rack blue polypropylene

- ESL57141 Dia ,16 MM
- ESL57142 Dia ,20 MM
- ESL57143 Dia ,25 MM



**Test Tube Holder Wooden**

Made of hard wood with steel spring , the jaws will accept tubes up to 20 mm diameter.

ESL57148



**Test Tube Holder-Wire Pattern**

Plated spring steel wire holder with finger grip. The jaws will accept tubes up to 40 mm diameter and their alignment maintained by a wire collar. Overall length 16 cm.

ESL57149





**Drying Rack,**

Wall mounted corrosion free

- ESL57151 20 PEGS
- ESL57152 30 PEGS
- ESL57153 48 Pegs ,coated wire
- ESL57154 55 Pegs,coated wire

Made of abs material  
 Made of steel / polyester  
 Plastic coated steel , wire tip are PVC coated size 500 x 400 mm  
 Coated steel , wire tip are PVC coated size 650 x 360 mm



**Tripod Stand**

all steel welded. Finished plated and legs are bent outward for stability.

- ESL57155 Length of one side 12.5 cm Top triangular,Height 20cm.
- ESL57156 Length of one side 15 cm Top triangular, Height 20cm.
- ESL57158 dia 12.5 cm Top circular,Height 20cm.
- ESL57159 dia 15 cm Top circular,Height 20cm.



**Cork Stopper Bark**

Cat. No	Size	Top	Length	Bottom
ESL57166	000	6	13	4
ESL57167	00	8	13	5
ESL57168	0	10	13	7
ESL57169	1	11	16	8
ESL57170	2	13	17	9
ESL57171	3	14	19	10
ESL57172	4	16	20	11
ESL57173	5	17	22	12
ESL57174	6	19	24	13
ESL57175	7	21	25	15
ESL57176	8	22	27	17
ESL57177	9	24	29	18
ESL57178	10	25	31	20
ESL57179	11	27	31	21
ESL57180	12	29	31	22
ESL57181	13	30	31	24
ESL57182	14	32	31	25
ESL57183	15	33	31	27
ESL57184	16	35	38	27
ESL57185	17	36	38	30
ESL57186	18	38	38	31
ESL57187	19	40	38	33
ESL57188	20	41	32	34

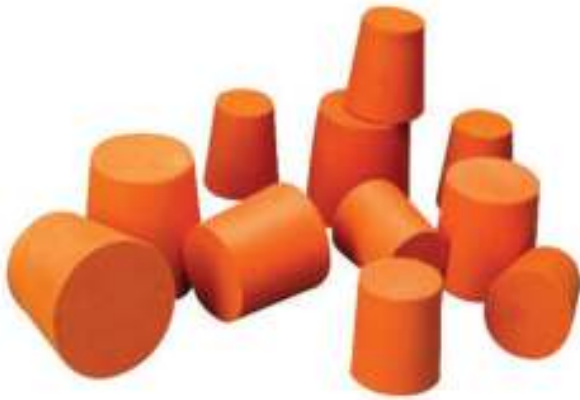


**Laboratory Jack**

Laboratory jack made of Aluminium

- ESL57161 10 X 10 CM Max. Hight : 18cm
- ESL57162 15 X 15 CM Max. Hight : 25cm
- ESL57163 20 X 20 CM Max. Hight : 28cm





**Stopper Rubber**

Made of Solid, superior quality rubber resistance to acid, alkali and ammonia, suitable for schools, colleges and Universities.

Cat. No	Top	Length	Bottom
ESL57195	7	16	5
ESL57196	9	16	6
ESL57197	10.5	20	8
ESL57198	11.5	20	9
ESL57199	12.5	20	10
ESL57200	14	24	11
ESL57201	16	24	13
ESL57202	18	24	15
ESL57203	20.5	26	27
ESL57204	21	26	18
ESL57205	22.5	28	19
ESL57206	24.5	28	21
ESL57207	26.5	28	23
ESL57208	28.5	28	25
ESL57209	31	32	27
ESL57210	31	32	29
ESL57211	36	35	31
ESL57212	38.5	38.5	33
ESL57213	45.5	36.5	35
ESL57214	42.5	40.5	38
ESL57215	49.5	40.5	40



**Stopper Rubber One Hole, Pk Of 50 Pcs**

Assorted containing 7 pcs. Each of size 8, 9, 11, 13, 15mm bottom dia and 3 pcs. Each of 17, 21, 23, 25, 29mm bottom dia with one hole. Pack of 50 pcs. Any other sets can be supplied as per specifications.

ESL57219



**Stopper Rubber Two Holes, Pk Of 50 Pcs**

Assorted containing 7 pcs. Each of size 8, 9, 11, 13, 15mm bottom dia and 3 pcs. each of 17, 21, 23, 25, 29mm bottom dia. With two holes. Pack of 50 pcs. Any other sets can be supplied as per specifications.

ESL57236



**Cork Borer Sharpener**

Cork Borer Sharpener, Die-cast alloy. Suitable for all borers

ESL57279



**Cork Borer Set 6**

Nickel-plated finish. Complete with cleaning rod having good grip and pipes of thick gauge. Set of 6 sizes 4-10mm

ESL57277



**Cork Borer Set 12**

Nickel-plated finish. Complete with cleaning rod having good grip and pipes of thick gauge. Set of 12 sizes 4-18mm

ESL57278





**Stopper Rubber Silicon**

Made of Solid, superior quality Silicon resistance to acid, alkali and ammonia, suitable for schools, colleges and Universities.

Cat. No	Top	Length	Bottom
ESL57253	7	16	5
ESL57254	9	16	6
ESL57255	10.5	20	8
ESL57256	11.5	20	9
ESL57257	12.5	20	10
ESL57258	14	24	11
ESL57259	16	24	13
ESL57260	18	24	15
ESL57261	20.5	26	17
ESL57262	21	26	18
ESL57263	22.5	22	19
ESL57264	24.5	28	20
ESL57265	26.5	28	23
ESL57266	28.5	28	25
ESL57267	31	32	27
ESL57268	31	32	29
ESL57269	36	35	31
ESL57270	38.5	38.5	33
ESL57271	45.5	36.5	35
ESL57272	42.5	40.5	38
ESL57273	49.5	40.5	40



**Tubing Glass**

Made of Borosilicate glass 3.3, light wall, length 0.5mtr approx.

ESL57283	Dia : 5mm
ESL57284	Dia : 6mm
ESL57285	Dia : 7mm
ESL57286	Dia : 8mm
ESL57287	Dia : 9mm
ESL57288	Dia : 10mm
ESL57289	Dia : 12mm
ESL57290	Dia : 14mm
ESL57291	Dia : 16mm
ESL57292	Dia : 18mm
ESL57293	Dia : 20mm
ESL57294	Dia : 25mm



**Tubing Clip**

Tubing clip made of spring steel plated wire according to Mohr

ESL57351	Mohr	For tube dia up to 45 mm
ESL57352	Mohr	For tube dia up to 65 mm

Nickel plated, with projecting plate to prevent damage to tubing by end of screw, with hinged bottom bar for direct fitting and removed without access to ends of tube. Max. Opening 15 mm

ESL57353	Hoffmann	Max. Opening 15 mm
ESL57354	Hoffmann	Max. Opening 25 mm



**Glass Tube Cutter**

Glass tubing cutter, up to an outer diameter of 40mm.

ESL57349



**Tubing Connector**

Polypropylene, ruffled end for rubber tubing. May be autoclaved. To fit tubing nominal bore.

ESL57342	Y SHAPE 4 MM
ESL57343	Y SHAPE 6 MM
ESL57344	Y SHAPE 8 MM
ESL57346	T SHAPE 4 MM
ESL57347	T SHAPE 6 MM
ESL57348	T SHAPE 8 MM

**Tubing Silicon**

Seamless, non toxic, translucent very flexible suitable for connecting to glass, Pack per meter.

ESL57314	2mm x 1mm (Bore x Wall Thickness).
ESL57315	3mm x 1mm (Bore x Wall Thickness).
ESL57316	3mm x 1.5mm (Bore x Wall Thickness).
ESL57317	4mm x 1mm (Bore x Wall Thickness).
ESL57318	4mm x 1.5mm (Bore x Wall Thickness).
ESL57319	5mm x 1mm (Bore x Wall Thickness).
ESL57320	5mm x 1.5mm (Bore x Wall Thickness).
ESL57321	6mm x 1mm (Bore x Wall Thickness).
ESL57322	6mm x 1.5mm (Bore x Wall Thickness).
ESL57323	6mm x 2mm (Bore x Wall Thickness).
ESL57324	6mm x 3mm (Bore x Wall Thickness).
ESL57325	7mm x 1.5mm (Bore x Wall Thickness).
ESL57326	7mm x 2mm (Bore x Wall Thickness).
ESL57327	8mm x 1.5mm (Bore x Wall Thickness).
ESL57328	8mm x 2mm (Bore x Wall Thickness).
ESL57329	8mm x 3mm (Bore x Wall Thickness).
ESL57330	9mm x 2mm (Bore x Wall Thickness).
ESL57331	10mm x 2mm (Bore x Wall Thickness).
ESL57332	10mm x 3mm (Bore x Wall Thickness).
ESL57333	12mm x 2mm (Bore x Wall Thickness).
ESL57334	12mm x 3.5mm (Bore x Wall Thickness).
ESL57335	14mm x 3mm (Bore x Wall Thickness).
ESL57336	14mm x 3mm (Bore x Wall Thickness).
ESL57337	16mm x 3mm (Bore x Wall Thickness).
ESL57338	25mm x 4mm (Bore x Wall Thickness).

**Visking Tubing**

A cellulose based, selectively permeable material, in tube form, which can be used to demonstrate osmosis and dialysis separation techniques. 14mm diameter.

ESL57356	30 Mtr
eSL57357	5 Mtr

**Tubing Rubber**

Soft quality, resistant to acid and alkalis. Pack of 10 meters. Orange Color.

ESL57298	3 mm x 1 mm (Bore x Wall Thickness).
ESL57299	4 mm x 1 mm (Bore x Wall Thickness).
ESL57300	5 mm x 1.5 mm (Bore x Wall Thickness).
ESL57301	6 mm x 1.5 mm (Bore x Wall Thickness).
ESL57302	7 mm x 1.5 mm (Bore x Wall Thickness).
ESL57303	8 mm x 1.5 mm (Bore x Wall Thickness).
ESL57304	9 mm x 2 mm (Bore x Wall Thickness).
ESL57305	10 mm x 2 mm (Bore x Wall Thickness).
ESL57306	12 mm x 2 mm (Bore x Wall Thickness).
ESL57307	15 mm x 3 mm (Bore x Wall Thickness).
ESL57308	16 mm x 3 mm (Bore x Wall Thickness).
ESL57309	19 mm x 3 mm (Bore x Wall Thickness).
ESL57310	20 mm x 3.5 mm (Bore x Wall Thickness).
ESL57311	25 mm x 3.5mm (Bore x Wall Thickness).





**Bunsen Burner Nickel**

Nickel plated burner tube with rotatable air regulator and cylindrical connector. Mounted in pressure die costed base.

- ESL57362 For LPG gas
- ESL57363 For natural gas



**Neoprene Bunsen Burner Hose,**

Connect your burner to a fuel source.

- ESL57359 Length 2 FT (.6M)
- ESL57360 Length 3 FT (.9M)



**Bunsen Burner**

Piezo ignition, Adjustable flame, Refillable butane tank, Applications: Sterilizing, Welding, Heating , Technical Specification, Max. Temperature 1300 Fuel tanker capacity 45 g, Working time 60 Min, **Dimension :** (H x W x D) mm 92 x 115 x 79

- ESL57367 PORTABLE
- ESL57368 LAB TORCH
- ESL57369 LAB PORTABLE



**Spirit Lamp**

Methylated Spirit Burner

ESL57371



**Bench Mats**

Made of cork , ideal for use with round bottom flask ,

- ESL57372 For flask capacity 50-100 ml Diameter 80 mm
- ESL57373 For flask capacity 250 ml Diameter 100 mm
- ESL57374 For flask capacity 500 ml Diameter 120 mm

**Bench Mats**

Made from calcium silicate, ideal for use under Bunsen burner, well finished edges

- ESL57375 Size : 150 x 150 mm
- ESL57376 Size : 200 x 200 mm
- ESL57377 Size : 230 x 230 mm
- ESL57378 Size : 300 x 300 mm



**Wire Gauze With Ceramic Centre**

Wire gauze with ceramic centres - high quality and extra strong

- ESL57379 Size : 125 x 125 mm
- ESL57380 Size : 150 x 150 mm



**Wooden Splints**

Soft dry wood for general laboratory use. Size 5 x 140 mm.

- ESL57386 Pack of 100
- ESL57387 Pack of 1000



**Spatula With Spoon**

One end flat and the other end spoon form, polished..

- ESL57390 Total length 12.5 cm
- ESL57391 Total length 15 cm
- ESL57392 Total length 20 cm







**Trowel**

Stainless steel, double ended with trowel-shaped scoops for handling large quantities of material. Length 175 mm and mean width 15 mm

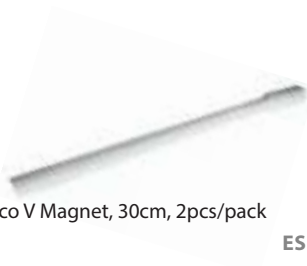
ESL57396



**Stirring Bar**

Dia 10Mm X H - 250 mm PP.

ESL57397



**Magnetic Retriever**

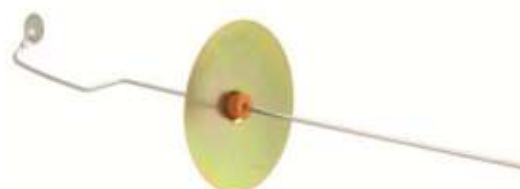
Magnetic Retriever PTFE/Alnico V Magnet, 30cm, 2pcs/pack

ESL57398

**Stirring Rod PP**

Stirring Rod

ESL57400



**Deflagrating Spoon With Cap**

Steel cup and rod held by cork in aluminium cap, length 35 cm and diameter of cap 90 mm cup 18 mm

ESL57402



**Pip-clay Triangle**

On stout iron wire, pipe-clay stems. Pk/10

ESL57382 One side length 55 mm

ESL57383 One side length 65 mm

ESL57384 One side length 75 mm



**Wire Holder, Plastic Handle**

Wire holder with plastic handle

ESL57408



**Spatula Chattaway**

One end flat and the other end bent up, polished.

ESL57388 Total length 15 cm

ESL57389 Total length 20 cm



**Tube Combustion**

Borosilicate glass, open both ends, for oxidisation and reduction of chemical substances. Length 30 cm.

ESL57410 OD 24 mm, Bore 20 mm

ESL57411 OD 22mm, Bore 17mm

ESL57412 OD 17mm, Bore 11mm

**Tube Combustion, Borosilicate Glass**

Borosilicate glass, for reduction of metal oxides with hydrogen. A small hole in the side of the lower end of the tube allows for escape of gas. Length 15 cm and dia. 2.5 cm.

ESL57413



**Nuffield Raised Centre 14 cm**

Raised centre section, one end flat and bent up and other end formed into a scoop. Stainless steel, length 14 cm

ESL57395



**Cobalt Glass**

For potassium dry reaction

ESL57405 SIZE : 7.5 X 5 CM

ESL57406 SIZE : 5 X 2.5 CM





**Universal Indicator Paper PH 1-14**

This test paper covers the range pH1 to 14. Box of 10 books each of 20 leaves, 65 x 10mm. 12 colour matches are printed on each book cover.

ESL57421



**Cobalt Chloride Test Paper**

Heat sensitive, colour change blue to pink with moisture. Depending upon humidity, papers may be pink on receipt and will need drying before use. Box of 10 books.

ESL57425



**Litmus Paper**

10 books each with 20 strips.  
Red Pk/200 Strips: Range pH 8-5, colour change.

ESL57415

**Blue Pk/200 Strips**

Range pH 8-5, colour change.

ESL57417

**Neutral Pk/200 Strips**

Colour change to red or neutral.

ESL57419



**Universal Indicator Paper PH 1-11**

Range pH 1 to 11 in clear colour coded steps. Colour chart is on the side of the plastic dispenser. Box of 10 books with twenty strips. 5m of 6mm paper.

ESL57423



**Parafilm**

No matter whether you wish to seal beakers, Erlenmeyer flasks, weighing bottles or graduated cylinders, the highly elastic and stretchable Parafilm® M laboratory film fits the opening of any vessel. It saves specimens from contamination or evaporating. Furthermore, it prevents fallen over flasks from spilling. Parafilm® M stretches up to 200 % of its original size and clings even around irregular shapes and surfaces.

ESL57435 Size : 100 mm x 38 mtr

ESL57436 Size : 100 mm x 75 mtr

ESL57437 Size : 50 mm x 75 mtr

**G Clamp**

- ESL57427 "Drop forged. Length 250 mm
- ESL57428 Drop forged. Length 200 mm
- ESL57429 Drop forged. Length 150 mm
- ESL57430 Drop forged. Length 125 mm
- ESL57431 Drop forged. Length 100 mm
- ESL57432 Drop forged. Length 75 mm
- ESL57433 Drop forged. Length 50 mm



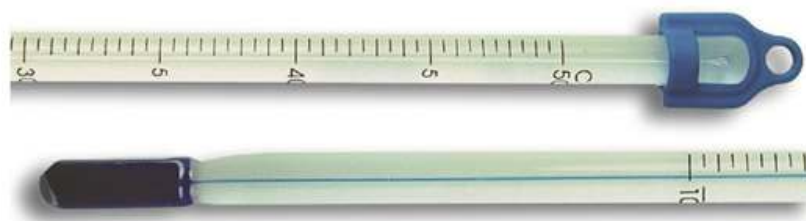
**Weight Ring**

Made of cast iron PVC coated ring for stabilizing Erlenmeyer flask immersed into water .

ESL57440 For flask sizes: 100 to 500 ML , Weight 0.22 KG

ESL57441 For flask sizes: 250 to 1000 ML , Weight 0.45 KG



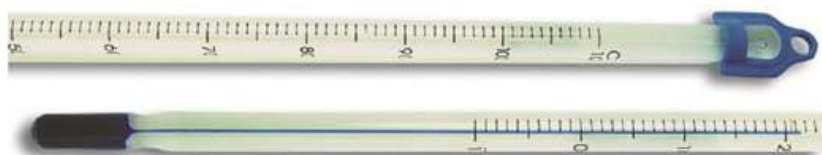


**Lab Thermometer**

Product Material: Glass tube with Kerosene filling (except \* - special brown filling for high range ),

Product Dimension :s 6.5mm dia x length

ESL57544	White bkd blue spirit	Range: -10 to 50 ° C, Division: 0.5 C, Accuracy: /-0.5 C @ 35 C
ESL57545	White bkd blue spirit	Range: -30 to 120 ° F, Division: 1.0 F , Accuracy: /-0.2 F @ 95F
ESL57546	White bkd blue spirit	Range: -35 to 50 ° C, Division: 1.0 C, Accuracy: /-1.0 C @ 35 C
ESL57547	White bkd blue spirit	Range: -20 to 110 ° C &F, Division: 1.0 C&F , Accuracy: /-1.0 C @ 35C
ESL57548	White bkd blue spirit	Range: -20 to 150 ° C&F, Division: 1.0 C&F, Accuracy: /-1.0 C @ 35 C
ESL57549	White bkd blue spirit	Range: 0 to 260 C&F, Division: 1.0 C&F, Accuracy: /-2.0 C @ 90 C
ESL57550	White bkd blue spirit	Range: 0 to 230 F, Division: 2.0 F, Accuracy: /-0.2 F @ 95 F
ESL57551	White bkd blue spirit	Range: -20 to 110 ° C, Division: 1.0 C, Accuracy: /-1.0 C @ 35 C
ESL57552	White bkd blue spirit	Range: -20 to 110°C, Division: 0.5 C, Accuracy: /-1.0 C @ 35 C
ESL57553	White bkd blue spirit	Range: 0 to 300 F, Division: 2.0 F, Accuracy: /-0.2 F @ 95 F
ESL57554	White bkd blue spirit	Range: -20 to 150 C, Division: 1.0 C, Accuracy: /-1.0 C @ 35 C
ESL57555	White bkd blue spirit	Range: 0 to 500 F, Division: 2.0 F, Accuracy: /-0.2 F @ 95 F
ESL57556	White bkd blue spirit	Range: -10 to 260 ° C, Division: 1.0C, Accuracy: /-2.0 C @ 90 C
ESL57557	White bkd blue spirit	Range: -10 to 210 ° C, Division: 1.0 C, Accuracy: /-2.0 C @ 90 C
ESL57558	White bkd brown spirit	Range: -10 to 33° C, Division: 2.0 C, Accuracy: /-2.0 C @ 90 C
ESL57559	White bkd brown spirit	Range: -10 to 300 ° C, Division: 1.0 C, Accuracy: /-2.0 C @ 90 C 4
ESL57560	White bkd brown spirit	Range: -10 to 360 ° C, Division: 2.0 C, Accuracy: /-2.0 C @ 90 C
ESL57561	White bkd blue spirit	Range: -1 to 51 ° C, Division: 0.1 C, Accuracy: /-1.0 C @ 35 C
ESL57562	White bkd blue spirit	Range: -1 to 51 ° C, Division: 0.2 C, Accuracy: /-1.0 C @ 35 C
ESL57563	White bkd blue spirit	Range: -1 to 101 ° C, Division: 0.2C, Accuracy: /-1.0 C @ 35 C



**Lab Thermometer**

Product Material: Glass Tube: Kerosene filled

These spirit filled thermometers use specially selected filling materials covering temperatures down to -200c. Normal fillings are coloured red on a white back glass but alternative colours are available as shown. The -200 ° C range thermometers are filled with a colourless liquid. Thermometers normally supplied with the non roll cap with ring.

ESL57564	White bkd red spirit , Length 200MM	Range: -10 to 60 ° C, Division: 1.0 C, Accuracy: /-1.5 C @ 35 C
ESL57565	White bkd red spirit , Length 250MM	Range: -10 to 150 ° C, Division: 1.0 C, Accuracy: /-1.0 C @ 35 C
ESL57566	White bkd red spirit , Length 305 MM	Range: -10 to 110 ° C, Division: 1.0 C , Accuracy: /-1.0 C @ 35 C
ESL57567	White bkd blue spirit , Length 305MM	Range: -10 to 110 ° C, Division: 1.0 C, Accuracy: /-1.0 C @ 35 C
ESL57568	White bkd red spirit , Length 305MM	Range: -10 to 150 ° C, Division: 1.0 C, Accuracy: /-1.0 C @ 35 C
ESL57569	White bkd blue spirit , Length 305MM	Range: -10 to 200 ° C, Division: 1.0 C, Accuracy: /-2.0 C @ 90 C
ESL57570	White bkd red spirit , Length 305MM	Range: -10 to 110 ° C, Division: 1.0 C, Accuracy: /-1.0 C @ 35 C
ESL57571	White bkd red spirit , Length 305MM	Range: -10 to 110 ° C, Division: 0.5 C, Accuracy: /-2.0 C @ 90 C
ESL57572	White bkd red spirit , Length 205MM	Range: -10 to 150 ° C, Division: 1.0 C, Accuracy: /-2.0 C @ 35 C
ESL57573	White bkd red spirit , Length 205MM	Range: -10 to 110 ° C, Division: 1.0 C, Accuracy: /-1.5 C @ 35 C





**Lab Thermometer**

This entry level range is now available in a choice of red, green or blue spirit filling and have Tri-top, moulded glass non-roll device to help prevent breakage. These thermometers are printed with a clear, easy-to-read scale making them particularly suitable for student use. Dia 76 mm, The initial TM Brand Thermometers are supplied as standard in protective PVC packaging in pack of 10 thermometers.

<b>ESL57574</b>	Red spirit , length 300 mm	Range: -10 to 50 ° C, Division: 0.5 C, Accuracy: /-0.5 C @ 35 C
<b>ESL57575</b>	Red spirit , length 200 mm	Range: -10 to 110 ° C, Division: 1.0 C, Accuracy: /-1.5 C @ 35 C
<b>ESL57576</b>	Red spirit , length 150 mm	Range: -10 to 110 ° C, Division: 1.0 C, Accuracy: /-2.0 C @ 35 C
<b>ESL57577</b>	Blue spirit, length 300 mm	Range: -10 to 50 ° C, Division: 0.5 C, Accuracy: /-0.5 C @ 35 C
<b>ESL57578</b>	Blue spirit, length 300 mm	Range: -10 to 110 ° C, Division: 1.0 C, Accuracy: /-1.5 C @ 35 C
<b>ESL57579</b>	Blue spirit, length 300 mm	Range: -10 to 110 ° C, Division: 1.0 C, Accuracy: /-1.5 C @ 35 C
<b>ESL57580</b>	Blue spirit, length 200 mm	Range: -10 to 110 ° C, Division: C 1.0 C, Accuracy: /-1.5 C @ 35 C
<b>ESL57581</b>	Blue spirit, length 150 mm	Range: -10 to 110 ° C, Division: 1.0 C, Accuracy: /-2.0 C @ 35 C



**Lab Thermometer**

Product Material: Glass Tube

The EduScience break-safe range of laboratory thermometers are encapsulated in PVC to contain any glass or filling material in the event of breakage.

Immersion: 76mm

<b>ESL57582</b>	Filling : Blue LoTox	Range : -10 to 50 ° C, Division: 0.5 C, Length: 305mm, Accuracy: /-0.5 C @ 35 C
<b>ESL57583</b>	Filling : Blue LoTox	Range : -10 to 50 ° C, Division: 0.5, Length: 305mm, Accuracy: /-0.5 C @ 35 C
<b>ESL57584</b>	Filling : Blue LoTox	Range : -10 to 110 ° C, Division: 0.5, Length: 155mm, Accuracy: /-1.0 C @ 35 C
<b>ESL57585</b>	Filling : Blue LoTox	Range : -20 to 110 ° C, Division: 1.0 C, Length: 305mm, Accuracy: /-1.0 C @ 35 C
<b>ESL57586</b>	Yellow Back with Red Spirit Filling	Range : -20 to 110 ° C, Division: 1.0 C, Length: 305mm, Accuracy: /-1.0 C @ 35 C



**Lab Thermometer Kit For Classroom**

Blue plastic tray which fits into standard classroom storage systems. Includes a variety of laboratory thermometers and a set of classroom notes.

- 8 x 150mm initial brand green filled thermometers
- 7 x 300mm initial brand green filled thermometers
- 1 x 300mm un calibrated green filled thermometer

**Boxed Dimensions :** 334 x 232 x 50mm

ESL57587



**Lab Thermometer Investigation Science Kit**

Blue plastic case enclosing a variety of instruments and a set of investigative science notes.

- 4 x 150mm initial brand green filled thermometers
- 4 x 200mm initial brand green filled thermometers
- 2 x small classroom thermometers
- 1 x dial type maximum/minimum thermometer
- 1 x soil temperature thermometer
- 1 x "Spot-check" clinical thermometer

**Boxed Dimensions :** 334 x 232 x 50mm

ESL57588





**Max Min Thermometer Digital Classic Design**

Large digital Max Min thermometer in a classic design with roof for indoor or outdoor use, this Max Min thermometer shows current temperatures and also maximum and minimum temperatures reached since the previous reset. A reliable digital Max Min thermometer complete with batteries included.

**Product Specifications :**

- Temperature Range : -20 to 50 ° C&F
- Accuracy: /-1 ° C
- IP Rating: IP 65
- Battery: 1 x AAA
- CE ,RoHS/WEE E: Compliant

**LCD Dimensions :** 16 x 52mm (current temperature display)

**Product Dimensions :** 203 x 100 x 30mm (when roof in horizontal position)

**Product Weight :** 135g

ESL57594



**Max Min Thermometer Digital Mini Lidded**

Digital Max Min thermometer in white case with roof. Suitable for outdoor or indoor use. This Max Min thermometer features a triple display which simultaneously shows minimum, maximum and the current temperature. Easy push button to reset the Max and Min temperatures and also comes complete with batteries included.

**Product Specifications :**

- Temperature Range : -10 to 50 ° C&F
- Display Resolution : 0.1C
- Accuracy : /-2 ° C
- Sampling Rate : Every 10 seconds
- Water Resistant : To IP65
- Battery usage : 1 x AAA (Included)
- CE ROHS/WEEE : Approved

ESL57595



**Hygrometer Hair Type**

For measuring of relative humidity in air 0-100 x 1% r.h. in plastic case.

ESL57590



**Hygrometer Thermo Hygrometer**

For measuring of relative humidity and temperature both in room and air. Range -10 to 50 ° C for thermometer and 0 to 100% for Hygrometer in plastic case.

ESL57591



**Thermometer Dial**

For measuring temperature range -10 to 50 ° C in plastic case.

ESL57593



**Lab Thermometer Classroom Wall Kit With Chart**

Colourful 380mm plastic wall thermometer and chart for recording temperatures.

**Boxed Dimensions :** 365 x 287 x 10mm

ESL57589





**Max Min Digital Heavy Duty , Green**

Large Digital Max Min Thermometer  
 Suitable for outdoor and indoor use in a green casing. Triple display shows minimum, maximum and current temperature simultaneously. This digital Max Min thermometer can be easily switched from C to F by a push button and it is also easy to reset the Max Min temperature.  
 Temperature Range : -10 to 40 ° C&F  
 Display Resolution : 0.11C  
 Accuracy : +/-1C  
 Sampling Rate : Every 10 seconds  
 Water Resistant : To IP65  
 Battery usage : 1 x AA (Included)  
 CE , ROHS/WEEE: Approved.

ESL57597



**Max Min Thermometer Digital Heavy Duty , White**

Large Max Min Digital Thermometer  
 Suitable for outdoor and indoor use in a white casing. Triple display shows minimum, maximum and current temperature simultaneously.  
 Temperature Range: -10 to 40 ° C&F  
 Display Resolution : 0.11 ° C  
 Accuracy : +/-1 ° C  
 Sampling Rate : Every 10 seconds  
 Water Resistant : To IP65  
 Battery usage : 1 x AA (Included)  
 CE ,ROHS/WEEE : Approved.

ESL57596



**Max Min Thermometer Digital Waterproof Boxed Grey**

Outdoor Digital Max Min Thermometer  
 Outdoor digital Max Min thermometer in a grey and white case with a large splash-proof display for outdoor and indoor use.

**Product Specifications :**

Temperature Range : -40 to 70 ° C&F  
 Divisions : 0.1 ° C  
 Accuracy : +/-1. ° C  
 Battery : 1.5 volt (AAA) or equivalent (Included)  
 CE,ROHS/WEEE : Approved

ESL57599



**Max Min Thermo&Hygrometer Electronic Jumbo**

Jumbo Digital Max Min Thermometer & Hygrometer  
 Jumbo digital Max Min thermometer featuring large displays for indoor temperature and humidity or outdoor temperature. Complete with 2 metre cable for the outdoor probe.

**Product Specifications :**

Temperature Range: Indoor: -10 to 50 °C&F / Outdoor: -50 to 70 ° C&F  
 Humidity Range: 20 to 99% RH (when humidity 20%, display 10%RH directly)  
 Divisions: 0.1 ° C  
 Accuracy: +/-1 ° C  
 Battery : 1.5 volt (AAA) or equivalent x 1 piece (Included)  
 CE ,ROHS/WEEE: Approved

ESL57598



**Max Min Thermometer Dial (Bimetallic)**

Bimetallic Max Min Thermometer

This Bimetallic Max Min Thermometer traditional design is activated by a bi-metal temperature sensing element. The Max Min Thermometer is reset by turning the button in the centre of the dial. A simple instrument to record the highest and lowest temperatures day and night.  
 C and F.

**Product Specifications :**

Thermometer Range : -20 to 50 ° C&F  
 Humidity Range : 0 to 100%RH  
 Thermometer Accuracy : +/- 1 ° C between 0 and 30C, otherwise +/- 2 ° C  
 Humidity Accuracy : +/- 5%RH between 40 and 80%RH, otherwise +/- 9%RH

ESL57600





**Max-Min Thermometer Electronic**

Digital Max Min Indoor Outdoor Thermometer  
 Digital Max Min indoor outdoor thermometer with white moulded case and two displays for outdoor and indoor temperature, each display has a maximum and minimum recording facility and can be displayed in °C or °F. This Max/Min thermometer comes complete with stand and 2.5m cable for the outdoor stainless steel probe and batteries are included.  
 Temperature Range : Indoor: 0 to 50 ° C&F / Outdoor: -50 to 70°C&F  
 Divisions : 0.1 ° C  
 Accuracy : /-2 ° C between -20 and 0°C /-1 ° C between 0 and 50 ° C /-2 ° C between 50 ° and 70 ° C otherwise /-3 ° C  
 Sampling Rate : 10 second  
 Battery : 1.5 volt (AAA) or equivalent x 2 pieces (Included)  
 CE,ROHS/WEEE : Approved

ESL57601



**Max Min Thermometer Lidded Green Push Button**

Euro Lid Max Min Thermometer  
 The Euro lidded Max Min thermometer has a modern design with a green scale on a white back in a moulded green plastic case and features a push button reset. A popular greenhouse Max Min thermometer which is used around the world.  
**Product Specifications :**  
 Nominal Range : -35 to 50°C&F  
 Accuracy : /- 2.0°C  
 Tolerance between limbs : /- 1.5°C

ESL57602



**Max Min Thermometer White Quick-Set**

Quick Set Max Min thermometer  
 The Quick Set Max Min thermometers are a popular design in a white casing and blue printed temperature with a push button reset C and F.  
**Product Specifications :**  
 Nominal Range : -35 to 50 ° C&F  
 Accuracy : /- 2.0 ° C  
 Tolerance between limbs : /- 1.5 ° C

ESL57603



**Max Min Thermometer White Magnet Re-Set**

The Magnet Reset Max Min Thermometer has a modern design with blue coloured scale in moulded white plastic complete with resetting magnet. These Max Min thermometers use a patented blue coloured liquid to replace the mercury but retain the ease of operation of the mercury instruments. °C &° F.  
**Product Specifications :**  
 Nominal Range : -35 to 50 ° C&F  
 Accuracy : /- 2.0 ° C  
 Tolerance between limbs : /- 1.5 ° C

ESL57604



**Max Min Thermometer Heavy Duty, Green**

Heavy Duty Max Min Thermometer  
 A classic Max Min thermometer design that has long been popular. This heavy duty Max Min thermometer has a clear and easy to read black temperature scale and is simple to reset with a push button.  
 C and F.  
**Product Specifications :**  
 Nominal Range : -40 to 50 ° C&F  
 Accuracy : /- 2.0 ° C  
 Tolerance between limbs : /- 1.5 ° C

ESL57605



**Max Min Thermometer cream Quick-set**

Quick Set Max Min thermometer  
 The Quick Set Max Min thermometers have a popular design and come in a cream moulding with black printed temperature scale. Our low cost Max Min thermometer model ideal for the greenhouse which has a push button resetting device.  
 C and F.  
**Product Specifications :**  
 Nominal Range : -35 to 50 ° C&F  
 Accuracy : /- 2.0 ° C  
 Tolerance between limb s : /- 1.5 ° C

ESL57606





**Thermometer Infrared Hand Held**

**Product Features**

Built-in laser pointer Over range indication  
Large backlit LCD Data hold and power off function

**Product Specifications**

Optical Resolution (D:S): 13:1  
Emissivity: Fixed at 0.95  
Response Time: <500ms  
Response Wavelength: 8 to 14mm  
Basic Accuracy: /-2%, /-2°C / 4°F  
Resolution: 0.1°C/°F  
Operating Conditions: 0 to 50°C <95%RH (non-condensing)  
Storage Conditions: -20 to 70°C <80%RH  
Diode Laser: Output <1mW, Wavelength 630 to 670, class II  
Battery: 1 x 9V (included)  
CE & RoHS/WEEE: Compliant

**Product Dimensions :** Packaged: 228 x 133 x 60mm

Unpackaged: 155.5 x 98.8 x 27.5mm

**LCD Dimensions :** 26.5 x 25.6mm

-50 to 550°C (-58 to 1022°F) - 38/702/0

ESL57612

-50 to 350°C (-58 to 662°F) - 38/701/0

ESL57613

**Thermometer Infrared Compact Hand Held**

**Product Features**

Built-in laser pointer Over range indication Large backlit LCD Data hold and power off function

**Product Specifications :**

Optical Resolution (D:S): 12:1  
Emissivity: Fixed at 0.95  
Response Time: <500ms  
Response Wavelength: 8 to 14m  
Basic Accuracy: /-2%, /-2 C / 4 F  
Resolution: 0.1 C/°F  
Operating Conditions: 0 to 50 C <95%RH (non-condensing)  
Storage Conditions: -20 to 70 C <80%RH  
Diode Laser: Output <1mW, Wavelength 630 to 670, class II  
Battery: 1 x 9V (included)  
CE RoHS / WEEE: Compliant

**LCD Dimensions :** 24.5 x 25mm

**Product Dimensions :** Packaged: 228 x 133 x 60mm

Unpackaged: 134 x 89 x 36mm

-50 to 800°C (-58 to 1472°F)

ESL57608

-50 to 500°C (-58 to 932°F)

ESL57609



**Thermometer Infrared Dual Laser**

**Product Features**

Precise IR and K-Type input temperature measurement  
Built-in dual laser pointers REC datalogger function for 12 points  
Adjustable emissivity: 0.1 to 1.0 °/°F selectable  
MAX/MIN/DIF/AVG record Large backlit LCD  
Trigger lock Adjustable High/Low alarm  
Automatic range selection, data hold and power off function  
Supplied in protective bag

**Product Specifications**

Optical Resolution (D:S): 13:1  
Response Time: <250ms  
Response Wavelength: 8 to 14mm  
IR Basic Accuracy: -50 to 0°/°F: /- 4°/7°F  
0 to 500°/°F: /-1.5% /-2°/3.6°F  
Above 500°/°F: /-2% /-2°/3.6°F  
K-Type Basic Accuracy: -50 to 1370°/°F: /- 1.5% /-1°/1.8°F  
Emissivity: Adjustable 0.1 to 1.0  
Resolution: 0.1°/°F  
Operating Conditions: 0 to 50° <95%RH (non-condensing)  
Storage Conditions: -20 to 70° <80%RH  
Memory: Storage of 12 readings  
Response Time: 1 second  
Battery: 1 x 9V (included)  
CE & RoHS/WEEE: Compliant

**LCD Dimensions :** 35 x 35mm

**Product Dimensions :** Packaged: 250 x 125 x 65mm

Unpackaged: 192 x 97 x 59mm

-50 to 1370°C (-58 to 2498°F)

ESL57610

-50 to 1050° (-58 to 1922°F)

ESL57611







**Thermometer Infrared Body Temperature**

Body Temperature Thermometer  
 Non-contact and hygienic infrared body temperature thermometer specially designed to take the body temperature of a person regardless of room temperature. The body temperature thermometer has a fast response time allowing a greater number of measurements to be taken in a short time. Designed to eliminate the chance of cross-contamination, it is ideally suited for use in schools, business and other environments where a large number of people are coming into contact with one another.

**Features**

- Easy and safe
- Selectable C or F
- Set alarm value
- Selectable body or surface temperature
- Memorization of the last 32 measurements
- Supplied with battery, full instructions and protective bag
- Laser targeting
- Trigger lock
- Automatic data hold
- Backlit LCD display

**Products Specifications**

Measuring Range: In Body Mode: 32 to 42.5C (90 to 108°F) - In Surface Temp Mode: 0 to 60 C (32 to 140 F)  
 Operating Temp: 10 to 40°C (50 to 104°F)  
 Storage Temp: 0 to 50°C (32 to 122°F)  
 Accuracy: +/-0.3°C (or 0.54°F)  
 Response Time: 0.5 second  
 Relative Humidity: <85%  
 Emissivity: 0.95 fixed value  
 Measuring Distance: 5 - 15cm  
 Resolution: 0.1°C (0.1°F)  
 Battery: 2 x AA (Supplied)

ESL57614



**Thermometer Infrared Forehead**

Infrared Forehead Thermometer  
 Ease of Use  
 Taking measurements of forehead temperature is quick, simple and non intrusive with this infrared forehead thermometer.  
 Can measure both forehead temperature and the surface temperature of object.  
 Measurements can be taken while the patient is asleep.  
 Stores up to 20 readings in the internal memory which helps track changes in the temperature of the patient.  
 Device will warn user if the temperature of the patient is too high or too low by way of a fever alarm.  
 Safe and Hygienic  
 Non contact measurements avoid the accumulation of bacteria, and reduce the need for cleaning and sterilisation of the forehead thermometer during normal use.  
 No danger from broken glass or swallowing the thermometer filling liquid (mercury or spirit).  
 Robust ergonomic design manufactured from tough engineering plastics.  
 More comfortable and convenient than anal and oral reading thermometers, especially for children.  
 Energy Efficient  
 The forehead thermometer will automatically switch off after 10 seconds of inactivity.

**Details**

Forehead Thermometer Temp. Mode: 32 to 42.2°C ( 89.6 to 108°F)  
 Milk Temp. Mode: 0 to 100°C ( 32 to 212°F)

**Products Specifications**

Temperature Measurement Range:  
 Forehead Temp. Mode: 32 to 42.2°C ( 89.6 to 108°F)  
 Milk Temp. Mode: 0 to 100°C ( 32 to 212°F)  
 Accuracy: +/-0.2°C ( /-0.4°F)  
 Response Time: 1 second  
 Battery: 2 x AAA (battery life approx 1000 operations)  
 CE, ROHS/WEEE: Approved  
**Product Weight :** 119g  
**Product Dimensions :** 143mm x 60mm x 50mm

ESL57615





**Thermometer Infrared Ear Thermometer**

**Infrared Digital Ear Thermometer**

A quick and easy infrared ear thermometer suitable for all ages. The infrared ear thermometer with digital display and memory comes complete with protective bag and 20 X replacement probe covers. Especially suited with use with babies, young children and the elderly. Pack of 20 replacement probe covers also available.

**Product Specifications :**

- Measuring Temperature Range : 35.5 to 42°C°F
- Displayed Temperature Range : 34 to 44°C°F
- Operating Temperature Range : 16 to 35°C ( 60.8 to 95.0 ° F)
- Operating Relative Humidity : 80%RH
- Divisions : 0.1°C°F
- Accuracy : /-0.2°C Between 35 and 42°C ( /-0.4°F between 95.9 and 107.6°F)
- Battery : 2 x AAA (Supplied)
- LCD **Dimensions :** 10mm x 20mm
- Product Dimensions :** 140mm x 70mm x 40mm

ESL57616



**Clinical Thermometer Digital Flexi-Head**

Easy to use digital flexi-head thermometer suitable for all ages especially babies, young children and the elderly. This model is the waterproof flexible probe model, suitable for oral use. Packaged in a clear plastic case with full instructions

**Product Specifications :**

- Temperature Range: 32 to 42°C
- Divisions: 0.1°C
- Accuracy: /-0.1°C Between 35.5°C and 42°C, otherwise /-0.2°C
- Response Time:\* Rectal: Approx 9 - 11 seconds
- Axillary: Approx 23 - 29 seconds
- Oral: 15 - 19 seconds
- Battery: LR41 or equivalent x 1 piece (Included)

ESL57621



**Thermometer Digital Probe With Timer**

Digital hand-held test thermometer with alarm function, twin displays, 1m cable and 235mm stainless steel probe. Featuring data hold and Max Min function. Includes battery, and hanger, stand and magnetic fixtures.

**Product Features:**

- Dual display for temperature and timer, Programmable high/low alarm,
- Wide measurement range, Maximum/Minimum temperature memory,
- Celsius and Fahrenheit interchangeable, Data hold function, 99 hour countdown timer, Timer setting memory
- Timer elapse time display, Stainless steel probe, Wall mount keyhole, Magnetic attachment, Flip out desk stand

ESL57617

**Thermometer Digital Probe With Timer**

Digital hand-held test thermometer with alarm function, twin displays, 1m cable and 235mm stainless steel probe. Featuring data hold and Max Min function. Includes battery, and hanger, stand and magnetic fixtures.

**Product Features:**

- Dual display for temperature and timer, Programmable high/low alarm,
- Wide measurement range, Maximum/Minimum temperature memory,
- Celsius and Fahrenheit interchangeable, Data hold function, 99 hour countdown timer, Timer setting memory
- Timer elapse time display, Stainless steel probe, Wall mount keyhole, Magnetic attachment, Flip out desk stand

ESL57617



**Thermometer Digital Oral**

Easy to use digital oral thermometer suitable for all ages especially babies, young children and the elderly. This oral thermometer is the standard rigid probe model, suitable for oral use. Packaged in a clear plastic case with full instructions and battery included.

**Product Specifications :**

- Temperature Range: 32 to 42°C
- Ambient Temperature during use: 5 to 35°C (80% RH)
- Storage Temperature : -25 to 55°C (95% RH)
- Divisions : 0.1°C
- Accuracy : /-0.1°C between 35.5 and 42°C, otherwise /-0.2°C
- Battery : LR41 or equivalent x 1 piece (Included)

ESL57619





### Balance 2 Pan, Plastic

Designed specially for small students use. Made from not-toxic high quality plastic, with no sharp corners. The total balance comprises of only 6 components, which can be easily assembled and disassembled. Both of the weighing containers are of different colours and bucket shaped for use with either of liquids or solids and are washable. Since the buckets are pivoted, the objects can be placed even on the edge without affecting the accuracy of measurement. Includes a broad tip-resistant base sliding poise for easy zeroing and check rod for support of off-centre load. Capacity 2kg Readability 1g.

ESL57623



### Balance Table Top 2 Pan, Roberval, 2 Kg

Simple model, suitable for teaching, made of steel plate and pans are of metal. 2 kg

ESL57627



### Bathroom Scale Mechanical

Bath room scale mechanical measuring range 0 - 180 kg

ESL57692



### Balance, Physics Balance 2 Pan, Hydrostatic

Hydrostatic Balance is useful for specific gravity experiments. Similar to analytical balance without any casing, but with one additional pan suspended through smaller frame. This pan has a hook underneath for suspending items in specific gravity experiments. Balance has detachable pans and is mounted on well-polished wooden base. Capacity 250g Sensitivity 5mg.

ESL57626



### Bathroom Scale Digital

Bath room scale digital measuring range 0 - 180 kg

ESL57694



### Balance Triple Beam

Single top pan, low form, suspension. Three graduated beams with notches for positioning sliding masses. Spring loaded zero adjust and magnetic damping gives stability and accuracy. Weighing capacity 610g with accuracy of 0.1g, expandable to 2610g with the use of supplementary masses.

Stainless Steel Pan, 150mm Diameter

Supplementary Masses: 2 x 1000g 1 x 500g.

Three notched Weighing Beams: 10g x 0.1g, 100g x 10g, 500g x 100g

ESL57630



### Height & Weight Scale Basic

Height and weight scale, measuring range 0-200 kg

ESL57689



### Height & Weight Scale Advance

Height and weight scale, measuring range 0-200 kg

ESL57690





**Spring Balance**

Newton Meters, robust plastic transparent body, overall length 285mm approx. with upper and lower suspension hooks, with zero adjustment, scales are both in grams and Newtons.

- ESP60047 Measuring : 100gm/1n, 1gm
- ESP60048 Measuring : 250gm/2.5N, 5gm
- ESP60049 Measuring : 500gm/5n, 10gm
- ESP6005 Measuring : 1kg/10n, 20gm
- ESP60051 Measuring : 2kg/20n, 40gm
- ESP60052 Measuring : 3kg/30n, 60gm
- ESP60053 Measuring : 5kg/50n, 100gm



**Spring Balance**

PRECISION DYNAMOMETER, The Precision Dynamometer is available in range of weight capacities and scales. They are incredible precise and are suitable for measuring weights, masses and forces. Each different weight capacity is colour coded for ease of identification. As well as offering a high level of precision, these dynamometer are also easy to read enabling accurate readings to be taken quickly and precisely.

- ESP60060 Measuring : 100gm/1n, 2gm
- ESP60061 Measuring : 250gm/2.5N, 5gm
- ESP60062 Measuring : 500gm/5n, 10gm
- ESP60063 Measuring : 1kg/10n, 20gm
- ESP60064 Measuring : 2kg/20n, 40gm
- ESP60065 Measuring : 3kg/30n, 60gm
- ESP60066 Measuring : 5kg/50n, 100gm



**Spring Balance**

force meter, Balance designed to work for mass and force activity. Dual calibrated in grams and Newtons.

- ESP60054 Measuring : 250gm/2.5N, 5gm
- ESP60055 Measuring : 500gm/5n, 10gm
- ESP60056 Measuring : 1kg/10n, 20gm
- ESP60057 Measuring : 2kg/20n, 40gm
- ESP60058 Measuring : 3kg/30n, 60gm
- ESP60059 Measuring : 5kg/50n, 100gm



**Spring Balance**

balance spring pocket size, moulded in plastic, reading scale on both sides.

- ESL57633 Measuring : 1.5 Kg, 25gm
- ESL57634 Measuring : 3 kg, 50gm
- ESL57635 Measuring : 6 kg, 100gm
- ESL57636 Measuring : 10 kg, 250gm



**Balance Digital- 600G/0.01G**

Xlogger Digital Balance - 600g/0.01g  
A superb digital balance for a competitive price. The XLE1054 offers multiple unit conversions, RS232 interface, parts counting, percentage weighing and dynamic weighing.

The unit has two backlit digital displays, one as seen above and a second at the rear so that the whole class may see the results displayed.

The XLE1054 may also be used to supplement the Xlogger data logging system. The Xlogger interface may be connected directly to the USB port of a computer running Excel and data is automatically imported and may be processed in a multitude of ways.

The balance comes complete with low voltage power adapter (It also operates on 6 x AA cells), wind shield, 500.00g calibration weight and full user instructions.

ESL57663





### Balance Digital Basic

High precision load cell. Rugged Plastic Housing. Big size Stainless Steel Platter. High contrast easy to read LCD display. Built-in rechargeable battery. Height adjustable feet. Full capacity subtraction. Stabilization time 1.5 seconds. Overload Protection.

Below Balance Weighing Facility. Checking Weighing, piece counting function. Can be contain bubble level. Pan size: 143 X 192mm

<b>ESL57664</b>	Capacity : 500 G , Readability : 0.1 G
<b>ESL57665</b>	Capacity : 1000 G , Readability : 0.1 G
<b>ESL57666</b>	Capacity : 2000 G , Readability : 0.1 G
<b>ESL57668</b>	Capacity : 5000 G , Readability : 0.1 G



### Balance Digital Basic

High precision load cell. Rugged Plastic Housing. Big size Stainless Steel Platter. High contrast easy to read LCD display. Built-in rechargeable battery. Height adjustable feet. Full capacity subtraction. Stabilization time 1.5 seconds. Overload Protection.

Below Balance Weighing Facility. Checking Weighing, piece counting function. Can be contain bubble level. Pan size: 128 X 157mm

<b>ESL57669</b>	Capacity : 300 G , Readability : 0.01 G
<b>ESL57670</b>	Capacity : 600 G , Readability : 0.01 G
<b>ESL57671</b>	Capacity : 1000 G , Readability : 0.01 G
<b>ESL57672</b>	Capacity : 2000 G , Readability : 0.01 G



### Balance Digital Precision

High precision load-cell, compact design. Full plastic housing. Stainless steel Platter. Super bright LCD display with back-light. Mains adapter supplied as standard. Height adjustable feet. Full Capacity subtraction. Simple 5 key panel for easy operation. Stabilization time 1.5 seconds. Overload Protection. Below Balance Weighing Facility. Selectable measure units, g,oz,ct. Checking Weighing, Piece counting function. CE approvals

<b>ESL57674</b>	Capacity : 300 G , Readability : 0.1 G
<b>ESL57675</b>	Capacity : 600 G , Readability : 0.1 G
<b>ESL57676</b>	Capacity : 1000 G , Readability : 0.1 G
<b>ESL57677</b>	Capacity : 2000 G , Readability : 0.1 G
<b>ESL57678</b>	Capacity : 200 G , Readability : 0.01 G
<b>ESL57679</b>	Capacity : 600 G , Readability : 0.01 G
<b>ESL57680</b>	Capacity : 1000 G , Readability : 0.01 G
<b>ESL57681</b>	Capacity : 2000 G , Readability : 0.01 G



### Balance Digital Analytical

Electromagnetic Force Compensation Technology. Aluminium Alloy die cast base and ss platter. Super Bright LCD display with back-light. RS232C Interface Clear Glass Windshield as standard. Over load protection, Bubble Level Adjustment, Under hook

Full capacity Subtraction Multi Weighing unit conversation g/mg/ct/oz. Check Weighing, Parts counting, percentage weighing Universal power adaptor supplied as standard Certificated calibration weight supplied as standard. Internal calibration system CE approval

<b>ESL57683</b>	Capacity : 300 G , Readability : 1 Mg
<b>ESL57684</b>	Capacity : 600 G , Readability : 1 Mg
<b>ESL57685</b>	Capacity : 1000 G , Readability : 1 Mg
<b>ESL57686</b>	Capacity : 220 G , Readability : 0.1 Mg
<b>ESL57687</b>	Capacity : 310 G , Readability : 0.1 Mg





**Balance Weight Physical**

**ESP60079** Capacity 500Gm

Comprising 1 x 200gm, 2 x 100gm, 1 x 50gm, 1 x 20gm, 2 x 10gm, 1 x 5gm, 2 x 2gm, 1 x 1gm. Polished Brass, supplied with Wooden block, as illustrated.

**ESP60080** Capacity 1000Gm

Comprising 1 x 500gm, 1 x 200gm, 2 x 100gm, 1 x 50gm, 1 x 20gm, 2 x 10gm, 1 x 5gm, 2 x 2gm, 1 x 1gm. Polished Brass, supplied with Wooden block, as illustrated.

**ESP60081** Capacity 2000Gm

Comprising 1 x 1000gm, 1 x 500gm, 1 x 200gm, 2 x 100gm, 1 x 50gm, 1 x 20gm, 2 x 10gm, 1 x 5gm, 2 x 2gm, 1 x 1gm. Polished Brass, supplied with Wooden block, as illustrated.



**Weight Set Hooked Weight**

Brass with hooks on both sides. Recessed bottoms to enable the weights to be hooked together. The bottom is flat when placed on a flat surface. Set of 9 weights. 10 - 1000g in wooden block.

**ESP60082**



**Weight Set Primary Weight**

These weights are polished and lacquered Brass weight sets fitted in a durable hardwood storage box as illustrated. 1 each of 1gm, 5gm, 20gm, 100gm and two each of 2gm and 10gm

**ESP60083**



**Slotted Masses And Hanger**

Slotted Masses and Hanger 100 gr (9 Loads), EduScience plated Brass  
Material : EduScience Plated Brass

**Consists of :**

- 1 x Masses hanger 10g
- 9 x Slotted Load 10g

**Dimension :** 2.50 (L) x 2.50 (W) x 5.70 cm (H)

**Weight :** 0.100g

**ESP60085**



**Slotted Masses And Hanger Brass**

Slotted Masses and Hanger 1000 gr (9 Loads), Brass  
Masses, disc shape and hanger. Used for many kind of experiments  
Total mass: 1000g, accuracy 5%  
Material : Brass

**Consists of :**

- 1 x Slotted Hanger Mass 100g
- 9 x Slotted Mass 100g

**Dimension :** 3.70 (L) x 3.70 (W) x 17.00cm (H)

**Weight :** 1.000kg

**ESP60088**



**Weight Slotted Masses And Hanger,**

Slotted set of masses and hanger. Set of 9 slotted masses, one hanger  
This improved set comprises masses of Brass with slots, brass hangers with hook. The design of the slots ensures that the masses may be easily removed and replaced but will not fall off accidentally.

**ESP60089** Total 100gm Set of 9 slotted masses, one hanger each of 10gm.

**ESP60090** Total 250gm Set of 9 slotted masses, one hanger each of 25gm .

**ESP60091** Total 1000gm Set of 9 slotted masses, one hanger each of 100gm

**ESP60092** Total 250gm Set of 4 slotted masses, one hanger each of 50gm

**ESP60093** Total 100gm Set of one hanger 20gm, three slotted masses 20g one mass 10gm and two masses 5gm

**ESP60094** Total 250gm. Set of one hanger 50gm, nine slotted masses 20gm, one mass of 10gm and two masses of 5gm





**Weight Hooked Masses**

Hooked masses cylindrical, Chromium plated with cylindrical weight with long hook. Loose or in wooden box.

- ESP60095 10gm each weight
- ESP60096 20gm each weight
- ESP60097 50gm each weight
- ESP60098 100gm each weight
- ESP60099 500gm each weight
- ESP60100 1000gm each weight
- ESP60101 200gm each weight

**Melting Point Apparatus Digital**

Melting point apparatus, 1°C resolution, with pack of 100 melting point tubes, closed at one end, 240V, Digital Selection and Display of Temperature High Accuracy

Easy to Operate with Plateau Facility

Number of Samples : 2

Temperature Range : Ambient to 300°C (572°F)

Temperature Accuracy : ±1.0°C @ 20°C (68°F), ±2.5°C @ 300°C (572°F)

Display : 3-digit LED (no display hold) | Display Resolution : 1°C

Ramp Rates : 20°C (68°F) per minute to plateau, 2°C (3.6°F) per minute to melt

**Dimensions :** 160 W x 220 D x 170 mm H (6.4 x 8.7 x 6.8")

**Weight :** 1.8 kg (4 lb) | Electrical Supply : 120/240V, 50/60 Hz, 75 W

ESL57725



**Melting Point Apparatus Analogue**

Melting point apparatus, with thermometer and pack of 100 melting point tubes, open both ends, 240V, NIST Certificate, UK & European Power Cords, Number of Samples: Up to 3

Number of Samples: Up to 3

Temperature Range : 50 to 250°C (122 to 482°F)

Heating Rate : 1 to 10°C (34 to 50°F) per minute

**Dimensions :** 370 W x 140 D x 110 mm H (15 x 5.5 x 4.3")

**Weight :** 1.7 kg (3.7 lb)

Electrical Supply : 120/240V, 50/60 Hz, 50 W

IP Rating : 40

Easy to Operate—Ideal for Educational Use

Supplied with Safe Spirit Filled Thermometer

ESL57726



**Weight Masses Hexagonal With Lifting Ring**

Hexagonal with lifting ring. Within international tolerance. Set of 6 (50gm, 100gm, 200gm, 500gm, 1kg 2kg)

ESP60103



**Weights Hooked Flat**

Weights, Brass, with hooks on both sides. Set of 9 Pcs, Capacity 500 gm, comprises of 1 x 200gm, 2 x 100gm, 1 x 50gm, 1 x 20gm, 2 x 10gm and 2 x 5gm

ESP60106





**Timer , Dual Timer And Clock**

The dual timer features two 24 hour countdown timers and also a 12/24 hour clock display. Counts in 1 second increments up to 24 hours. Complete with magnetic clip and stand. Batteries included.

**Product Specifications :**

- Timer Count: 1 second countdown/up to 24 hours
- 12/24 hour clock
- Time Accuracy Standard: +/- 60 sec/month
- Key Durability: Rubber key - 500,000 times (@200g +/- 20g)
- Contact switch - 200 times (vertical press)
- Battery : 1 x LR44 (Supplied)
- Battery Life : Approx 150 days
- CE , ROHS/WEEE: Approved
- Operating Temperature : 0 to 40°C (95% RH)
- Operating Voltage: 1.2V to 1.7V x 2
- Current Consumption :10mA (Stand-by current)
- 25mA (average alarm current)
- Electrostatic discharge ESD : +/-8kV
- LCD Dimensions :** 12mm x 32mm
- Product Dimensions :** 50mm x 60mm x 12mm



**Timer , Four Way Timer And Clock**

This device features 4 timers in one compact unit with 24 hour countdown and count up function. It also benefits from a large easy to read display and a 12/24 hour clock. Complete with stand and magnetic clip. Batteries included.

**Product Specifications :**

- Timer Count: 24 hour countdown and up
- 12/24 hour clock
- Time Accuracy Standard: +/- 60 sec/month
- Battery : 2 x LR44 (Included)
- Battery Life : Approx 150 days
- Operating Temperature : 0 to 40°C (95% RH)
- Operating Voltage : 1.2V to 1.7V x 2
- Key Durability : Rubber key - 500,000 times (@200g +/- 20g)
- Contact switch - 200 times (vertical press)
- CE,ROHS/WEEE: Approved
- Current Consumption :10mA (Stand-by current)
- 25mA (average alarm current)
- Electrostatic discharge ESD : +/-8kV
- Alarm Sound : 70dB
- LCD Dimensions :** 22mm x 50mm
- Product Dimensions :** 62mm x 75mm x 15mm

ESL57740



**Stop Clock**

Two sweep hands, one indicating seconds, the other recording minutes. Start-stop lever on the left hand side, zero reset lever on right hand side. Movement housed in metal case. Diameter of dial 100mm divided 0-60 x 1. Fitted in powder coated metal case.

ESL57733

ESP59918



**Stopwatch Budget**

Budget Stopwatch

1/100 second stopwatch with split timer function, calendar and time. Comes complete with lanyard cord. Batteries included.

Features:

1/100 second stopwatch, Split timing function, Up to 23 hours, 59 minutes, 59 seconds, Clock shows hours, minutes, seconds, 12/24 hour selectable, Calendar shows day, month, year, Includes lanyard,

**Product Specifications :** Timer Count: 1/100 second  
Battery: 1 x LR44 (Included), CE, ROHS/WEEE: Approved,

**LCD Dimensions :** 12mm x 27mm, Product  
**Dimensions :** 80mm x 55mm x 17mm



**Timer Bench Top**

**Product Specifications :**

- Timing Period : Up to 9 hours / 59 minutes / 59 seconds
- Time Accuracy Standard: Within +/- 1 second
- Resolution: 1/100 second for 30 minutes then 1 second thereafter
- Product Material: ABS
- Battery : 1 x AA (supplied)
- Operating Temperature : 0 to 50°C
- Storage Temperature : -10 to 60°C
- CE,ROHS/WEEE : Approved
- LCD Dimensions :** 63.7 x 19.7mm
- Product Weight :** 197g
- Product Dimensions :** 100 x 97 x 70.5mm

ESL57739

ESL57735





**Timer Triple Timer And Clock****Product Specifications :**

Timer Count: 20 Hour x 3  
 Time Accuracy Standard : /- 60 sec/month  
 Key Durability: Rubber key - 500,000 times (@200g /- 20g)  
 Contact switch - 200 times  
 Battery : 2 x LR44 (Included)  
 Battery Life : Approx 1 year  
 CE , ROHS/WEEE : Approved  
 Operating Temperature : 0 to 40°C (95% RH)  
 Operating Voltage : 1.2V to 1.7V  
 Current Consumption: 15A (stand-by current)  
 10mA (average alarm current)  
 Alarm Sound Level : 70dB Min 1ft from product  
 Electrostatic discharge ESD : /-8kV

**LCD Dimensions :** 45mm x 41mm**Product Weight :** 60g**Product Dimensions :** 92mm x 69mm x 13mm

ESL57737

**Timer , Digital Kitchen Timer And Clock**

Digital timer featuring 99 minutes 59 Seconds countdown count up timer with memory function, and 12 / 24 hour clock. Comes with hanger, stand and magnetic fixing. Battery included.

**Product Specifications :**

Timer Count : 99 minutes / 59 seconds  
 Battery : 1 x AAA (Supplied)  
 CE , ROHS/WEEE : Approved  
 Operating Temperature : 0 to 40°C (95% RH)

**LCD Dimensions :** 48mm x 20mm**Product Dimensions :** 67mm x 77mm x 27mm

ESL57741

**Stopwatch Analogue**

Time measurement. One button have function to Start, Stop and Reset. In Stopwatch can be found freeze over round.

Size : Overall 50mm diameter

Thickness : 16mm

Scale : 0-60 x 0.2 sec., 0-30 x 1min

Material : Stainless steel

Mechanical (analogue) type timer

One button type for start button, reset and mechanic rotator spring

**Dimension :** 6.50 (L) x 6.50 (W) x 1.50cm (H)**Weight :** 0.085 kg

ESL57745

**Timer Slimline**

Budget Stopwatch

1/100 second stopwatch with split timer function, calender and time. Comes complete with lanyard cord. Batteries included.

Features :

1/100 second stopwatch  
 Split timing function  
 Up to 23 hours, 59 minutes, 59 seconds  
 Clock shows hours, minutes, seconds  
 12/24 hour selectable  
 Calendar shows day, month, year  
 Includes lanyard

**Product Specifications :**

Timer Count : 1/100 second

Battery : 1 x LR44 (Included)

CE ,ROHS/WEEE: Approved

**LCD Dimensions :** 12mm x 27mm**Product Dimensions :** 80mm x 55mm x 17mm

ESL57738

**Timer , Countdown Digital Large**

Large Digital Countdown Timer

Large digital countdown timer covering 99 minutes 59 Seconds. The timer is supplied with stand, clip and magnetic fixing. All of our timers are supplied with batteries included.

**Product Specifications :**

Timer Count: 99 minute / 59 second  
 Time Accuracy Standard: /- 60 sec/month (@ 25°C)

Battery : 1 x AAA (Supplied)

Battery Life : Approx 1 year

Operating Temperature : 0 to 40°C (95% RH)

Operating Voltage : 1.2 to 1.7V

Slide Switch Reliability : 5000 cycles

Key Durability: Rubber key - 500,000 times (@200g /- 20g)

Contact switch - 200 times (vertical press)

Current Consumption :15 A (Stand-by current)

10mA (average alarm current)

Electrostatic discharge ESD : /-8kV

Alarm Sound : 70dB Min 1ft from product

**LCD Dimensions :** 38mm x 64mm**Product Dimensions :** 70mm x 80mm x 20mm

ESL57742

**Timer , Countdown Digital Mini**

Mini digital timer featuring 99 minutes 59 Seconds countdown and memory function. Complete with stand, clip and magnetic fixing. All of our timers are supplied with batteries included.

**Product Specifications :**

Timer Count: 99 minute / 59 second countdown

Time Accuracy Standard: /- 60 sec/month

Key Durability: Rubber key - 100,000 times (@200g /- 20g)

Contact switch - 5000 times (vertical press)

Battery : 1 x AAA (Supplied)

Battery Life : Approx 2 year

Operating Temperature : 0 to 40°C (95% RH)

Operating Voltage: 1.2 to 1.7V

Current Consumption :10?A (Stand-by current)

&amp;12mA (average alarm current)

Electrostatic discharge ESD : /-8kV

**LCD Dimensions :** 38mm x 64mm**Product Dimensions :** 55mm x 55mm x 25mm

ESL57743





**PH Meter Pen Type**

The most cost effective pH tester, widely applied for general precision requirement in various water analytical situations.

The smallest and thinnest shape: 148×29×14mm. The diameter of the electrode: 10mm..

The best function: automatic calibration, automatic temperature compensation, automatic power off, low voltage alarm, pH electrode invalidation display, etc.

The easiest to use : single button operation.

The reliable structure design: meet IP57 waterproof, replaceable batteries, calibration solution, electrode soaking solution and standby batteries in a portable case.

The most cost-effective pen tester.

ESL57749



**PH Meter Pocket Type**

Economy pH tester, meet general requirements, cost-effective.

Automatic calibration, no temperature compensation.

Low voltage alarm display.

10 minutes automatic shut-down.

Replaceable electrode configuration calibration solution.

IP 57 waterproof rating.

Measuring range : 0~14.0 pH

Resolution : 0.1 pH

Accuracy : ±0.1pH±1 digit

Temperature compensation : No

Automatic Calibration :

1 point calibration (7.00 pH)

Power :

2 AAA batteries, 1.5V × 2, more than 100 hours of continuous using

Size and weight : 39×25×176 mm/95g

ESL57747



**PH and Conductivity Meter Desk Top**

pH + Conductivity Double-Parameter measurement meter which is suitable for general measurement in laboratory. It is suitable for measuring the pH value of moderate ionic strength aqueous solution, and conductivity values of conventional solution

- The most widely used pH + Conductivity Double-Parameter measurement meter.

- Meter meets with the requirement of international GLP standards. Its features up to automatic calibration, automatic temperature compensation, data storage, timing measurement, clock display, RS-232 output, function setting and self-diagnose etc.

- There are three different measurement modes: stable display mode; time measurement mode; continuous measurement mode.

- Automatically recognize pH buffer solution. User can choose anyone from three series of standard buffer solutions: Europe & USA series, NIST series and China series.

- Adopt advanced and original conductivity measurement technology, use 1 pc of conductivity electrode (K=1), it can meet measuring accuracy requirement for range within 0.5µS/cm ~ 200mS/cm by using only one-point calibration.

Can switch Conductivity, TDS, Salinity and Resistivity.

Meter has the only product serial number.

Dust-proof and waterproof meter meets IP54 standards. All sockets are seal protected by the silica gel caps.

ESL57759



**PH Meter Desk Top**

Lab pH Meter DESK TOP

General laboratory bench pH meter, which is suitable for measuring moderate ionic strength solutions, such as surface water, lake water and industrial wastewater. It can be used in most of the areas related to water quality analysis. Meter meets with the requirement of international GLP standards. Its features up to automatic calibration, automatic temperature compensation, data storage, timing measurement, clock display, RS-232 output, function setting and self-diagnose etc.

- There are three different measurement modes: stable display mode; time measurement mode; continuous measurement mode.

Automatically recognize pH buffer solution.

Meter has the only product serial number.

Dust proof and waterproof meter meets IP54 standards. All sockets are seal protected by the silica gel caps. pH .

ESL57753





### PH Meter Potable Hand-held

Portable advanced single measurement water quality meter  
Smart electrode interchangeable water quality measurement with single input, multi-parameters readable. Easy operation, meter powered by six AAA batteries, receptacle device is built-in for tripod mountable enable to do long time monitoring purposes.

#### FEATURES :

Professional look design accurate portable meters with large LCD display, BNC connector.

All electrodes with BNC connector compatible to any other electrodes.

Hold function, low battery icon indicator, automatic power off in 15 minutes and may disable.

Built-in different temperature compensation selectable: PT100, PT1000 (pH electrode only), Thermistor 30K, 10K ohm.

RFS (Recover to Factory Setting) function is included.

3 points pH calibration: 4, 7, 10 (Adjustable). Calibration buffer solution are included with soaking solution.

Conductivity calibration points: 1413uS. Calibration solution is included. Conductivity electrode may convert to TDS and Salinity concentration, adjustable conductivity to TDS conversion factor from 0.4 to 1.0. Three in one conductivity electrode (Cond. EC.TDS. Salinity measurement).

Conductivity cell constant (K) selectable: 0.1, 1.0, 10 (Selectable and adjustable).

DO 100% self-calibration is convenient and simple. Calibrated both Saturated DO/zero DO (Na<sub>2</sub>SO<sub>3</sub>) before shipment.

Compact DO electrodes supplied with 3M cable and membrane cap, electrolyte.

Galvanic electrodes do not require long warm up time as polarographic type electrodes. (Polarization is required about 10-215 minutes.)

Tripod receptacle mountable design for long time monitoring purposes.

All sensors are well calibrated before shipment. Warranty period is two years. Long life sensors

#### SUPPLIED :

Meter

Battery-AAA x 6 pcs

Operation manual

Electrodes

Black carrying case

pH buffer solution x 3 pcs ( pH 4 ,pH7, pH10)

1413uS buffer solution x1

(3M) Soaking Solution x 1

#### Specifications :

Data Hold:Freeze the display reading.

Meter **Dimension** : 180mm x 58mm x 32mm (With BNC connector)

Power supply:AAA batteries x 6 pcs / 9V AC/DC (Option)

Temperature:0~90 (PH) 0~90 (Cond/TDS/Salt/)

Temp. accuracy: 0.5

PH:

Measurement range PH: 0 to 14 pH

Accuracy 1% of full scale 1 digit

Resolution:0.01(pH)

ESL57751



### Electrode Holder Flexible

Three electrodes can be put into electrode holder that is used with electro-chemistry instrument.

The arc-type bracket of attractive appearance can be turned to any direction and lifted up and down vertically, with the electrode standing vertically anywhere.

The material of holder is ABS, of axis of rotation is stainless steel, which is sturdy and durable.

Base of holder is made up of ABS hull, cast iron counter weight and axis of rotation of stainless steel. All of these lead to professional design, attractive appearance and stability.

Three electrodes can be put into electrode chuck (electrode capΦ16 mm)

ESL57761





**Conductivity Meter Pocket Type**

Economy conductivity tester, meet general requirements, cost-effective  
 Long measurement range, automatic switching range.  
 Automatic calibration, automatic temperature compensation (without temperature display.)  
 Low voltage alarm display.  
 10 minutes automatic shut down.  
 Conductivity calibration solution configuration.  
 IP57 waterproof rating.  
 Measuring range Divided into three sections, automatic switching range:  
 (0~99.9) $\mu$ S/cm(100~999) $\mu$ S/cm (1.00~10.00)mS/cm  
 Resolution : 0.1/1 $\mu$ S/cm:0.01 mS/cm  
 Accuracy  $\pm$ 1%FS  
 Temperature compensation : (0~50) $^{\circ}$ C (Auto)  
 Automatic Calibration 1 point calibration(1413 $\mu$ S/cm)  
 Power : 2 AAA batteries, 1.5V  $\times$  2, more than 100 hours of continuous using  
 Size and **Weight** : 39 $\times$ 25 $\times$ 176 mm/ 87g

ESL57755



**Conductivity Meter Pen Type**

The most cost effective pen conductivity tester, ability to switch among conductivity, TDS, salinity and resistivity, widely applied in surface water, sewage, drinking water, soil less, printing, wash water of plating tank, aquarium, fish pond, swimming pool, hot spring, etc. Compared with similar products: the widest measurement scope 0~50mS/cm, more measurement parameters, ability to switch among conductivity, TDS, salinity and resistivity. multinomial calculation for TDS and salinity to ensure the conversion precision of the full scale.  
 The smallest and thinnest shape : 148 $\times$ 29 $\times$ 14mm. The diameter of the electrode: 10mm.  
 The best function: automatic calibration, automatic temperature compensation, automatic switch of range, automatic power off, low voltage alarm, etc.  
 The easiest to use : single button operation.  
 Meet IP57 waterproof rating, replaceable batteries, calibration solution and standby batteries in a portable case.

ESL57757

**Spectrophotometer UV VIS Smart**



ESL57764





### Spectrophotometer Double Beam UV VIS

Optical System Double beam optics  
 Spectral Band Pass Width(nm) < 1.0  
 Wavelength range(nm) 190~1100  
 Accuracy(nm) : <  $\pm 0.3$  (at D2 Peak 656.1nm, 486.0nm)  
 Reproducibility(nm) <  $\pm 1.0$   
 Setting(nm) 0.1  
 Slew rate(nm/Min) about 5000  
 Scanning speed(nm/Min) maximum 3000  
 Photometric  
 Range(Abs) -4.0 ~ 4.0  
 Accuracy(Abs)  $\pm 0.004$  (at 1.0),  $\pm 0.002$  (at 0.5)  
 Reproducibility(Abs)  $\pm 0.002$  (at 1.0),  $\pm 0.001$  (at 0.5)  
 Stray light(%T) 0.05 (220nm, 340nm)  
 Baseline flatness(ABS/h) <  $\pm 0.001$  (at 550nm)  
 Baseline Flatness(ABS) <  $\pm 0.001$  (200 ~ 1100nm)  
 Noise Level(A) < 0.001  
 Drift(A/hr) 0.002 (at 340nm)  
 Monochromatic Modified Czerny-Turner type with 1200 lines/mm  
 blazed Grating  
 Light Source Tungsten-Halogen Lamp & Deuterium Lamp  
 Lamp Change Wavelength 340~410 (Default 370), include Auto Position  
 System  
 Standard Cell Holder Automatic Rotary type 8-position Multi-Cell Holder  
 Interface Ports USB, Serial ports, Parallel ports  
 Power Requirement Free Voltage  
**Overall Dimensions** : (mm) 600(W)x400(D)x250(H)  
**Weight** : 16kg(Only Main System)

ESL57765

ESL57763



### Photometer Portable Round Cell Holder

Accessory for spectrophotometer

ESL57769

### Photometer Portable Mini

Optical System Reflectance Monochromatic with Optical LED  
 Detector Photo-diode  
 Photo-diode 128x64 dot matrix graphic LCD  
 Printer Small label printer (Optional)  
 Power requirement Four 1.2V Ni-MH rechargeable batteries  
 DC 9V 1A Adapter  
 Inhibition Reproducibility  $\pm 3\%$   
 Data save Maximum 2000  
 Interface Ports USB communications RS-232C serial  
 Data download PC S/W Provided (Optizen MiNiView)  
 Time setting Extraction 5min/Reaction 10min  
**Overall Dimensions** : 110(W) x 48(H) x 245(D)  
**Weight** : 500g

ESL57767

### Photometer Portable Cell Holder Cover

Accessory for photometer portable mini

ESL57768





**Vernier Calliper - Whirl, Plastic**

Columbus type calliper enabling the user to read either inside, outside or depth measurements. With dual scale 0-12 cm x 0.1mm Imperial scale graduated to 5 x 1/128 provided with thumb wheel for easy motion of jaws, in plastic case.

ESL57774



**Micrometer 0-25 Mm With Lock**

With ratchet top, accurately machined stainless steel rod. Range 0-25 x 0.01 mm, supplied in case. Accuracy is perfect for a hobbyist or student -- at 10mm, accuracy is +/- .003mm.

ESL57784



**Vernier Calliper - Whirl, Steel**

Columbus type calliper enabling the user to read either inside, outside or depth measurements. With dual scale 0-12 cm x 0.1mm Imperial scale graduated to 5 x 1/128 provided with thumb wheel for easy motion of jaws, in plastic case.

ESL57775



**Micrometer 0- 25 mm**

With ratchet top, accurately machined stainless steel rod. Range 0-25 x 0.01 mm, supplied in case. Accuracy is perfect for a hobbyist or student -- at 10mm, accuracy is +/- .003mm.

ESL57783



**Vernier Calliper Digital**

Measuring range : 0-150mm , Readability : 0.01mm

ESL57781



**Micrometer Digital**

Measuring range : 0-25mm , Readability : 0.001mm

ESL57786



**Vernier Calliper Aluminium**

Vernier calliper made of aluminium , high quality .

ESL57777 0-150 0.05 mm

ESL57778 0-125 0.05 mm



**Spherometer Superior**

Brass dial head about 40mm dia., Divided and marked in 100 divisions, vertical scale 10-0-10mm, fitted on heavy brass disc, with 3 pointed legs, distance between legs 40mm.

ESL57723





**Flexible Desk Lamp**

Versatile flexible neck  
 • Metal and plastic construction  
 • Integral on/off switch  
 • Height: 340mm approx

ESL57877



**Lamp Bulbs, Round**

M.E.S. Cap, 1.25V

ESL57890

**Lamp Bulb E 10, 1.5v/0.2a (10pcs/Pack)**

Lamp Bulb E 10, 1.5V/0.2A (10pcs/pack)  
 Voltage: 1.5V  
 Ampere: 0.2A  
 Packaging: 10pcs/pack  
**Dimension :** 14.00 (L) x 9.00 (W) x 2.00cm (H)

ESL57889

**Lamp Holder Mounted SBC**

Solid steel Small Bayonet Cap (SBC) lamp holder with a tough powder coat paint finish and a solid brass lamp holder with 2 x 4mm electrical sockets. Ready to use. Pack of 10

ESL57880 ( 12V 21W lamp), PK OF 10

ESL57881 (12V- 36W Axial lamp), PK OF 10

ESL57882 (12V - 24W Axial lamp), PK OF 20



**Lamp Bulb E 10, 2.5v/0.5a (10 Pcs/Pack)**

Lamp Bulb E 10, 2.5V/0.5A (10 pcs/pack)  
 Voltage: 2.5V  
 Ampere: 0.5A  
 Packaging: 10pcs/pack  
**Dimension :** 14.00 (L) x 9.00 (W) x 2.00 cm (H)  
**Weight :** 0.013kg

ESL57888



**Lamp Bulbs, Lens Ended**

2.2V, 0.25A, lens ended, M.E.S. Cap.

ESL57891



**Battery UV Unit**

Battery powered Ultra Violet light source ideally suited to demonstration use. Comes complete with on/off switch. Requires 4 x AA batteries (not supplied).  
 Dimensions (L x H x W): 165 x 35 x 41mm.

ESL57898

**Battery Holders Pk Of 10**

The Irwin Tapped pack of 10 battery holders hold 4 x D (R20) batteries with outputs at 1.5, 3, 4.5 and 6V. Batteries and leads not supplied. Each output has a 4mm socket. Manufactured in the UK from premium strong perspex.  
 Manufactured in the UK



ESL57899

**Battery Holder**

Size: Overall : 175 x 62mm , thickness 10mm for D size battery  
 Material : Brass and plastic  
 Positive and negative given plate attached to plastic base with bolts and given alligator clip, each battery with nuts and bolts of the base



ESL57901

**Cell holder**

Cell-holder Made of unbreakable plastic to hold battery, curved sides help prevent battery from falling out when it is upside down.

ESL57903

Single For 'D' Size Battery

ESL57904

Double For 'D' Size Battery

ESL57905

Double For 'AA' Size Battery

ESL57906

Single For 'AA' Size Battery

ESL57907

Stackable



**Mini Motor DC**

This little yet powerful motor is idea for hundreds of electrical experiments and projects. Voltage requirements are 1.5V ~ 4.5V, 0.2A ,DC volts.

ESP59128 Power requirements : 1.5V ~ 4.5V, 0.2A

ESP59129 Power requirements : 3V ~ 6V, 0.2A

ESP59130 Power requirements : 6V ~ 12V, 0.2A



**De-soldering Pump**

High sucking power, plastic body with sturdy metal rod, easy to clean and maintain.

ESP59606



**Soldering Iron**

With wooden / Bakelite handle, lightweight body, element tested for high insulation, with long life

pencil bit

ESP59601 25 Watts

ESP59602 65 Watts

ESP59603 125 Watts



**Soldering Iron Stand**

Soldering iron with stand

ESL57453



**Copper Wire**

Bare copper wire roll - measured by mass, lengths  
Includes: 1 Spool

- ESL57928 500g roll - 14 SWG (12 AWG) - 0.08" (2.0 mm) Dia. Approximate length is 50 ft.
- ESL57929 500g roll, 16 SWG (14 AWG) - 0.064" (1.6 mm) Dia. Approximate length is 85 ft.
- ESL57930 250g roll, 18 SWG (16/17 AWG) - 0.048" (1.2 mm) Dia. Approximate length is 80 ft.
- ESL57931 250g roll, 20 SWG (19 AWG) - 0.036" (0.91 mm) Dia. Approximate length is 140 ft.
- ESL57932 250g roll, 22 SWG (21 AWG) - 0.028" (0.71 mm) Dia. Approximate length is 225 ft.
- ESL57933 250g roll, 24 SWG (23/24 AWG) - 0.022" (0.56 mm) Dia. Approximate length is 375 ft.
- ESL57934 250g roll, 26 SWG (24/25 AWG) - 0.018" (0.46 mm) Dia. Approximate length is 550 ft.
- ESL57935 250g roll, 28 SWG (29/30 AWG) - 0.0148" (0.38 mm) Dia. Approximate length is 800 ft.
- ESL57936 250g roll , 30 SWG (32/33 AWG) - 0.0124" (0.32 mm) Dia. Approximate length is 1150 ft.
- ESL57937 250g roll , 32 SWG (33/34 AWG) - 0.0108" (0.27 mm) Dia. Approximate length is 1500 ft.



**Chromium Resistance**

This is chromium wire that can be used in many applications in the classroom or lab. It's functional characteristics are the same as nichrome wire. It's makeup is 15% Cr, 4% Al, Balance Fe. Maximum operating temperature is 1150°C. Density is 6.74g/cm<sup>3</sup>

Many industrial and hobby hot wire foam cutters also use chromium wire. Chromium wire is also commonly used in ceramics, as an internal support structure to help some elements of clay sculptures hold their shape while they are still soft. Chromium wire is used because of its ability to withstand the high temperatures.

- ESL57943 18 GAUGE SWG - 16/17 AWG - 0.048" DIA. Includes: (1) 125g Roll
- ESL57944 20 GAUGE SWG - 19 AWG - 0.036" DIA. Includes: (1) 125g Roll
- ESL57945 22 GAUGE SWG - 21 AWG - 0.028" DIA. Includes: (1) 125g Roll
- ESL57946 24 GAUGE SWG - 23/24 AWG - 0.022" DIA.. Includes: (1) 125g Roll
- ESL57947 26 GAUGE SWG - 24/25 AWG - 0.018" DIA. Includes: (1) 125g Roll
- ESL57948 28 GAUGE SWG - 29/30 AWG - 0.0148" DIA. Includes: (1) 125g Roll
- ESL57949 30 GAUGE SWG - 32/33 AWG - 0.0124" DIA. Includes: (1) 125g Roll
- ESL57950 32 GAUGE SWG - 33/34 AWG - 0.0108" DIA. Includes: (1) 125g Roll



**Lamp Bulbs, Round**

D Battery Holder with Socket Terminals  
Used as battery holder size UM1 or D  
Size: 120 x 70mm, with 4mm socket terminal  
Material: Plastic  
Can be mounted on the board  
**Weight :** 0.029kg



ESL57900

**Crocodile Clip Pk/10**

Crocodile clip without sleeve Pk/10

ESL57955

**Crocodile Clip With Plastic Sleeved Red Pk/10**

Spring-loaded, serrated jaws, with screw to clamp end of lead held in tubular extension, both sides insulated. Length 50 mm and jaws open 9 mm, Red Colour

ESL57956

**Crocodile Clip With Plastic Sleeved Black Pk/10**

Spring-loaded, serrated jaws, with screw to clamp end of lead held in tubular extension, both sides insulated. Length 50 mm and jaws open 9 mm, Black Colour

ESL57957



**Safety Socket For Banana Plugs**

Safety socket 4mm for Banana plugs in improved design.

- ESL57910 Black
- ESL57911 Fdc
- ESL57912 Yellow
- ESL57913 Green
- Banana Plugs With wire** 4mm Stackable Plug Lead
- ESL57914 Length 50 cm , Red
- ESL57915 Length 50 cm , Black
- ESL57916 Length 25 cm , Red
- ESL57917 Length 25 cm , Black
- ESL57918 Length 75 cm , Red
- ESL57919 Length 75 cm , Black
- ESL57920 Length 100 cm , Red
- ESL57921 Length 100 cm , Black







### Water Bath Thermostatic Digital

Digital baths are designed for general use and are economically priced without compromising quality. Simple digital controller for setting temperature in 1°C increments. Designed for immersion of flasks, bottles and racks in a highly stable temperature environment. Available in 4, 14 and 22 litre options.

#### High quality build and features

Comprising of a high quality corrosion resistant stainless steel tank, with a bright clean finish housed in a durable painted outer case. Painted surfaces feature antibacterial finish with good chemical resistance. Fitted with side lifting handles for easy lifting.

High quality build and features Comprising of a high quality corrosion resistant stainless steel tank, with a bright clean finish housed in a durable painted outer case. Painted surfaces feature antibacterial finish with good chemical resistance. Fitted with side lifting handles for easy lifting.

#### Controls and safety

Temperatures can be easily and rapidly set with the push button, wipe clean control panel in 1°C increments. Temperature setting is retained in memory, even after 'power off'. Water baths are pre-calibrated for consistent accuracy. Thermal cut out fitted in the heater. IP rated, illuminated on/off power switch and heater indication lamp. Bath fitted with non-slip rubber feet.

#### Temperature

Display/resolution: Digital LED/1°C

Temp. Range: Ambient + 5°C - 99°C

Temp. Setting: Push button

Stability/uniformity:  $\pm 0.2^\circ\text{C}/\pm 0.1^\circ\text{C}$

Temperature memory: Retained in memory even after 'power off'.

ESL58188	Capacity : 4 Ltr	Dimensions External: 332w x 185d x 290h mm Internal: 300w x 150d x 150h mm
ESL58189	Capacity : 14 Ltr	Dimensions External: 361w x 332d x 290h mm Internal: 325w x 300d x 150h mm Water level maximum: 130mm shelf fitted working depth 115mm
ESL58190	Capacity : 22 Ltr	Dimensions External: 538w x 332d x 290h mm Internal: 500w x 300d x 150h mm Water level maximum: 130mm shelf fitted working depth 115mm

All models have 3 year warranty

Complete with perforated shelf for even heat distribution

Side lifting handles

UK manufactured

Accessory lids, racks and baskets available





### Water Bath Thermostatic Unstirred Digital

Clifton digital baths provide a stable temperature environment ideal for meeting quality control requirements, featuring PID temperature control for precision.

Designed for immersion of flasks, bottles and racks for a wide variety of laboratory applications.

#### High quality build and features

Comprising of a high quality corrosion resistant stainless steel tank, with a bright clean finish housed in a durable painted outer case. Painted surfaces feature antibacterial finish with good chemical resistance. Fitted with side lifting handles for easy lifting.

Heaters and temperature sensor are concealed under the tank providing a clutter free working area which is easy to wipe clean. Supplied with a removable sturdy low height stainless steel perforated shelf, for even heat distribution. The shelf provides a deeper volume of water, for standing containers and accessory test tube racks in the bath. Three year warranty and comprehensive customer support. Accessory lids available. Above 60°C it is recommended that to achieve optimum performance the bath should be covered with a lid. Clifton Range®

#### Controls and safety

Temperatures can be easily and rapidly set with the push button, wipe clean control panel, featuring a bold LED display. The high precision PID temperature controller, ensures that accuracy and repeatability is guaranteed. Temperature is set in increments of 0.1°C and retained in memory, even after 'power off'. Water bath features a thermal safety cut out which is fitted to the heater. There is an over temperature alarm automatically set at 4°C above set temperature, including a visual indicator and safety heating cut out, to protect samples from over heating. Water baths are pre-calibrated at two separate temperatures for consistent accuracy. IP rated, illuminated on/off power switch and heater indication lamp. Bath fitted with non-slip rubber feet.

#### Temperature

Display / resolution: Digital LED / 0.1°C

Temp. Range: Ambient + 5°C - 99°C

Temp. Setting: push button in 0.1°C increments

Stability/uniformity: ± 0.2°C/± 0.1°C

Temperature memory: Retained in memory even after 'power off'.

<b>ESL58192</b>	Capacity : 4 Ltr	Dimensions External: 332w x 185d x 290h mm Capacity Nominal Tank Capacity: 4 Litres	Internal: 300w x 150d x 150h mm Brimful Capacity: 6 litres
<b>ESL58193</b>	Capacity : 8 Ltr	Dimensions External: 332w x 270d x 290h mm Capacity: Nominal Tank Capacity: 8 Litre	Internal: 300w x 240d x 150h mm Brimful Capacity: 10 litres
<b>ESL58194</b>	Capacity : 14 Ltr	Dimensions External: 361w x 332d x 290h mm Capacity Nominal Tank Capacity: 14 Litres	Internal: 325w x 300d x 150h mm
<b>ESL58195</b>	Capacity : 22 Ltr	Dimensions External: 538w x 332d x 290h mm Capacity Nominal Tank Capacity: 22 Litres Drain outlet fitted, large 12mm bore for fast emptying an accessory tap can be added for convenience.	Internal: 500w x 300d x 150h mm

All models have 3 year warranty

Complete with perforated shelf for even heat distribution

Side lifting handles

UK manufactured

Accessory lids, racks and baskets available





### Water Bath Thermostatic Unstirred Analogue

Analogue boiling baths are designed for applications that require continuous boiling. This range has the flexibility where the controls can be regulated from a

Gentle simmer to a vigorous boil.

#### High quality build and features

Comprising of a high quality corrosion resistant stainless steel tank, with a bright clean finish housed in a durable painted outer case. Painted surfaces feature antibacterial finish with good chemical resistance. The bath, which is simmer-statically controlled, is ideally suited to prolonged periods of boiling. Fitted with side lifting handles for easy lifting.

Fitted with a sheathed immersion element and thermal safety cut out. The heater is directly immersed in water providing rapid boiling. Fitted with a constant level device, that maintains a fixed level of liquid which eliminates the need to regularly top up the bath. Three year warranty and comprehensive customer support. Accessory lids available. Above 60°C it is recommended that to achieve optimum performance the bath should be covered with a lid. Deep chamber option (product code: NE1B-18W) can be fitted with an accessory tray to conveniently raise or immerse items in boiling water and is suitable for immersion of tall vessels. Clifton Range®

#### Controls and safety

Easy to use analogue dial pointer for setting temperature in 10°C increments. The bath can control the amount of boiling from a gentle simmer to a vigorous boil. Thermal cut out fitted in the heater.

Always connect the constant level with laboratory tubing to a water supply, adjust the flow to gently top up the water level, whilst maintaining boiling. IP rated, illuminated on/off power switch and heater indication lamp. Bath fitted with non-slip rubber feet.

Temperature

Temp. Range: Simmer to boiling at 100°C

Temp. Setting: analogue dial pointer

Temp. Control: Energy regulator controls the amount of boiling from a gentle simmer to vigorous boil

**ESL58196**

Capacity : 14 Ltr

**Dimension** :s (mm) Overall - 361w x 332d x 290h / Working - 325w x 300d x 150h

Electrical supply: 230v

Power consumption: 2500w

**ESL58197**

Capacity : 18 Ltr

**Dimension** :s (mm) Overall - 362w x 332d x 290h / Working - 325w x 300d x 200h

Electrical supply: 230v

Power consumption: 2500w

Drain outlet: Drain outlet fitted, large 12mm bore for fast emptying

Deep fill chamber: can be fitted with accessory tray to raise or immerse items into boiling water

Accessory tray: ST-1 - Raise and lower sterilizing tray.

SA01409 - Pair of guide rail assemblies for ST1 Tray and NE1B-18W

All models have 3 year warranty

Complete with shelf for good water circulation

UK manufactured

Accessory lids, racks and baskets available





### Water Bath Thermostatic

Clifton digital stirred baths provide a stable temperature environment ideal for meeting quality control requirements, featuring PID temperature control for precision. Designed for immersion of flasks, bottles and racks for a wide variety of laboratory applications.

High quality build and features

Comprising of a high quality corrosion resistant stainless steel tank, with a bright clean finish housed in a durable painted outer case. Painted surfaces feature antibacterial finish with good chemical resistance. The thermostirrer is robust and entire casing is constructed from stainless steel for durability.

Supplied with a removable stainless steel shelf, ensuring good water circulation throughout the chamber. Three year warranty and comprehensive customer support. Accessory lids, racks, coolers and shelves available. Above 60°C or below ambient it is recommended that to achieve optimum performance the bath should be covered with a lid. Clifton Range®

#### Controls and safety

Temperatures can be easily and rapidly set with the push button, wipe clean control panel, featuring a bold LED display. The high precision PID temperature controller, ensures that accuracy and repeatability is guaranteed. Temperature is set in increments of 0.1°C and retained in memory, even after 'power off'.

When a low liquid level is detected "FILL" message automatically appears on the display and heating is suspended. Once refilled, heating is restored and temperature control resumes automatically. There is an over temperature alarm automatically set at 4°C above set temperature, including a visual indicator to protect samples from over heating.

Water baths are pre-calibrated at two separate temperatures for consistent accuracy. Illuminated on/off power switch and heater indication lamp. Bath fitted with non-slip rubber feet.

#### Temperature

Display / resolution: Digital LED / 0.1°C

Temp. range: Ambient + 5°C - 99°C

Ambient to -20°C with accessory immersion dip cooler (DC1-300 or DC2-300)

Temp. setting: push button in 0.1°C increments

Stability/uniformity: ± 0.05°C/± 0.01°C

Temperature memory: Retained in memory even after 'power off'.

Timer : Variable 00:01 to 99.59 hh:mm.

Audible alarm and visual 'end' message

Safety feature: Low liquid level warning

#### ESL58198

Capacity : 14 Ltr

**Dimension** :s (mm) Overall - 361w x 332d x 170h / Working - 219w x 298d x 150h  
Electrical / power supply: 120v or 230v models available/ 1250w

#### ESL58199

Capacity : 28 Ltr

**Dimension** :s (mm) Overall - 537w x 332d x 240h / Working - 395w x 298d x 200h  
Electrical / power supply: 120v or 230v models available / 1250w

All models have 3 year warranty

Complete with shelf for good water circulation

UK manufactured

Accessory lids, racks and baskets available





### Water Bath Thermostatic Digital Oil Heating Circulator

Clifton® Digital Water and Oil Heating Circulator are designed for external circulation of temperature controlled water and heat transfer fluids in a closed circuit or for maintaining a stable temperature environment in the bath for the immersion of flasks, bottles and racks.

Thermocirculator can be fitted to water baths, tanks and containers using accessory Mount Bracket.

Clifton® Thermostirrer is a durable stainless steel construction, painted surfaces are powder painted with tough anti-bacterial finish with good chemical resistance. Easy to use controls that wipe clean and have an anti-bacterial finish. Immersed components are corrosion resistant. Quiet running in use and providing excellent water temperature stability. Indication of heating, over temperature alarm and timer running.

When a low liquid level is detected a "FILL" message automatically appears and heating is suspended. Once refilled, heating is restored and temperature control resumes automatically.

Over and under temperature alarms automatically protect work in the water bath, providing heater cut off, visual message and indicator.

A second safety device can be set just above the working temperature, protecting samples.

Thermocirculator pump comes with convenient push-fit and lock fittings on both inlet and outlet ports for secure external liquid circulation.

### Controls

Featuring a bold LED display of measured temperatures in real-time and in increments of  $\pm 0.1^{\circ}\text{C}$ , using a precision PID temperature controller. Setting for water temperature only or combination of temperature and time. Timer setting variable in 1-minute increments from 00:01 [hh:mm] to 99:59 [hh:mm] with "end" message on completion of the timed period. Time and temperature settings are retained in the memory, even after the unit has been turned off.

Easy to use controls, utilising touch keypads for setting time and temperature values with indicators for heating, over temperature alarm and timer.

The heater unit can be set to run at a set temperature or commence the timer once the water reaches set temperature.

Features auto setting over and under temperature alarm protecting your work at set temperature.

Every unit undergoes a factory calibration at two temperatures for validation.

A second safety device can be set just above the working temperature, protecting samples.

<b>ESL58200</b>	Capacity : 14 ltr	<b>"Dimension</b> : External: 361w x 332d x 170h mm Thermocirculator additional 120mm to bath height Internal: 219w x 298d x 150h mm - working area of the bath Capacity Nominal Tank Capacity: 14 Litres"
<b>ESL58201</b>	Capacity : 22 ltr	<b>"Dimension</b> : External: 537w x 332d x 170h mm Internal: 395w x 298d x 150h mm Capacity Nominal Tank Capacity: 22 Litres"

All models have 3 year warranty

Complete with shelf for good water circulation

UK manufactured

Accessory lids, racks and baskets available





### Water Bath Thermostatic 2 Ltr Shallow, Comp. W. S. steel Perforated False Base

Clifton shallow Baths™ are available in digital or analogue option. Their small footprint provides a stable temperature environment for life science preparations. Perfect for heating small height samples such as micro tubes, micro plates and bottles.

#### High quality build and features

Comprising of a high quality corrosion resistant stainless steel tank, with a bright clean finish housed in a durable painted outer case. Painted surfaces feature antibacterial finish with good chemical resistance. The shallow chamber is perfect for heating smaller samples.

Heaters and temperature sensor are concealed under the tank providing a clutter free working area which is easy to wipe clean. Supplied with a removable sturdy low height stainless steel perforated shelf, for even heat distribution. Three year warranty and comprehensive customer support. Accessory lids available. Above 60° it is recommended that to achieve optimum performance the bath should be covered with a lid. Clifton Range®

#### Controls and safety

Digital bath option allows temperatures to be easily and rapidly set with the push button, wipe clean control panel, featuring a bold LED display. High precision PID temperature controller that ensures accuracy and repeatability is guaranteed. Temperature setting in increments of 0.1°C and temperature setting retained in memory, even after 'power off'.

Thermostatic bath option has an easy to use analogue dial pointer for setting temperature in 5°C increments.

All Shallow Baths™ have IP rated, illuminated on/off power switch and heater indication lamp. Features a thermal safety cut out which is fitted to the heater. Digital baths feature an over temperature alarm automatically set at 4°C above set temperature, including a visual indicator and safety heating cut out, to protect samples from over heating. Shallow Bath™ fitted with non-slip rubber feet.

#### Temperature

##### Digital

Display / resolution: Digital LED / 0.1°C

Temp. Range: Ambient + 5°C - 99°C

Temp. Setting: push button

Stability/uniformity: ± 0.2°C/± 0.1°C

Temperature memory: Retained in memory even after 'power off'.

##### Thermostatic

Temp. Range: Ambient + 5°C - 99°C

Temp. Setting: analogue dial pointer

Stability/uniformity: ± 0.25°C/± 0.1°C

**ESL58202**

Capacity : 2 ltr

**Dimension** :s (mm) Overall - 332w x 185d x 135h / Working - 300w x 150d x 65h  
Electrical / power supply: 120v or 230v models available / 200w

All models have 3 year warranty

Complete with shelf for good water circulation

UK manufactured

Accessory lids, racks and baskets available





### Water Bath Thermostatic Triple

Clifton analogue Triple-baths™ feature three independently controlled unstirred water baths in one space saving unit. Ideal for heating samples in micro centrifuge tubes and for other molecular biology applications.

#### High quality build and features

Comprising of 3 high quality corrosion resistant stainless steel tanks, with a bright clean finish housed in a durable painted outer case. Each chamber can be set to a different temperature and used simultaneously. Painted surfaces feature antibacterial finish with good chemical resistance.

Triple 4 litre bath is fitted with side lifting handles for easy lifting. These shallow baths require less water and less process chemicals, so are therefore economical to use.

Heaters and temperature sensors are concealed under the tanks providing a clutter free working area which is easy to wipe clean. Supplied with 3 removable sturdy low height stainless steel perforated shelves, for even heat distribution. Triple-baths™ are available in two sizes, 3 x 2 litre and 3 x 4 litre chambers.

Accessory lids available. Above 60°C it is recommended that to achieve optimum performance the chambers should be covered with a lid. Covering the bath also reduce energy consumption and running costs. Three year warranty and comprehensive customer support.

#### Controls and safety

Easy to use analogue dial pointer for setting temperature, graduated in 5°C divisions for each tank. With 3 independent controllers, each chamber can be operated separately and simultaneously. The Triple-bath™ includes IP rated, illuminated on/off power switch and heater indication lamp for each tank.

Water baths are pre-calibrated for consistent accuracy. Thermal cut out fitted in the heater. Bath fitted with non-slip

Rubber feet.

#### Temperature

Temperature control: Analogue dial pointer - graduated in 5°C divisions

Temp. range: Ambient + 5°C - 99°C

Temp. setting: Turn dial pointer

Stability/uniformity: ± 0.5°C/± 0.5°C

<b>ESL58203</b>	Capacity : 2 Ltr	<b>Dimension</b> : External : 535w x 332h x 135h mm Internal: 300w x 150d x 65h mm Capacity Nominal Tank Capacity: Triple bath tanks, 2 Litres each.
<b>ESL58204</b>	Capacity : 4 Ltr	<b>Dimension</b> : External : 535w x 332h x 290h mm Internal: 300w x 150d x 150h mm Capacity Nominal Tank Capacity: Triple tanks, 4 Litres each

All models have 3 year warranty

Complete with shelf for good water circulation

UK manufactured

Accessory lids, racks and baskets available





### Water Bath Digital Triple-bath

Clifton digital Triple-baths™ feature three independently controlled unstirred water baths in one space saving unit. Ideal for heating samples in micro centrifuge tubes and for other molecular biology applications.

#### High quality build and features

Comprising of 3 high quality corrosion resistant stainless steel tanks, with a bright clean finish housed in a durable painted outer case. Each chamber can be set to a different temperature and used simultaneously. Painted surfaces feature antibacterial finish with good chemical resistance.

Triple 4 litre bath is fitted with side lifting handles for easy lifting. These shallow baths require less water and less process chemicals, so are therefore economical to use.

Heaters and temperature sensors are concealed under the tanks providing a clutter free working area which is easy to wipe clean. Supplied with 3 removable sturdy low height stainless steel perforated shelves, for even heat distribution. Triple baths™ are available in two sizes, 3 x 2 litre and 3 x 4 litre chambers.

Accessory lids available. Above 60°C it is recommended that to achieve optimum performance the chambers should be covered with a lid. Covering the bath also reduce energy consumption and running costs. Three year warranty and comprehensive customer support.

#### Controls and safety

Temperatures can be easily and rapidly set with the push button, wipe clean control panel. Temperature displayed clearly with bright LED display in 1°C increments. Temperature setting is retained in memory, even after 'power off'. With 3 independent controllers, each chamber can be operated separately and simultaneously.

The Triple-bath™ includes IP rated, illuminated on/off power switch and heater indication lamp for each tank.

Water baths are pre-calibrated at two separate temperatures for consistent accuracy. Thermal cut out fitted in the heater. Bath fitted with non-slip rubber feet.

#### Temperature

Display/resolution: Digital LED/1°C

Temp. Range: Ambient + 5°C - 99°C

Temp. Setting: Push button

Stability/uniformity: ± 0.25°C/± 0.1°C

Temperature memory: Retained in memory even after 'power off'

<b>ESL58205</b>	Capacity : 2 ltr	<b>Dimension</b> :s External: 535w x 332h x 135h mm Internal: 300w x 150d x 65h mm Capacity Nominal Tank Capacity: Triple tanks, 2 Litres each
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<b>ESL58206</b>	Capacity : 4 ltr	<b>Dimension</b> :s External: 535w x 332h x 290h mm Internal: 300w x 150d x 150h mm Capacity Nominal Tank Capacity: Triple tanks, 4 Litres each
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All models have 3 year warranty

Complete with shelf for good water circulation

UK manufactured

Accessory lids, racks and baskets available







**Hinged Lid Assymoulded Lid New Style Clear Plastic**

Hinged lid assymoulded lid new style clear plastic

ESL58209



**Stainless Steel Gabled Lid**

Stainless steel gabled lid

ESL58210

**Test Tube Rack Stainless Steel 18 X 19mm**

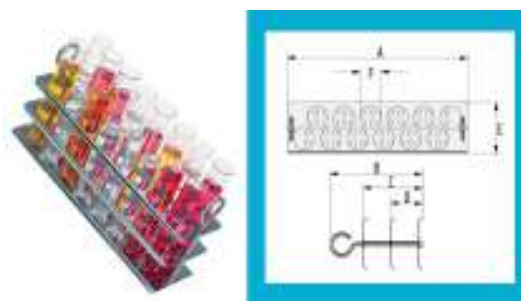
Test tube rack stainless steel 18 x 19mm

ESL58211

**Test Tube Rack Stainless Steel 12 X 32mm**

Test tube rack stainless steel 12 x 32mm

ESL58212



**Water bath Irwin school**

The Irwin water bath specifically designed for School Science Departments. It is built around a Gratnells deep tray and so can be stored in a Gratnells trolley. Water capacity is from 2 to 8 litres. Because of the shallow profile of the heating element, 3 litres of water gives the equivalent depth to 8 litres in a EduScience Bath, thus it reaches temperature much faster. Digital temperature control will maintain the water temperature within 1 degree Centigrade Separate temperature sensor which can control the whole bath or an individual test tube 500W silicone heating element Particularly suitable for hard water areas as the element may be easily removed and cleaned Gives additional bench space in the prep room. Light and easy to carry with safety cut-out sensor.

Even temperature distribution no stirrer required Student proof temperature lock Large capacity will take up to 4 test tube racks Cost effective and practical solution for all your water bath needs Comes complete with a lid and Z type test tube rack

Available in either 60 degrees centigrade or 100 degrees Centigrade options.

ESL58207 60 degrees C

ESL58208 100 degrees C

**Ultrasonic Bath**

- Frequency: 53KHz , • Heating: No, • Degas: Yes, • Timer (minute): 1-99, • Housing: SUS304,
- Drain : No, • Stainless steel cover: Yes
- Ultrasonic power(W): 100, • Heating power(W): No, • Degas power(W): 100,



ESL58245 Capacity : 3 Ltr Tank size (LxWxD) cm : 24x14x10  
Overall size (LxWxD) cm : 27x16x24  
Tank capacity (litre): 3

ESL58246 Capacity : 6 Ltr Tank size (LxWxD) cm : 30x15x15  
Overall size (LxWxD) cm : 33x18x29  
Tank capacity (litre): 6





### Water Bath Ultrasonic, Thermostatic Heated And Timed ,Ultrasonic -230V

Clifton industrial strength ultrasonic baths are designed for demanding applications and suitable for continuous operation. Featuring heating and timer controls with ultrasonic boost, degas and sweep functions. Ideal for cleaning delicate or fragile components and glassware, especially where there may be a risk of breakage as a result of manual cleaning.

#### High quality build and features

High quality stainless steel tank and construction for durability. Fitted with side lifting handles for easy lifting. Featuring ultrasonics with sweep function for perfect and even distribution of ultrasonic activity. Features an ultrasonic boost function for 25% more power. The auto-degassing function is useful for liquid changes in the tank, de-carbonating and degassing HPLC solutions.

Three year warranty and comprehensive customer support. Accessory lids available. It is recommended that to achieve consistent heating, minimise evaporation and to prevent contamination when ultrasonic bath is not in use, it should be covered with a lid. Clifton Range®

#### Controls and safety

Temperature, time and activating sonic can be easily and rapidly set with the push button, wipe clean

Control panel, featuring an illuminated bold display. Splash proof controls with a drip bar above control panel, guides spills and drips away from the easy to use temperature and timer dials.

Touch keypads for boost, sweep, degas with start/stop and on/off functions. Temperature is set with analogue dial in increments of 5°C, time values in 1 minute increments with indication of time remaining as well as a permanent 'on' function. Bath will switch off after 12 hours if no keys have been activated, to prevent unintended operation.

Heating elements are controlled electronically to reduce energy demand and prevent overheating if allowed to run dry. Illuminated on/off power switch. Bath fitted with non-slip rubber feet. This range is designed for intermittent and permanent 'on' use. Do not allow items to touch base of the tank, we recommend accessory baskets.

#### Temperature

Display / resolution : Digital LED / 0.1°C

Temp. Range : 30°C - 80°C

Temp. Setting: Analogue dial pointer in increments of 5°C

Timer: Time setting 1 minute with indication of time remaining or permanent 'on' function.

ESL58205	Capacity : 1 ltr	<b>Dimension</b> :s (mm) Overall - 200w x 100d x 180h / Working - 190w x 85d x 60h
		Electrical / power supply: 120v or 230v models available / 60w Ultrasonic effective output: 30w Ultrasonic peak power / frequency: 240w / 38kHz Accessory basket: BSK-1

ESL58206	Capacity : 12 ltr	<b>Dimension</b> :s (mm) Overall - 365w x 278d x 321h / Working - 300w x 240d x 200h
		Electrical / power supply: 120v or 230v models available / 800w Ultrasonic effective output: 200w Ultrasonic peak power / frequency: 800w / 38kHz Accessory basket: BSK-12

All models have 3 year warranty

Complete with shelf for good water circulation

UK manufactured

Accessory lids, racks and baskets available

ESL58244





**Drying Cabinets**

Fitted with toughened glass doors.

Extras: Can be fitted with an interior fan and dial thermostat control for faster and safer drying Ideal for keeping products dry or testing electronic assemblies

<b>ESL58255</b>	Capacity : 113 LTR	Shelves supplied is 2 shelves, External dimension (mm) : 545 x 730 x 360 Internal dimension (mm) 460 x 728 x 341
<b>ESL58256</b>	Capacity : 226 LTR	Shelves supplied is 3 shelves, External dimension (mm) : 652 x 928 x 449 Internal dimension (mm) : 567 x 926 x 430
<b>ESL58257</b>	Capacity : 540 LTR	Shelves supplied is 3 shelves, External dimension (mm) : 1550 x 581 x 600, Internal dimension (mm) : 1650 x 583 x 610



**Ovens Drying Moisture Extraction**

The forced air extractor is a bolt-on unit and can be retro-fitted to our other ovens if required. (OPTIONAL EXTRA).

Capacities: 150 Litres

Temperature range: 40 C to 250 ° C

Interior : CLAD coated steel

Circulation : Fan assisted and extract unit

Output vent : for 50mm opening/diameter tubing

Temperature control : direct reading hydraulic

Safety: Thermostat with warning indicator.

CE compliant.

ESL58262



**Ovens Incubators Dual Purpose**

Manufactured with economy and a dual function in mind. These units are ideally suited to laboratories requiring an incubator and an oven in one convenient cabinet. These can be used as a general purpose incubator, yet at the flick of a switch can be used as either a 250 ° C oven or steriliser making it the obvious cost-effective solution for many laboratories.

Capacities: 150 Litres

Optional/Extras: Can be fitted with:

Digital controller, and/or a run back timer

Stainless steel chamber

PID Digital control & readout (DIG)

Dial thermometer readout

Programmable timers. CE compliant.

ESL58265





### Oven General Purpose

Suit most laboratory applications including drying, heating and general use.

Temperature Range: 40 C to 250 °C

Fluctuation: typically  $\pm 1$  °C

Exterior: Easy clean powder coated body

Interior: Aluminium clad steel chamber as standard (Stainless steel also available)

Controls: Calibrated dial thermostat

Safety: Independent overheat safety thermostat

Warranty: Full UK 1 year parts labour

Circulation: Internal forced air.

CE compliant.

<b>ESL58268</b>	Capacity : 10 LTR	Shelf positions:1, No. Of shelves: 1, External dimension (HxWxD): 415x375x350mm, Internal dimension (HxWxD): 150x275x243mm, Max load height: 105mm, Power: 350watts
<b>ESL58269</b>	Capacity : 20 LTR	Shelf positions: 2, No. Of shelves: 2, External dimension (HxWxD): 540x375x382mm, Internal dimension (HxWxD): 275x275x275mm, Max load height: 190mm, Power: 500 watts
<b>ESL58270</b>	Capacity : 30 LTR	Shelf positions: 3, No. Of shelves: 2, External dimension (HxWxD): 570x415x422mm, Internal dimension (HxWxD): 305x315x315mm, Max load height: 220mm, Power: 750 watts
<b>ESL58271</b>	Capacity : 40 LTR	Shelf positions: 3, No. Of shelves: 2, External dimension (HxWxD): 670x415x422, Internal dimension (HxWxD): 404x315x315, Max load height: 320mm, Power: 1000 watts
<b>ESL58272</b>	Capacity : 50 LTR	Shelf positions: 3, No. Of shelves: 2, External dimension (HxWxD): 625x590x422 mm, Internal dimension (HxWxD): 325x490x315 mm, Max load height: 240mm, Power: 1000 watts
<b>ESL58273</b>	Capacity : 75 LTR	Shelf positions: 3, No. Of shelves: 2, External dimension (HxWxD): 625 x 590 x 567mm, Internal dimension (HxWxD): 333x490x460mm, Max load height: 248mm, Power: 1250watts
<b>ESL58274</b>	Capacity : 100 LTR	Shelf positions: 4, No. Of shelves: 3, External dimension (HxWxD): 735x590x567mm, Internal dimension (HxWxD): 445x490x460mm, Max load height: 360mm, Power: 1250watts
<b>ESL58275</b>	Capacity : 120 LTR	Shelf positions: 4, No. Of shelves: 3 , External dimension (HxWxD): 735x560x659mm, Internal dimension (HxWxD): 445x490x552mm, Max load height: 360mm, Power: 1500watts
<b>ESL58276</b>	Capacity : 150 LT R	Shelf positions: 4, No. Of shelves: 3, Power: 1500watts





### Incubators General Purpose

Suit most laboratory applications including drying, curing, and general use.  
 Temperature Range : Ambient 10 C to 100 ° C  
 Fluctuation: typically  $\pm 0.75$  ° C  
 Exterior: Easy clean powder coated body  
 Interior: Aluminium clad steel chamber as standard (Stainless steel also available)  
 Controls: Calibrated dial thermostat  
 Safety: Independent overheat safety thermostat  
 Warranty : Full UK 1 year parts & labour  
 CE compliant.

ESL58295	Capacity : 10 LTR	Shelf positions: 1, No. Of shelves: 1, External dimension (HxWxD): 415x375x350mm, Internal dimension (HxWxD): 150x275x243mm, Max load height: 105mm, Power: 250watts
ESL58296	Capacity : 20 LTR	Shelf positions: 2, No. Of shelves: 2, External dimension (HxWxD): 540x375x382mm, Internal dimension (HxWxD): 275x275x275mm, Max load height: 190mm, Power: 350watts
ESL58297	Capacity : 30 LTR	Shelf positions: 3, No. Of shelves: 2, External dimension (HxWxD): 570x415x422mm, Internal dimension (HxWxD): 305x315x315mm, Max load height: 220mm, Power: 500 watts
ESL58298	Capacity : 40 LTR	Shelf positions: 3, No. Of shelves: 2, External dimension (HxWxD): 670x415x422mm, Internal dimension (HxWxD): 404x315x315mm, Max load height: 320mm, Power: 500 watts
ESL58299	Capacity : 50 LTR	Shelf positions: 3, No. Of shelves: 2, External dimension (HxWxD): 615x590x422mm, Internal dimension (HxWxD): 325x490x315mm, Max load height: 240mm, Power: 500 watts
ESL58300	Capacity : 75 LTR	Shelf positions: 3, No. Of shelves: 2, External dimension (HxWxD): 623x590x567mm, Internal dimension (HxWxD): 333x490x460mm, Max load height: 248mm, Power: 750 watts
ESL58301	Capacity : 100 LTR	Shelf positions: 4, No. Of shelves: 3, External dimension (HxWxD): 735x590x567mm, Internal dimension (HxWxD): 445x490x460mm, Max load height: 360mm, Power: 750 watts
ESL58302	Capacity : 120 LTR	Shelf positions: 4, No of shelves: 3, External Dimension (HxWxD): 735x590x659mm, Internal Dimension (HxWxD): 445x490x552mm, Max load height: 360mm, Power: 1500 watts
ESL58303	Capacity : 150 LT R	Shelf positions: 4, No of shelves: 3, Max load height: 360mm, Power: 1500 watts,

### Sterilizer Hot Air

Manufactured to conform with the strict requirements of hot air sterilization up to 250°C in life science laboratories.

Uses: Standard disinfection of instruments and applications is not always thorough enough in medicine and biological research. Often high temperature dry sterilization is the only acceptable method of biological cleansing.

Temperature range: 30 ° C to 250 ° C

Interior: Stainless steel with fan circulation

Timer: 120 minute mechanical run-back timer

Controls: PID digital and readout (DIG)

Safety: thermostat with warning indicator

500 C version is available for protein denaturation.

CE compliant.



ESL58324	Capacity : 50 LTR	No of shelves: 2, Shelf positions: 3, External Dimension (HxWxD): 625x590x422mm, Internal Dimension (HxWxD): 325x490x315mm, Max load height: 240mm, Power: 1000 watts.
ESL58325	Capacity : 75 LTR	No of shelves: 2, Shelf positions: 3, External Dimension (HxWxD): 625x590x567mm, Internal Dimension (HxWxD): 333x490x460mm, Max load height: 248mm, Power: 1000 watts.
ESL58326	Capacity : 100 LTR	No of shelves: 3, Shelf positions: 4, External Dimension (HxWxD): 735x590x567mm, Internal Dimension (HxWxD): 445x490x460mm, Max load height: 360mm, Power: 1000 watts
ESL58327	Capacity : 120 LTR	No of shelves: 3, Shelf positions: 4, External Dimension (HxWxD): 735x590x659mm, Internal Dimension (HxWxD): 445x490x552mm, Max load height: 360mm, Power: 1500 watts
ESL58328	Capacity : 150 LTR	No of shelves: 3, Shelf positions: 4, Power: 1500 watts





**Water Still 4 Ltr /Hour Borosil Basic Plus**

Cap: 4 ltrs / hr, Single Safety, Pressure Temperature Switch with manual reset button- with UK PLUG and ON/OFF switch on the heater. CE Certified.

ESL58355



**Water Still 4 Ltr /Hour Borosil Basic**

Water still borosil basic designed for reliable continuous operation incorporating a host of features unmatched by comparable stills. It is easy to use, safe to operate, thoroughly reliable and above all Low Cost. Features :

Abundant Output. The still provides, 4 litres/hr of distilled water produced through a power input of 3KW by a chromium plated heater housed in a horizontal Glass Boiler

Distilled output is cool ensured by a high efficiency condenser. Temperature of distillate 25°C – 40°C tested for ambient room temperature of 30° C. CE MARKED

Dimensions ( W x D x H) 50 cm x 15 cm x 45cm, 50 cm x 20 cm x 55cm Weight 6 kg. Approx., Power 220/240V, 50/60 Hz.

Single phase. 3KW Heater.

Water Supply Min. Flow rate 1 litre/min.

Min. Pressure 3 p.s.i. (0.2 x 105 NM-2) Ideal for general Laboratory use- capable of producing pyrogen free water.

Output 4 lit/hr

Conductivity (using raw water) 3.0 – 4.0 µS/cm

Conductivity (using treated water) 1.5 – 2.0 µS/cm

PH 5.5 – 6.0

Distillate quality Pyrogen free Construction

The stand is powder coated for long rust free Operation.

Heater is a 3KW Chromium plated heater fitted with a thermostat, which shuts off automatically in case of water supply failure.

The Boiler & Condenser are designed for high efficiency and provided with threading for easy plumbing of condenser.

Boiler is provided with Teflon screw cork for insitu cleaning of the boiler.

All plumbing connections to the equipment are made via

Screw thread connectors

Our water still has following additional safety features:

Gate Valve : Prevents water wastage.

Flow Switch : For Boiler Safety

On/Off switch with water failure indicator lamp.

Packing Info: packing

**Dimensions :** 50 cm x 47 cm x 46 cm. Gross

**Weight :** 12.00 kgs. Approx.

ESL58354



**Water Still 4 Ltr /Hour Metal Element**

For a continuous supply of distilled water. The evaporation unit is Simply connected to an existing water supply system. Easy to operate and clean.

Versions are available for 110 V/60 Hz and 230 V/50 Hz. All connections included. Without tubing.

Technical data :

Distilled water per hour : 4 litres

Conductivity : 1,5 – 2,5 µS

Connected load : 3 kW

Tubing : 10 mm

**Weight :** 9 kg

Dimensions (H x L x W) : 600 x 190 x 190 mm

ESL58353



**Water Still 4 Ltr /Hour Borosil Basic Pro**

Cap: 4 ltrs / hr, Dual Safety, with two Pressure Temperature Switch with manual reset button- with UK PLUG and ON/OFF switch on the heater. CE Certified.

ESL58356





### Water Still 4 Ltr /Hour Borosil Silica Heater

Single Water Distillation Unit with 3 KW Silica Heater, Cap: 4 ltrs / hr.

Features :

Gate Valve to prevent water wastage.

Flow switch for boiler safety.

Teflon drain cock for easy maintenance.

High quality distillate.

Power coated stand.

Safety Built - in.

Silica Heater

Provided with a threaded Connection for easy, safe and quick assembly of Silica Heater.

Easy Cleaning

The Boiler is provided with a Teflon screw cock for easy cleaning of the boiler

Screw Thread Connectors

All plumbing connections are via screw thread connectors with silicon rubber 'o' rings. This facilitates easy fitting and removal of hose, without using excessive force, avoiding the danger of glassware breakage during assembly.

With over Heat protection : Pressure Temperature Switch (PTS): Shuts off the unit when water level in the boiler falls below the heater.

ESL58357



### Water Still 4 Ltr /Hour Borosil Automatic Double Distillation

Water still borosilicate Glass, Cap: 4 ltr/hr, 4 ltr/hr, Double Distillation with automatic cabinet . it is ideal for procuring ultra high purity water for demanding applications in the laboratory / tissue culture work.

it incorporates several safety devices for optimum use in hospitals and labs and has been designed to meet the International Safety Standards IEC 61010-01. Special features include Flow Control Safety, Gate Valve, Level Sensor as well as a Reservoir Level Sensor for automatic operation of the unit.

ESL58359



### Water Still 4 Ltr /Hour Borosil Automatic Single Distillation

Water still borosilicate Glass, Cap: 4 ltr/hr, single distillation with automatic cabinet . it is ideal for procuring ultra high purity water for demanding applications in the laboratory / tissue culture work.

it incorporates several safety devices for optimum use in hospitals and labs and has been designed to meet the International Safety Standards IEC 61010-01. Special features include Flow Control Safety, Gate Valve, Level Sensor as well as a Reservoir Level Sensor for automatic operation of the unit.

ESL58358



### Ducted Fume Extractor Cabinet

Large ducted hood mounted local extraction cabinet designed specifically for laboratories. It is commonly used in dental & medical labs, pharmaceutical laboratories, research & development and school science laboratories.

This unit exhaust air through a flexi-duct externally to the atmosphere. Although, it's a ducted fume extractor, you don't need to have a special vent to use the BV930H-D. Its flexi-ducts can be fitted to a normal domestic vent or placed on a partially opened window.

it also provides operators with a safe workstation, as handling of all the potential harmful chemicals is done within the hood enclosure in front of the intake filter area. For artwork applications, the enclosure can accommodate a standard A1 drawing boards, which will tilt at an angle so the unit captures the overstay efficiently, keeping the surrounding working area clean.

it is designed for immediate operator protection . If outside venting isn't possible, ES also offers re-circulatory fume cabinets such as the and BV930H-C. Both units have higher filtration specifications.

Applications

The ducted fume extractor cabinet is suitable to filter fumes, vapours and particulates from:

Spray Adhesives

Conformal coatings (thin polymer film usually used to coat circuit boards), Paints, Monomers, Resin, Sealants, Solders, Light Grinding , Organic Solvents, Cleaners, Hazardous powders & particulates.

ESL58382





### Bench Top Environment Cabinet Enclosure

Sealed environment enclosure for sensitive sample handling -NO Transfer Hatch, Supplied with Nitrite glove ports, 2 x 8mm push-fit gas connections and internal power socket. Green Base

ESL58371



### Ducted Spray Booth

It is ideal for applications that include filtration of aerosol adhesives (glue booth for spray mounts), aerosol lacquers and fixatives and airbrush sprays applied to artwork up to A1 size. A1 drawing boards can be placed into the hoods at an angle for efficient over-spray capture. The workstation hood also accommodates prototypes, models, ceramic parts, PCB's etc., placed onto the hood base to be sprayed, soldered, cleaned, glued, moulded, sanded etc.

These cabinets are designed for studio / classroom / workshop cleanliness and for immediate operator protection whereby 'large' particulates (> 5 microns) are filtered out and 'fine' particulates (<5 microns) together with odours, gases, vapours and fumes within the hood enclosure are exhausted to atmosphere via the flexi-duct(s).

#### Key Features

For artwork applications, standard A1 drawing boards can be placed within the hood enclosure. The boards fit at an angle for efficient over-spray capture.

3D items, models, printed circuit boards etc. may be placed onto the hood base for spraying, cleaning, sanding, gluing etc. The Flexi-ducts can be fixed to a standard domestic vent(s) or simply placed through a partially open window to facilitate portability or convenience.

With the aid of a "Y" piece the 2 ducts can be placed through one hole in the wall.

Why choose the glue booth extraction unit?

The BV100H-D hood mounted extraction unit, like all ES filtration and extraction systems carries a lifetime guarantee. The unit has been designed to make sure it's quiet in operation and can be assembled in seconds. Simply place onto a desk, bench or trolley and then plug in and switch on to start extracting particulates from applications like glue over-spray and aerosol adhesives.

How does it filter harmful substances and solvent?

ESL58390



### Ducted Fume Extractor Cabinet 2

it is ideal for use with spray adhesives, conformal coatings and paints, monomers, hazardous powders and particulates, resins, sealants, solders, light grinding particles, organic solvents and cleaners etc.

All handling and/or use of potentially harmful substances is carried out within the hood enclosure in front of the intake filter area. For artwork applications, standard A2 drawing board can be placed within the hood enclosure. The board fits at an angle for efficient overspray capture.

These fume cabinets are designed for immediate operator protection whereby 'large' particulates (> 5 microns) are filtered out and 'fine' particulates (<5 microns) together with odours, gases, vapours and fumes within the hood enclosure are exhausted to atmosphere via the flexi-duct(s).

The Flexi-duct can be fixed to a standard domestic vent or simply placed through a partially open window to facilitate portability and/or convenience. Key Features, Can accommodate standard drawing boards, Clear polycarbonate panel for protection

Hood lighting

ESL58386



### Particle Filter IFA2p (Pack Of 6)

ack of 6 particle filters IFA2. For general spray and dust particle capture

ESL58402







**Hood Mounted Filtration Cabinet**

Hood mounted filtration cabinet with a high-efficiency carbon filter specifically designed to provide local exhaust ventilation in areas where it's not possible to use ducted level unit or fume filtration cabinet.

Applications:

The is for use in areas where external venting is impractical and hydrocarbon vapour and gas filtration is necessary. This unit is capable of filtering fumes, vapours and particles from:

Electrochemical (cleaning solvents, conformal coatings, etc.), Resins, Sealant and adhesives both in aerosol and static form Solder pots and soled irons.

The is also used in orthopaedics and dental laboratories to control staff exposure to methyl methacrylate and cyanoacrylate adhesives. It's also used to for safe weighing of hazardous powders.

Key Features of :

Clear polycarbonate panel for protection Hood lighting, Large capacity making it ideal for a wide range of uses, What's included with the ? Filter unit with fan(s), Hood Enclosure, Hood Light, Polycarbonate hinged front panel , 1 x Particulate filter, 1 x Activated Carbon Filter, Power Lead, Data/Warranty Booklet

ESL58394



**Spray Booth**

it is a general purpose hood mounted filtration cabinet and workstation for light aerosol spray and airbrush use and fume/vapour absorption and dilution. It designed for use within art, graphics, design technology areas, crafts and modelling. It has a big working space, and can accommodate up to an A1 size artwork, as well as prototypes, scale models, ceramics, PCBs and more.

its Applications:

Suitable for art and graphics, hobbies, modelling and craft application. It will extract fumes and filter particles created by:

it includes, Aerosol Adhesives, Lacquers, Fixatives, Airbrush Sprays, Solders, Light Grinding, Key Features

A2 or A1 drawing boards can be placed into the hoods at an angle for efficient over-spray capture.

The workstation hood also accommodates prototypes, models, ceramic parts, PCB's etc, placed onto the hood base to be sprayed, soldered, cleaned, glued, moulded, sanded etc.

ESL58409



**Water Swan Neck Tap Cold With Lever**

Swan Neck Tap - Cold with Lever

ESL58550



**Water Swan Neck Tap Hot**

Swan Neck Tap - Hot

ESL58551



**Water Mixer Swan Neck Tap With Lever**

Swan Neck Mixer Tap with Lever

ESL58549



**Gas Tap 2 Way 90 Degree**

Gas tap double for bench mounting

ESL58558



**Gas Tap 2 Way 180 Degree**

Gas tap double for bench mounting

ESL58559



**High Efficiency Filter Cabinet**

High-efficiency filter cabinet with acrylic capture shield to contain and filter within dental labs, electronic design, pharmaceutical labs, and classroom environments.

It includes :

- Filter unit with fan(s)
- Acrylic Spray Shield
- 1 x Particulate filter
- 1 x Activated Carbon filter
- Power Lead
- Data/Warranty Booklet

Application :

it is suitable for use in numerous situations where external venting is impractical but where contaminant capture and filtration is necessary. This includes the filtration of fumes, vapour and particulates emanating from: Monomers, adhesives, hazardous powders/particulates, conformal coatings, resins, sealants, solders, light grinding particles and dusts, organic solvents etc.

The folding PETG shield can be stored if not required thus reducing the unit footprint considerably. Handling and / or use of potentially harmful substances is carried out in front of the intake filter area. Cleaned air is vented to the top rear of the units .

Key Features, Folding clear petg plastic fume shield, Carry handle, ,Sturdy steel construction

ESL58398





### Hot Plat Pro

Max. Heating temperature is 380°C, High resolution LCD displays actual temperature, Aluminium cover with ceramic work plate, allows for immediate heat transfer, External temperature control is possible with temperature sensor PT1000, Digital temperature control with Max. Temperature at 380°C

#### Specifications

Work plate Dimension 140x140mm, Power 510W, Heating output 500W, Voltage 100-120/200-240V 50/60Hz, Temperature display LCD, Heating temperature range Room temp.+5°C - 380°C, Over heat Protection 420°C, Temperature display accuracy  $\pm 1^\circ\text{C}$ , External temperature sensor PT1000 (accuracy  $\pm 0.5^\circ\text{C}$ ), Protection class IP21

**Dimension :** [W x D x H] 320x180x108mm,

**Weight** 2.2kg, permissible ambient temperature and humidity 5-40°C 80%RH

ESL58418



### Magnetic Stirrer Basic

Maintenance free brush-less DC motor, Speed range of 0-1500 rpm, Max. Stirring quantity of H<sub>2</sub>O at 20L, Stainless steel work plate cover with ceramic material provides good chemical resistance performance,

#### Specifications :

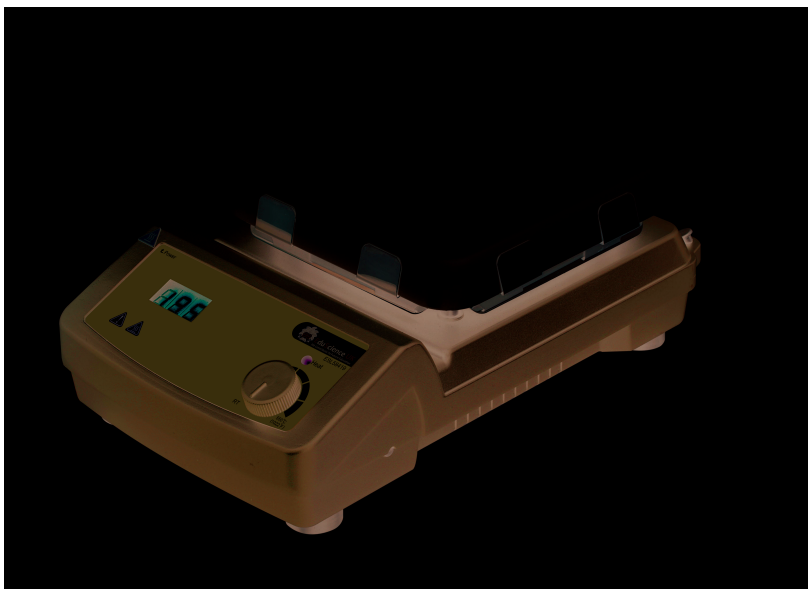
Work plate dimension  $\phi 135\text{mm}$  (5 inch), Work plate material Stainless steel cover with ceramic, Motor type Brush-less DC motor, Motor input power 18W, Motor output power 10W, Power 30W, Voltage 100-240V, 50/60Hz, Stirring positions 1, Max. Stirring quantity [H<sub>2</sub>O] 20L, Max. Magnetic bar [length] 80mm, Speed range 0-1500rpm, Speed display Scale Protection class IP42,

**Dimension :** [WxDxH] 160x280x85mm,

**Weight :** 2.8kg

Permissible ambient temperature and humidity 5-40°C, 80%RH

ESL58430



### Hot Plat ADV

LED screen shows temperature

Max. Temperature up to 550°C

Separate safety circuits with fixed safety temperature of 580°C

External temperature control is possible by connecting the temperature sensor (PT 1000) with an accuracy at  $\pm 0.5^\circ\text{C}$

Glass ceramic work plate provides excellent chemical-resistant performance and most efficient heat transfer.

The "HOT" warning will flash if the work plate temperature is above 50°C even when the hotplate is turned off Work plate Dimension 184x184mm (7 inch), Work plate material Glass ceramic, Power 1010W, Heating Power 1000W, Voltage 100-120/200-240V, 50/60Hz, Heating position 1, Heating temperature range Room temp.-550°C, increment 5°C, Control accuracy of work plate  $\pm 10^\circ\text{C}$ , Safety temperature 580°C, Temperature display LED, Temperature display accuracy  $\pm 1^\circ\text{C}$ , External temperature sensor PT1000 ( $\pm 0.5^\circ\text{C}$ ), Heating warning 50°C, Protection class IP21,

**Dimension :** [W x D x H] 215x360x112mm

**Weight :** 4.5kg, Permissible ambient temperature and humidity 5-40°C, 80%RH

ESL58419



### Magnetic Stirrer Mini

Suitable for stirring small size items, necessary for all kinds of labs, especially education and R&D institution. ABS plastic case, beautiful appearance, step-less speed regulation.

Range 0~2300 R/M (No Load) Max Stirring Capacity 1000ml, stirrer Timing range 0-2300 rpm (empty load),

Max. Stirring content 1000ml

Face diameter  $\phi 120\text{mm}$

Other technical parameters Power adapter DC6V

**Exterior Dimension :** and weight  $\phi 120 \times 49\text{mm} / 500\text{g}$

ESL58429





### Magnetic Stirrer Pro

High resolution LCD displays actual speed. Brush-less DC motor is maintenance free Aluminium cover with ceramic work plate, allows for immediate heat transfer, External temperature control is possible with temperature sensor PT1000, Digital temperature control with Max. Temperature at 380°C, Digital speed control with Max. Speed up to 1500rpm, Max. Stirring quantity of H<sub>2</sub>O at 5L

#### Specifications :

Work plate Dimension 140x140mm, Work plate material Aluminium cover with ceramic coating, Motor type Brush-less DC motor, Motor rating input 2.4W, Motor rating output 1.8W, Power 10W, Voltage 100-120/200-240V 50/60Hz, Stirring positions 1, Max. Stirring quantity[H<sub>2</sub>O] 5L, Max. Magnetic bar[length] 50mm, Speed range 200-1500rpm, Speed display LCD, Control accuracy of sensor ±20rpm, Protection class IP21, **Dimension** : [W x D x H] 320x180x108mm

**Weight** : 2.2kg, Permissible ambient temperature and humidity 5-40°C 80%RH

ESL58431



### Hot Plat Magnetic Stirrer Basic

Maintenance free brush-less DC motor

Max. Temperature to 340°C

Stirring speed up to 1500 rpm

Stainless steel work plate with ceramic coating provides good chemical-resistant performance

Safety circuits provide overheating protection

A wide variety of accessories are available

Specifications :

Work plate dimension φ135mm(5 inch), Work plate material stainless steel cover with ceramic, Motor type Brush-less DC motor, Motor rating input 18W, Motor rating output 10W, Power 550W, Heating output 500W, Voltage 100-120/200-240V 50/60Hz, Stirring positions 1, Max. Stirring quantity[H<sub>2</sub>O] 20L, Max. Magnetic bar[length] 80mm, Speed range 100-1500rpm, resolution±1rpm, Speed display Scale, Temperature display Scale, Heating temperature range Room temp.-340°C, Over temperature protection 350°C, Temperature display accuracy ±0.5°C, Protection class IP42

**Dimension** : [WxDxH] 160x280x85mm

**Weight** 2.8kg, Permissible ambient temperature and humidity 5-40°C, 80%RH

ESL58439



### Hot Plate Magnetic Stirrer Mini

suitable for stirring small size items, necessary for all kinds of labs, especially education and R&D institution , Power adapter DC6V Exterior dimension and weight Φ120x49mm/500g

Stepless speed regulation.

Constant power heating, no-load surface temperature 120 °C

A thermal protection device of 150 °C.

Range 0~2300 R/M(no load)

Max Stirring Capacity 1000mL.

ESL58438



### Hot Plat Magnetic Stirrer Pro

Brush-less DC motor is maintenance free and explosion-proof

Digital temperature control with Max. Temperature at 340°C, Digital speed control with Max. Speed up to 1500rpm, Max. Stirring quantity of H<sub>2</sub>O at 20L, Safety circuits provide overheating protection, The "HOT" warning will flash if the plate temperature is above 50°C even when the hotplate is turned off High-resolution LCD display shows actual temperatures and speed (displays the time also), External temperature control is possible by connecting the temperature sensor(PT 1000) with accuracy at ±0.2°C, Stainless steel work plate with ceramic coating provides good chemical-resistant performance Remote function provides PC control and data transmission, A wide variety of accessories are available

Specifications :

Work plate dimension φ135mm(5 inch), Work plate material stainless steel cover with ceramic, Motor type Brush-less DC motor, Motor rating input 18W, Motor rating output 10W, Power 550W, Heating output 500W, Voltage 100-120/200-240V 50/60Hz, Stirring positions 1, Max. Stirring quantity[H<sub>2</sub>O] 20L, Max. Magnetic bar[length] 80mm, Speed range 100-1500rpm, resolution±1rpm, Speed display LCD, Temperature display LCD, Heating temperature range Room temp.-340°C, increment 1°C, Temperature control accuracy ±1°C(<100°C), ±1%(>100°C), Over temperature protection 360°C, Temperature display accuracy ±0.1°C, External temperature sensor PT1000 (accuracy ±0.2), "Hot" warning 50°C, Data connector RS232, Protection class IP42

Specifications :

Work plate dimension φ135mm(5 inch), Work plate material stainless steel cover with ceramic, Motor type Brush-less DC motor, Motor rating input 18W, Motor rating output 10W, Power 550W, Heating output 500W, Voltage 100-120/200-240V 50/60Hz, Stirring positions 1, Max. Stirring quantity[H<sub>2</sub>O] 20L, Max. Magnetic bar[length] 80mm, Speed range 100-1500rpm, resolution±1rpm, Speed display Scale, Temperature display Scale, Heating temperature range Room temp.-340°C, Over temperature protection 350°C, Temperature display accuracy ±0.5°C, Protection class IP42

**Dimension** : [WxDxH] 160x280x85mm,

**Weight** : 2.8kg, Permissible ambient temperature and humidity 5-40°C, 80%RH

ESL58440





### Hot Plat Magnetic Stirrer LCD

LCD display for precise monitoring of speed and temperature, Built-in PID controller ensures safe heating of the medium with overheating protection, Max. Heating plate temperature 550°C, Glass ceramic work plate provides excellent chemical resistant performance and most efficient heat transfer, External temperature control is possible by connecting the temperature sensor (PT1000) with an accuracy at  $\pm 0.2^\circ\text{C}$ , Digital speed controlling, max. speed at 1500rpm, Outstanding brushless DC motor enables more stirring power, Two rotating knobs enable easy adjustment of speed and temperature, The "HOT" warning will flash when the work plate temperature is above 50°C even when the hotplate is turned off Remote function provides PC control and data transmission Specifications

Work plate Dimension [W x D] 184x184mm (7 inch), Work plate material Glass ceramic, Motor type Shaded pole motor, Motor rating input 15W, Motor rating output 1.5W, Power 1030W, Heating output 1000W, Voltage 100-120/200-240V 50/60Hz, Stirring positions 1, Max. stirring quantity, [H<sub>2</sub>O] 10L, Max. Magnetic bar [length] 80mm, Speed range 0-1500rpm, Speed display Scale, Temperature display LCD, Heating temperature range Room temp.-550°C, increment 5°C, Temperature control accuracy  $\pm 1^\circ\text{C}$ , Overheating protection 580°C, Temperature display accuracy  $\pm 1^\circ\text{C}$ , External temperature sensor PT1000 (accuracy  $\pm 0.2$ ), "Hot" warning 50°C, Protection class IP21

**Dimension :** [WxDxH] 215x360x112mm

**Weight :** 4.5kg, Permissible ambient temperature and humidity 5-40°C, 80%RH

ESL58441



### Hot Plat Magnetic Stirrer LED ADV

LED display for precise monitoring of temperature

A wide speed range of 0 to 1500rpm

Max. Heating plate temperature 550°C

External temperature control is possible by connecting the temperature sensor (PT1000) with accuracy at  $\pm 0.2^\circ\text{C}$

The "HOT" warning will flash if the work plate temperature is above 50°C, Work plate Dimension [W x D] 184x184mm (7 inch)

Work plate material Glass ceramic, Motor type Shaded pole motor, Motor rating input 15W, Motor rating output 1.5W, Power 1030W, Heating output 1000W, Voltage 100-120/200-240V 50/60Hz, Stirring positions 1, Max. stirring quantity, [H<sub>2</sub>O] 10L, Max. Magnetic bar [length] 80mm, Speed range 0-1500rpm, Speed display Scale, Temperature display LED, Heating temperature range Room temp.-550°C, increment 5°C, Temperature control accuracy  $\pm 1^\circ\text{C}$ , Overheating protection 580°C, Temperature display accuracy  $\pm 1^\circ\text{C}$ , External temperature sensor PT1000 (accuracy  $\pm 0.2$ ), "Hot" warning 50°C, Protection class IP21

**Dimension :** [WxDxH] 215x360x112mm,

**Weight :** 4.5kg, Permissible ambient temperature and humidity 5-40°C, 80%RH

ESL58442

### Heating Mantle Controlled

Heating mantle Control Method : Proportional Voltage Control.

Based on the user's need, before using, the temperature should be controlled by using a separate thermometer As the heated part (heated object) is hand-woven using fibre glass, Fire is prevented by a built-in Thermal protector, which automatically shuts down, the product in case the inside temperature exceeds an appropriate temperature.

The product resumes normal operation when the inside temperature returns to normal.

Thermal Insulation uses non-toxic asbestos-free ceramic wool (fibre glass).

There are two kinds of heated part shape like flask type and beaker type.

Products installed temperature voltage controller.

Case Construction Steel, with chemically resistant powder coating

Thermal Insulation Asbestos-free ceramic wool. (Fibre glass)

Heating Element Ni-chrome wire

Mantle Woven glass fibre mat

Heating Element Temperature Up to 450 °C, Maximum

Supply Voltage & Frequency AC 110~220V (or 220~230V), 50/60Hz

ESL58455

For flask capacity 100 ml

ESL58456

For flask capacity 250 ml

ESL58457

For flask capacity 500 ml





**Vacuum Pump Hand Operated**

Hand Operated Vacuum Pump

ESL58470



**Vacuum Pump Electric Lab Use**

Oil-free pump. With innovative electronic, mechanical technology and human design concept make Rocker's family quiet and low vibration, compact and light weight, clean and maintenance free, safe and comfortable.

Max. Vacuum: -680mmHg \* Max. Flow: 23 l/Min \* Motor rotation: 1750 RPM \* Horse power: 1/8 HP \* Noise level: 50.0dB

ESL58472



**Autoclave Media**

Electrically heated, 12 litre capacity bench top autoclave designed specifically for the safe and effective sterilization of media.

- Dual interlocking handles prevent the lid being removed until the vessel has reached a safe pressure and temperature.
- Fully CE marked to the Medical Devices Directive 93/42/EC
- Sterilizes at 121 °C.
- Full one year warranty
- Maximum capacity liquids 500ml
- Made in the UK

**Dimensions :** Height: 420mm

ESL58481 12 Litre

ESL58482 9 Litre



**Vacuum Pump Electric**

Vacuum pump, electric:

Single stage

Suction capacity 4,6 m<sup>3</sup>/h

Ultimate vacuum 10 Pa

Noise 46 - 50 dB(A)

Suction connector KS 6/4 mm

Motor power 120 W

Voltage source 220 - 240 V / 50 - 60 Hz

**Dimension :** s 28x12x21 cm

**Weight :** 7 kg

ESL58471



**Vortex Mixer**

Touch operation or continuous mode

Used for various mixing applications with optional adapters

Specially designed vacuum suction feet for body stability

Robust aluminium-cast construction

Specifications

Voltage 110-120V/220-230V,50/60Hz

Power 60W

Mixing motion Orbital

Orbital diameter 4mm

Motor type Shaded pole motor

Motor rating input 58W

Motor rating output 10W

Speed range 2500rpm

Run type Touch operation/Continuous

**Dimension :** [WxHxD] 127x130x160mm

**Weight :** 3.5kg

Permissible ambient temperature 5-40 °

Permissible relative humidity 80%RH

Protection class

IP21

Fixed Speed

ESL58494

Variable Speed

ESL58495





**Centrifuge Basic**

Speed range of 300-4500rpm, Individual control of speed and time, Faster acceleration and deceleration, Perfectly suitable for 15mL cell culture tubes and a full line of collection tubes , Specifications , Speed Range 300-4500rpm,increment: 100rpm, Max. RCF 2490xg, Speed accuracy ±100rpm, Rotor Capacity 1 type, Run Time 1sec-99min HOLD(Continuous operation), Motor DC motor, Display LED, Safety Devices Door interlock,Over-speed detection, Acceleration, /Braking time [Sec] 23s 23s Power Single-phase,220V-240V,50Hz/60Hz, 3A;100V-120V,50Hz/60Hz, 3A 70W,

**Dimension :** [D×W×H] 301×354×217mm

**Weight :** 6kg, Advanced Features sound-alert function.

ESL58504



**Centrifuge Basic LCD**

Easy programming to achieve high accuracy of speed control, Easy operation with intuitive menu and easy-to-read display Rotor speed can be set and displayed by RPM or G-force, Maintenance-free brush-less DC motors, Quick spin function with press and hold pulse key, Lid with electric lock and automatic release function saves processing time and prevents samples overheating Automatic self-diagnosis on start up showing accumulative running time and last running parameters, Braking time 2 gears adjustable(for A6-50P rotor), A12-10P and A6-50P are not interchangeable, Specifications

Speed Range 300-4500rpm,increment: 100rpm, Max. RCF 2490xg, Speed accuracy ±20rpm, Rotor Capacity 1 type, Run Time 30sec-99min/Continuous, Motor Brush-less DC motor, Display LCD , Safety Devices Door interlock,Overspeed detector; Automatic internal diagnosis, Acceleration /Braking time [Sec] 20s 13s , Power Single-phase, 110V-240V,50Hz/60Hz, 3A, 70W

**Dimension :** [D×W×H] 301×354×217mm

**Weight :** 6kg, Certification CE, UL, IVD, Advanced Features Speed/RCF switch; Short-time run function; sound-alert function

ESL58505



**Centrifuge Mini**

Ideal for micro-filtration and quick spin-downs, Easy-to-use with dual start/stop function, 5000rpm fixed speed, Compatible with 2mLx8 and PCR8x2 rotors, Quiet running, noise level ≤45dB, Rotor change without tools, Accelerates and brakes in seconds, Available in two colours i.e., green, blue

ESL58503



**Centrifuge Tube Sterile Bulk-Pp, 15ml**

SPINNING Centrifuge Tube Sterile Bulk-PP,

ESL58537 15ml, 25/pack

ESL58538 50ml, 25/pack



**Centrifuge Hand, 2 X 15ml**

A single speed hand driven machine consisting of die-cast parts and a steel pinion and worm drive. Screw clamps the machine to the bench. Stove enamelled finish, with removable crank handle. Suitable for 15ml glass tubes.

ESL58528

**Centrifuge Hand, 4 X 15ml**

A single speed hand driven machine consisting of die-cast parts and a steel pinion and worm drive. Screw clamps the machine to the bench. Stove enamelled finish, with removable crank handle. Suitable for 15ml glass tubes.

ESL58529





**Pipette Filler Electric ADV**

Compatible with most of the plastic and glass pipettes from 0.1 -100mL  
 Eight speeds of selection for aspiration and dispensing different liquids  
 Large LCD display showing low battery warning and speed settings  
 Enables single-handed operation with minimum effort  
 Light and ergonomic design providing easy usability  
 High capacity Li-ion battery enable long runtime of operation  
 Powerful pump fills a 25mL pipette in<5 seconds  
 0.45µm replaceable hydrophobic filter  
 Rechargeable during use  
 Specifications  
 Aspiration Speed 25mL<5s (8 shift)  
 Dispensing Speed Motor (8 shift)/Gravity  
 Battery Lithium-ion  
 Battery Service Life More than 8 Hours of Intermittent Use  
 Charging Time 2-3 Hours  
 Pipette Types Glass or Plastic Pipette (0.1-100mL), Pasture Pipettes  
 Filter 0.45µm Hydrophobic  
 Weight 200g

ESL58570

**Micro-pipette Variable Range Basic**

Pipettes cover a volume range from 0.1µL to 10mL  
 Ergonomic design provides excellent operating experience  
 Large display window allows for easy volume identification  
 Easy calibration and maintenance  
 Each Micro Pipette supplied with an individual calibration certificate according to ISO8655 , please select your suitable volume range :

- ESL58573 Volume range : 0.1-2.5µl
- ESL58574 Volume range : 0.5-10µl
- ESL58575 Volume range : 2-20µl
- ESL58576 Volume range : 5-50µl
- ESL58577 Volume range : 10-100µl
- ESL58578 Volume range : 20-200µl
- ESL58579 Volume range : 50-200µl
- ESL58580 Volume range : 100-1000µl
- ESL58581 Volume range : 200-1000µl
- ESL58582 Volume range : 1000-5000µl
- ESL58583 Volume range : 2-10ml



**Pipette Filler Electric Basic**

Suitable for almost all commonly used glass or plastic pipettes.  
 Enables single-handed operation with minimum effort  
 Compatible with most of the plastic and glass pipettes from 0.1-100mL  
 Easily adjustable speed control• 0.45µm replaceable hydrophobic filter  
 Stable and reliable performance, elegant appearance  
 High capacity Li-ion battery enable long operation time.  
 Specifications  
 Aspiration Speed 25mL<7s  
 Dispensing Speed Motor/Gravity  
 Battery Lithium-ion  
 Battery Service Life More than 8 Hours of Intermittent Use  
 Charging Time 2-3 Hours  
 Pipette Types Glass or Plastic Pipette (0.1-100mL), Pasture Pipettes  
 Filter 0.45µm Hydrophobic  
 Weight 200g

ESL58569

**Pipette Controller**

Ease of use  
 Precise pipetting control  
 Robust and light weight  
 Compatible with most of the plastic and glass pipettes from 0.1 -100mL  
 3µm replaceable hydrophobic filter  
 Easy cleaning and maintenance



ESL58568

**BOTTLE TOP DISPENSER**

Excellent chemical resistance, components are made of PTFE, FEP, BSG, PP  
 Fully autoclavable at 121 °C  
 Four ranges of bottle-top dispenser covering different volume range  
 Easy for cleaning and maintenance  
 The optional flexible discharge tube with safety handle permits fast and precise dispensing  
 Vapour pressure Max. 500mbar, viscosity Max. 500mm<sup>2</sup>/s,  
 Temperature Max. 40 °C, density Max. 2.2g/cm<sup>3</sup>

ESL58590

- ESL58590 Volume range : 0.5-5 ml
- eSL58591 Volume range : 1.0-10 ml
- eSL58592 Volume range : 2.5-25 ml
- eSL58593 Volume range : 5.0-50 ml





**EduScience UK**



## FURNITURE



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# FURNITURE

- Classroom Furnitures
- laboratory Fittings





### Science Cart

This mobile system will transform any room into a science lab. The cart is fitted with sets of trays for laboratory experiment equipment and easily movable from room to room.

The EduCart is a flat packed, cost-effective mobile teaching complex and convenient storage system, which provides an integrated approach to teaching natural sciences with the use of modern technology.

The EduCart frame is made out of sturdy, acid resistant steel with doors that are fire and scratch resistant. One of the side has a heavy duty handle for easy manoeuvring and, with the help of our high quality wheels, the cart can be easily pushed over uneven ground.

The autonomous water system consists of an acid resistant polypropylene sink with a stainless steel faucet. The water flow can be easily controlled with a button that is connected to the built-in electric pump.

**Size of the cart assembled :** L1509 x W690 x H1073mm.

**ESA62322**

### Mobile Science Bench

The Mobile Science Bench (MSB) has been designed by science teachers for Secondary and Tertiary school science teaching and learning. It is a self-contained mobile science laboratory enabling the teaching of science in any classroom within your school or institution. The MSB provides an ideal flexible laboratory facility for wheel in Lectures and demonstrations and as a temporary laboratory facility when schools are undergoing redevelopment and change. The bench is designed for Secondary students providing the correct working height and the width allows easy access through standard doorways.



#### Features:

Laboratory grade working surface: Trespa Athlon, Pull out surfaces for extra working space, Gratnells trays provide ample storage space for equipment, Lockable doors for safety, Push/pull handles for easy manoeuvrability, Lockable castors for stability, Mains plug with minimum 4 socket outlet, Double gas tap tubing for bottled gas\*, Running water via clean waste water tanks. Powerful water pump and waste disposal system, Screw in sockets for standard retort stands, Computer monitor arm, Lockable computer storage

#### Supplied with:

12 x Blue Shallow Gratnell trays (6 on each side), 1 x Small drip cup sink, 1 x 2 way gas tap with fixed tubing, 1 x Swan neck water tap 5 x lockable doors with keys, Tubing connected to gas tap (no gas regulator supplied), Computer screen monitor arm, 2 x Screw in retort stand sockets, 2 x water containers (1 x waste-Black, 1 x fresh-Clear), 1 x smooth constant flow fully sealed IP65 rated water pump, Self-Priming pump up To 3m (10ft), Suitable For 15mm Quick Connect Plumbing, Run dry protection Strainer to protect from debris, 1 x Irwin Powerswitch PSU, 1 x Input Supply voltage 230V dc Supply frequency 50Hz, Mains fuse Rear panel 2A, 20mm quick blow Mains plug 3A, Output Voltage 2, 4, 6, 8, 10, 12V ac nominal 1, 3, 5, 7, 9, 11V full wave rectified DC nominal, Maximum output current 5A AC or DC Please note: The bench is not supplied with either a gas regulator or gas bottle. A suitable and sufficient COSHH (Control of Substances Hazardous to Health Regulations) and DSEAR (Dangerous Substances and Explosive Atmospheres Regulations) risk assessment must be performed for gas and gas equipment by the school.

**Size :** 1250 (Height) x 1530 (Width) x 700 (Depth)

\* Gas bottle requirements are Butane gas in either 3.5kg or 4.5kg sizes.

**ESA62324**





### Primary Science Bench

A fully functional, mobile science laboratory designed specifically for Primary Schools.

All benches are supplied with mains power, lockable castors and both cupboards contain Gratnells trays. Complete Primary Science Bench supplied fully assembled with all the below options. Options can be modified to suit your teaching environment. Please call us to discuss further.

Laboratory grade working surface - 16mm Trespa, Pull out surfaces for extra working area, Plenty of storage space, Gratnells trays for storage of science equipment, Lockable wheels, Lockable cupboard doors, Butane Gas (optional), Running water with clean and waste tanks, Monitor arm (optional)

Length : 1400mm

Depth : 700mm Height: 845mm .

Weight : 210Kgs approximately

Please note: The bench is not supplied with either a gas regulator or gas bottle. A suitable and sufficient COSHH (Control of Substances Hazardous to Health Regulations) and DSEAR (Dangerous Substances and Explosive Atmospheres Regulations) risk assessment must be performed for gas and gas equipment by the school.

**Dimensions :** 1200 (Height) x 1400 (Width) x 700 (Depth)

**Weight :** 205kg,

\* Gas bottle requirements are Butane gas in either 3.5kg or 4.5kg sizes.

ESA62325



### Mobile Food Technology Bench

Versatile mobile Food Technology Bench which allows the teaching of Food Technology to be performed in an ordinary classroom. The unit comes complete with running water, clean and waste water tanks, a full sized cooker/grill, a twin hob induction cooker, a silicone pastry mat and rolling pin, 5 standard Gratnells trays and additional storage. Requires 2 x Mains outlet ? 1 for the cooker/water and 1 for the induction hob.

The unit is sized to easily fit through standard doorways and is fitted with wheels (two lockable) for ease of use.

#### Key features:

Food Grade working surface 16mm Trespa Athlon

Full size electric cooker with grill

Twin induction hob and large silicone pastry mat in locked storage cupboard

Running water with clean and waste tanks

Gratnells trays for storage of utensils and cooking equipment

Lockable cupboard doors

Easy push with lockable wheels for stability

Only requires 2 x 13A socket for power

#### Dimensions :

Length : 1424 mm

Depth : 700mm

Height : 950 mm

ESA62327



**Fume Cupboard Mobile Eduscience 1000Rs**

Mobile Fume Cupboard

Product Description

The unit gives good flexibility and can be manoeuvred to different locations. An RS CMS schools filter is used to absorb the fumes generated during practical work. A pre filter is fitted to protect the filter and the filter and fan are housed in the base of the unit. A counterweighted front sash and clear laminated safety glass sides and rear provide 360° visibility ideal for demonstrations. The unit comes complete with an integral storage cupboard and fan failure monitoring system. The optional services are remote gas, electrical socket, and remote water service including drip cup, bottle trap and a 2m flexible drain hose.

Complies to building bulletin 88 from the Department of Education and Employment

Tested by CLEAPSS

Designed to comply to BS 7989:2001

Benefits:

Variable air volume (two speed)

Fully mobile

360° visibility

No ducting required

Sliding front sash

Fan failure monitoring

Restraining stainless steel tether

Integral storage cupboard

Specifications:

Average inflow: 0.4m/s

Minimum working aperture: 200mm high

Maximum working aperture: 365mm high

Voltage : 230V

Filter type: RS CMS schools filter, a blended filter to meet the national curriculum needs for teaching science

Please note that the appearance of the product may differ from the models shown. If in doubt please contact customer services.

**Size :** 1000 x 700 x 1850mm (w x d x h)

Internal **Dimensions :** 840 x 500 x 865mm (w x d x h)

Minimum working aperture : 200mm high

Maximum working aperture : 365mm high

Voltage : 230V 50Hz 1ph



ESA62329



**Fume Cupboard Static Filtration**

Static Filtration Fume Cupboard

Product Description

**Features & Benefits:**

it is ideally suited for the use in the classroom or prep-room, 22kg CMS carbon filter, Filtrate pre-filter, Polypropylene worktop and vulcathene dricup, Low airflow alarm, No ducting required, Sliding front sash, Standard services including: gas and water, Single electric socket, Plain stand, Light, Energy efficient

**Specifications**

External size: 1000 x 760 x 2200mm (WxDxH)

Internal size: 950 x 550 x 780mm (WxDxH)

Minimum working aperture: 200mm high

Maximum working aperture: 365mm high

Average airflow: 0.4M/s (alters with sash position)

Voltage: 230V 50Hz 1ph

Filter: CMS schools filter blended to meet the national curriculum needs for teaching science

ESA62334





### Fume Cabinet Ductless

EDU Chemcap ductless fume cabinet, for bench mounting. Pre-filter and Chemcap filters (x2), MP type.

Sound Level:<50dBA, Face Velocity: >0.3m/s , Power: 96W , Air Changes: 0.59 m3

#### Features

Quiet operation >50dBA.

Anemometer airflow indicator.

All round visibility of cabinet interior.

Edu Chemcap exceeds the requirements of important international standards for use of re-circulatory filtration cabinets in schools and colleges:

Design Note 29 and Building Bulletin 88 Ideal for teaching practical chemistry

ES EDU Chemcap fume cabinet (ductless, re-circulatory filtration) is ideal for use in education, providing staff and students with a flexible system that allows excellent all round vision and ensures safety is maintained.

The use of Chemcap Carbon filtration (type MP) makes it ideal for a mixed use laboratory and removes a very wide variety of fumes and vapours.

Cabinets have trapezium shaped front access and double hinged front doors which open fully to allow access to the cabinet interior for loading, setting up an experiment and for cleaning. The base tray is black which is excellent for highlighting spillages. Two services ports with covers are provided in the rear panel.

Cabinet can be placed onto an existing work surface or supplied with its own mobile bench (optional cupboard doors and services kit).

The mobile bench enables the cabinet to be fully mobile, large castors (lockable) facilitate easy movement of the cabinet from room to room over

rough floors and door sills.

The secure docking hub is an optional extra which is a wall mounted lockable cabinet providing security and protection for utility connections.

Filtration technology ES is a leader in carbon filtration technology: High performance laboratory grade carbon filter media is impregnated with additives to ensure the best possible retention capacity and filtration performance.

Chemcap Enviro Filters: was one of the first companies to replace potentially toxic and carcinogenic inorganic additives with environmentally friendly and biodegradable compounds, whilst achieving excellent retention capacities that are amongst the best in the world.

Filtration used In EDU Cabinets Pre-filtration; eliminates particles at 5.0micron or larger to an efficiency of 92% as defined in BS EN ISO 779.

Carbon Filtration eliminates toxic species and compounds within the recommended occupational exposure limit for pollutant gases having molecular weight equal to or greater than 30.

Efficiency 99.9%.

Optional: HEPA filtration (H14 Standard) eliminates particles 0.3 microns or larger to an efficiency of 99.995%.

Optional extras

Secure Docking Hub. Security and protection for your students and staff - enables your cabinet to be moved around safely.

Wall-mounted secure utility connections cabinet.

Lockable, accessed by authorised users only.

Customizable access plate in base.

Connections secure at all times, in use or not.

Mobile Bench. Make your portable EDU Chemcap fume cabinet fully mobile with the addition of a robust epoxy coated pressed steel open stand (Part No. AT0013/01) or cupboard (Part No. AT0013/02). Large lockable castors assist when moving over rough floors and door sills. Double electrical socket included, mounted to the rear of the bench.

Mobile bench Option Services Kit Option. Gas tap and swan neck water tap with drip cup. Connectors and hoses (1.5m) are included.

**ESA62331** Dimensions (mm) WxDxH: 1020x750x1130

**ESA62332** Dimensions (mm) WxDxH: 1020x750x1950

**ESA62333** Dimensions (mm) WxDxH: 1020x750x1950





**Safety Cabinet Acid And Alkali Floor**

Use of caustic materials present many hazards, particularly if acids and alkalis are stored incorrectly or with other chemicals. These storage cabinets enable secure and identifiable storage in the workplace.

Welded all steel structure for extra strength Seven lever safe lock for high security Full length heavy duty hinges with concealed fixings to prevent forced entry New regulation labels enclosed to be fitted by customer to suit regulations Powder coated with Germ Guard Active Technology anti-bacterial paint. Made from 1.5mm steel Integral liquid-tight sump encourages the correct handling of spills through the use of absorbent Reaction to Fire Classification EN 13501-1

<b>ESA62335</b>	W 900 x d 460 x h 700mm	Number of shelves - 1, Number of doors - 2, <b>Dimensions</b> : 2
<b>ESA62336</b>	W 1200 x d 460 x h 1800mm	Number of shelves - 3, Number of doors - 2, <b>Dimensions</b> : 2
<b>ESA62337</b>	W 350 x d 300 x h 700mm	Number of shelves - 1, Number of doors - 1, <b>Dimensions</b> : 1
<b>ESA62338</b>	W 460 x d 460 x h 900mm	Number of shelves - 3, Number of doors - 1, <b>Dimensions</b> : 2
<b>ESA62339</b>	W 900 x d 460 x h 1800mm	Number of shelves - 3, Number of doors - 2, <b>Dimensions</b> : 2
<b>ESA62340</b>	W 900 x d 460 x h 900mm	Number of shelves - 2, Number of doors - 2, <b>Dimensions</b> : 1





**Safety Cabinet Hazardous, Floor**

Hazardous Floor Cupboards enables the separate storage and transportation of hazardous substances as demanded by the COSHH regulations. Fire tested and certified EN13501-1 'No snag' handles Adjustable spill-retaining galvanised shelves for superior spill management Integral liquid-tight sump encourages the correct handling of spills through the use of absorbent Welded integrated sump, angled lid to discourage article placement and a hasp and staple lock (padlock not supplied)

<b>ESA62341</b>	W 1200 x d 460 x h 1800mm	Number of shelves - 3, Number of doors - 2, <b>Dimensions : 2</b>
<b>ESA62342</b>	W 350 x d 300 x h 700 mm	Number of shelves - 1, Number of doors - 1, <b>Dimensions : 1</b>
<b>ESA62343</b>	W 900 x d 460 x h 1200 mm	Number of shelves - 2, Number of doors - 2, <b>Dimensions : 2</b>
<b>ESA62344</b>	W 900 x d 460 x h 1800 mm	Number of shelves - 3, Number of doors - 2, <b>Dimensions : 2</b>
<b>ESA62345</b>	W 900 x d 460 x h 700 mm	Number of shelves - 1, Number of doors - 2, <b>Dimensions : 2</b>
<b>ESA62346</b>	W 900 x d 460 x h 900 mm	Number of shelves - 1, Number of doors - 2, <b>Dimensions : 2</b>

**Safety Cabinet Radioactive Storage**



**Radioactive Storage Cupboard**

**Product Description**

This is a stoutly built enamelled sheet-steel cupboard having a louvred, lockable door bearing a standard international red and yellow warning plate. Two keys are provided for the lock. The rear wall of the cupboard carries two narrow steel shelves which ensure that any containers placed on them are at the maximum possible distance from the door.

The dimensions of the cupboard are such that assuming a maximum stock of 30 ° Ci in the form of Co60 is kept on the shelf, the dose rate at the surface of the door would be less than 0.5 mR/hr. A rectangular plastic tray is provided to contain any spillages.

The cupboard is provided with small fixing holes so that it may be screwed to a wall. It is recommended that it is sited away from normally occupied areas and that its back is against or attached to a wall.

**Dimensions : 380 x 380 x 380mm.**

Tray: 310 x 240 x 20mm deep.

**ESA62347**



**Safety Cabinet Drugs and Poisons**

**Drugs And Poisons Cabinet**

**Product Description**

Lockable cabinet for the secure storage of scheduled drugs and poisons. Designed for wall mounting through special reinforced panels incorporated in the back.

Features include sealed hinges and three adjustable shelves. Door hinges to the right.

**Dimensions : W458 x H610 x D152mm.**

**ESA62348**





**Trolley With Gragnells Tray**

The Gragnells storage system is unique and designed for the organisation of all types of school equipment and the enormous range of science materials and equipment that need storing. Manufactured from square steel tubes with slots at 25mm intervals to take trays. The trolleys have 80mm castors and are ideal when transporting equipment around the room. Metal runners are required and sold separately but are adjustable and can accommodate our range of super-tough trays. Supplied flat packed for self assembly. Please note: Trays and runners are sold separately.

<b>ESA62349</b>	Double column tall frame	Size W710 x D420 x H1850mm. This product holds up to 34 shallow trays.
<b>ESA62350</b>	Double column - h725mm	Size: W710 x D420mm. This product holds up to 12 Shallow trays and comes with heavy duty castors.
<b>ESA62351</b>	Double column - h850mm	Size: W710 x D420mm. This product holds up to 12 Shallow trays and comes with heavy duty castors.
<b>ESA62352</b>	Single column - h725mm	Size: W370 x D420mm. This Products hold up to 6 shallow trays and come with heavy duty castors.
<b>ESA62353</b>	Single column - h850mm	Size: W370 x D420mm. This product holds up to 6 Shallow trays and comes with heavy duty castors.
<b>ESA62354</b>	Treble column tall frame - 1850mm	Size: W1055 x D420mm in 2 heights with adjustable feet with flat metal top.
<b>ESA62355</b>	Treble column - h725mm	Size: W1055 x D420mm. This product holds up to 18 Shallow trays and comes with heavy duty castors.
<b>ESA62356</b>	Treble column - h850mm	Size: W1055 x D420mm in 2 heights with recessed top.







**Lab Trolley Three Tier Apparatus**

Three Tier Apparatus Trolley  
Fully welded, tubular end frame construction in stainless steel. Shelf heights 210mm, 520mm and 820mm from floor level. The shelves are fixed (i.e. not removable) for added stability and are supplied lipped edges up, (lipped edges down are available on request). Maximum weight limit is 200kg uniform distributed load. Size: L1060 x W460 x H900mm.

ESA62358



**Ribbed Rubber Mat**

Ribbed Rubber Mat, Rubber mat to fit the three and two tier apparatus trolleys. 3mm thick  
Size: 1000 x 460mm.

ESA62362

**Lab Wall Bench**

Lab wall bench different sizes are available according to your lab room size.

ESA62386



**Lab Student Bench Octagonal Shape With Tap & Sink**

Lab student bench octagonal shape with tap & sink

ESA62378

**Lab Student Bench Octagonal Shape**

Lab student bench octagonal shape

ESA62379



**Lab Teacher Bench**

Lab teacher bench

ESA62373





**Computer Teacher Table**

Size: 1600x750x900mm (LxDxH)  
 Table top from 24mm thick melamine laminated MDF with 2mm thick PVC edging on all sides  
 Front panel 220mm high from 24mm thick melamine laminated MDF with 2mm thick PVC edging on all sides  
 Frame from 50x20x2mm thick epoxy powder coated mild steel oval tube with end cap  
 Front connecting frame from 40x20x1.5mm thick epoxy powder coated mild steel tube  
 1 no. CPU Holder from 25x2mm thick epoxy powder coated mild steel flat bar  
 1 no. 13Amp/220Volts Double electric outlet  
 1 no. Data network outlet  
 1 no. Cable cover 80mm dia

ESA62397

**Computer Student Table**

Size:900x750x750mm (LxDxH)  
 Table top from 24mm thick melamine laminated MDF with 2mm thick PVC edging on all sides  
 Front panel 220mm high from 24mm thick melamine laminated MDF with 2mm thick PVC edging on all sides  
 Frame from 50x20x2mm thick epoxy powder coated mild steel oval tube with end cap  
 Front connecting frame from 40x20x1.5mm thick epoxy powder coated mild steel tube  
 1 no. CPU Holder from 25x2mm thick epoxy powder coated mild steel flat bar  
 1 no. 13Amp/220Volts Double electric outlet  
 1 no. Data network outlet  
 1 no. Cable cover 80mm dia

ESA62401



**Lab Stool Stacking PP**

Stool stacking PP 685mm  
 black

ESA62366



**Charging Cabinet**

ES232PS is ideally working for transporting, securing, protecting and charging up to 32 tablets, accommodate almost any tablet up to 13" screen size. Data Synchronize Function, Create, Delete, Move and Modify easily and quickly through by Sync function and charging compatibly with most of any tablets even it mixed in both IOS &Android.  
 USB Charging Standard, providing DC5V/2.4A power from each USB port. Multiple Tablet Charging Design will comes more popular to be used for many kinds of deployment in educations, enterprises, governments or retail stores. Way and demand of store/secure/charging/centralize managing devices will comes more bigger than ever.  
 Compact design  
 Mixture design in steel and plastic for durable structure, quality looks and keeps the weight light  
 5" caster with brakes and handle for easy movement  
 Front and rear doors are able to be lock by padlock  
 Divider with cable management  
 Sliding door design(front)  
 Cable management for power cord  
 Data synchronization(through USB)  
 Three AUX Power Outlets(support US/EU/UK/AU type)  
 Individual Power Switch & Breaker for AUX  
 Support US/EU/UK/AU types power cord  
 LED indicator for charging and sync status(each port)

ESA62414



**Lab Stools Standard ES 1**

Lab stools standard ES 1 with gas lift and 5 prongs.

ESA62367





**Charging Trolley**

ES310PS is ideally working for transporting, securing, protecting and charging up to 10 tablets, accommodate almost any tablet up to 10.1" screen size. Data Synchronize Function, Create, Delete, Move and Modify easily and quickly through by Sync function and charging compatibly with most of any tablets even it mixed in both IOS & Android.

USB Charging Standard, providing DC5V/2.4A power from each USB port. Multiple Tablet Charging Design will comes more popular to be used for many kinds of deployment in educations, enterprises, governments or retail stores. Way and demand of tore/secure/charging/centralize managing devices will comes more bigger than ever.

**Features**

- Compact design
- Mixture design in steel and plastic for durable structure, quality looks and keeps the weight light
- Sliding door design for space saving concern
- 3-Point steel locking mechanism
- Providing key lock
- Adjustable divider with cable management
- Data synchronization (through USB)
- LED indicator for charging and sync status(each port)
- Provide full 2.4A charging current per USB port
- Support US/EU/UK/AU types power cord
- Optional accessories(buy additionally)

ESA62415



**Wall Mounting Kit**

Wall Mount Kit for ES310PS

ESA62418



**Charging Trolley**

ES232VS is ideally working for transporting, securing, protecting and charging up to 32 mobility devices, accommodate almost any devices such as tablet/Chromebook/ laptop up to 15.6" screen size. Intelligently support Smart Charging Technology by a built-in Smart Charging Controller. Optimize charging time and preventing overload on power current to ensure the devices are charging safely. Provide cable management and AC adapter bracket. A way be more easy and convenient to manage and install cables and AC adapters.

**Features**

- Compact design
- Mixture design in steel and plastic for durable structure, quality looks and keeps the weight light
- 5" caster with brakes and handle for easy movement
- Front and rear doors are able to be lock by padlock
- Sliding drawer with cable management
- AC adapter bracket
- Cable management for power cord
- Built-in smart charging controller
- Three AUX Power Outlets
- Individual Power Switch & Breaker for AUX
- Support US/EU/UK/AU types power cord and power strip
- LED indicator for charging and power status

ESA62416



**Wheel Set**

Wheel Set for ES310PS

Tray with casters for easy movement

ESA62417





**Flower Table**

Table top are made of 18mm thick melamine laminated MDF with PVC Edging on all sides  
Frame are made of 38mm dia x 1.5mm thick mild steel pipe welded to 40x20x1.5mm thick mild steel tube with epoxy powder coating

- ESA63601**                      Size: 1200mm x 530mm height
- ESA63602**                      Size: 1200mm x 590mm height
- ESA63603**                      Size: 1200mm x 640mm height

**Half Arc Table**

Table top are made of 18mm thick melamine laminated MDF with PVC Edging on all sides  
Frame are made of 38mm dia x 1.5mm thick mild steel pipe welded to 40x20x1.5mm thick mild steel tube with epoxy powder coating

- ESA63606**                      Size: 1200mm x 600mm x 530mm (LxDxH)
- ESA63607**                      Size: 1200mm x 600mm x 590mm (LxDxH)
- ESA63608**                      Size: 1200mm x 600mm x 640mm (LxDxH)



**Half Round Table**

Table top are made of 18mm thick melamine laminated MDF with PVC Edging on all sides  
? Frame are made of 38mm dia x 1.5mm thick mild steel pipe welded to 40x20x1.5mm thick mild steel tube with epoxy powder coating

- ESA63610**                      Size: 1200mm x 600mm x 530mm (LxDxH)
- ESA63611**                      Size: 1200mm x 600mm x 590mm (LxDxH)
- ESA63612**                      Size: 1200mm x 600mm x 640mm (LxDxH)

**Horseshoe Table**

Table top are made of 18mm thick melamine laminated MDF with PVC Edging on all sides  
Frame are made of 38mm dia x 1.5mm thick mild steel pipe welded to 40x20x1.5mm thick mild steel tube with epoxy powder coating

- ESA63614**                      Size: 1800mm x 600mm x 530mm (LxDxH)
- ESA63615**                      Size: 1800mm x 600mm x 590mm (LxDxH)
- ESA63616**                      Size: 1800mm x 600mm x 640mm (LxDxH)



**Rectangular Table**

Table top are made of 18mm thick melamine laminated MDF with PVC Edging on all sides  
Frame are made of 38mm dia x 1.5mm thick mild steel pipe welded to 40x20x1.5mm thick mild steel tube with epoxy powder coating

- ESA63618**                      Size: 1200mm x 600mm x 530mm (LxDxH)
- ESA63619**                      Size: 1200mm x 600mm x 590mm (LxDxH)
- ESA63620**                      Size: 1200mm x 600mm x 640mm (LxDxH)



**Crescent Table**

Table top are made of 18mm thick melamine laminated MDF with PVC Edging on all sides  
 Frame are made of 38mm dia x 1.5mm thick mild steel pipe welded to 40x20x1.5mm thick mild steel tube with epoxy powder coating

- ESA63622                      Size: 1200mm x 530mm height
- ESA63623                      Size: 1200mm x 590mm height
- ESA63624                      Size: 1200mm x 640mm height



**Trapezoid Table**

Table top are made of 18mm thick melamine laminated MDF with PVC Edging on all sides  
 Frame are made of 38mm dia x 1.5mm thick mild steel pipe welded to 40x20x1.5mm thick mild steel tube with epoxy powder coating

- ESA63626                      Size: 1200mm x 600mm x 530mm (lxdxh)
- ESA63627                      Size: 1200mm x 600mm x 590mm (lxdxh)
- ESA63628                      Size: 1200mm x 600mm x 640mm (lxdxh)

**Student Table**

Table top are made of 18mm thick melamine laminated MDF with PVC Edging on all sides  
 Top support from epoxy powder coated mild steel angle with wired basket under the top  
 Skid frame from epoxy powder coated mild steel pipe epoxy powder coated with glides end cap

- ESA63630                      Size: 700mm x 500mm x 710mm (lxdxh)
- ESA63631                      Size: 700mm x 500mm x 760mm (lxdxh)
- ESA63632                      Size: 700mm x 500mm x 820mm (lxdxh)



**Student Table Free-form Kg**

Free-form student table low height with melamine laminated MDF top with PVC edging for safety. With metal legs epoxy powder coated, Table top from 19mm thick melamine laminated MDF with 3mm thick PVC edging, Top support from 40x20x1.5mm thick mild steel tube with epoxy powder coating, Legs frame from 38mm dia x 1.5mm thick mild steel pipe epoxy powder coated. **Dimensions** : 1650x1150x520m (LxDxH)

ESA63635



**Teacher Table**

Size: 1300x600x760mm (LxDxH)  
 Table top from 24mm thick melamine laminated MDF with 2mm thick PVC edging on all sides  
 Skid frame from epoxy powder coated mild steel pipe epoxy powder coated with glides end cap  
 Front panel, side panel and shelf from 18mm thick melamine laminated MDF  
 Built-in drawer from 18mm thick melamine laminated MDF

ESA63639





**Laptop Table, Oval Type**

Oval shape laptop table at lounge level with MDF laminated finish top with PVC edging with tubular frame with height adjustable feet , Top are made of 19mm thick melamine laminated MDF with PVC edging , Frame from 25x25x2mm thick epoxy powder coated mild steel tube with height adjustable feet.

**Dimensions :** 510x380x660mm (LxDxH)

ESA63643



**Student Art , Science Stool**

Adjustable height staff task stool with synthetic seat and back, chrome footing with aluminium star base with castor wheels , Synthetic seat shell, five-base turnstile of polished aluminium pressure casting on castors with soft running surface, height adjustable foot-ring Dia 46 cm of chromed-steel tube , Seat height infinitely adjustable through gas compression spring

**Dimensions :** Adjustable height from 40.5 to 53 cm

ESA63678



**Chair C Frame PP Shell**

Steel tube framework, chair stackable, floor gliders with felt glide surfaces exchangeable insert, seat shell with elliptic grip hole, ergonomically shaped, Synthetic seat and back stackable armless with cantilever epoxy powder coated frame

ESA63647	Shell h 31cm	Seat height 31 cm
ESA63652	Shell h 35cm	Seat height 35 cm
ESA63657	Shell h 38cm	Seat height 43 cm
ESA63662	Shell h 43cm	Seat height 46 cm
ESA63667	Shell h 46cm	Seat height 38 cm
ESA63672	Shell h 51cm	Seat height 51 cm



**Open Shelf Cabinet Wooded With 25 Compt.**

Storage unit with fixed back panel, top shelf, bottom shelf and middle panel dividers with 25 no. Open compartment with 25 no. Removable plastic tote containers , Cabinet panels and shelves are made of 18mm thick melamine laminated MDF with PVC edging , Cabinet back panel from 6mm thick one side melamine faced MDF.

**Dimensions :** 1875x450x1170mm (LxDxH)

ESA63681





### Open Shelf Cabinet Wooded With 8 Totes ,

Height 1

Open shelving unit with middle vertical partition with 8 no. Compartments and 8 No. Removable plastic trays. Cabinet panels and shelves are made of 18mm thick melamine laminated MDF with PVC edging, Cabinet back panel from 6mm thick one side melamine faced MDF ,

**Dimensions :** 750x450x915mm (LxDxH)

ESA63682



### Open Shelving Unit, 3 Shelves H 1

Open shelving unit with 3 adjustable shelves , Cabinet panels and shelves are made of 18mm thick melamine laminated MDF with PVC edging , Cabinet back panel from 6mm thick one side melamine faced MDF, Adjustable shelves by means of shelf pin.

**Dimensions :** 750x450x1220mm (LxDxH)

ESA63684



### Open Shelf Cabinet Wooden With 12 Totes ,

Height 2

Open shelving unit with middle vertical partition with 12 no. Compartments and 12 No. Removable plastic containers trays. Cabinet panels and shelves are made of 18mm thick melamine laminated MDF with PVC edging , Cabinet back panel from 6mm thick one side melamine faced MDF ,

**Dimensions :** 750x450x1675mm (LxDxH)

ESA63683



### Open Shelving Unit, 5 Shelves H 2

Open shelving unit with 5 adjustable shelves , Cabinet panels and shelves are made of 18mm thick melamine laminated MDF with PVC edging , . Cabinet back panel from 6mm thick one side melamine faced MDF , Adjustable shelves by means of shelf pin.

**Dimensions :** 750x450x1520mm (LxDxH)

ESA63685





**Open Shelving Metal, Depth 1**

Heavy duty metal open shelving with 4 shelves with cross bar support , Vertical frame from 40x40x2mm thick mild steel slotted angle with epoxy powder coating , Adjustable shelves from 1.2mm thick mild steel sheet with epoxy powder coating , Cross bar support from 25x3mm thick mild steel flat bar with epoxy powder coating .

**Dimensions :** 900x460x2135mm (LxDxH)

ESA63686

**Open Shelving Metal, Depth 2**

Heavy duty metal open shelving with 4 shelves with cross bar support , Vertical frame from 40x40x2mm thick mild steel slotted angle with epoxy powder coating , Adjustable shelves from 1.2mm thick mild steel sheet with epoxy powder coating , Cross bar support from 25x3mm thick mild steel flat bar with epoxy powder coating .

**Dimensions :** 900x610x2135mm (LxDxH)

ESA63687



**Book Display Unit,4 Sided With 5 Compartments**

Free-standing mobile book display unit with total 20 no. Book display compartments. The display compartments occur on all 4 no. Sides with 5 no levels on each side of the unit , Panels composite are made of 18mm thick melamine laminated MDF with PVC edging on all exposed edges for user safety , With 100mm dia non staining castor .

**Dimensions :** W580mm x D580mm X H 1750mm

ESA63696



**Book Browser Unit, Mobile, Open Top**

Mobile book browser with 4 compartment for storage of books and magazines , Side panels, divider and base from 18mm thick melamine laminated MDF with PVC edging , With 4 no. Compartment for book and magazine storage , With 100mm dia heavy duty castor .

**Dimensions :** 600x600x450mm (LxDxH)

ESA63701







#### Storage Cabinet Wooden With Doors 4 Shelves

Lockable cabinet with combination wardrobe. One side unit consists of 4 adjustable shelves and other unit with chrome plated oval tube hanging rod. Both doors are lockable, Cabinet door, panels and shelves are made of 18mm thick melamine laminated MDF with PVC edging, Cabinet back panel from 6mm thick one side melamine faced MDF, Hanging rod from oval tube chrome plated, Adjustable shelves by means of shelf pin.

**Dimensions :** 900x600x2130mm (LxDxH)

**ESA63706**

#### Storage Cabinet Wooden With Doors 5 Shelves

Lockable storage cabinet with hinge door with 5 adjustable shelves, Cabinet door, panels and shelves are made of 18mm thick melamine laminated MDF with PVC edging, Cabinet back panel from 6mm thick one side melamine faced MDF, Doors with square lock and heavy duty tower bolts, Adjustable shelves by means of shelf pin.

**Dimensions :** 900x600x2130mm (LxDxH)

**ESA63707**



#### DVD/CD Display Stand Unit

Double sided stand unit 1 no. Browser shelf component with divided compartments component on each side, Panes and made of 18mm thick melamine laminated MDF with PVC edging for users safety, Browser compartment from epoxy powder coated mild steel sheet with grooved matting rubber, Base with plastic glides.

**Dimensions :** 1200x800x1000mm (LxDxH)

**ESA63715**



#### Book Browser Unit, Mobile, Combination, Shelf, Box And Hanger Rod.

Mobile book browser unit with 2 no. Horizontal shelves on each sides. 1 no. Top box compartment and top hanger rod, Browser unit panel are made of 18mm thick melamine laminated MDF with PVC edging, Frame components from mild steel epoxy powder coated, With 100mm dia castor.

**Dimensions :** 900x400x900mm (LxDxH)

**ESA63702**



#### Material Storage Cabinet Wooden

Material storage cabinet with 2 lockable door. With internal divider and with fixed and adjustable shelves. Including plastic tote containers and louver panels to be fixed at the door, Cabinet door, panels and shelves are made of 18mm thick melamine laminated MDF with PVC edging, Back panel from 6mm thick one side melamine faced MDF, Door are lockable and at the back of the door with louvre to hang the trays.

**Dimensions :** 1000x750x1830mm (LxDxH)

**ESA63711**





#### Library Search Station LH

Rectangular library table with laminated finish with PVC edging. Leg base from round mild steel, privacy frame and top frame from mild steel tube epoxy powder coated. With fixed type CPU holder, cable cover and wire management , Top from 25mm thick melamine laminated MDF with PVC edging , Privacy panel from 18mm thick melamine laminated MDF with PVC edging , Top support and privacy frame from epoxy powder coated mild steel tube  
**Dimensions** : 1500x750x590mm (LxDxH)

ESA63716

#### Library Search Station MH

Rectangular library table with laminated finish with PVC edging. Leg base from round mild steel, privacy frame and top frame from mild steel tube epoxy powder coated. With fixed type CPU holder, cable cover and wire management , Top from 25mm thick melamine laminated MDF with PVC edging , Privacy panel from 18mm thick melamine laminated MDF with PVC edging , Top support and privacy frame from epoxy powder coated mild steel tube , Fixed type CPU holder from 18mm thick melamine laminated MDF , Leg frame from epoxy powder coated round mild steel with height adjustable feet.  
**Dimensions** : 1500x750x640mm (LxDxH)

ESA63717

#### Library Search Station HH

Rectangular library table with laminated finish with PVC edging. Leg base from round mild steel, privacy frame and top frame from mild steel tube epoxy powder coated. With fixed type CPU holder, cable cover and wire management , Top from 24mm thick melamine laminated MDF with PVC edging , Privacy panel from 18mm thick melamine laminated MDF with PVC edging , Top support and privacy frame from epoxy powder coated mild steel tube , Fixed type CPU holder from 18mm thick melamine laminated MDF , Leg frame from epoxy powder coated round mild steel with height adjustable feet  
**Dimensions** : 1500x750x760mm (LxDxH)

ESA63718



#### White Board Square Type

Porcelain enamel faced marker board , Magnetic porcelain finish board sheet white , Back from 9mm thick MDF with aluminium foil tape , With aluminium profile side rail and with pen tray.

**Dimensions** : 1220x1220mm (LxH)

ESA63722





**Art Cart Kg**

Mobile Art Cart consisting with fixed divider, with 2 no shelves and anodized rod as guard rails. With bottom 2-drawer box and sides panel with bow handle , Structure are made of 18mm thick melamine laminated MDF with 3mm thick PVC edging , Anodized rod as guard rails to prevent materials from falling , castor from 75mm dia.

**Dimensions :** 1050x400x900mm (LxDxH).

ESA63728

**Art Cart Mobile**

Mobile Art Cart consisting of top supply tray with with fixed divider, 2 no of with shelves anodized rod as guard rails. With bottom 2-drawer box and sides panel with bow handle , Structure are made of 18mm thick melamine laminated MDF with 3mm thick PVC edging , Anodized rod as guard rails to prevent materials from falling , castor from 75mm dia.

**Dimensions :**1050x400x900mm (LxDxH).

ESA63729



**Display Board Mobile,4 Fold**

4 Fold Mobile Tack Board with tubular frame epoxy powder coated. All front side tack board with fabric and back side with melamine laminate , Double sided tack board with fabric as per manufacturer standard , Frame from 25x25x2mm thick epoxy powder coated mild steel tube , Leg frame from epoxy powder coated 21mm dia mild steel pipe , With 50mm dia castor.

**Dimensions :** Board Size: 1200x1500mm (LxH) Total Height 1900mm

ESA63724



**Outdoor Table, Adult**

Outdoor table for adult in solid Wood top with epoxy powder coated metal frame , Top from solid wood with Polyurethane Finish , Frame from epoxy powder coated mild steel tube with height adjustable feet.

**Dimensions :** 1500x750x750mm (LxDxH)

ESA63779



**Outdoor Chair, Adult**

Outdoor chair without backrest with strip solid wood seat , Seat in strip solid wood with wood shield finish , Frame from epoxy powder coated mild steel tube with height adjustable feet.

**Dimensions :** 1500x450x450mm (LxDxH)

ESA63778



**Display Board Mobile,Double Sided White&Tack**

Mobile one side tack board and one side marker board with tubular frame epoxy powder coated. With castors and 2 with breaks diagonally , Magnetic porcelain finish board sheet white for marker board , With 6mm thick cork board with fabric with 3mm thick MDF inner base , With aluminium profile side rail and with pen tray for marker board , Metal frame from 50x25x1.5mm thick Mild steel tube with epoxy powder coating .

**Dimensions :** Board Size: 1250x1370mm (LxH) Total Dimension: 1300x500x1800mm (LxDxH)

ESA63723





EduScience UK



# PRIMARY



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## Primary Science

- General Science
- Life Science
- Observation and Investigation
- Physical Science
- School Kits

## Primary Mathematics

- Algebra
- Base Ten
- Fractions
- Geometry
- Measurements
- Number and counting
- Pattern
- Sorting and Lacing





### Science School Kit Complete

List of Elementary Kit Complete (21 item):

- Balance Kit 10 set - Water Kit 10 set - Mineral Kit 3 set - Wind Chart 1 set - Sound Kit 10 set - Adaptation of Animal Chart & Card 1 set - Nutrition Card 1 set - Digestive System Chart & Card 1 set - Coal and oil Kit & Chart 2 set - Light Kit complete 10 set - Optic Kit 10 set - Simple machine Kit 10 set - Transformation of Energy Chart & Card 1 set - Heat Kit complete 10 set - Plant Reproduction Chart 1 set - Magnet Kit 10 set - Electric Kit complete 10 set - Solar System Chart & Apron 1 set - Sun, Earth, and Moon Apron 1 set - Cupboard for Kit 1 set - Stand 1 set

ESM61621



### Science Elementary School Kit (Set Of 1)

List of Elementary, EduScience Primary Kit 1 Set , Balance Kit 1 set, Water Kit 1 set, Mineral Kit 1 set, Wind Chart 1 set, Sound Kit 1 set, Adaptation of Animal Chart & Card 1 set, Nutrition Card 1 set, Digestive System Chart & Card 1 set, Coal and oil Kit & Chart 1 set, Light Kit complete 1 set, Optic Kit 1 set, Simple machine Kit 1 set, Transformation of Energy Chart & Card 1 set, Heat Kit complete 1 set, Plant Reproduction Chart 1 set, Magnet Kit 1 set, Electric Kit complete 1 set, Solar System Chart & Apron 1 set, Sun, Earth, and Moon Apron 1 set, Experiment Manual Book 1 exp, Wood Box 1 set

Dimension : (L) 86.00 x (W) 67.00 x (H) 31.00 cm

Weight : 35.000 kg

ESM61622



### Science Elementary School Kit (Set Of 5)

EduScience Elementary Kit 5 Set.

#### Consist of :

Balance Kit 5 set, Water Kit 5 set, Mineral Kit 1 set, Wind Chart 1 set, Sound Kit 5 set, Adaptation of Animal Chart & Card 1 set, Nutrition Card 1 set, Digestive System Chart & Card 1 set, Coal and oil Kit & Chart 1 set, Light Kit complete 5 set, Optic Kit 5 set, Simple machine Kit 5 set, Transformation of Energy Chart & Card 1 set, Heat Kit complete 5 set, Plant Reproduction Chart 1 set, Magnet Kit 5 set, Electric Kit complete 5 set, Solar System Chart & Apron 1 set, Sun, Earth, and Moon Apron 1 set, Cupboard for Kit 1 set, Stand 1 set

#### Packaging :

Kit 1 : 77 x 62 x 32 cm, 30 kg, Kit 2 : 33.5 x 17 x 81.5 cm, 7.5 kg, Kit 3 : 160 x 20 x 57 cm, 44.5 kg, Kit 4 : 160 x 12 x 37.5 cm, 33 kg

**Dimension :** (L) 0.00 x (W) 0.00 x (H) 0.00 cm

**Weight :** 125.000 kg

ESM61624





### General Science Kit

#### Consist of :

- ESPE-S-01 Battery Holder 1 pc
- ESPE-S-02 Lamp Holder 2 pcs
- ESPE-S-03 Resonance Box 1 pc
- ESPE-S-04 Cube, Wood 1 pc
- ESPE-S-05 Cube, Aluminum 1 pc
- ESPE-S-06 Expansion Rod Holder 1 pc
- ESPE-S-07 Substance Dyes 1 pc
- ESPE-S-08 Lugol, Solution 1 pc
- ESPE-S-09 Burning Bridge 1 pc
- ESPE-S-14 Vacuum Hanger 1 pc
- ESPE-25/10 Spirit Burner 100 ml, Brass 1 pc
- ESPE-S-16 Plastic Funnel 1 pc
- ESPE-70/105-1 Dropping Pipette 10.5 cm 1 pc
- ESPE-S-18 Batang Pengatur Nada 2 pcs
- ESPE-S-19 Pengatur Tinggi Rendah Bunyi 1 pc
- ESPE-S-10 Binocular Pipe 1 pc
- ESPE-S-20 Multipurpose Vessel 1 pc
- ESPE-S-21 Card Paper 1 pc
- ESPE-14/35-40 Rubber Stopper with Two Holes, 35/40 mm 1 pc
- ESPE-S-22 Mirror 1 pc
- ESPE-S-23 Transparant Plastic Card 1 pc
- ESPE-S-24 Single Pulley 2 pcs
- ESPE-S-25 Cover for Beaker 250 ml 1 pc
- ESPE-S-28 Scale Aluminum Plate 10 pcs
- ESPE-S-29 Balance Cube 10 pcs
- ESPE-S-30 Masses 10 gr 1 pc
- ESPE-S-31 Balloon 5 pcs
- ESPE-S-32 Expansion Bolts Screws Rod Holder 2 pcs
- ESPE-S-33 Expansion Bolts Screws Rod 2 pcs
- ESPE-S-34 Compass Needle 1 pc
- ESPE-40/150.016 Test Tube ? 16 x 150 mm 3 pcs
- ESPE-S-37 Rope 1.5 m 1 pc
- ESPE-85/010 Test Tube Holder 1 pc
- ESPE-S-38 Copper Wire 1 pc
- ESPE-S-40 Blow Pipe for Balloon 1 pc
- ESPE-S-41 Tabung Pendengar, Rubber 2 pcs
- ESPE-S-42 Box Scales 1 pc
- ESPE-S-43 Glass Pipe 1 pc
- ESPE-S-45 Balance Pole 1 pc
- ESPE-S-46 Balance Plate Hanger 2 pcs
- ESPE-S-47 Plate Hanger 2 pcs
- ESPE-S-11 Nikelin Wire 1 pc
- ESPE-S-48 Spring Balance 1 pc
- ESPE-70/025 Lamp Bulb E 10, 2.5V/0.3A 2 pcs
- ESPE-S-49 Tuning Fork 1 pc
- ESPE-S-51 Arm Balance 1 pc
- ESPE-S-52 Balancing Arm 1 pc
- ESPE-S-54 Balance grooved 1 pc
- ESPE-S-56 Mini Trolley 2 pcs
- ESPE-S-57 Stand Balance grooved 1 pc
- ESPE-S-58 Turbine and Turbine House 1 pc
- ESPE-S-59 Plastic Hose 2 pcs
- ESPE-25/100 Alcohol Thermometer -10°C – 110°C 1 pc
- ESPE-S-60 Rod Thermal Expansion 1 pc
- ESPE-S-61 Basic Compass 1 pc
- ESPE-S-62 Magnet Float 2 pcs
- ESPE-S-63 Rod Thermal Expansion 1 pc
- ESPE-S-66 Rod Shadows 1 pc
- ESPE-S-67 Double Pulley 1 pc
- ESPE-45/250 Erlenmeyer Flask 250 ml 1 pc
- ESPE-11/250 Beaker 250 ml 1 pc
- FSP 11.17/137 Marble 1 pc
- ESPE-22/025-09 Cylindrical Magnet ? 9 x 25 mm (2 pcs/pack) 1 pc
- ESPE-11.19/139 Plastic Syringe 10 ml 2 pcs
- ESPE-90/011 Magnifier ? 50 mm, Magnifying 3x 1 pc
- ESPE-S-12 Expansion Rod Screw 1 pc
- ESPE-99/030 Connecting Lead DC 50 cm with Alligator Clip, Black (5 pcs/pack) 5 pcs
- ESPE-96 Knife Type Switch 1 pc
- ESPE-28/060-1 Optical Pin 25 mm, Stainless 3 pcs
- ESPE-58 Compass 1 pc
- ESPE-06/20 Biology for Elementary School (20 items/set) 1 set
- ESPE-S-68 SD 1 set

ESM61625





**Natural Science Kit For Elementary School (130 Items)**

**Consist of :**

- Flat Mirror Holder 2 pcs
- Hose Clamps 4 pcs
- Dynamo Motor 1 pc
- Lamp Bulb E 10, 2.5V/0.5A 2 pcs
- Rope, 1 m 1 pcs
- Spiral Pin 20 pcs
- Short Connecting Cable 7 pcs
- Long Connecting Cable 7 pcs
- Pulley  $\phi$  7 cm 1 pc
- Pulley  $\phi$  3.5 cm 1 pcs
- Shaft Holder 2 pcs
- Connecting Lead DC 25 cm, Alligator Clip, Red 1 set
- Connecting Lead DC 25 cm, Alligator Clip, Black 1 set
- Double Pulley 1 pc
- Single Pulley 1 pc
- Battery Holder 1 pc
- Plastic Pipe 1 pc
- Ring with Three Legs 1 pc
- Button Switch On/Off 1 pc
- Multimeter 1 pc
- A-Shaped Holder 2 set
- Candle Holder 1 pc
- Translucent Screen, 110 x 100 mm 1 pc
- Screen Holder 1 pc
- Lamp Holder 2 pcs
- Multipurpose Board Holder 4 pcs
- Red Color Filter 1 pc
- Green Color Filter 1 pc
- Blue Color Filter 1 pc
- Yellow Color Filter 1 pc
- Plate Mirror 1 pc
- Test Tube  $\phi$  16 x 125 mm 1 pc
- Tube Clamp 1 pc
- Plastic Syringe 50 ml 1 pc
- Plastic Syringe 10 ml 2 pcs
- Magnifier  $\phi$  50 mm, Magnifying 3x, Plastic 1 pc
- Aluminum Pipe, Long 2 pcs
- Aluminum Pipe, Medium 1 pc
- Aluminum Pipe, Short 1 pc
- Multipurpose Board 1 pc
- Color Plastic Sheet 1 pc
- Rubber Sheet 1 pc
- Balloon 1 pc
- Large Concave Mirror 1 pc
- Prism, Right Angle with Holder 1 pc
- Alcohol Thermometer -10 °C – 110 °C 1 pc
- Plasticine, 10 g 1 pc
- Capsule Tube 1 pc
- Flashlight Cap with 1 Slit 1 pc
- Kaleidoscope Tube 1 pc
- Kaleidoscope Tube Cover 2 pcs
- Kaleidoscope Object Tube 1 pc
- Kaleidoskop Mirror 3 pcs
- Black Circular Sheet with Hole 1 pc
- Yellow Circular Sheet 1 pc
- Red Circular Sheet 1 pc
- Beads 1 set
- Balance Bowl 1 pc
- Lever with Balancer 1 pc
- Balance Bowl Hanger 1 pc
- Plastic Tub 1 pc
- Top 2 Color  $\phi$  5 cm 1 pc
- Top 2 Color  $\phi$  3 cm 1 pc
- Top 6 Color  $\phi$  5 cm 1 pc
- Top 6 Color  $\phi$  3 cm 1 pc
- Top 2 Color (Elektric) 1 pc
- Top 6 Color (Elektric) 1 pc
- Beater 1 pc
- Propeller 1 pc
- Shadow Rod I 1 pc
- Shadow Rod II 1 pc
- Scale Board 1 pc
- Tuning Fork 1 pc
- Plastic Funnel 2 pcs
- Plastic Hose, 100 cm 1 roll
- Speaker 1 pc
- Ruler 30 cm, Plastic 1 pc
- Half Circle Protractor 1 pc
- Rubber Belt,  $\phi$  8 cm 1 pc
- Resistor 100 Ohm 1 pc
- Resistor 200 Ohm 1 pc
- Brass Plate 1 pc
- Copper Plate 1 pc
- Zinc Plate 1 pc
- Plastic Plate 1 pc
- Aluminium Plate 1 pc
- Wood Plate 1 pc
- Rubber Plate 1 pc
- Carton Plate 1 pc
- Dynamometer 1.5 N 1 pc
- Periscope 2 pcs
- Periscope Mirror 2 pcs
- Digital Stopwatch 1 pc
- Load 4 pcs
- Rubber Band 3 pcs
- Mirror Holder 1 pc
- Candle  $\phi$  14 mm 1 pc
- Small Tool Box 4 pcs
- Copper Wire, 0.5 m 1 pc
- Flashlight 1 pc
- Battery, AA 4 pcs
- Clips 5 pcs
- Styrofoam 1 pc
- Cylindrical Magnet 9 x 25 mm (2 pcs/pack) 1 pair
- L-Shaped Plate 2 pcs
- Circular Plate 1 pc
- Pulley 2 cm 1 pc
- Red LED 1 pc
- Measuring Cylinder 100 ml, Plastic 1 pc
- Rectangel Plastic Tank 1 pc
- Double Tape 1 pc
- Iron Powder 100 gr
- Sandpaper 1 lbr
- Compass 1 pc
- Guitar String 1 pc
- Plastic Ring 1 pc
- Filter Paper  $\phi$  9 cm 1 pc
- Small Float 1 set
- Shaft Ring 2 pc
- Carton with Slit 1 pc
- Circular Wire 1 pc
- Styrofoam Ball 1 pc
- Solar Cell 1 pc
- Holder Clamp 2 pcs
- Kaleidoscope Tube Holder 1 pc
- Lever Clamp 1 pc
- Manual Book 1 eks
- Learning Guide Book 1 eks
- Container Box 1 pc
- Tray 1 s

ESM61623







### A Space Farm Kit

This kit has been designed to illustrate to young students, how we might grow our food in an environment other than ours here on the earth. The Space Farm experiments permit young scientists to germinate seeds in nutrient solutions without using soil. After the initial germination occurs, students may transfer the sprouted seedlings to real soil from their own environment. Includes background information on hydroponic cultivation. Required, but not included: 1,000 mL beaker or 2 quart container and distilled water. Designed for 24 students working in pairs. Grades 4-6

ESM61626



### Elementary Crime Solving Kit

Hold your entire class of student detectives spellbound with a mystery at the mall. This exercise is designed to show young students how the scientific method works in everyday life, in this instance through forensic science. The students must solve a crime (the problem) through observation, reasoning, and experimentation. Includes fibres and hairs as evidence, fingerprints, blood types, and personal profiles full of clues and circumstantial evidence. Students work as a team to reach a decision as to who they believe stole the shirt, then compare their suspect to the official police evidence. Required, but not included: microscope, water bath, distilled water, and glass test tubes with stoppers. Designed for 24 students working in six groups of four. Meets national standards for grades 2-6.

ESM61627



### Science Inquiry

Mysteries for elementary aged students to solve! Gather clues to reveal the contents of the mystery boxes, discover why raisins dance, investigate mystery ink and moo milk. Students learn to use observation, classification, communication, measurement, prediction, and inference, and formulate and test hypotheses as they plan and conduct simple science investigations. You will need small mystery items, whole milk, a clear carbonated drink, tape and water. Designed for 24 students working in six groups of four. Meets national standards for grades K-4.

ESM61628



### Matter For Minors

Matter for Minors is an introduction to observation and investigation. Using a discovery approach, students investigate the three states of matter (solids, liquids and gasses) and learn the properties and vocabulary related to each. Includes extensive materials for sorting and classifying solids and the required chemicals for exploring gas phases of matter and changes in matter. Includes tests with answer keys. Required, but not included: hot plate, ice cubes, and assorted containers. Designed for 24 students working in six groups of three to five. Grades K-4

ESM61629





### Exploring Conductivity Of Solids Mini Kit

Students build a simple conductivity tester and use the circuit to test the conductivity of a variety of solid substances. They analyse the same substances to determine whether they are magnetic. The data collected is compared and contrasted to evaluate the properties that make an item conductive. Includes all testing materials, a manual complete with background information, and reproducible student materials. Goggles are required; one pair is included in the mini kit. Class kit is designed for 24 students working in groups of four. Grades 3-6

ESM61630



### Exploring Conductivity Of Solids Class Kit

Goggles are required. Grades 3-6

ESM61631



### Let's Build Electromagnets, Single Kit

Students use the Engineering Design Process to problem solve as they build electromagnets. Inquiry based investigations explore core materials, core thickness, number of wraps per coil, magnetic field, electrical charge, and heat energy. Lessons culminate in a design the strongest electromagnet competition. Includes an extensive instructor's manual with lesson plans, background information, reproducible stepwise student instructions, worksheets, complete answer keys, and all materials required for investigation. Available as a single kit for a small group or a class pack with materials for 24 students working in groups of four. Batteries included.

Grades 3-5

ESM61632



### Let's Build Electromagnets Class-pack

Students use the Engineering Design Process to problem solve as they build electromagnets. Inquiry based investigations explore core materials, core thickness, number of wraps per coil, magnetic field, electrical charge, and heat energy. Lessons culminate in a design the strongest electromagnet competition. Includes an extensive instructor's manual with lesson plans, background information, reproducible stepwise student instructions, worksheets, complete answer keys, and all materials required for investigation. Available as a single kit for a small group or a class pack with materials for 24 students working in groups of four. Batteries included.

Grades 3-5

ESM61633



**Measuring Beaker Set**

5 PCS Measuring beaker , Capacity:  
100 ml, 200 ml, 300 ml, 500 ml,1000 ml

ESM61634

**Measuring Beaker Set**

7 pcs, Measuring beaker, Capacity:  
50 ml, 100 ml, 200 ml, 250 ml, 300 ml,  
500 ml,1000 ml

ESM61635

**Measuring Cylinder Set**

7 Kinds cylinder 7pcs/set / 10 ml ,25  
ml ,50 ml ,100 ml ,250 ml ,500 ml  
,1000 ml 1pcs

ESM61636

**Pan Balance**

Elementary Pan Balance 1000 CC Packed in white box. Without weights & weight box  
Balance size:

Wide : 9cm Length : 28.3cm High:15.9cm

ESM61637

**Balance Kit (Set Of 10)**

It is ideal for use by Primary School student, aged 6-12 years. The student will be able to understand the basic concept of a balance. Versatility of the kit enable the students to perform experiments with their own ideas.

**Consist of :**

1. Plane 10 pcs
2. Foot Left Right 20 pcs
3. Plastic Lever 10 pcs
4. Spring Plug 10 pcs
5. Bowl 20 pcs
6. Set of Masses (1, 2, 5, 10, 20, 50 and 100 g) 10 set
7. Corrugated Box Plastic 410 x 295 x 191 mm, (# 3 mm, Green colour) 1 pc

**Experiment topics :**

Balance concept, Relation between weight and volume

**Dimension :** (L) 41.00 x (W) 31.00 x (H) 19.50 cm, **Weight :** 7.000 kg

ESM61638

**Balance Kit**

It is ideal for use by Primary School student, aged 6-12 years. The student will be able to understand the basic concept of a balance. Versatility of the kit enable the students to perform experiments with their own ideas.

Manufactured with high quality standard.

**Experiment topics:**

Balance concept. Relation between weight and volume.

**Specification:**

1. Plane 1 pc
2. Foot Left & Right 2 pcs
3. Plastic Lever 1 pc
4. Spring Plug 1 pc
5. Bowl 2 pcs
6. Set of Masses (1, 2, 5, 10, 20, 50 and 100 g) 1 set
7. Tools Box 1 pc

ESM61639





### Characteristics Of Matter

Ten experiments exploring the Characteristics of Matter include: Properties of Matter, States of Matter, Physical Properties of Solids, Physical Properties of Liquids, Melting Point, Boiling Point, Solubility of Solids, Density, Chemical Properties, and Identification of Unknown Solutions. Includes reproducible student labs, reproducible assessment materials for each lab, vocabulary, and complete answer keys. Required, not included: balance, ice, (24) small test tubes, test tube racks, 10 ml graduated cylinders, (6) beakers or clear cups, chemical splash goggles. Allow three one hour lab periods. Designed for 24 students working in groups of four. Meets national standards for grades 5-9.

ESM61640



### Changes In Matter

Ten activities acquaint students with classifying matter as elements, mixtures, or compounds and introduce them to atomic structure and nomenclature. Students are introduced to properties of common elements, compounds, and mixtures and learn how symbols are used to code for chemical elements. They separate common mixtures by evaporation and chromatography; proving that mixtures are not chemically combined. They learn that while elements are pure substances made of only one type of matter, compounds are pure substances made up of different chemically combined elements. Students observe that chemical reactions between solutions result in the formation of new compounds with different properties. They learn that colour changes, effervescence, formation of solids, and new odours are all indicators that a chemical reaction has occurred. Includes reproducible student instructions, assessment for each activity, vocabulary, and complete answer keys. Required, not included: chemical splash goggles. Designed for 24 students working in groups of four. Meets national standards for Grades 6-9.

ESM61641



### Light Colour

Ten activities include Introduction to Waves, Electromagnetic Spectrum, Reflection of Light, Reflection from a Plane Mirror, Reflection from Concave and Convex Mirrors, Refraction through Concave and Convex Lenses, Separation of White Light into the Colours of the Visible Spectrum, How Reflection Determines the Colour of Objects, Mixing the Primary Colours of Light, and Mixing the Primary Colours of Pigment. Includes all materials for investigations, reproducible student data sheets, assessment questions, and answer keys. Designed for 24 students working in six groups of four.

ESM61642



### Meeting Molecules

This kit is designed to help students differentiate between physical and chemical changes using extensive hands-on activities. Students model the states of matter: a solid, a liquid, and a gas; and the phase changes between them. They learn the difference between atoms and molecules. A great introduction to physical science and chemistry which bridges the use of common household ingredients and laboratory chemicals. Students investigate molecular motion in liquids, evidence of chemical change, and the effects of changing different variables within a chemical reaction. May be used as a stand-alone kit or as a companion kit to follow 1-132, Matter for Minors. Required, not included: hot plate, pot holders, glass beaker, various small containers, red and black construction paper, copy paper, citrus juices, milk, ice, matches, chemical splash goggles, and gloves. Designed for up to 30 students.

ESM61643





### Investigation Indicators

Dramatic colour changes and kitchen chemistry make this kit ideal for attracting elementary scientists. Utilizing the investigative and experimental what if approach, students predict, observe, and analyse using common household items they recognize. First they test for acids using natural indicator solutions from red cabbage and black bean juice, then they are introduced to the terms acid and base as they learn to use blue and red litmus papers. Finally, the students compare the natural indicator system to Universal Indicator pH paper and use colour charts; then they make their own Universal Indicator Test Strips from Universal Indicator Solution and filter paper. Using gelatin and a choice of indicator solutions, students make a solid gelled indicator product for testing acids and bases. Includes directions for the isolation and characterization of compounds which act as indicators. Designed for 24 students working in six groups of four. Meets national standards for Grades 5-8.

ESM61644



### Recycle It

Students are introduced to the carbon cycle and made aware of products which undergo recycling processes. They model paper recycling on a small scale using waste paper. Then, they reuse the paper product they create as part of their recycling effort. Required, but not included: hand mixer, blender, or food processor. Designed for 24 students working in six groups of four. Meets national standards for grades K-8. Meets national standards for grades 2-6.

ESM61645



### Recycling Plastics By Density Class Kit

Students use a flow chart template and a simple sink or float methodology to determine the identity of recyclable polymers. Using small pieces of the plastics in question, students identify an item by recycle number so they know how the plastic should be recycled in their community. Younger students should be encouraged to collect plastics for testing. Great for introducing the concept of recycling at any grade level. Includes the properties of individual polymers, common sources of household plastics for items in each recycle category, and the chemical structure, description, and density range of each recyclable polymer for applications with older students. Class kit includes materials for 24 students working in groups of four and requires goggles and scissors. Grades 3-12

ESM61646



### Recycling Plastics by Density Mini Kit

Students use a flow chart template and a simple sink or float methodology to determine the identity of recyclable polymers. Using small pieces of the plastics in question, students identify an item by recycle number so they know how the plastic should be recycled in their community. Younger students should be encouraged to collect plastics for testing. Great for introducing the concept of recycling at any grade level. Includes the properties of individual polymers, common sources of household plastics for items in each recycle category, and the chemical structure, description, and density range of each recyclable polymer for applications with older students. Class kit includes materials for 24 students working in groups of four and requires goggles and scissors. Mini kit includes one pair of goggles. Grades 3-12

ESM61647





### Simple Machines Kit

An introductory kit for an entire unit exploring the basics of simple machines: inclined planes, levers, screws, wedges, axles with wheels, and gears. Ten hands-on experiments employing simple machines, most of which students build. Students culminate their studies with the ability to create their own simple machines. Includes instructor's manual, extensive student worksheets, complete answer key, extension activities, hammer, pulleys, spring scales, rulers, string, weights, nails, screws, fulcrums, nuts and bolts, paper clips, and marbles. Designed for 24 students working in six groups of four. Meets national standards for grade levels 5-8.

ESM61648



### Measurments Kit

Students gain experience taking scientific measurements using metric units and become familiar with common equivalent measures. Nine real-world activities lead students through the concepts of measuring with accuracy; learning metric place values; estimating metric lengths, distances, areas, masses, and volumes; measuring volume in litres, square measure, cubic measure; identifying metric measures in our world; identifying mass vs weight; measuring by displacement; and taking temperatures in Celsius and Fahrenheit. Includes extension activity suggestions, student exercises, and assessment activities for testing understanding. Grades 5-8

ESM61649



### Common Indicators

Introduce students to the colourful world of acid base indicators. Teach students when it is appropriate to use which indicator, and how different indicators are commonly used. Includes Phenolphthalein for indicating basic solutions and use in standard acid-base titration, Universal Indicator for using over a wide range of acid-base pH, and Methyl Orange for testing strongly acid solutions. The kit includes one 30 ml dropper bottle of each Phenolphthalein, Universal Indicator, and Methyl Orange, a sample reproducible lab sheet for recording results for testing common substances, and six Universal Indicator Colour Charts.

The kit has a wide variety of applications. A great kit for investigating. Utilizing an experimental approach, students can predict, observe, and analyse the pH of common household solutions, physiological fluids, environmental samples, and foods to become familiar with acid base chemistry and characterize the pH profiles of different classes of substances. Grades 5-8

ESM61650



### Exploring Conductivity Of Solutions Class Kit

Students build a simple conductivity tester and use it to evaluate the conductivity of various chemicals and solutions. They evaluate the chemistry of conductivity by evaluating ionic and non-ionic substances, acidic and basic substances, solid and liquid metallic ions, and substances with different polarities. Extension activities have students exploring practical questions such as how electricity can electrocute through water, what properties make a good sports drink, and how electroplating occurs. Goggles are required; one pair is included in the mini kit. Class kit is designed for 24 students working in groups of four. Grades 7-10

ESM61651





### Exploring Conductivity Of Solutions Mini Kit

13-105 Exploring Conductivity Mini Kit (ideal for one student or a small group). Goggles are required; one pair is included in the mini kit. Grades 7-10

ESM61652



### Build Your Own Simple Electric motor Single Kit

Designing simple electric motors from wire and magnets, students explore the effects of number of coils, wire thickness, and sizes, shapes, strengths, and types of magnets. They are guided through the engineering design process with four progressive experiments and a design competition. Great for introducing guided inquiry-based learning, systematic problem solving, and engineering design practices. Kits include instructor's manual with lesson plans, background information, reproducible stepwise student protocols, and guided worksheets. Safety goggles and batteries not included; single kit requires 3 D-cell batteries; class-pack requires 18 D-cell batteries. Designed for working in groups of four.

ESM61653



### Build Your Own Simple Electric motor Class-pack

Designing simple electric motors from wire and magnets, students explore the effects of number of coils, wire thickness, and sizes, shapes, strengths, and types of magnets. They are guided through the engineering design process with four progressive experiments and a design competition. Great for introducing guided inquiry-based learning, systematic problem solving, and engineering design practices. Kits include instructor's manual with lesson plans, background information, reproducible stepwise student protocols, and guided worksheets. Safety goggles and batteries not included; single kit requires 3 D-cell batteries; class-pack requires 18 D-cell batteries. Designed for working in groups of four.

ESM61654



### Physical changes Kit

Students investigate physical changes in size, shape and states of matter to determine whether they produce new substances. Materials are provided with four activities in which students learn to (1) identify examples of phase changes, (2) investigate examples of things that happen to matter they absorb or lose heat and (3) explore changing the sizes and shapes of substances. Includes reproducible student data sheets and assessment questions. Required, but not included: microwave, clock. Designed for 24 students working in six groups of four. Grades K-4

ESM61655





### Oil Spill Junior Kit

Train your elementary aged students to work as an environmental engineering team. They learn physical and chemical properties of oil while experiencing how engineers and scientists approach oil spill disasters. The perfect hands-on activity to pair with your favourite elementary level oil spill book. Students create their own oil spill models and use them to simulate basic oil containment and removal techniques. They learn to measure data and compare results. Ideal for implementing scientific process, establishing problem solving skills, and introducing inquiry based learning. Includes multiple sets of worksheets for differentiated learning. Teachers manual, materials, and supplies included. Just add water. Designed to accommodate 32 students working in pairs. Plan for 4-6 hours of activities. Grades K-5

ESM61656

### Oil Spill Junior Refill

Oil Spill Junior Refill. Grades K-5

ESM61657



### Forces, Motion, and Simple Machines kit

this kit has been designed to incorporate a wide range of interesting hands-on investigations to enhance your existing science curriculum. Aligned with the Next Generation Science Standards, this kit covers the fundamental science concepts of forces, motion, and simple machines. Investigations include force couples involving "action and reactions, sliding and rolling friction, centrifugal and centripetal forces, velocity, simple periodic motion, periodic motion of a pendulum, uniform linear motion, accelerated motion, efficiency of machines, ideal and actual mechanical advantage, pulley systems, the pulley as a modified lever, the inclined plane, and the use of levers to multiply force and speed and change direction. Contains enough materials for six work stations and a teacher's guide. Grades 4-8

ESM61664







**Mini Scope**

Build your own 150X compound microscope and use it to take a look into the micro-world. Students learn about the structure and design of a microscope as they assemble their own working model. All microscope parts are provided. Includes a diagram and explanation of how microscopes project real and virtual images through lenses and directions for microscope use. Learn to prepare your own specimens using the slides included. Complete microscope including light source measures 90 x 200 mm. Makes 1 microscope. Grades K-8

ESM61658



**Owl Pellet Kit**

Owl pellets are a favourite at any grade level and allow for a wide range of activities from observation and data recording; to measuring, sorting, classifying, and predicting; to predator-prey relationships. Higher level students may identify skeletal parts of small mammals, study the interrelatedness of food chains, and identify habitats and ecosystem variables. AP Biology and AP Environmental Sciences students might study food webs and energy flow, population densities, and the availability and diversity of prey. Designed for 24 students working in pairs. Grades K-12

ESM61659



**Owl Pellet Refill**

Owl pellets are a favourite at any grade level and allow for a wide range of activities from observation and data recording; to measuring, sorting, classifying, and predicting; to predator-prey relationships. Higher level students may identify skeletal parts of small mammals, study the interrelatedness of food chains, and identify habitats and ecosystem variables. AP Biology and AP Environmental Sciences students might study food webs and energy flow, population densities, and the availability and diversity of prey. Designed for 24 students working in pairs. Grades K-12

ESM61660





**Chick-U-Bator**

Nothing fascinates children more than observing life! Watch the miracle of birth together through the clear plastic dome of this mini incubator. The entire hatching process may be observed in your own classroom with this easy to assemble incubator. Students engage in anticipation of the hatching process while you study what occurs inside the developing eggs. As students take the place of the mother hen, they learn the important responsibilities they must perform to keep the fertile eggs alive while they grow. May be used to hatch 1-3 chicken, 8 quail, 1-3 duck, or 4 pheasant eggs. Fertile eggs may be obtained from local hatcheries. UL approved. Grades K-5

ESM61661



**The Food Chain**

This kit is designed to show the intricate balance and relationships between different levels of the food chain and the importance of these levels to humans and our environment. Students study the different relationships within an environment, the importance of each organism, how energy is transferred, and the delicate balance in the environment of a food web. Producers, consumers, herbivores, carnivores, omnivores, predators, prey, decomposition, energy flow, food cycles, food chains, food webs, and food pyramids are all discussed. Differentiated to teach food chain (Grade 3 ? 5) and food web (Grade 6 ? 8) related topics. Students observe pond water food webs and soil habitat food chains, model the decomposition of plant matter, and design their own food chains and food webs. Includes instructions for games, experiments, and activities. Required but not included: outdoor soil, turnip, and moldy food. Microscopes recommended. Designed for 24 students working in groups of four. Grades 4-7

ESM61662



**Dichotomous Keys**

Dichotomous keys are used to help classify and identify various objects. With this kit, you will guide students through the process of using keys with several real-world examples, just like scientists! This kit includes seven different activities, ranging from easy to challenging, basic to scientific. The culminating activities include Constructing a Tree Key to Your Own School and Using a Dichotomous Key to Identify Seashells. These activities include classification of real shells and real trees using their scientific names. Required, but not included: coloured pencils or crayons. Designed for 24 students working in six groups of four. Grades 5-8

ESM61663





**Geometric Logic Board Small Size**

Rectangle: [big]-7.7 x 3.8 x 0.5 cm / 7.7 x 3.8 x 0.2 cm , [small]- 4.5x2.3x0.5 cm / 4.5x2.3x0.2 cm

Square: [big]- 5.4x5.4x0.5 cm / 5.4x5.4x0.2 cm , [small] 3.2x3.2x0.5 cm / 3.2x3.2x0.2 cm

Hexagonal: [big]-diagonal: 6.6x0.5 cm / 6.6x0.2 cm , [small]- diagonal: 3.8x0.5 cm / 3.8x0.2 cm

Triangle: [big] - side length: 8.9 cm , [small] - side length: 4.6 cm

Circle: [big] - diameter: 6 cm , [small] - diameter: 3.5 cm Total: 60 pcs / set

ESM62071



**3D Geo Solids Set**

17 shapes 3D Geo Solids Set (10cm, 4 colour)

ESM62073



**Geometric Logic Board Big Size**

Rectangle: [big]-11.7x6.1x0.75 cm/ 11.7x6.1x0.25 cm , [small]- 7.5x3x0.75 cm/ 7.5x3x0.25 cm

Square: [big]-8.4x8.4x0.75 / 8.4x8.4x0.25 cm , [small]- 4.8x4.8x0.75 cm/ 4.8x4.8x0.25 cm

Hexagonal: [big]-diagonal: 10.5x0.75 cm / 10.5x0.25 cm , [small]- diagonal: 6.9x0.75 cm / 6.9x0.25 cm

Triangle: [big] - side length:12.6cm , [small] - side length: 7cm Circle: [big] - diameter:9.5 cm , [small] - diameter:5.4 cm Total: 60 pcs / set

ESM62072

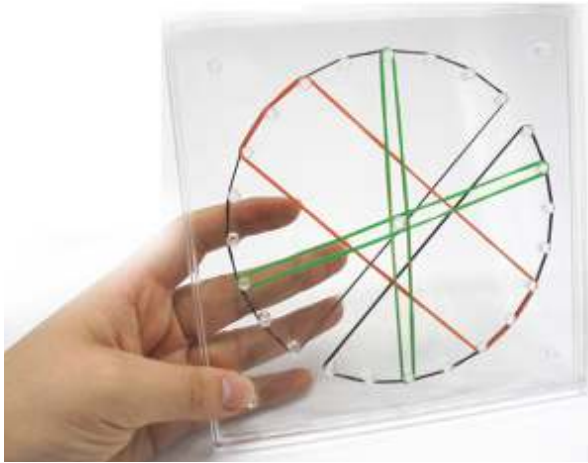


**3D Expansion Geo Solids**

10cm ,3D expansion Geo solids ,10 shapes fit into individual transparent acrylic containers and packed in white box. Contain triangular prism, cube, pentagonal prism,hexagonal prism, cylinder, triangular pyramid, square pyramid, hexagonal pyramid and pentagonal pyramid and cone

ESM62074

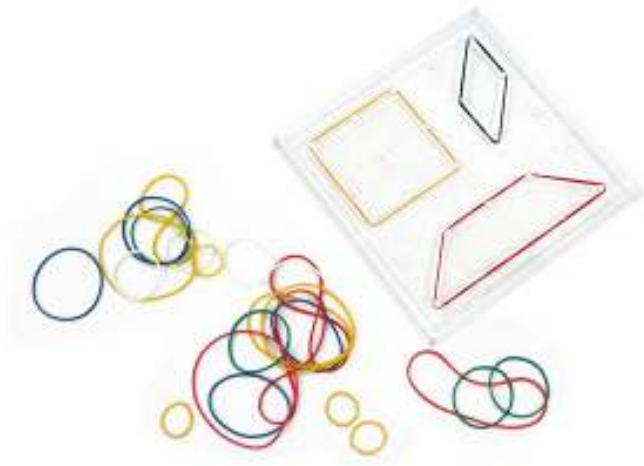




**Geoboard Transparent Circle 10 cm**

transparent on Single sided Geobaord , With Circular knobbed pins hold rubber bands in place. Includes rubber bands in assorted colors and sizes  
Side size 15 Cm

ESM62075



**Geoboard Transparent Square 15 cm**

transparent on Single sided Geobaord , Knobbed pins hold rubber bands in place. Includes rubber bands in assorted colors and sizes  
Side Size 15 CM

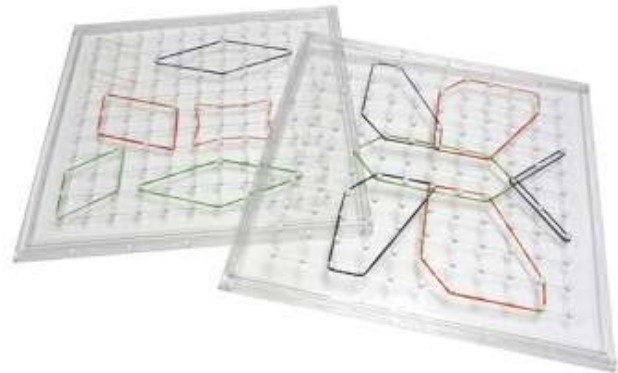
ESM62076



**Geoboard Transparent Geometric 15 cm**

Geoboard transparent , Single sided Knobbed pins hold rubber bands in place. Includes rubber bands in assorted colors and Sizes  
Side size is 15 cm

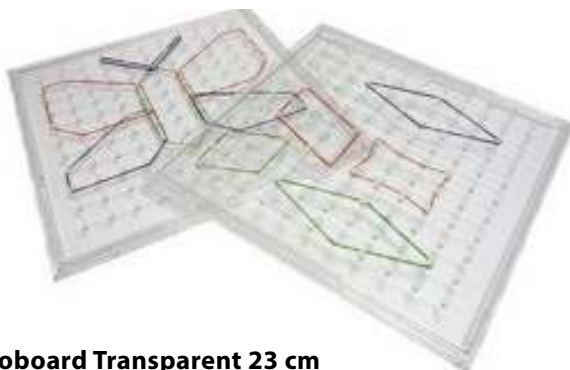
ESM62077



**Geoboard Transparent Square 23 cm**

Geoboard transparent , Single sided Knobbed pins hold rubber bands in place. Includes rubber bands in assorted colors and Sizes  
Side size is 23 CM  
Number of Pin is 137 Pins

ESM62078



**Geoboard Transparent 23 cm**

1PC 23cm  
transparent on Double sided Geobaord , Knobbed pins hold rubber bands in place. Includes rubber bands in assorted colors and sizes  
100 pins, the other side is 137 pins (10\*10 Lines, the other side 10\*12 Lines)

ESM62079

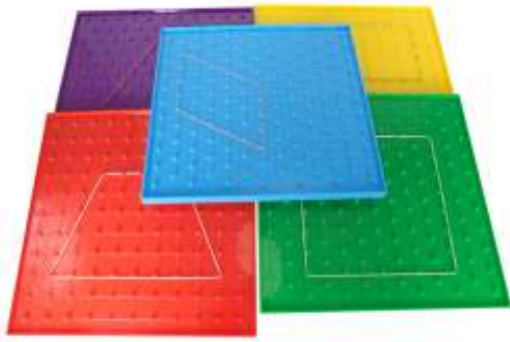


**Geoboard 12.5 cm (Pk/6)**

6pcs 12.5cm geoboard size:12.5x12.5x1cm  
6 colour  
1pcs/colour 6 rubber band bag  
Coloured Single sided Geobaord , Knobbed pins hold rubber bands in place. Includes rubber bands in assorted colors and sizes

ESM62081





**Geoboard Coloured 23 cm**

1PC 23CM

Coloured Single sided Geobaord , Knobbed pins hold rubber bands in place. Includes rubber bands in assorted colors and sizes

100 pins, the other side is 137 pins (10\*10 Lines, the other side 10\*12 Lines)

ESM62080



**Rubber Bands (Pk/100)**

Rubber Bands 100PCS /Bag

ESM62083



**Geoboard 15 cm (Pk/6)**

Coloured Single sided Geobaord , Knobbed pins hold rubber bands in place. Includes rubber bands in assorted colors ( 6 diffident Colours ) side Size each is 15CM

ESM62082



**Pentominoes (Pk/60)**

Pentominoes Tub 60PCS/small tub -- Each shape with 5 length & widely each 2cm link 12shape packing in small hand tub

ESM62084

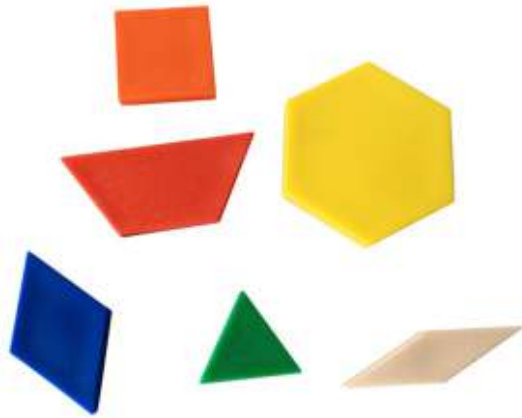


**Pattern Blocks Tub (Pk/250)**

This set used to explore patterns, symmetry, linear and area measurement, fractions and problem solving. set of 250PCS/in small tub Consist of : Trapezoid 50pcs,hexagon 25pcs, rhombic 50pcs,triangle 50 pcs,rhomboid50pcs,square25pcs packing in hand small round tub.

ESM62085

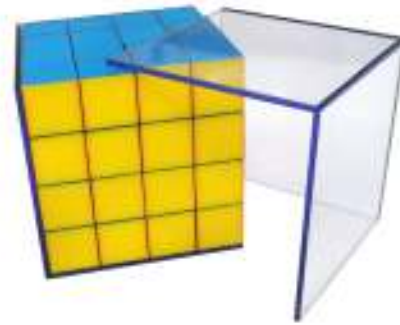




**Pattern Blocks Plastic (Pk/250)**

This set used to explore patterns, symmetry, linear and area measurement, fractions and problem solving.  
 set/250PCS of 0.5CM Double Side Flat solid blocks in 6 colours diffident shapes as following : Trapezoid 50pcs,hexagon 25pcs, rhombic 50pcs,triangle 50 pcs,rhomboid 50pcs,square 25pcs

ESM62086



**Magic Cubes**

Magic Cubes plastic with transparent housing

ESM62087



**Beads Large (Pk/160)**

160PCS Large Beads  
 Diameter 2.1 cm 4 shapes, red, yellow, blue, green mixed 3 colour string 3 bundle

ESM62088



**Beads Large In Tub (Pk/160)**

Large beads tub 160 PCS /Small tub  
 Contain of :2.1 CM. 4 shape with red ,yellow,blue,green 4 colours mixed & 3 colours string 2 bundle packing in small hand tub

ESM62089



**Beads Small (Pk/650)**

650 PCS Small Beads  
 Diameter 1.3 CM 4 shape, red, yellow, blue, green mixed 3 Colour string 3 bundle

ESM62090



**Threading Set Animals (Pk/48)**

3.6 CM 48 PCS  
 Big Size Beads 6Color 6 colours threading 72cm

ESM62091





**Lacing Animal Set Pk/9**

9 PCS Thread-Board

Bear, dog, duck / red, yellow, green 3 colour string 9 bundle

ESM62092



**Bolt and Nuts Set**

These easy-to-hold, large size bolts & nuts are made from sturdy plastic, durable for classroom use. Ideal for children to develop fine motor skills , stored in

Paring Screw Tub

set / 32 PCS of assorted Shapes :

Square, triangle, pentagon, criss cross

,4 shapes 8 Pcs Each

ESM62093



**Links (Pk/200)**

Use these 4-color links for sorting, patterning, counting, measurement, even graphing

set of 200 pcs big Counting links ( size L7 X W 5CM) in 4 assorted colour : red, yellow, blue, green.

ESM62094



**Links Counting (Tub/500)**

Use these 4-color links for sorting, patterning, counting, measurement, even graphing

set of 500 pcs Small Counting links in 4 assorted colour : red, yellow, blue, green .

stored in handy tube.

ESM62095





**Base Plate 15 cm**

Base Plate 15CM 4 Colours 4 PCS/packing Round plate, red, yellow, blue, green

ESM62096



**Bear Counters 6 Colors (4,8,12G) School Bear (Pk/96)**

This interesting set of plastic bears comes in three sizes, three weights (4,8 and 12 Grams) and six colors. it is used to learn size recognition, counting and sorting. Bears are also proportionally weighted and can be used on a balance for measurement discoveries , Set of 96 Pcs ,

ESM62097



**Aquatic Set**

84PCS, 14 shapes 6 Colours Aquatic Set / TPR

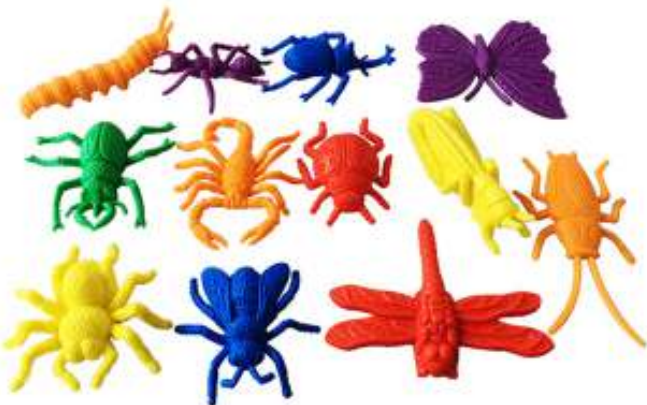
ESM62100



**Bear Counters 6 Colours (4,8,12G) Darling Bear(Pk/96)**

This interesting set of plastic darling bears comes in three sizes, three weights (4,8 and 12 Grams) and six colors. it is used to learn size recognition, counting and sorting. Bears are also proportionally weighted and can be used on a balance for measurement discoveries , Set of 96 Pcs ,

ESM62098



**Insect Set**

72 pcs Insect Set 6colors 12shapes

ESM62099



**Bear Counters 4 Colours (4,8,12G) (Pk/96)**

This interesting set of plastic bears comes in three sizes, three weights (4,8 and 12 Grams) and four colors. it is used to learn size recognition, counting and sorting. Bears are also proportionally weighted and can be used on a balance for measurement discoveries , Set of 96 Pcs ,

12g(24pcs) 8g(24pcs) 4g (48pcs)  
Colors : Red, yellow, blue, green

ESM62101







**Bear Counters Set (3,6,9,12G) (Pk/48)**

This interesting set of plastic bears comes in three sizes, four weights (3,6,9 and 12 Grams) and six colors. it is used to learn size recognition, counting and sorting. Bears are also proportionally weighted and can be used on a balance for measurement discoveries , Set of 48 Pcs , 12g (24pcs) , 9g (8pcs) , 6g (8pcs) , 3g (24pcs)  
Colors : Red, yellow, blue, green  
Packaged in reusable storage box.

ESM62103



**Fruit Set (Pk/96)**

96PCS six kinds of fruit set mixed with pineapple , carambola, papaya,tomato, lemon,pear.  
Colour mixed with red,yellow, light green, green,orange. 3cm~5cm

ESM62105



**Counters Wild Animal (Pk/120)**

exploration into counting, sorting, color recognition , Animal figures come in 4 different colors and represent the wild animals , 10 Different animals in red,green,blue and yellow colour set of 120 Pcs

ESM62107



**Cotton Reels (Tub/122)**

Plastic cotton reels in 4 colors are perfect for lacing and patterning activities , set of 122 pcs Red, yellow, blue, green, each colour 30 PCS Doll head 2 pcs 3 colour string 2 bundle packed in hand tub

ESM62104



**Counters Farm Animal (Pk/192)**

exploration into counting, sorting, color recognition , Animal figures come in 4 different colors and represent the Farm Animals ( poultry and family animals) , 12 Different animals in red,green,blue and Yellow colour set of 192 Pcs

ESM62106





**Counting Links (Pk/500)**

500PCS

Counting Links

With yellow, blue, green, red, 4color mixed. 4.2\*1.7cm packed in polybag

ESM62108



**Hundred Pocket Chart**

Hundred pocket chart

PVC and Coated Paper, 67cm x 67cm, 354.5g

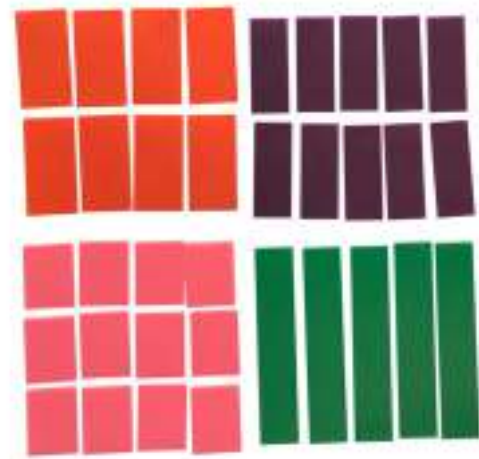
ESM62109



**A B.C. Blocks Tub (Pk/60)**

60 PCS A B.C. Blocks supplied in plastic tube.

ESM62110



**Fraction Tile Set Square**

the squer Fraction Tiles kit help student to visualize fraction concepts . Set includes 51 pieces creating one whole, halves, thirds, fourths, fifths, sixths, eighths, tenths and twelfths.

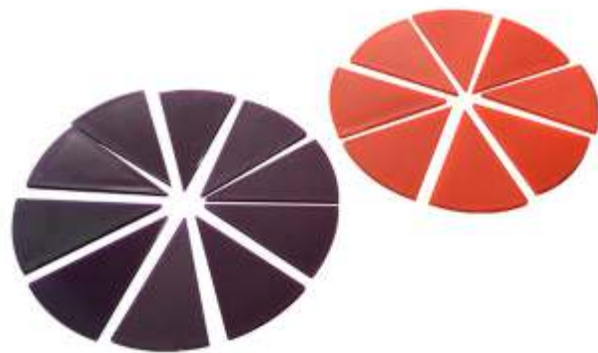
ESM62111



**Tangram Plastic (Pk/280)**

Tangram was invented in China it is used to practice problem solving with this set of 280 tangrams in four assorted colors: red, blue, yellow, green

ESM62113



**Fraction Tile Set Circle**

durable manipulatives make visualizing fractions a snap. used for small-group activities, the Fraction Circles Set comes with a dual-use work tray/ storage box and includes one whole circle plus eight circles divided into halves, thirds, fourths, fifths, sixths, eighths, tenths and twelfths.

ESM62112





**Vertex Ball And Rods (Pk/330)**

330 PCS Vertex ball and rods in white box and colour label

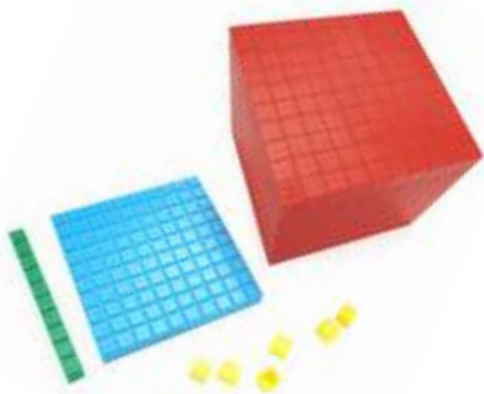
ESM62114



**Base 10 Sets (Pk/131)**

Convex surface Base 10 sets 131pcs (1 red cube, 5 number printed flats, 5 blank flats, 20 rods and 100 1cm units) The red decimetre cube : Hollow (light), can be either one unique (closed) or box-like.

ESM62117



**Base 10 Sets (Pk/121)**

Convex surface Base 10 sets 121pcs (1 red cube, 10 blank flats, 10 rods and 100 1cm units)

The red decimetre cube : Hollow (light), can be either one unique (closed) or box-like.

ESM62116



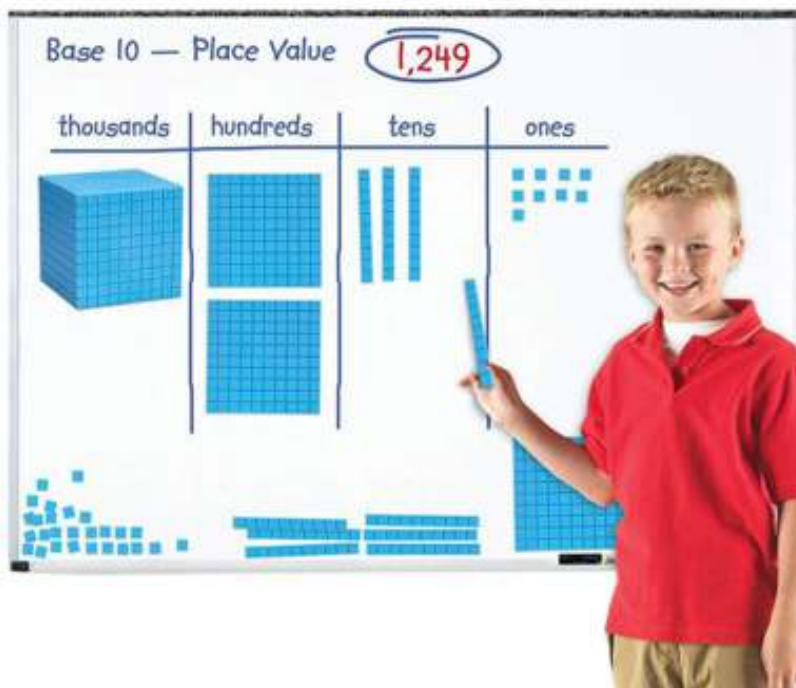
**Sunflower Stars (Tub/80)**

Sunflower Stars Tub

80PCS/big tub -

With red, yellow, blue, green, white, pink 6 colours Inked Packing in big tub

ESM62119





**Counters Coin (Pk/200)**

200PCS 2 colour coin D : 2.5cm, yellow,red double coin 200 pcs/bag

ESM62120



**Linking Cube (Pk/100)**

100 PCS 10 colours 2 CM Link cube

ESM62122



**Trundle Wheel**

Trundle wheel use to measure long distances using metrics! Counting "clicker" clicks with each meter so students see and hear the measurement. it has anti slip rubber tire for accurate reading

ESM62124



**Balance Junior**

This balance is perfect for measuring, exploring volume, and comparing solids and liquids. it has clear buckets with removable lids hold solids or up to 500 ml of liquid and allow students to see what they have placed inside.

- Buckets remove easily for emptying and the buckets' lids can be used as platforms.
- Child-friendly, balance is sturdy enough to withstand years of hands-on measurement.
- Build observation and estimation skills while gaining a deeper understanding of mass measurement.

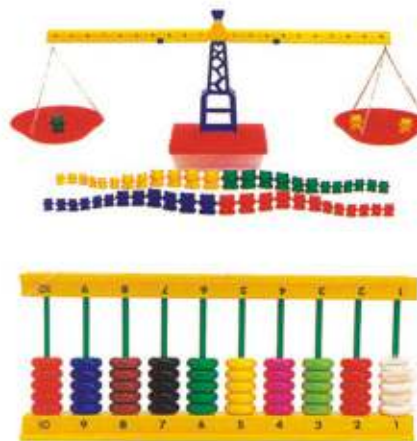
ESM62125



**Bucket Balance**

This durable plastic Bucket balance enable students measure and compare amounts. Transparent pans allow students to see what they are measuring and relate visual and measured observations. Each pan detaches for easy clean up and holds solids or up to 500 ml of liquid.

ESM62127

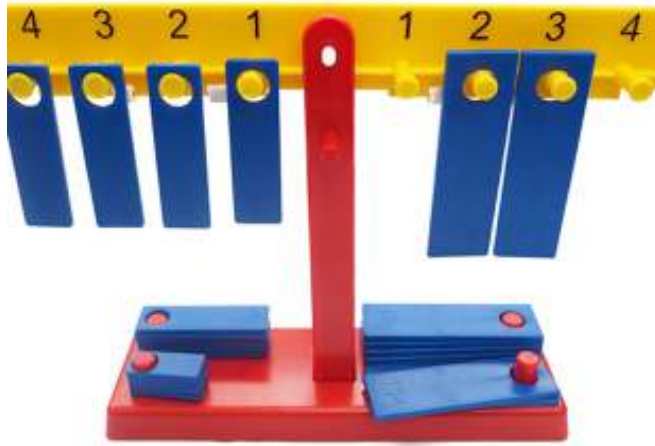


**Balance Large Kit**

Large Balance Kit

ESM62126





**Math Balance**

the Math balance use to teach number relationships . As students manipulate the balance, they gain insight into abstract concepts of number operations, algebraic equations and properties of arithmetic. Set includes 8.5" tall balance, ten 10g weights, fifteen 5g weight and twenty five Pcs of 1g weight . suitable for Grades 3–6

ESM62128



**Ruler Over Head**

5PCS Over head ruler sets

ESM62129



**Measuring Set**

Elementary level students use clay, rolling pins, crayons, and beans in these six creative, action packed activities that grab their attention. Hands-on experiences help them learn to measure length, volume, and mass; learn to measure volumes of irregularly shaped items by volumetric difference; and practice using metric measurement units in science. Students gain experience using measurement related terminology. Includes student data sheets and an answer key. Balance suggested, not included. Designed for 24 students working in six groups of four. Grades K-4

ESM62130



# EduScience

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