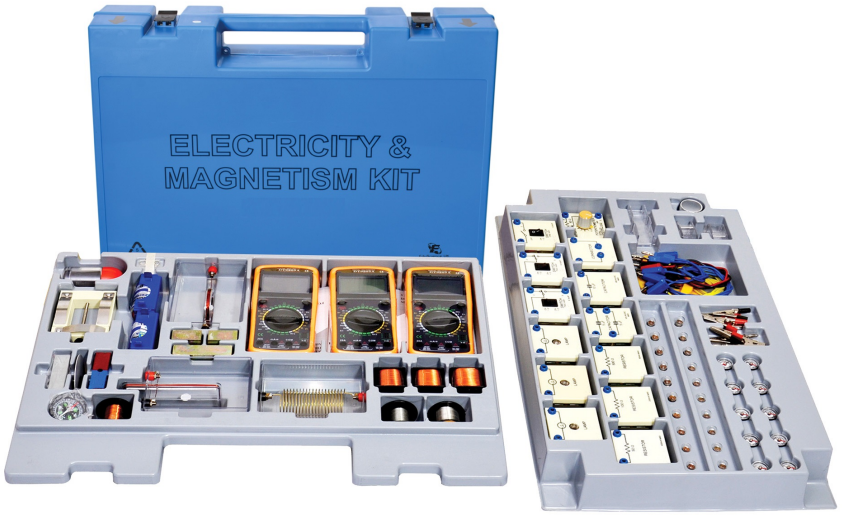
Physics

Electricity & Magnetism kit 4

ESP59118

Senior High School

- The apparatuses are precisely designed for easier experiment setup and successful result.
- The guide book consists of 45 experiments.



Component List

Consists of 47 components, packed in a plastic injection moulding box.
Dimensions: 68 × 44 × 18 cm. Weight : 12.9 Kg.

Cat. code	Component	Qty
PEO 325 01	Potentiometer, 50 Ω	1 pc
ESP 359 01	50 Ohm, 5 W Resistor	1 pc
ESP 359 02	100 Ohm, 5 W Resistor	1 pc
ESP 351 07	500 Ohm, 5 W Resistor	1 pc
ESP 403 01	5 µF, 50 V Capacitor	1 pc
ESP 403 02	10 µF, 50 V Capacitor	1 pc
ESP 504	Lamp Holder	3 pcs
ESP 502	SPST Switch	1 pc
ESP 503	SPDT Switch	2 pcs
ESP 501	Connector Box	1 pc
ESP 60/5A	Power Supply 5 A, 12 V	1 pc
ESP 221 01	Cell Holder	2 pcs
ESL 99/30-025	Connecting Leads, 250 mm, Blue	3 pcs
ESL 99/40-025	Connecting Leads, 250 mm, Yellow	3 pcs
KAL 99/10-050	Connecting Leads, 500 mm, Black	1 pc
KAL 99/20-050	Connecting Leads, 500 mm, Red	1 pc

Cat. code	Component	Qty
ESL 99/30-050	Connecting Leads, 500 mm, Blue	2 pcs
ESL 99/40-050	Connecting Leads, 500 mm, Yellow	2 pcs
ESP 331	U and I core	1 pc
ESP 355	Coil with 150 turns	1 pc
ESP 356	Coil with 500 turns	1 pc
ESP 357	Coil with 1000 turns	1 pc
ESP 333 01	Base for Aluminium disc	2 pcs
ESP 332	Solid Iron Core	1 pc
ESP 333 02	Alumunium Disc and Axle	1 pc
ESP 331 04	U-Core Foot	1 pc
ESP 240 03	Digital Multimeter, DT 9205A	3 pcs
ESP 20.14/113	Bar Magnet, ALNICO, Red-Blue	1 pc
ESP 291	Circular Conductor	1 pc
ESP 290	Straight Conductor	1 pc
ESP 292	Solenoid Conductor	1 pc
ESP 20.30/125	Sprinkler Iron Filling	1 pc

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Cat. code	Component	Qty
PEF 320	Plotting Compasses, Plastic	10 pcs
KAL 70/025-05	2.5 V, 0.5 A E10 Lamp Bulb E10	1 pack
KAL 70/120-50	12 V, 3 W E10 Lamp Bulb	10 pcs
PEO 483 02	Copper Wire, Ø 0.2 mm	1 pc
ESP 481 02	Constantan Wire, Ø 0.2 mm	1 pc
KAL 92/200	Fuse Wire	1 pc
ESL 015	Pin	4 pcs
ESL 016	Paper Clips	2 pcs
PEO 460 02	Alligator Clips with Plug, Black & Red	4 pcs
PEO 460 01	Alligator Clips with Socket, Black & Red	4 pcs
PED 135 02	Copper Electrode	1 pc
ESP 130 02	Zinc Electrode	1 pc
ESP 132 02	Conductivity Plate	2 pcs
ESP 333 03	Thompson's Ring	1 pc
ESP 58	Compass	1 pc

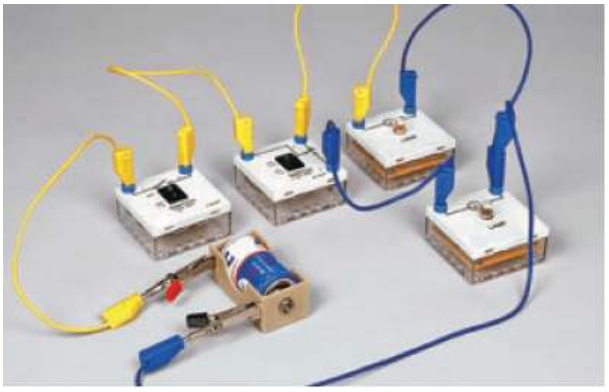
Experiment Topics

Fundamental Principle

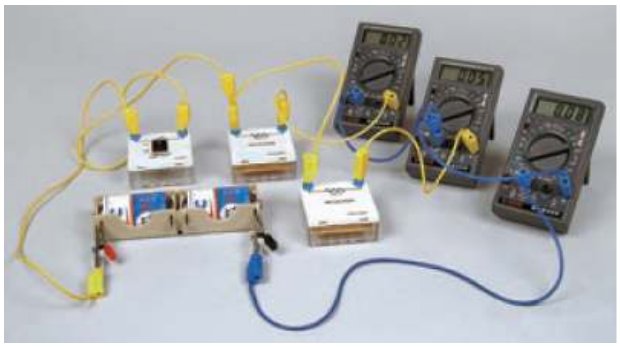
- LU-1 Simple Circuit
- LU-2 One Way and Two Way Single Pole Switches
- LU-3 Circuit to Turn on a Lamp From Two Switches
- LU-4 Measuring Voltage. The Voltmeter I
- LU-5 Measuring Voltage. The Voltmeter II
- LU-6 Measuring Current. The Ammeter
- LU-7 Conductor and Non Conductors
- LU-8 Conducting and Non Conducting Liquids I
- LU-9 Conducting and Non Conducting Liquids II

Electric Resistance

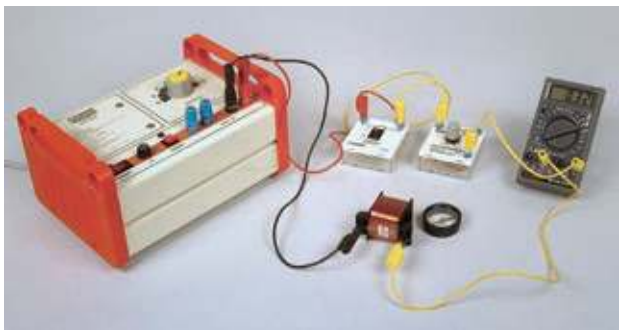
- LU-10 Ohm's Law
- LU-11 Using Ohm's Law to Determine Resistances
- LU-12 The Resistances of a Lamp
- LU-13 Lamps in Series and Short Circuit
- LU-14 Resistors in Series
- LU-14a Resistors in Series II
- LU-15 Lamps in Parallel
- LU-16 Resistors In Parallel
- LU-17 Combined Series and Parallel Connection 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)



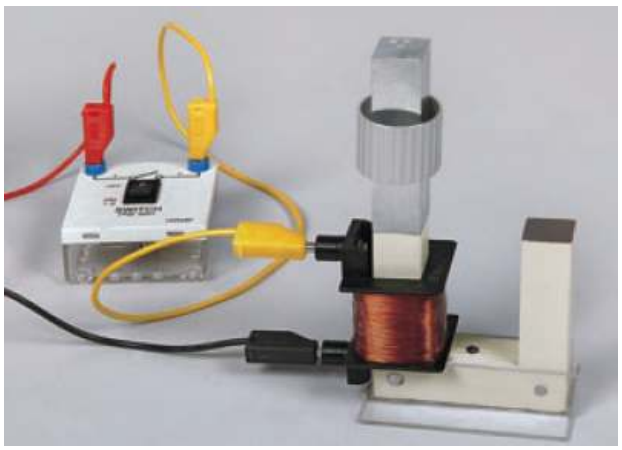
LU-3 One Way and Two Way Single Pole Switches



LU-16 Resistors In Parallel



LU-33 Electromagnets



LU-43 Thompson's Ring

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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

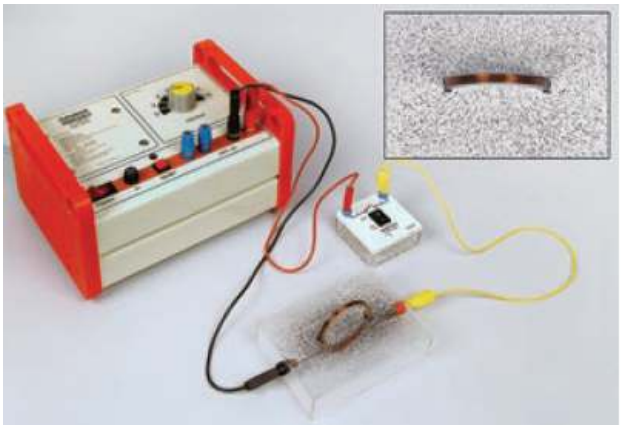
LU-30	Magnetic Field Around a Straight Wire
LU-31	Magnetic Field Around a Circular Wire
LU-32	Magnetic Field Around a Solenoid
LU-33	Electromagnets

Electromagnetic Induction

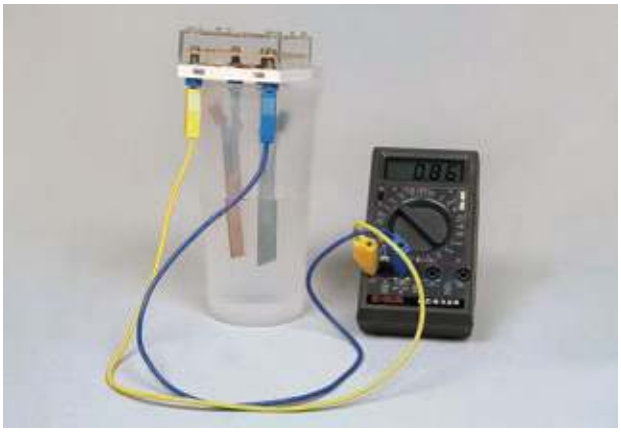
LU-34	Electromagnetic Induction
LU-35	Electromagnetic Induction II
LU-36	Laminated and Not Laminated Iron Core
LU-37	Useful Eddy Current
LU-38	The Transformer

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



LU-31 Magnetic Field Around a Circular Wire



LU-28 Voltage Generator by Metals Immersed in Electrolyte Solution

Electricity and Magnetism experiment guide in English.

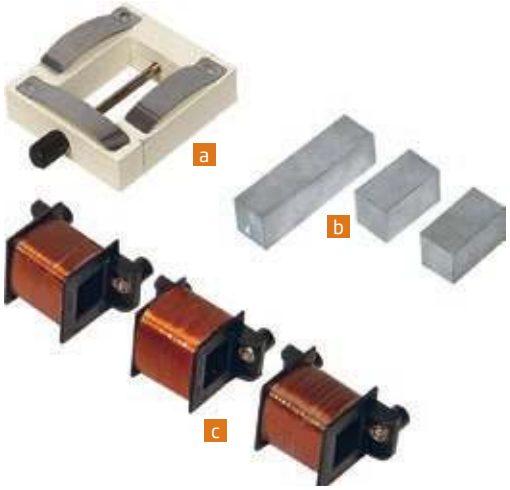
Component Details

Core and Coil

a. Set of I and U core (ESP 331) is laminated iron core, completed with lock bolt and spring plate to lock the coil.

b. Set of solid iron core (ESP 332) is non laminated solid iron core, consisting of 1 long I core and 2 short I cores.

c. The150 turns (ESP 355), 500 turns (PEF 356), and 1000 turns (ESP 357) coils can be combined to produce a model of step-up and step-down transformer.



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Section Box Component

The components are mounted on a plastic house with 4 mm socket. These are connected using a Connecting Leads to form a circuit.

Plastic house: 64 × 64 × 28 mm

- Potentiometer, 50 Ω (ESP 325 01)
- Resistor, 50 Ω (ESP 359 01)
- Resistor 100 Ω (ESP 359 02)
- Resistor 500 Ω (ESP 351 07)
- Capacitor 5 micro F (ESP 403 01)
- Capacitor 10 micro F (ESP 403 02)
- Lamp holder (ESP 504)
- Switch, SPST (ESP 502)
- Switch, SPDT (ESP 503)
- Connecting box (ESP 501)

Magnetic Field Observation Tools

a. Iron powder (ESC 20.30/125).
b. Alnico bar magnet (ESP 20.14/113).
c. Compass (ESP 58).
d. Plotting compass (ESP 320).

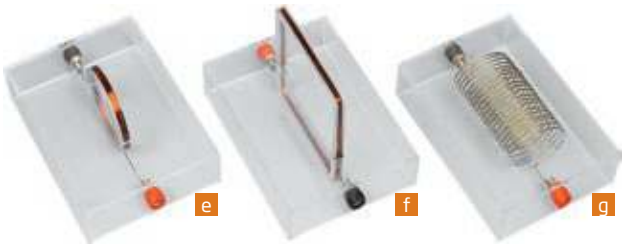
Battery Holder (ES 221 01)

This is the holder for D sized battery, designed to build series and parallel connection.

Conductor and Solenoid

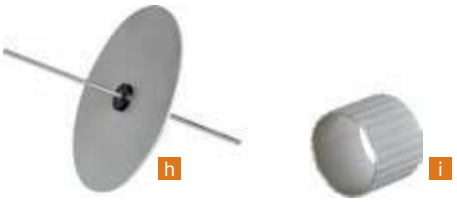
These are to observe the magnetic field on powered conductor. These tools are mounted on transparent box to put on an overhead projector to get enlarged view of the produced magnetic field pattern.

e. Straight conductor (ESP 290).
f. Circular conductor (ESP 291).
g. Solenoid (ESP 292).



Aluminum Disc with Axle and Thompson Ring

h. Aluminum disc with axle (ESP 333 02): disc diameter is 70 mm, 100 mm axle length, used for Eddy current concept experiment.
i. Thompson ring (ESP 333 03): 32 mm diameter, 25 mm long, used for Lenz's Law concept experiment.



Connecting Cable

- Fibrous cables with 4 mm banana plugs.
- Red and black colored cables are used for power supply connection. Yellow and blue colored cables are used for component connection in a circuit.
- Available in the length of 250 and 500 mm.