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ELECTRICITY

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Electricity

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Electricity

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Electric

Battery Holder



D Cell Battery Holder

56044

Single holder can be snapped together in parallel or series to extend capacity or voltage.



56047 D Cell Battery Holder with Fahnestock Clips

56048 D Cell Battery Holder with Leads

Each type holds all standard D cell batteries and comes with 6 red and black pre-stripped leads or Fahnestock clips for easy connection. Made of unbreakable plastic. Curved sides help prevent the battery from falling out when it is upside down.



Battery Holder

MS303.1-1 Blue, plug-in type

MS303.1-2 Yellow, plug-in type

MS303.2-1 Blue, button type

MS303.2-2 Yellow, button type



Battery Holder MS303.4



Battery Holder MS303.5

Conductivity of Solution



Conductivity of Solutions 310

For showing the electrical properties of liquids. Consists of a molded socket on a PVC cover, provided with binding posts for connection of two wire cords. Two wire electrodes are internally connected to the lamp circuit. The cover is designed to fit clear glass tumbler. Light bulb, glass tumbler is provided.

Conductivity of Solutions, with Plastic Cup 315

Lamp and Board



Lamp Board

1200-1

3 Lamps, Economy, Acrylic Base, 6" x 8"

1200-14

5 Lamps, Economy, Parallel, Acrylic Base, 5" x 15"



4-Lamp Board

1200-6 4 Lamps, Acrylic Base,

1200-6B 4 Lamps, Acrylic Base, Small Type



Gooseneck Table Lamp

1200-15

Gooseneck Lamp, UL Standard, SJ-076



Miniature Lamp

1200-16 Mini lamps, 1.5V, 0.3A, 10pcs/pk

1200-17 Mini lamps, 2.5V, 0.3A, 10pcs/pk

1200-18 Mini lamps, 6.3V, 0.5A, 10pcs/pk

1200-19 Mini lamps, 3.8V, 0.3A, 10pcs/pk

1200-20 Mini lamps, 4.8V, 0.5A, 10pcs/pk

Receptacle



Mini Lamp Holder

1200-08 Miniature lamp holder, spring posts

1200-09 Miniature lamp holder, screw posts



Mini Lamp Holder

1200-10

Miniature plastic lamp holder with screw type binding posts

Resistance and Rheostats



Slide Wire Rheostats

1820-A	Rheostats, slide wire, 5.0 Ohms, 3.0 Amps
1820-B	Rheostats, slide wire, 10 Ohms, 2.0 Amps
1820-C	Rheostats, slide wire, 20 Ohms, 2.0 Amps
1820-D	Rheostats, slide wire, 50 Ohms, 2.0 Amps
1820-E	Rheostats, slide wire, 50 Ohms, 1.5 Amps
1820-F	Rheostats, slide wire, 200 Ohms, 1.25 Amps
1820-G	Rheostats, slide wire, 2000 Ohms, 0.3 Amps
1820-H	Rheostats, slide wire, 360 Ohms, 1.10 Amps
1820-I	Rheostats, slide wire, 89 Ohms, 1.10 Amps
1820-J	Rheostats, slide wire, 45 Ohms, 3.10 Amps
1820-K	Rheostats, slide wire, 5.6 Ohms, 8.4 Amps



Resistance Box



Resistor Coil Set 1821

A set of three precision resistor coils made of constantan wire, with resistances of 5 Ohm, 10 Ohm, and 15 Ohm respectively. Low tolerance (1%) allows accurate results.



Knife Switch with Spring Posts

The spring binding posts allow for quick electrical connections to a circuit.

917 Knife switch spring post, SPST

918 Knife switch spring post, SPDT

919 Knife switch spring post, DPDT

Switches and Contacts



Contact key 319

This key is used to open and close an electrical circuit momentarily. Excellent for demonstrating Morse code



Plug Type Switch MS302.4



Mini Knife Switch 909

Single knife single throw.

Electric Demonstrator



Knife Switches

912 Knife Switch, Single Pole, Single Throw

913 Knife Switch, Single Pole, Double Throw

914 Knife Switch, Double Pole, Single Throw

915 Knife Switch, Double Pole, Double Throw



Electrolysis Brownlee with Jar 498

Conductivity of Solutions

Lets your students actually observe increases and decreases in a liquid's conductivity! Consists of a molded socket on a PVC cover, provided with binding posts for connection of two wire cords. Two electrodes are internally connected to the lamp circuit. The cover is designed to fit a clear glass tumbler. Light bulb, glass tumbler, and instructions sheets are provided.

(4" x 4" x 5"; .5lb



Electrolysis Brownlee Apparatus 499

This is the simplest type of electrolysis apparatus. Platinum electrodes are attached to insulated connecting rods which are attached to binding posts mounted on a non-conducting support. The support rests across the top of a battery jar (not included) and has 2 clips that hold 2 inverted test tubes. The unit operates on a 6V battery or 10V DC power supply.

Contemporary Brownlee 499-2

Brownlee Electrolysis Apparatus New Design! This unit features several improvements over the standard Brownlee. The open front spring clips make it much easier to remove the test tubes while the tubes remain submerged. The test tubes have been graduated for a clear measurement of the volume of gas generated. The black acrylic background aids in viewing the water level while supporting the test tubes. The binding posts have been repositioned for easy access and greater safety. The unit measures 140mm x 203mm x 38mm. Instructions included. Brownlee Electrolysis Apparatus, New Design.



Student Cell Voltaic with 2 Electrodes 1822

Voltaic Cell
The voltaic cell is ideal for demonstrating the characteristics of a primary cell! Supplied with 2 electrodes, copper and zinc.
(4" x 4" x 5"; .55lb).



Electro Physics



Wheatstone Bridge 2305

An excellent introduction to the process of finding an unknown resistance using the aid of the Wheatstone Bridge. A one meter long resistance wire is stretched taut across a meter stick mounted on an anodized aluminum base. Binding posts are connected on each end for convenient connection. A knife edged switch slides freely across the meter stick for varying the resistance of the wire. A aluminum bar with binding post runs across the top of the unit to provide known, equal resistance.

Wheatstone Bridge MS309-2, 309-3

Simple and durable, this Slide wire Wheatstone Bridge consists of a resistance wire with a sliding contact and a strip of aluminum to provide two "arms" of the bridge for known and unknown resistances. This apparatus also allows you to see how the resistance of a conductor varies with its length, diameter and material for an interesting and informative lab experience. The resistance wire is one meter long and is made of 0.5mm-diameter nickel-chromium wire. Strips of heavy aluminum without soldered joints are provided with a single gap in each of two arms for the resistances. You add a galvanometer to show when the circuit is balanced. Includes instructions. Requires a wide range of circuit elements, depending on selected experiments



Electromagnetism

Electromagnetism



Lenz's Law Apparatus

501-10(MS310.1)

Consists of two metal rings connected by an aluminum beam that can rotate freely on a support. One of rings is a closed loop, the other has an opening for comparison. When a bar magnet moves into or out of the loop the magnetic flux will change. According to Lenz's Law, a current will be induced in the loop to oppose the change. Students can verify the law by analyzing the movement of the loop.

8 x 6 x 3"

Electromagnets

505-2

This kit is designed for elementary through high school students to learn the principles and applications of electromagnets. Includes two coils on plastic spools a U shape iron core, a straight iron core, two magnetic needles with stands, and a pair of wires. Students can build a bar and a U shape electromagnets with a 6V battery or DC power supply, and determine the magnitude and polarity of electromagnetic forces. Comes in a 5 x 5 x 1.5" plastic case. Weight s 7 oz.



Large Iron Clad Electromagnet

505-3

A strong enamel covered electromagnet powered by four 1.5 volt C batteries. Equipped with alligator clip leads approximately 6" in length. The unit measures 75mm diameter x 260mm length. Batteries not included



Gilley Coil (Electromagnet Kit)

511

Experiment with induced currents, reversed polarity and magnetic lines of force. Kit includes 2, 350 turn copper coils with 2 binding posts on each coil; 1 round iron core; square iron core; 2 half-round iron cores; "U"-shaped double core; plastic card; 4 color-coded leads with alligator clips; iron filings in reusable jar; instruction booklet. Operation requires 6 volt dry cell or lab power supply (not included).

Primary and Secondary Coil

1440

Used to study electromagnetic induction & transformer principles. The outer coil is 4-1/2" tall and 2-3/4" in diameter. The inner coil is 3-3/4" tall and 1-1/4" in diameter. The removable steel core with handle is 1/2" in diameter and 5-1/2" tall. All coils are wrapped with 20 gauge magnet wire with insulated binding posts as connectors.



Electricity and Magnetism Kit

1828

This kit can used to demonstrate most of the principles of electricity. Supplied with an easily understood instruction manual. The kit contains the following:

- 1 - Voltmeter 0-1.5V, 0-3V;
- 1-Milliammeter 0-500mA, 0-1000mA;
- 1-Electroscope;
- 1-Battery Kit;
- 1-Mimi Rheostat;
- 2-Bar Magnet 2" length;
- 1-Compass needle;
- 2-Resistors;
- 1-Mini Electromagnet;
- 1-Horseshoe Magnet;
- 2-Mini Contact Switches;
- 2-Bulb Holders, 1-pkg. Of Iron Filings,
- 1-Battery Holder D-Cell;
- 1-Coil;



1-Coil of Wire; 1-Steel Rod Electromagnet;
1-Coil of Wire; 1-Steel Rod Electromagnet;
1-Acrylic Piece 19mm x 120mm;
2-Plastic Rods 5mm x 120mm



Electromagnetic Field and Flux MS403

Perfect for all classroom experiments requiring an external magnetic field. Great for studying induction and the rate of magnetic flux change through a coil.

Current Balance 1851

This unit is used to measure the current traveling through a conductor. To explain the reaction and its rule of a loaded conductor in the magnetic field, in order to formulate a clear conception of magnetic induction.



Magnetic Field Demo. MS403-1

Perfect for all classroom experiments requiring an external magnetic field. Great for studying induction and the rate of magnetic flux change through a coil. Made of four layers of 0.67 mm wires (23 gauge) with approximately 710 turns of polyurethane enameled copper wire. PVC core is 5-5/16" L with a 1-3/8" diameter. Designed to carry 7-10 amperes intermittently.



Lorentz Force Demonstrator 63412

Demonstrates the motion of electrons in a magnetic field, and determines the charge-to-mass ratio of an electron (e/m). Accelerating voltage is continuously variable between 0 and 250V. Polarity of voltage on deflecting plates and polarity of electromagnet can both be reverted.



Electric Bell MS406

The apparatus consists of a magnet, a shaded pole, and a bell, all mounted on a board. It is designed to show how electrical energy converted to sound energy (bell).



Magnetism Torch MS307.4

As per magnetism principle, only moving the torch at horizontal direction a few second, then the torch will be light on.



Generator and Motor



Miniature Motor 280A

Operates on 1.5V or 3V DC. 7000-11000 rpm.
Dimensions 40mm L x 21mm D.
Weight: 23 grams (0.08oz)

Motor Generator 1840

Similar to a St. Louis Motor, but capable of DC and AC operation. May be operated as a magneto, series motor, shunt motor, series generator and shunt generator. Two permanent magnets and two electromagnets included.

This well-designed apparatus demonstrates both shunt-wound and series-wound connections for motors and generators, and can be used with AC or DC supplies. Includes a 2-pole armature, commutator, brushes, and a coil for use as an electromagnet. Also includes a powerful horseshoe magnet. Easily dismantled to change the configuration. Requires a DC power supply, sold separately. Size: 9 x 9cm x 8cm high.



Miniature Motor Model 1847

This model of both an AC and DC motor is quick to put together and easy to assemble and disassemble. This unit is self-contained and even includes the wrench and screw driver needed. Demonstrate both permanent and electromagnet motors. Everything comes packed in it's own protective case which becomes the base for the motor.



AC / DC Generator



1850

With this unit both alternating & direct current can be demonstrated. By turning the handle, the current that is produced can be seen as it lights the lamp. The quicker the handle is turned the brighter the light. Each unit is cleaned & lubricated. All units are tested to make sure they meet performance standards.

One-Handed Generator

1852

Simple, convenient, and easy! This simple generator can be operated with one hand, and will generate up to ten volts. Moderate cranking speeds will generate approximately 5.5 volts DC. The alligator clips on the end of the connection cords provide a convenient hook up to any electrical device. The unit's transparent casing also allows for viewing of the inside workings of the generator during operation. (8" x 5-1/2" x 2"; .5lb).



DC Generator - Hand powered

1853

This pistol grip style handle generator can be utilized with almost any experiment requiring up to 12 Volts DC current. Housed in tough clear plastic. This unit is not only functional but costs about half of that of similar models. This generator can also be used as hand generated flashlight due to the mounted lamp on the end or use the binding post to connect an outside electrical circuit.



St. Louis Motor 1857

The St. Louis Motor is useful in demonstrating the operations of a DC motor. The motor consists of a 2 pole armature mounted between magnets. The steel supports are mounted on a ridge plastic base. Will operate on 3 to 9 volts DC.

All the parts are open to view, so you can easily show the components of a motor or generator. You can also build on this basic apparatus to perform a variety of demonstrations, including magnetic fields, D.C. motors, series and shunt fields and generators. The motor comes with a two-pole D.C. armature that you can connect to a mechanical device or to another St. Louis Motor for motor and generator demonstrations. Brushes are adjustable for contact with commutators. The two permanent bar magnets are supported by white-plated spring-brass clamps, which can be adjusted to show the effects of pole separation. This versatile teaching tool comes with instructions for performing many experiments. Size: 16cm long, 10cm high. Requires low voltage D.C. power supply.



DC Motor Kit 1858

This kit allows students to build their own DC Motor from scratch. All of the needed parts are included along with a detailed instruction manual. The unit is 7.5"x 9"x 5" after assembled and runs on one AA battery.



Motor Generating Model MS307.3

Demonstrates that the basic structure of a motor and an electric generator is the same. The construction of the apparatus is such that all the parts are readily observable.

DC Motor Y64012

This DC motor was designed for students to learn about electromagnetic forces. The open structure resembles the diagram found in many textbooks. Polarity of the magnets can be reversed to change the direction of rotation. The motor can also be used with a rheostat to observe the change of speed with the change of current. The DC motor can stand vertically or horizontally for best view and operates on a 1.5V battery. Completely assembled, this open design is similar to diagrams in most textbooks and allows easy learning of motor-related principles. Magnets can be reversed to change rotation direction of the motor. To observe change of speed with current, use an external rheostat (not included). Motor can be used vertically or horizontally, for both experiments and demonstrations. Motor is lightweight and can be used with a 1.5V battery or external power supply that you provide. Instructions and storage case included. Size: 4.5 x 5 x 2".



Electronic Instrument

Student Meter



Analog Multi-Meter

1306-40

DC Voltage Range: 2.5V, 10V, 50V, 500V DC
Current Range: 0.5mA, 10mA, 250mA
AC Voltage Range: 10V, 50V, 500V
Resistance Range: 10k Ohm, 1M Ohm



Digital Multi-Meter

1306-41

DC Voltage Range: 200mV, 2000mV, 20V, 200V, 1000V DC
Current Range: 200uA, 2000uA, 20mA, 200mA, 10A AC
Voltage Range: 200V, 750V
Resistance Range: 200 Ohm, 2000 Ohm, 20K Ohm, 200k Ohm, 2000k Ohm

Student Meters

Globe Brand, Student Grade(+ / -2.5% accuracy)

1309-0 A/C Ammeter, 0 - 1/5A, Double Scale

1309-1 AC/DC Ammeter, 0 - 3A Black

1309-2 DC Ammeter, -20 - 0 - 100uA Red

1309-3 DC Ammeter, 0 - 500uA Red

1309-4 DC Ammeter, 0 - 1mA Red

1309-5 DC Ammeter, 0 - 100mA Red

1309-6 DC Ammeter, 0 - 200mA Red

1309-7 DC Ammeter, 0 - 500mA Red

1309-8 DC Ammeter, 0 - 1A Red

1309-9 DC Ammeter, 0 - 3A Red

1309-10 DC Ammeter, 0 - 5A Red

1309-11 DC Ammeter, 0 - 10A Red

1309-12 DC Ammeter, 0 - 5A Red

1309-13 DC Ammeter, 0 - 50mA, 0 - 500mA, 0 - 5A



Student Meters

Globe Brand, Student Grade(+ / -2.5% accuracy)

1309-14 DC Voltmeter, 0 - 3V Blue

1309-15 DC Voltmeter, 0 - 5V Blue

1309-16 DC Ammeter, 0 - 10V Blue

1309-17 DC Voltmeter, 0 - 5V, 0 - 15V Blue

1309-18 DC Voltmeter, 0 - 3V, 0 - 10V, 0 - 15V Blue

1309-19 DC Voltmeter, 0 - 3V, 0 - 15V, 0 - 300V Blue

Galvanometer

1309-20 Galvanometer, -500 - 0 - 500uA white

1309-21 Galvanometer, -35 - 0 - 35mV White

1309-22 Galvanometer, 500 - 0 - 500mA DC White

Projection Voltmeter Electric Meters for Overhead Projectors

Great for teaching electricity concepts to large classes! These fully functional electric meters are built in transparent cases so that they can easily be projected for classroom education. Each unit incorporates dampening features, magnetic shielding and an accuracy of + or - 2.5%. 4" x 4.5"; 4.3oz. Provided with a well-written instruction sheet offering a number of suggested uses. (6" x 2-1/2" x 5"; .294lb)

1309-30 Projection Voltmeter, -0.5V, 0, 2.5V & -2V, 0, 10V

1309-31 Projection Voltmeter, -100mA, 0, 500mA, & -500mA, 0, 2.5A

1309-32 Projection Galvanometer, -300uA, 0, 300uA

Electronic Supplies

Connector Clips



Alligator Clip Insulating Cover 309-A

A flexible, vinyl insulator. It covers entire clip except nose. Package of 10, five red and five black.



Alligator Clip 309-B

Alligator Clip, without Insulator. 10pc/pk



Alligator Clip 309-C

Alligator clip, with Insulator, Black/Red, 10pc/pk



Banana Plug 309-D

Banana Plug, Cross Patch/Stacking, black/red, 10pc/pk



Battery Connector 56045

9V Battery Connector 15cm red and black leads with insulated snap-in connector.



Fahnestock Clips 56534

For one wire. 1" length, 5/16" width, with screw hole. Package of 100.

Connector Cords



Banana Plug Cord

199-13 Banana plug cord, stacking/cross patch, Blk/Red,12"

199-14 Banana plug cord, stacking/cross patch, Blk/Red,18"

199-15 Banana plug cord, stacking/cross patch, Blk/Red,24"

199-16 Banana plug cord, stacking/cross patch, Blk/Red,36"

199-17 Banana plug cord, stacking/cross patch, Blk/Red,48"



Alligator/Banana Cord

199-19 Alligator/banana cord, stacking/cross patch,12"

199-20 Alligator/banana cord, stacking/cross patch,18"

199-21 Alligator/banana cord, stacking/cross patch,24"

199-22 Alligator/banana cord, stacking/cross patch,36"

199-23 Alligator/banana cord, stacking/cross patch,48"



Alligator Clip Cord

309-1 Alligator Clip Cord, Insulated, Blk/Red, 12"

309-2 Alligator Clip Cord, Insulated, Blk/Red, 18"

309-3 Alligator Clip Cord, Insulated, Blk/Red, 24"

309-4 Alligator Clip Cord, Insulated, Blk/Red, 36"

309-5 Alligator Clip Cord, Insulated, Blk/Red, 48"