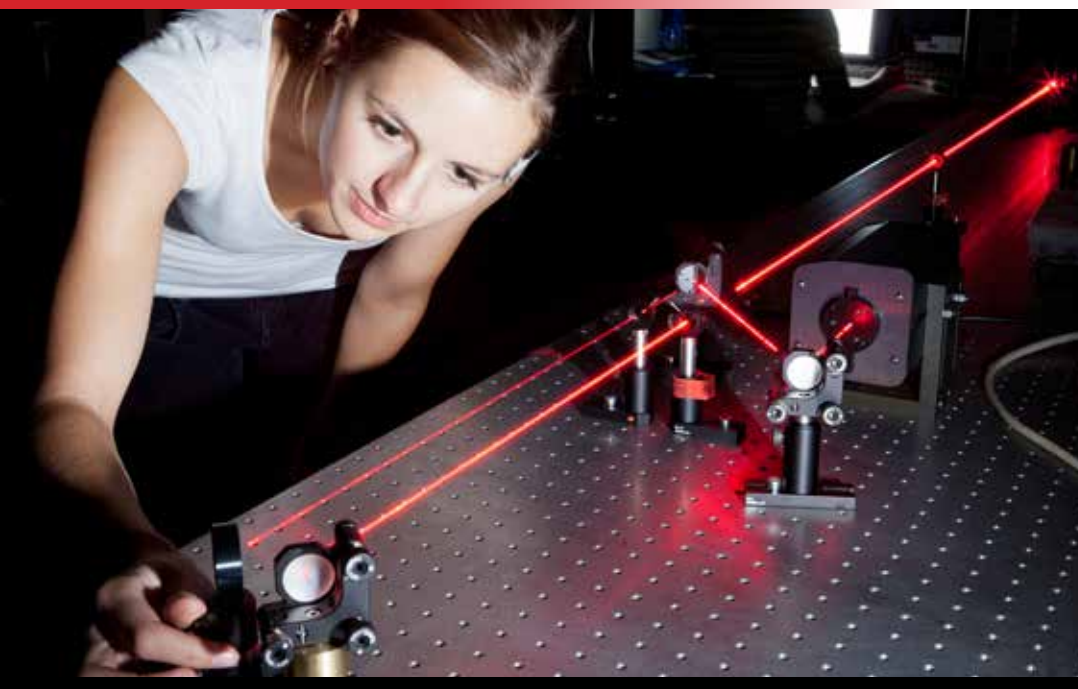


Science – Physics



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FCJJ-37 Renewable
Energy Education Set

£173.11

Order code 06-6551



PH0900
Electrostatics Kit
16 Piece Set

£25.17

Order code 52-3634



Full range of Physics products available at:

www.rapidonline.com

Power Supplies & Meters

PSU
Base.co.uk

VSPSU Volt Switch Single - 5A AC/DC Selectable Output

The PSU Base Volt Switch is a low voltage power supply that can output AC and DC at 5A with selectable voltages of 2, 4, 6, 8, 10 or 12V. The PSU features an electronic cut-out system to protect against short circuits and overloading.

- Low voltage 5A power supply
- Unregulated output
- AC and DC outputs may be used simultaneously
- AC Voltages will be approx. 2V higher than the DC values
- 5-year warranty



Type	Order code	1+
	53-6899	110.57

567871

Velleman
30V, 5A DC Laboratory Dual Power Supply

This grey DC power supply from Velleman has a dual LED display showing voltage and current and is ideal for laboratory use.

- 4-digit display
- Coarse and fine adjustments
- Insulated safety terminals
- Low noise temperature controlled fan
- Setting lock function
- 10mV/1mA setting resolution
- Fuse protected
- Input voltage: 220VAC (± 10%) 50/60Hz
- Output voltage: 0 to 30VDC
- Output current: 0 to 5A
- Output power: 150W max
- Operating temperature: 0 to +40°C,
- Dimensions: 117 x 190 x 270mm
- Manufacturer's part LABPS3005N



Type	Order code	1+
DC lab. power supply	70-0768	117.78

563908

Electricity & Electronics

EISCO
Test & Training Equipment

Basic Electricity Kits

These basic electricity kits from Eisco are ideal for teaching various topics related to electricity.

The kits provide a low-cost and flexible alternative to the "circuit board" approach for investigations into simple electricity circuits.

Each component - such as a switch or bulb holder - is mounted on its own individual plastic panel fitted with 4mm sockets. The panels are then formed into circuits by using 4mm stackable leads.

The kits are supplied in polystyrene trays that keep the units organised. Designed as a resource for the teaching of introductory electricity, these kits include a well-structured instructional manual.



Type	Order code	1+
Basic kit	52-4207	30.38
Comprehensive kit	52-4092	145.60

568089

Tektronix®

Bench Power Supplies

Our range of Keithley bench DC power supplies, integrated with sensitive source meters, facilitate replication of the latest battery technologies. They give engineers opportunities to research product performance over the complete battery lifecycle, from charged to flat and new to end-of-life. They provide a variety of options for engineers:

- Power levels up to 150W
- Current up to 5A
- Voltage from 0-72V
- A wide range of measurement functions such as DC and AC volts, DC and AC current, two and four-wire ohms, continuity, frequency, period, RTD, thermistor, and thermocouple temperatures, diode test and capacitance
- Multiple interface options including LAN/LXI, USB-TMC, GPIB and RS-232 for data acquisition and automated testing

www.rapidonline.com/tektronix/bench-power-supplies





Rheostats

Useful for a variety of laboratory demonstrations, these rheostats provide a variable resistance in electrical circuits.

Oxidized constantan wire is wound on a vitreous enamelled tube. A sliding contact carriage, mounted on the slide bar, carries a phosphor bronze contact for long life. The rheostats have three binding posts with 4mm sockets for electrical connections: one at each end of the winding and another at the end of the slide bar.

- Available in a range of resistance values

Resistance in Ohms	Order code	1+
20	52-3337	22.79
37	52-3336	21.93
55	52-3334	20.33
125	52-3335	22.79

565527



Van De Graaff Generator Motor Or Hand Driven

These Van De Graaff generators have been specially designed for electrostatic experiments, and where a source of high voltage is required.

The generators are mounted on a stable base along with a choice of a hand-cranked pulley or a smooth-running AC motor.

- Develop voltage up to 200kV, depending on ambient conditions
- Spark length up to 60mm
- Sphere: aluminium
- Charge collecting belt: silicon rubber with excellent insulation resistance
- Belt-tracking easily adjusted
- Acrylic shaft allows for full visibility
- Charge collecting combs: aluminium mesh, clearly visible
- Connections: 4mm sockets in dome and base
- Discharger: spherical 100mm dia., with insulated handle and 4mm sockets
- 52-3416 can be operated by hand, or from a 110 or 220V AC mains supply
- 52-3636 is operated by hand only

Drive method	Order code	1+
Motor or hand	52-3416	136.91
Hand only	52-3636	111.49

565575

Technical specifications

Technical specifications for all of these products can be found at

www.rapidonline.com



Demonstration Motor/Generator AC/DC

This multipurpose apparatus allows students to easily compare and contrast an AC generator and a DC generator as well as an AC motor and a DC motor.

The front of the apparatus has brushes designed to collect direct current (DC) through a split ring and the back of the apparatus has brushes designed to collect alternating current (AC).

- Clever design produces AC & DC current at the same time
- Allows students to easily compare and contrast AC and DC generators and AC and DC motors
- Includes activity guide
- **Eisco type PH1245N8**

Type	Order code	1+
AC/DC motor/dynamo	52-3489	33.41

565608



Demountable Transformer Kit and Coils

A large scale transformer ideal for classroom demonstrations.

It consists of a magnetic circuit made up of highly permeable U-shaped metal sheeting which can be closed via two clamps with tightening screws.

The transformer is supplied with 4 coils. A range of optional additional coils are available separately.

- Transformer kit, 52-3479, contains:
 - One coil of 500 turns
 - One coil of 1000 turns
- Magnetic core section: 40 x 40mm
- Length 150mm
- Height 170mm
- Supplied with power supply cable
- Additional coils with various numbers of turns are available separately

Please note: For safety reasons these transformer kits and coils are fitted with shrouded 4mm sockets and therefore must be used with a shrouded type 4mm plug or lead set such as order code **17-2454**

Type		Order code	1+
Transformer kit		52-3479	131.46
Turns	Current	Order code	1+
Coils			
50	4A	52-3474	30.75
100	2A	52-3475	21.15
200	1A	52-3477	30.75
1000	0.3A	52-3476	30.75
1000	1A	52-3480	30.75
2000	0.05A	52-3478	30.75

565605



Demonstration Moving Coil Meter



Used to demonstrate the working principle of AC or DC ammeters or voltmeters, the meter is housed in a 300 x 150 x 30mm ABS plastic case with glass front and rear panels.

Exchangeable scales with built-in shunts are available separately that allow the meter to measure higher voltage and current.

- Moving coil type
- Accuracy of $\pm 2.5\%$
- Basic sensitivity 5mA
- 100mV f.s.d. (full scale deflection)
- **Eisco type PH1116**

No scales are included with the meter.

Exchangeable scales with built-in shunts are available separately that allow the meter to measure higher voltage and current.

Type	Order code	1+
Demonstration meter	52-3338	43.55
Scale - 1V	52-2999	6.86
Scale - 0 to 1A	52-3339	6.86

565528



Gold Leaf Electroscope

This gold-leaf electroscope is great for hands-on experience with electrostatic principles in physics classrooms and labs.

When an electrostatic charge is induced or transferred to the electroscope, the charge causes a thin piece of gold leaf to be repelled away from its mount. The resultant deflection of the leaf shows the presence of an electrostatic charge and the angle of the leaf can be used as a measure of the charge.

The solidly constructed sheet anodised aluminium frame of the electroscope is mounted on a plastic base. Front glass window slides up to allow the insertion of ionizing material into chamber. A transparent scale is attached inside the chamber to measure the deflection of the gold leaf.

- Supplied with two gold leaf sheets
- Fitted with 4mm socket
- When assembled, the electroscope measures 165 x 95 x 71mm
- **Eisco type PH0916B**

Note: the gold-leaf does not come pre-attached to the electroscope. Instructions on how to properly attach the gold-leaf to the conducting rod are included in the Experiment Guide.

Replacement gold leaf is available separately.

Type	Order code	1+
Electroscope	52-3640	15.50
Gold leaves pack	52-3641	3.67

565653

Gases & Liquids

eISCO

Basic and Advanced Ripple Tank Kits

These ripple tank kits are supplied complete with all accessories needed for wave investigations.

Each water wave behaves similarly to a curved lens. The crest of the wave is seen as a bright region and the trough is seen as a dark region.

The ripple tanks have a mechanical vibrator attached to a wave generator that produces either point wavelets or parallel wave fronts.

- Advanced model is supplied complete with a power supply and wave controller
- Basic model requires additional power supply and controller

Type	Order code	1+
Advanced ripple tank	52-3442	235.40
Basic ripple tank	52-3383	76.06
Controller (52-3383)	52-3704	10.28

565558

eISCO

Jolly Bulb with Gauge

This Jolly bulb apparatus consists of a 60mm diameter bulb directly connected to a bourdon pressure gauge.

The apparatus is used for investigation of gas at a constant volume. By inserting the glass bulb into either warm or cold water, the expansion or contraction of the air contained in the bulb can be seen as a pressure change on the gauge.

- 60mm diameter glass bulb
- Gauge calibrated in both kg/cm² and in psi
- Eisco type PH0138C

Type	Order code	1+
Jolly bulb + gauge	52-3700	29.24

565673

Rapid

Refraction/Wave Tank

Study the concept of refraction and the pattern of transverse waves with this Refraction / Wave tank.

Place different materials into the tank and demonstrate the refraction / internal reflection of those materials and how they vary from one another.

- Transparent acrylic tank
- Wooden handle

Type	Order code	1+
Refraction/wave tank	06-2246	60.81

533970

eISCO

Boyle's Law Apparatus

This high quality Boyle's law apparatus comes complete with accessories, including a 405mm pump with braided hose.

The apparatus is 685mm tall with a powder-coated metal base approximately 205 x 125mm.

Experiments can be carried out with water or by simply adding any food colouring to the water.

- High quality pressure gauge
- 200mm braided nylon flexible hose
- Hand operated pump
- PPE funnel
- Instruction manual
- Eisco type PH0150A

Type	Order code	1+
Boyles law app.	52-3414	126.71

565573

PSU

Base.co.uk

CLASUB10 Charles' Law Apparatus - Classpack of 10

The PSU Base Charles' Law apparatus is a simple way of demonstrating that the volume of a fixed mass of gas is proportional to its absolute temperature. Each unit is supplied with an easy to read oil bead and clear measurements ready to use.

- Classpack of 10
- Mercury free
- Dimensions 335 x 40mm
- Capillary tube 0 to 20cm reading
- Thermometer -10°C to +100°C
- Supplied singly

Type	Order code	1+
Charles' Law apparatus classpack	53-6923	175.72

567894

PSU

Base.co.uk

CLASUB Charles' Law Apparatus - Single

The PSU Base Charles' Law apparatus is a simple way of demonstrating that the volume of a fixed mass of gas is proportional to its absolute temperature. Each unit is supplied with an easy to read oil bead and clear measurements ready to use.

- Mercury free
- Dimensions 335 x 40mm
- Capillary tube 0 to 20cm reading
- Thermometer -10°C to +100°C
- Supplied singly

Type	Order code	1+
Charles' Law apparatus single	53-6922	18.52

567893

Rapid

Balloons

These packs of balloons offer great value for money.

- Supplied in packs of 100



Type	Order code	1+
Round	06-9972	4.94

563496

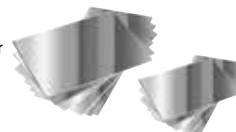
Lights & Optics

Rapid

Plastic Mirrors

These plastic mirrors are an essential base for any equipment used to investigate symmetry.

- Available in sizes A4 and A6
- Supplied in pack of 10



Size	Order code	1+
A4	07-0006	24.47
A6	07-0007	5.44

563520

eISCO

Rectangular and Semi-Circular Solid Glass Blocks

High quality solid glass blocks for use in optical and light experiments.

- Range of shapes



Type	Order code	1+
Rectangular	52-3315	3.86
Semi-circular	52-3316	2.98

565544

eISCO

Acrylic Prisms Set of 7

A set of seven clear acrylic blocks. The blocks are 25mm thick and are fully polished on all faces.

- Rectangle 75 x 50mm
- Semi circle 75mm dia.
- Triangle 60° x 60° x 60°, 58mm side
- Triangle 90° x 45° x 45°, 75mm hypotenuse
- Triangle 90° x 60° x 30°, 75mm hypotenuse
- Bi-convex 75mm long, curved faces 100mm radius
- Bi-concave 75mm long, curved faces 100mm radius
- Wooden storage box
- Eisco type PH0571



Type	Order code	1+
Acrylic prism set	52-3362	22.04

565544



Spectrum Tubes, Holder & Power Supplies

A range of spectrum tubes, associated holders and power supplies, for use in spectral analysis experiments.

- Wide range of materials
- Power supplies and tubes are sold separately

Note: The spectrum tubes are intended for intermittent use only and are not suitable to be used as a lamp source. They should be used for periods of 30 seconds on / 30 seconds off. Their expected life will vary depending on the gas they contain. Their useful life will be reduced if they are not used as recommended or allowed to overheat. Use tubes only with the Eisco power supply, 52-3613.

Type	Order code	1+
Tube holder	52-3612	24.73
PSU 240V AC	52-3613	147.72
Spectrum tubes		
Argon	52-3615	13.17
Carbon dioxide	52-3616	8.93
Helium	52-3617	13.17
Hydrogen	52-3618	13.17
Iodine vapour	52-3619	10.80
Krypton	52-3620	13.17
Neon	52-3621	13.17
Nitrogen	52-3622	13.17
Oxygen	52-3623	13.17
Sulphur	52-3624	10.80



Premium Quality Diffraction Gratings

A range of premium quality transmission type diffraction gratings mounted in 50 x 50mm frames.

- Eisco PDG19 series

Lines per mm	Order code	1+
80	52-3045	14.34
100	52-3046	14.34
300	52-3047	14.89
600	52-3048	19.03
1200	52-3049	18.03



Spectroscope Kit

This industry standard spectroscope can be used for measuring light wavelengths and colours from various light sources. The spectroscope measures wavelengths from 400 to 700nm for detailed examination.

- Measures wavelengths from 400 to 700nm
- Eisco type PH100QA

Type	Order code	1+
Spectroscope	52-3382	5.95



PH0602A Traditional Ray Box

This traditional ray box has three openings, two of which can be used simultaneously by two sets of pupils. Only a minimum of accessories are needed to cover a wide range of optics experiments.

The two side openings each have two slots for blanking plates or 50mm slide accessories. The front opening has seven grooves for accessories and lenses. The front opening has been designed so that when used with a biconvex cylindrical lens of 75mm focal length, divergent or convergent rays are obtained through the slit plate.

- Set includes:
- Ray box with 2m flex and two 4mm plugs
- 12V, 21W, B15 bulb
- 1x slit plate
- 2x aluminium blanking plates
- Eisco type PH0602A
- **Note:** A12V 2A power supply is required (not included).

Type	Order code	1+
Ray box	52-3678	15.19



Eisco Light Box and Optical Set

This set of optical equipment is ideal for a wide range of reflection, refraction and colour-mixing experiments.

The light box consists of a 12V, 24W light source that can produce convergent, divergent or parallel beams. On one end, the light box has an adjustable cylindrical convex lens for producing a parallel beam. On the other end, there is a triple aperture system for colour mixing experiments. The box also has lateral apertures with adjustable hinged mirrors. All apertures in the box have vertical channels to hold slit plates and colour filters, etc.

The optical set includes acrylic blocks, a set of three mirrors, two slit black plates and a set of seven mounted colour filters.

- Supplied with experiment guide
- Eisco type PH0615

Note: power supply for lamp not included.

Type	Order code	1+
Light box & optic set	52-3673	42.46

Order online

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For further information:

www.rapidonline.com/activate

STEAM resources

Visit our STEAM lab for project ideas

www.rapidonline.com/steam-lab



Standard Spectrometer



An economically priced, high-quality, precision manufactured instrument capable of quantitative work. The main structural parts of this laboratory grade spectrometer, including the collimator and telescope bodies are manufactured from heavy castings for durability and precision. This lab-quality spectrometer offers excellent quality at a price that every classroom can afford.

Collimator

The collimator consists of an adjustable slit on one end, with an achromatic converging lens (focal length 178mm) on the other. The lens is secured in a tube which can be adjusted by hand to ensure the slit is in the focal plane of the lens, thus producing parallel rays. Scale: 170mm diameter, 0 to 360° x 1°, capable of independent rotation, with locking screw. A spring-loaded vernier scale (attached to the telescope mount) provides readings to 0.1deg (6 minutes of arc). Collimator mounted on fixed pillar with axis adjustment.

The collimator is mounted on a spring loaded support, integral with the base.

Prism Table

The prism table is mounted on a 175mm diameter circular degree scale. The scale can be rotated around the central axis and is provided with a clamping screw. The prism table is provided with three levelling screws and has lines marked to assist with precise placement of the prism.

Note: Neither the prism nor the diffraction grating are supplied.

Telescope

The astronomical type telescope consists of an achromatic objective at one end and a Ramsden's eyepiece with cross wires. The position of the lens can be adjusted by hand. The telescope is mounted on heavy bearings, and can be rotated around the central axis of the apparatus. A clamping screw allows fixing of the telescope position and a tangent screw allows fine movement. A vernier scale allows the position of the telescope to be read to a precision of 0.1°.

- Quality, precision manufacture
- Diffraction grating holder
- Rotatable prism table
- Affordably priced for the classroom
- Astronomical type telescope with Ramsden eyepiece
- Supplied in durable storage box
- Includes working instructions
- Product dimensions: 420 x 310 x 280mm (16.5 x 12.2 x 11in.)
- Weight: 4.95kg (10.9 pounds)
- Standard accessories: 1-prism clamp for prisms up to 40mm high, 1 diffraction grating holder, aperture 25 x 25mm, 1 small screwdriver, 1 Tommy bar for axis adjustment
- Eisco type PH0619

Type	Order code	1+
Spectrometer	52-3340	174.50



Enhanced Optical Bench Set

This optical bench kit includes an enhanced set of accessories allowing the user to perform more experiments than other more basic kits. The bench is 1m long and is graduated on one side.

- **Set includes:**
- 1x 1m optical bench with end supports and graduation scale
- 8x riders with tightening screw
- 1x lamp housing with 12V, 24W halogen bulb
- 6x lens holder for 50mm dia. lenses
- 3x biconvex lenses: +10, +20 & +50
- 1x biconcave lens -20
- Set of diaphragms
- 1x plain mirror 100 x 100mm
- 1x translucent screen 100 x 100mm
- 1x transparent screen 100 x 100mm
- 1x object screen white 100 x 100mm
- **Eisco type PH0649**

Power source for lamp not included.

Type	Order code	1+
Optical bench set	52-3679	60.78

565670

Magnets



Alnico Bar Magnets

Shaw Magnets Bar Magnets are made from Alnico magnetic material. Alnico is an alloy of iron, ALuminium, Nickel and CObalt and has a high resistance to loss of magnetism. The magnets are supplied in pairs, complete with keepers which further help to 'keep' the magnetism without gradual loss and to protect their magnetic surfaces. North poles are denoted by a dimple or a notch.

- Red paint finish
- Complete with keepers
- Notch or dimple denotes North pole
- **Supplied in pairs**
- **Shaw Magnets Types ALN040, ALN060, ALN050 & ALN075**

Type	Order code	1+
12 x 5 x 40mm	06-5981	4.41
15 x 5 x 60mm	06-5975	7.35
15 x 10 x 50mm	06-5977	10.39
15 x 10 x 75mm	06-5979	13.92

501636

Eisco Basic Plotting Compass 16mm



Only

£0.319

Order code 52-3695

www.rapidonline.com



Ceramic Magnets



Colour-coded bar magnets in a neat storage box.

- Size of each magnet 14 x 10 x 50mm
- Easy to see if all magnets have been returned after use
- Supplied as a **box of 20**

Type	Order code	1+
Ceramic magnets	06-6302	17.47

80603



Large Ferrite Block Magnets

These large painted bar magnets, with red and blue poles, are stamped with N and S.

- Ideal classroom resource
- Low-cost, reliable and durable
- 14 x 10 x 50mm
- Supplied in **packs of 20**

Type	Order code	1+
Large ferrite magnets	06-0586	9.98

72031

Compasses



Plotting Compasses



The Shaw Plotting Compasses 14.5mm (Pack of 50) are manufactured in a plastic case and can be used to plot lines of magnetic fields.

- 14.5mm diameter
- Supplied in **packs of 50**

Type	Order code	1+
Plastic 14.5mm Pk 50	06-0668	11.55

72045

Weights & Hangers



Brass Slotted Masses and Hanger Sets

A range of mass hangers complete with removable slotted brass masses.

- Each set consists of 1 hanger plus masses
- The hanger is the same weight as a single mass
- Total weight of set is for hanger plus masses
- See Technical Specification table for full details
- Supplied **in sets**

Total weight	Each weight	Order code	1+
100g	10g	06-2185	6.93
250g	50g	06-2186	11.36
500g	100g	06-2187	20.22
1000g	100g	06-2188	41.52

534078



Brass Slotted Mass Weights

A range of individual brass mass weights with slots, allowing them to be used on suitable mass hangers.

- Made from solid brass
- Each mass is marked for easy identification
- **Eisco PH0258G series**

We recommend using these masses with only Eisco mass hangers as other brands of mass hanger may not fit.

Mass	Order code	1+
1g	52-3402	0.431
2g	52-3403	0.389
5g	52-3404	0.508
10g	52-3405	0.554
20g	52-3406	0.891
50g	52-3407	1.68
100g	52-3408	2.93

565570



Bench Mounting Pulleys

Bench mounting pulleys with a variety of clamping and securing methods.

- **06-2419** is an aluminium pulley, 50mm in diameter, mounted in a metal frame for clamping to a board or bench up to 25mm thick
- **06-2150** is an aluminium pulley, 70mm in diameter mounted in a metal bracket with two clamping screws for bench and rod support respectively. It can be clamped to a board or bench edge upto 38mm thick, screwed to a flat surface or clamped to a 13mm diameter support rod

Type	Order code	1+
Horizontal	06-2149	8.64
Vertical	06-2150	10.68

537509



Rockets

Rapid Paper Rocket Launcher

The launcher system comes as an unpainted flat-pack, needing only a screwdriver and pliers for assembly. Once set up, the launcher becomes the most popular piece of equipment in the school!

- Quick assembly
- Fantastic opportunity to engage pupils in designing and making
- Tested by hundreds of children (and adults)
- Can launch paper rockets up to 50 ft into the air
- Nose cones are available separately in **packs of 30**
- Paper-rolling mandrels are also available separately

Type	Order code	1+
Nose cones (30)	70-1522	8.37
Rolling mandrel	70-1524	1.27

81691

Rapid Air Powered Rocket Launcher

This Rocket Launcher is a working device that helps students to visualise the principle of action and reaction forces.



A 2 Litre plastic bottle (not included) is used as a rocket. Students can create a variety of rocket designs using empty fizzy drink bottles as part of a design and make project. The launch pad has a solid, durable metal base and is equipped with a simple triggering mechanism. It is powered by an ordinary bicycle pump and can launch the rocket to surprising heights.

- Visualise the principle of action and reaction forces
- Design and make rockets using empty 2 litre fizzy drink bottles
- Solid, durable metal base
- Simple triggering mechanism
- Powered by a standard bicycle pump
- Can launch rockets to surprising heights

Type	Order code	1+
Rocket launcher	06-2234	49.98

533965



Cochranes Of Oxford Solar System Orrery Height 100mm

Only

£21.76

Order code 52-7143

www.rapidonline.com

Solar System

Cochranes of Oxford Orbit Tellurium 2



This attractive hands-on Tellurium model from Cochranes of Oxford shows the Sun, Earth and Moon, correctly geared to show each month as the Earth orbits the Sun.

The flexible design instantly engages pupils and illustrates complex relationships more easily. The Orbit Tellurium 2 is an ideal model to aid lessons on: 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, the use of sundials and shadow sticks, lunar months and festivals linked to the Moon.

- 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
- 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 (No batteries required)
- Size: 65cm long, 25cm high

Type	Order code	1+
Orbit Tellurium 2	52-7141	217.40

502602

Motion, Motors & Accessories

Rapid Car for Motion Experiments

This sturdy car has a hook on one end that can be used for attaching cables, spring balances or for joining two cars together.

Applications for this vehicle include: experiments on simple and accelerated motion, friction impulse, conservation laws and inclined planes.

- Low friction plastic wheels
- Single-piece moulded plastic body
- Rectangular well enables placing of weights
- Can be used with or without a track

Type	Size	Order code	1+
Car	Small	52-1218	8.38

81785



eisco THOMSON & BAKER & CO. LTD.

Premium Gyroscope

This premium quality gyroscope is fitted on a high quality metal stand.

- Premium, heavy duty 75mm brass rotor
- 3 pairs of adjustable cast iron pivots fitted on stand
- Fluid motion for seamless performance
- Ideal for study of complex gyroscope physics concepts such as kinematics, angular velocity, angular acceleration and precession decay
- Generate compelling mathematic discussions regarding torque, swivel rate, mass per arc unit, etc.
- Beautiful functional display piece for home or office
- Includes string
- **Eisco type PH0342**

Type	Order code	1+
Gyroscope	52-4253	48.03

571087



Materials

Rapid

Ice Melting Kit - Thermal Conductivity Demonstration

This ice melting kit can be used to demonstrate the difference in thermal conductivity and thermal capacity between two different materials.

The kit consists of two identically sized blocks, one made of aluminium, the other made of plastic. When an ice cube is placed on the aluminium block it turns into water in seconds, while an ice cube placed on the plastic block melts slowly. This is due to the aluminium block having a larger heat capacity and a higher thermal conductivity than the plastic block.

- Supplied complete with instructions

Type	Order code	1+
Ice melting kit	06-2237	17.01

534082



eisco THOMSON & BAKER & CO. LTD.

Thermal Conductivity of Metal Apparatus

Comprising strips of copper, iron, aluminium and brass fixed to a wooden ring, this economical apparatus demonstrates the varying speeds of heat conduction along differing metal strips.

The outer ends of the metal strips have small recesses for holding paraffin wax. By heating the centre where the four strips meet, the wax can be seen to melt at different times, governed by the conductivity of the four different metals.

- Strips of copper, iron, aluminium and brass
- Wooden ring
- **Eisco type PH0400B**

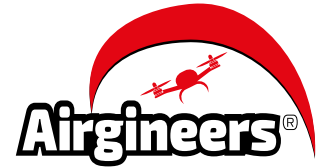
Type	Order code	1+
Conductivity of metal	52-3333	5.25

565526



NEW CHALLENGE COMING SOON!

Airineers is a STEAM challenge for secondary school aged students who will need to design, build and learn to fly their own radio-controlled quadcopter, also known as a drone.



DESIGN

1

Design using free CAD software

Autodesk are the biggest name in CAD software and have products that are used in engineering, product design, architecture, film, game design and VR. Airineers have worked closely with Autodesk to develop resources for the Fusion 360 and TinkerCAD software to help students learn how to design a drone from scratch, and the best part is that for schools and students, this software is completely free.

Fusion 360

Fusion 360 is professional-grade software that combines computer-aided design, manufacture and engineering (CAD, CAM and CAE) into a single software package. Whilst the software is installed and run locally, Fusion 360 allows users to harness the massive power of Autodesk's cloud computing to speed up rendering and processing of more complex designs.

TinkerCAD

TinkerCAD is a free, easy-to-use browser-based app for 3D design, electronics and coding with a shallow learning curve. Because it is browser-based, there is no software to install and students can access it almost anywhere

Visit www.airineers.co.uk to learn how to access the software.

Design Examples

Airineers Micro Drones can be manufactured using all manner of techniques and materials, each with different advantages. Here are just a few examples.

3D printing



CNC milling and 3D printing



Please note these images show a camera module which is not part of the standard Airineers Micro Drone design.

Foamboard and 3D printing

Vacuum forming and 3D printing

BUILD

2

Soldering



3D Printing



Vacuum forming



Airineers was created to provide a cutting-edge design and manufacture project that would allow students to learn CAD skills and apply them to manufacturing techniques such as 3D printing, laser cutting and vacuum forming as well as hand-made prototypes.

3 FLY

Now's the time to fly your drone, either for fun or in team or individual challenges, and increase your skills at pitch, yaw and roll.



Environmental



90x125x3mm Solar Module 5V 1.15W

OPL50A23101 Solar cell module, 5.0V, 230mA, 1.15W 90 x 50 x 3mm with pre-installed output leads 300mm 24AWG red and black.



- Small size enables easy series or parallel connection for higher voltage/current output
- Two Pre-wired output leads 300mm X 24AWG black and red
- Resin laminated solar cell
- **IP65** Ingress protection

Voltage	Power	Order code	1+	5+	10+	25+
5V	1.15W	55-0016	9.63	8.98	7.99	7.28

502676



Wind Power Renewable Energy Science Kit V4.0

With this kit, you can assemble a realistic wind turbine complete with electric generator and adjustable rotor blades that are designed with complex aerodynamic curves to look and work like modern-day wind turbine blades. Then, conduct experiments to optimize the turbine's performance by adjusting the angle of the blades and discover how to use the wind turbine to light up an LED and charge a rechargeable battery.



- Ages: 8+
- Experiments: 5
- Batteries Required: AA Rechargeable (1)

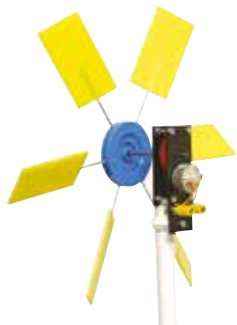
Type	Order code	1+
Wind/renewable energy	70-0387	37.97

562913



Wind Turbine

This Wind Turbine model can be used to carry out a wide range of experiments with wind power. The blades of the turbine can be easily adjusted, attached and removed. This allows students to investigate the effects of changing the number, pitch, size and shape of the blades. Some of the effects can be quite counter-intuitive and will provoke students into thinking and discussing the concepts of energy and power.



The turbine blades are made of corriflute plastic. Some pre-cut blades are included, but it is also possible to cut new blades of different shapes and sizes. The blades can be attached and removed simply by pushing them on and off the posts on the turbine hub.

- Corriflute plastic blades
- DC output
- Supplied assembled

Type	Order code	1+
Wind Turbine	06-1573	25.80

553096



Solar Kit Vehicle Apollo

- Age class: 10 years and over
- Dimensions 7 x 4 x 3cm
- Manufacturer's part **47170**

Not suitable for children under 3 years of age, danger of choking on small parts.



Type	Order code	1+
Solar car kit	60-3700	3.25

553600



H-racer 2.0 Hydrogen Fuel Cell RC ar

Discover the automotive technology of the future by building and driving your own hydrogen fuel cell car. The H-racer has received many awards including Time Magazine's "Best Inventions", Business Week International Design Excellence Award and many more. Ideal for educational use in Science or Design & Technology.

- Powered by hydrogen which you create from water using the hydrogen station
- Electricity required for this process is supplied by a solar panel so the process is a truly green source of renewable energy!
- Kit includes a solar cell, hydrogen station, remote control, hydrogen fuel cell car, manual and experiment guide



Powered by hydrogen which you create from water using the hydrogen station

Electricity required for this process is supplied by a solar panel so the process is a truly green source of renewable energy!

Kit includes a solar cell, hydrogen station, remote control, hydrogen fuel cell car, manual and experiment guide

Type	Order code	1+
H-racer 2.0	06-6531	101.69

500762



Hydrocar



The Hydrocar solar hydrogen vehicle is a working model offering a futuristic glimpse of what things could look like in the next decades, when cars run on clean hydrogen fuel.

- Watch as oxygen and hydrogen gases form in two transparent containers on the back of the vehicle
- Runs on clean hydrogen from a reversible Polymer Electrolyte Membrane (PEM) fuel cell
- The kit's fuel cell unit combines water electrolysis and fuel cell functions into one device
- Car can steer independently of the user once in operation
- When the car hits a barrier, it will automatically find its way by reversing and turning 90°
- Cool blue flashing lights in the cockpit

Type	Order code	1+
Hydrocar	06-6527	63.89

500760



Fuel Cell Car Science Kit



Horizon's Fuel Cell Car Science Kit uses a reversible Polymer Electrolyte Membrane (PEM) hydrogen fuel cell that combines electrolysis and power conversion into one single device. Watch as oxygen and hydrogen gases are formed in the two transparent water containers. The car steers independently of the user once in operation: when the car hits a barrier, it will automatically find its way by reversing away at 90°. Included in the box is a Renewable Energy Education Manual as well as an Experiment Guide. This science kit combines cutting-edge science, education and fun for all!

- Demonstrates how hydrogen could be used as a 100% clean fuel for cars in the future
- Car can steer independently of the user once in operation
- When the car hits a barrier, it will automatically find its way by reversing and turning 90°
- Great kit for students to construct together and learn about this great new technology
- Easy to construct and operate
- Supplied with a fuel cell, solar cell, a car chassis, a small electric motor, two water and gas storage containers, cables, tubes, a plastic syringe and full users manual
- Suitable for **Key Stages 3 & 4** (ages 11 to 16)

Requires water and 2x AA batteries (not included).

Type	Order code	1+
Fuel cell car kit	06-6521	56.23

500757

Smart Materials



Thermocolour Sheet

A self-adhesive 150 x 150mm sheet printed with a thermochromic liquid crystal ink which changes colour when heated above 27°C.



A sample pack is also available, containing a 50 x 150mm thermocolour sheet and a 1m length of resistance wire which can be attached to the back of the sheet and used as a heating element when a small current is passed through it.

- Use as a heat or temperature indicator
- Heat sensitive jewellery
- Advertising displays and signs
- Information pamphlet with sample pack

Type	Order code	1+
Thermocolour sheet	06-1270	5.71
Sample pack	06-1272	4.25

73046

Pricing

Pricing correct at time of going to press.
For up-to-date pricing visit
www.rapidonline.com



Moreform Modelling Plastic
(Polymorph)



Polymorph is one of a new generation of polymers with all the characteristics of a tough, machinable engineering material, yet it fuses and becomes easily mouldable between 30°C and 62°C.

- Can be simply heated with hot water or a domestic hair-dryer
- Mould by hand to create prototypes or solve manufacturing problems currently outside the capacity of other materials
- Applications include: moulding handles and orthopaedic aids, vacuum forming moulds, repairs, modelling, sculpture, stands and mounts, etc.
- Non-hazardous, biodegradable and can be used over and over again
- Supplied in granular form in packs of 0.5 and 1kg
- Supplied complete with application notes
- The material was pioneered for use in schools by the Technology Enhancement Programme (TEP)

Type	Order code	1+
500g	87-0091	9.79
1kg	87-0093	19.40

34444



Smart Materials Demonstration Pack



A pack containing samples of several smart materials, in a re-usable plastic storage case.

- Polymorph
- Thermocolour sheet
- Phosphorescent 'glow-in-the-dark' sheet
- Magnetic sheet
- Metal Paper
- Rigid PVC foam plastic
- Lenticular sheet
- Anodised-effect card
- Galvanised-effect card
- QTC (quantum tunnelling composite)
- Includes Smart Materials book

Type	Order code	1+
Smart materials demo pack	06-8126	16.01

81683



SPEEDY DELIVERY

Learn how to pick up objects and move them around with the VEX Clawbot IQ!



Discover new hands-on builds and programming opportunities to further your understanding of a subject matter.



Drivetrain + Distance Building Instructions (19 steps):

- Right Wheel: steps 1 to 6
- Left Wheel: steps 7 to 12
- Distance Sensor: steps 13 to 19

Building Tips for All Steps



https://education.vex.com/xyleme_content/speedy-delivery-iq/pdf/speedy-delivery-iq.pdf