



Physics

Astronomy	287	Gasses & Liquids	273	Power Supplies & Meters	299
Circuit Components	296	LEDs	296	Rockets	284
Conductivity & Energy	280	Light & Optics	289	Science Kits	262
Electricity	294	Magnets	275	Solar Power & Hydrogen Fuel	281
Flight	287	Materials & Properties	279	Sound	283
Forces, Pressure & Gravity	264	Motion, Motors & Accessories	269		

Full range of Physics available at:

www.rapidonline.com

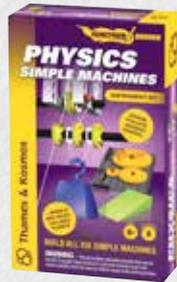
STEM Experiment Kits



With Physics Discovery, you can build 12 models and then conduct experiments with the models to learn about forces and simple machines.

Each model demonstrates a fundamental idea in mechanical physics. For example, you can build a balance scale to learn about lever arms, a freight elevator to learn about pulleys, a bicycle to learn about wheels, a motion picture machine to learn about centripetal and centrifugal forces, and a transmission to learn about gears. The 32-page book offers illustrated instructions for building projects and experiments.

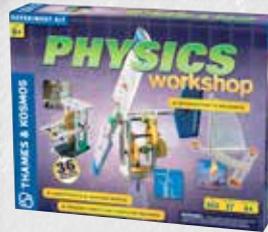
Order code **70-0344** **£20.35**



Establish a foundation in physics by building models of all six simple machines: levers, pulleys, inclined planes, screws, wedges, and wheels and axles.

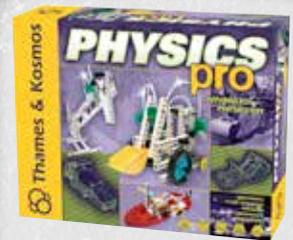
Assemble and use a spring scale to measure how the machines change the direction and magnitude of forces, making work easier to do.

Order code **70-0348** **£10.57**



This kit provides a comprehensive explanation of mechanical physics. Through building 36 models and conducting subsequent experiments with the models, you will learn the fundamental laws of mechanical physics. Start by building small models, such as a fixed pulley, to learn about basic forces and simple machines. Then, work your way up to more complex machines, such as a pendulum clock, to learn more advanced concepts like work and centripetal force. This hands-on approach is both fun and effective because the principles of physics are demonstrated right in front of you.

Order code **70-0359** **£34.93**



With this advanced physics kit, you can continue your study of statics and dynamics from previous lessons and begin your study of more advanced topics in physics, including fluid dynamics, energy, oscillation, hydraulics, and pneumatics. By adding advanced topics like fluid dynamics to your physics repertoire, you can now build some really spectacular models and devices, such as a wind tunnel, pneumatic shocks, and a hydraulic lift. You will see how physics extends far beyond the classroom, giving us an amazing set of tools that can be applied in the real world to engineer marvellous things.

Order code **70-0361** **£39.90**



Order code **70-0357** **£24.84**



Order code **70-0354** **£32.13**



Order code **70-0352** **£85.69**



Order code **70-0363** **£51.41**



Order code **70-0342** **£20.50**



Order code **70-0387** **£26.99**

For full details and to see our full range of Thames & Kosmos products visit www.rapidonline.com

Education LED Pack

A considerable range of LEDs and LED related products are neatly packaged in this classroom kit.

- All the pieces come in re-sealable polythene bags
- Offers a significant saving over separately bought items
- Storage box with compartment tray and lid
- Dimensions of the box: 43cm x 43cm x 7cm
- Suitable for all ages
- Total number of components = 680
- Supplied as a **pack**

Kit contains:	Order code
1x 5mm red LED (pack 100)	55-1790
1x 5mm green LED (pack 100)	55-1792
1x 5mm yellow LED (pack 100)	55-1794
25x Flashing 5mm red LED	55-0140
25x Flashing 5mm green LED	55-0142
25x Flashing 5mm yellow LED	55-0144
1x 3mm red LED (pack 100)	55-1770
1x 3mm green LED (pack 100)	55-1772
1x 3mm yellow LED (pack 100)	55-1774
1x LED tester	55-0000
1x Miniature LDR	58-0134
1x Shallow tray	14-0430
1x Tray lid	14-0436
1x Insert 8 compartment	14-0443
Total no. of components = 680	

Order code
13-0122
Only
£44.63



Components Spares Kit

A comprehensive range of essential electronic consumables offering a huge saving over individually purchased items.

- The kit is ideal for the classroom and contains LEDs, resistors, capacitors, etc.
- All the pieces are neatly packed into a well laid out stackable storage box with lid
- Dimensions of the box: 43cm x 31cm x 7cm
- Great school resource
- Total number of components = 1945
- Supplied as a **pack**

Kit contains:	Order code
1x 5mm red LED (pack 100)	55-1796
1x 5mm green LED (pack 100)	55-1792
1x 5mm yellow LED (pack 100)	55-1794
1x Carbon film resistor kit (pack 1000)	13-0260
1x Electrolytic capacitor kit (pack 93)	13-0220
1x Polyester capacitor kit (pack 100)	13-0215
30x Stripboard 25 x 64mm	34-0500
2x Single sided pins (pack 100)	34-0610
2x Equipment wire (pack 11)	01-0108
100x BC548B Transistor	81-0466
50x LM741 Op-amp	82-0458
50x NE555 Timer	82-0336
1x Shallow Tray	14-0430
1x Tray lid	14-0436
1x Insert (3 long compartments)	14-0438
Total number of components = 1945	

Order code
13-0108
Only
£58.72



Electrical Kit

This respectable sized kit contains a wide range of high quality electrical consumables suitable for even the most ambitious students.

- Cost saving over buying components separately
- Ideal for tight school budgets
- Great resource for all ages
- Dimensions of box: 43cm x 31cm x 7cm
- Total components = 105
- Supplied as a **pack**

Kit contains:	Order code
10x 6V electronic buzzer + 10cm lead	35-3596
30x Push to make switch	78-0100
3x Crocodile leads (pack 10)	17-0350
5x Medium torque motor	37-0142
10x 6V LES lamps	41-0105
10x Bulb holders	41-0070
1x Shallow Tray	14-0430
1x Tray lid	14-0436
1x Tray insert	14-0440

Order code
13-0114
Only
£28.47



Electrical Essentials Kit

A cost-saving classpack containing a selection of essential electrical accessories.

- Cost saving over buying parts separately
- Popular parts can be topped up
- Packed in a Grattells storage tray with lid
- Please see individual product descriptions for full details
- Suitable for **Key Stages 2, 3 & 4** (ages 7 to 16)
- Supplied as a **pack**

Technical specification					
Order code	Quantity	Description	Order code	Quantity	Description
17-0350	1	Crocodile leads (Pack of 10)	76-0100	3	Slide switches
21-0100	1	12-Way connecting block	75-0057	3	Round rocker switches
18-0546	3	Battery clips	75-0730	3	Rectangular rocker switches
18-1092	6	AA zinc chloride batteries	41-0070	12	MES bulb holders (screw connection)
37-0342	1	Pulley black 10mm	37-0344	1	Pulley black 20mm
86-0405	1	100 x 3mm flat blade screwdriver	37-0346	1	Pulley black 30mm
86-0455	1	75 x No.1 Phillips screwdriver	37-0348	1	Pulley black 40mm
37-0144	3	Miniature 3V motors	18-0563	3	2x AA battery holders
35-3596	3	Buzzers 6V	18-0129	3	C size battery holders
01-0108	1	Stranded wire pack	18-1444	3	C size batteries
34-5926	1	Band pack	18-0150	3	1x AA battery holders
14-0430	1	Grattells tray (shallow)	85-0230	1	Light duty wire cutter
14-0436	1	Lid for tray	60-0515	3	Reed switches

Order code
70-1014
Only
£27.10



Wire Starter Pack

A substantial kit containing a wide array of wire related consumables.

- Ideal for the classroom
- Contains wire cutters and strippers, wire, batteries and battery clips
- Offers a massive saving over separately purchased items
- Moulded box included
- Dimensions of the box: 43cm x 31cm x 7cm
- Great resource for all ages
- Supplied as a **pack**

Kit contains:	Order code
5x Wire stripper	86-0350
5x Economy side cutter	85-0205
10x Equipment wire (pack)	01-0108
15x PP3 zinc chloride battery	18-1448
50x PP3 battery clip	18-0105
1x Shallow tray	14-0430
1x Tray lid	14-0436

Order code
13-0112
Only
£37.87



Electricity Classpack

A cost-saving classpack containing a selection of commonly used electrical accessories.

- Cost saving over buying parts separately
- Popular parts can be topped up
- Packed in a Grattells storage tray with lid
- Please see individual product descriptions for full details
- Supplied as a **pack**

Kit contains:	Quantity	Description
41-0125	10	3.5V bulbs
18-0125	5	2x AA battery holders
41-0070	5	Bulb holders
37-0140	5	Motors
18-0105	5	Battery snaps
17-0350	1	Crocodile leads (Pack of 10)
01-0102	5	Wire
75-0180	5	Toggle switch
76-0100	5	Slide switch
78-0115	5	Push on/off switch
78-0112	5	Push to make switch
35-3610	5	Buzzer
14-0430	1	Grattells tray
14-0436	1	Lid for tray

Order code
70-1012
Only
£37.83



Forces, Pressure & Gravity

RVFM

Displacement Vessels - Copper



These copper vessels are designed for use in experiments with density, specific gravity and Archimedes' principle where volumetric displacement of a liquid is involved.

- Seamless
- Flared top edge
- Angled spout for convenient overflow collection
- Copper construction

Size	Order code	1+
100 x 50mm	06-6944	5.55
115 x 90mm	06-6946	4.45

079620

eISCO
Trust Education & Learning

Tin Displacement Vessels

Displacement vessels with spout, for specific gravity experiments.

- Seamless
- Flared top edge
- Angled spout for convenient overflow collection
- Material: metal (tin)



Diameter	Height	Order code	1+
90mm	115mm	52-3347	4.80
125mm	225mm	52-3348	7.45

565936

RVFM

Displacement Vessel 500ml



This vessel is ideal for use in experiments with density, specific gravity and Archimedes' principle where volumetric displacement of a liquid is involved.

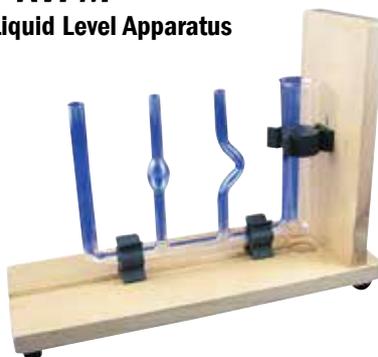
- Flared top edge with pouring lip
- Capacity graduations
- Angled spout for convenient overflow collection
- Borosilicate glass

Capacity	Order code	1+
500ml	06-6956	4.13

079621

RVFM

Liquid Level Apparatus



This **liquid level apparatus** can be used as part of a physics project to show that the level of liquid in connected vessels is constant irrespective of the vessel size or shape. Consists of four different glass vessels connected by a common base tube.

- Size 230 x 100 x 160mm

Size	Order code	1+
230 x 100 x 160mm	52-2664	23.12

550591

RVFM

2.8cm Wave Kit



This kit can be used to demonstrate the properties of **electromagnetic waves** and as an aid to teaching the behaviour of visible light. The value of using microwave radiation is two fold - firstly, the concept that visible light is a small section of a much wider band of frequencies may be introduced; secondly microwave radiation shares so many common properties with visible light that many experiments can be undertaken which would otherwise be impossible due to limitations on time or equipment costs.

- Kit contains both transmitter and receiver
- Compatible with similar 2.8cm systems from other manufacturers

Type	Order code	1+
Wave Kit	52-2666	350.00

550593

RVFM

Joule's Calorimeter

A Joule's Calorimeter for experimenting with the conversion of electrical energy into heat energy. The calorimeter consists of a nickel-plated copper outer vessel with a lagged copper inner vessel. The cover has terminals for the 3 to 6V heating coil, a built-in stirrer and a hole for a thermometer to record the temperature changes.



- Apparatus for experimenting with the conversion of electrical energy into heat energy

- Nickel-plated copper outer vessel
- Copper inner vessel
- Felted wool cloth lagging
- Outer vessel is 100mm tall and 75mm in diameter
- Inner vessel is 75mm tall and 50mm in diameter
- 3 to 6V heating coil, Max. current 1A
- Built-in stirrer
- Hole for a thermometer (not included)

Type	Order code	1+
Joule's Calorimeter	52-9535	10.50

501638

RVFM

Push-Pull Spring Balances



The design of these products means that they can demonstrate not only the weight of suspended objects but also the force used to push or pull objects. A clear extended rod allows pupils to use a drywipe marker to create their own scale ranges.

- Each range colour coded
- Calibrated in Grams and Newtons
- Instruction and ideas sheet included
- Suitable for **Key Stages 1, 2, 3 & 4** (ages 5 to 16)

Range	Order code	1+
250g (blue)	06-6766	3.68
500g (green)	06-6768	3.68
1Kg (beige)	06-6770	3.68
2Kg (red)	06-6772	3.68
3Kg (white)	06-6774	3.68
5Kg (yellow)	06-6776	3.68
Complete set	06-6778	20.93

079807

RVFM

Spring Balances with Metal Scales

A range of spring balances with rectangular plastic bodies and metal scales.

- Zero adjuster
- Suspension ring and load hook
- Graduated in both grams and Newtons



MOQ 2		
Type	Order code	2+
0 to 100g /1N	06-2169	0.804
0 to 250g /2N	06-2170	1.09
0 to 500g /5N	06-2171	1.09
0 to 1000g /10N	06-2172	1.09

538800

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We bring
STEM to life

RVFM
Plastic Spring Balance Scales



These colour-coded spring balances have a robust transparent plastic body with chrome-plated rings at the top and hooks at the bottom. Capacities range from 100g up to 5kg. They are graduated in both grams and Newtons.

- Can be used for both force and mass measurements
- Bevelled top for use on an inclined plane
- Zero adjustment
- Clear plastic tube allows students to see the action of the spring
- Fitted with chrome plated hooks and rings
- Overall length 285mm
- Length of tube: 160mm
- 20mm diameter

Capacity	Colour	Order code	1+
100g /1N	Dark brown	06-2177	1.92
250g /2.5N	Blue	06-2178	1.92
500g /5N	Green	06-2179	1.92
1000g /10N	Light brown	06-2180	1.92
2000g /20N	Red	06-2181	2.06
3000g /30N	White	06-2182	2.06
5000g /50N	Yellow	06-2183	2.45

RVFM
Slotted Brass Mass Sets

These sets of 9 brass masses include a brass hanger.

- Each set consists of 1 hanger and 9 masses
- The hanger is the same weight as a single mass
- Stated weight of set is for hanger plus 9 masses
- Weight tolerance is $\pm 3\%$
- Supplied in sets



Type	Order code	1+
100g set	52-0080	7.06
200g set	52-0081	9.30
500g set	52-0083	22.44
1000g set	52-0082	33.15

Free Delivery*

on all orders over £30 (excl. VAT)
(UK mainland only)

* See Terms & Conditions for full details - www.rapidonline.com/terms

RVFM
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

Mass of hanger	Masses (each)	Number of removable masses	Total mass	Order code
10g	10g	9	100g	06-2185
50g	50g	4	250g	06-2186
100g	100g	4	500g	06-2187
100g	100g	9	1000g	06-2188

Total weight	Each weight	Order code	1+
100g	10g	06-2185	5.58
250g	50g	06-2186	8.77
500g	100g	06-2187	16.26
1000g	100g	06-2188	32.13

RVFM
Slotted Mass Sets

This brass mass set combines to weigh 1kg.

- Slotted
- Circular with hole and slot
- 1% tolerance



Set includes: 1 x 100g brass hanger plus 9 x 100g masses.

Weight	Order code	1+
1kg	52-2693	18.42

EISCO
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	0.39
2g	52-3403	0.429
5g	52-3404	0.46
10g	52-3405	0.501
20g	52-3406	0.807
50g	52-3407	1.52
100g	52-3408	2.65

EISCO

Brass Weight Hangers

A range of individual brass mass weight hangers for use with slotted masses.

- Made from solid brass
- Each hanger is marked for easy identification
- Eisco PH0258H series



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

Mass	Order code	1+
10g	52-3409	0.664
20g	52-3410	0.909
50g	52-3411	1.52
100g	52-3412	3.16

RVFM
9-Piece Hook Weight Set



A set of 9 weights with hooks, the set consists of 7 polished brass weights plus 2 black-enameled weights with flat countersunk bottoms.

- Each weight is accurately adjusted
- Weight value clearly indicated
- Set contains: 1x 10g, 2x 20g, 1x 50g, 1x 100g, 2x 200g, 1x 500g, 1x 1000g
- Supplied as a set of 9

Type	Order code	1+
Hook weight set	06-2192	28.91

RVFM
Economy Hook Weight Set



A set of black-painted weights with a fixed hook on their tops. The bottoms of the weights are recessed and contain a bar that allows the weights to be hung from each other to produce various masses.

- Set includes 1 each of 10g, 50g, 100g, 500g & 1kg, plus 2 each of 20g & 200g
- Plastic storage box
- Supplied as a set

Type	Order code	1+
Hook weight set	06-2191	26.72

RVFM

Pendulum Bobs for Simple Pendulums



A range of bob weights ideal for use as simple pendulums.

- Range of diameters
- Range of materials

MOQ 2				
Diameter	Material	Order code	2+	
13mm	Lead	06-2218	0.525	
19mm	Lead	06-2219	0.74	
Price each				
Diameter	Material	Order code	1+	
13mm	Brass	06-2221	0.873	
19mm	Brass	06-2222	1.48	
MOQ 3				
Diameter	Material	Order code	3+	
13mm	Steel	06-2224	0.407	
MOQ 2				
Diameter	Material	Order code	2+	
19mm	Steel	06-2225	0.615	
25mm	Steel	06-2226	0.819	



Stackable Weights



A set of 80 clearly marked stackable weights for use with most scales and balances.

- Supplied with 20 each of 1g, 2g, 5g and 10g
- Suitable for **Foundation and Key Stages 1 & 2** (ages 4 to 11)

Type	Order code	1+
Stackable weights	52-1592	8.94

RVFM

Expandable Springs – Hooke's Law



These expandable springs are ideal for demonstrating Hooke's Law.

- Ideal for showing resolution of forces, kinetic energy measurement, etc.
- Expandable springs are 50mm x 15mm dia., and will recover from a 400mm approx. stretch
- Available in **packs of 25 and 100**

Type	Order code	1+
Expandable springs (25)	37-0416	1.94
Expandable springs (100)	06-6022	7.75

Compression Springs
DIN 1700
– 400-piece

This 400-Piece Assortment of Compression Springs have been manufactured with spring steel material and conforms to DIN 1700. Supplied in a sheet steel 12-compartment box.

Including the following pieces:

- 111 springs 20.5 x 5.5 x 0.5mm (L x ϕ x Thickness)
- 70 springs 30 x 10.5 x 0.5mm (L x ϕ x Thickness)
- 50 springs 33 x 14.2 x 0.8mm (L x ϕ x Thickness)
- 20 springs 66 x 10.8 x 0.8mm (L x ϕ x Thickness)
- 50 springs 28.5 x 10.5 x 1mm (L x ϕ x Thickness)
- 15 springs 80.5 x 14.5 x 1mm (L x ϕ x Thickness)
- 15 springs 62.5 x 13.75 x 1mm (L x ϕ x Thickness)
- 25 springs 40.5 x 12.1 x 1.6mm (L x ϕ x Thickness)
- 7 springs 77.5 x 17.6 x 1.6mm (L x ϕ x Thickness)
- 30 springs 22.5 x 14.5 x 2mm (L x ϕ x Thickness)
- 4 springs 88.5 x 27 x 2mm (L x ϕ x Thickness)
- 3 springs 81.5 x 22.5 x 2.5mm (L x ϕ x Thickness)

Type	Order code	1+
400 pieces	49-0192	43.45



Assortment of Tension/Extension Springs – 350-piece

This 350-piece assortment of tension/extension springs conforms to DIN 2095 and are manufactured with spring steel. Supplied in a 20-compartment box.

Including the following pieces:

- 56 springs 2 x 5.5 x 0.5mm (L x ϕ x Thickness)
- 20 springs 41.4 x 6 x 0.55mm (L x ϕ x Thickness)
- 32 springs 20 x 7 x 0.63mm (L x ϕ x Thickness)
- 30 springs 28 x 7.5 x 0.7mm (L x ϕ x Thickness)
- 35 springs 39 x 5.5 x 0.8mm (L x ϕ x Thickness)
- 20 springs 44.6 x 9 x 0.8mm (L x ϕ x Thickness)
- 40 springs 22.5 x 6.3 x 0.9mm (L x ϕ x Thickness)
- 30 springs 49 x 7 x 1mm (L x ϕ x Thickness)
- 6 springs 75.4 x 11 x 1mm (L x ϕ x Thickness)
- 26 springs 41 x 8.5 x 1.2mm (L x ϕ x Thickness)
- 5 springs 90.2 x 13 x 1.2mm (L x ϕ x Thickness)
- 20 springs 47.9 x 10 x 1.4mm (L x ϕ x Thickness)
- 10 springs 55.9 x 15 x 1.4mm (L x ϕ x Thickness)
- 4 springs 105 x 15 x 1.4mm (L x ϕ x Thickness)
- 3 springs 120 x 17 x 1.6mm (L x ϕ x Thickness)
- 6 springs 87.2 x 12 x 1.8mm (L x ϕ x Thickness)
- 2 springs 151 x 22 x 2mm (L x ϕ x Thickness)
- 1 springs 122 x 24 x 2.2mm (L x ϕ x Thickness)
- 3 springs 123 x 18 x 2.5mm (L x ϕ x Thickness)
- 1 springs 139 x 28 x 2.5mm (L x ϕ x Thickness)

Type	Order code	1+
350 pieces	49-0193	73.11

Need a product urgently?

We can offer a next day, before noon, delivery service
01206 751166

RVFM

Steel Extension and Compression Springs

Closely wound steel springs with loops on both ends for attaching to scales and weights, etc.



- Diameter, extension type: 6mm approx.
- Diameter, compression type: 1cm approx.
- Wire thickness 19 swg

Technical specification			
Type	Dimensions	Average extension with 200g load	Order code
Extension	10cm x 6mm dia.	120mm	06-2156
Extension	15cm x 6mm dia.	230mm	06-2157
Extension	22.5cm x 6mm dia.	430mm	06-2158
Compression	30cm x 1cm dia.	N/A	06-2155

MOQ 2				
Size	Type	Order code	2+	
10cm x 6mm	Extension	06-2156	0.74	
Price each				
Size	Type	Order code	1+	
15cm x 6mm	Extension	06-2157	0.911	
22.5cm x 6mm	Extension	06-2158	1.11	
30cm x 1cm	Compression	06-2155	1.43	



200-piece Compression and Extension Spring Assortment

An assortment of 200 plated compression and extension springs in a plastic storage case.

- Draper type 56380



Type	Order code	1+
Spring assortment	91-1605	9.31

RVFM

Rubber Bands



A choice of popular sizes of rubber bands, ideal for general use in the home, office, school, or workshop.

- Supplied in boxes weighing 454g

Size	Dimensions (mm)	Order code	1+
No 10	31.75 x 1.6	34-9970	5.81
No 14	50.8 x 1.6	34-9972	5.34
No 16	63.5 x 1.6	34-9973	5.34
No 18	76.2 x 1.6	34-9974	5.34
No 19	88.9 x 1.6	34-9975	5.13
No 24	152.4 x 1.6	34-9977	5.34
No 30	50.8 x 3.2	34-9978	5.33
No 32	76.2 x 3.2	34-9979	5.34
No 33	88.9 x 3.2	34-9980	5.34
No 34	101.6 x 3.2	34-9981	5.13
No 35	114.3 x 3.2	34-9982	3.49
No 36	127 x 3.2	34-9983	5.13
No 38	152.4 x 3.2	34-9984	5.34
No 63	76.2 x 6.3	34-9985	5.34
No 64	88.9 x 6.3	34-9986	5.34
No 65	101.6 x 6.3	34-9987	5.33
No 69	152.4 x 6.3	34-9988	5.34
No 75	101.6 x 9.5	34-9989	7.85
No 89	152.4 x 12.7	34-9990	7.27

RVFM

Polypropylene Twine

A strong polypropylene twine, ideal for packing solutions at home, the office or school.

- Also ideal for design and pulley projects
- Supplied in **balls of 2.25kg**



Type	Order code	1+	5+
Polypropylene twine 2.25kg	14-0999	21.29	19.72



White Cotton String

A general-purpose white cotton string, also useful for model making.

- Approximate thickness 1.2mm (thin), 2.2mm (medium), 3.5mm (thick)
- Sold by reel weight



Type	Reel weight	Order code	1+
Thin	250g	06-9272	2.24
Medium	500g	06-9274	4.50
Thick	500g	06-9276	4.50

RVFM

Pulley Starter Pack



A great pulley starter pack offering a range of different sized and shaped pulleys.

- 2 each of 10, 20, 30, 40, 50 and 60mm diameter
- 2x miniature pulleys
- 4x pulley stops
- Supplied in **packs of 18**

Type	Order code	1+
Pulley starter pack	37-0391	9.41

RVFM

Pulleys



Sturdy plastic pulleys in a range of diameters.

- 4mm centre holes
- Supplied in **packs of 10**

Reducers are available to allow these pulleys to fit on to a 2mm shaft. Please see order codes **37-0401** and **52-2049**.

Type	Order code	1+
10mm	37-0407	2.02
20mm	37-0405	2.51
30mm	37-0399	3.09
40mm	37-0397	4.70
50mm	37-0395	5.02
60mm	37-0393	5.66

RVFM

Miniature Pulleys

Miniature pulleys which will push-fit on to 2mm shafts, commonly found on miniature motors.

- Manufactured in high-impact polystyrene
- All sizes include motor spindle stand-offs
- Diameter quoted is nominal overall diameter
- All sizes have 2mm bore
- Supplied in **packs of 10**



Diameter	Order code	1+
8mm	37-0371	1.45
10mm	37-0373	1.59
12mm	37-0376	2.09
18mm	37-0378	2.35
25mm	37-0381	2.76
30mm	37-0383	2.66

RVFM

Deluxe Pulley Blocks

Plastic pulleys with wide grooves, mounted in tough, unbreakable plastic frames.

- Frames have hooks at both ends for suspension and loading
- Axle pin can be easily unlocked and removed for disassembly
- Approx. length of frames 70mm
- Available in 50mm diameters in single, double and triple sheave versions



Type	Diameter	Order code	1+
Single	50mm	06-6970	1.76
Double	50mm	06-6972	2.12
Triple	50mm	06-6978	2.65

RVFM

Wooden Pulleys



Wooden pulleys, available in a range of diameters.

- 4mm centre hole (37-0415 is 4.5mm)
- Supplied in **packs of 10**

Diameter	Centre hole	Order code	1+
20mm	4mm	37-0413	1.23
30mm	4.5mm	37-0415	1.34
40mm	4mm	37-0409	2.66
50mm	4mm	37-0411	3.05

RVFM

Adjustable Table Clamp Pulley

A nylon pulley mounted on a sturdy clamp suitable for attaching to tables and benches up to 4.5cm thick. The pulley is 4.5cm in diameter and can be adjusted from flush with



the tabletop to 13cm above it. In addition, the pulley can be rotated through 360° to suit any experimental setup.

- 4.5cm dia. pulley with ball-bearing pivot
- Pulley position can be adjusted up and down and through 360°
- Clamp attaches to tables up to 4.5cm thick

Type	Order code	1+
Pulley with clamp	06-2198	14.44

RVFM

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	6.73
Vertical	06-2150	8.09

RVFM

S-Hooks

S-shaped hooks for a variety of laboratory uses including pendulums, scale pans, attaching to cords and for lifting slotted masses, etc.

- Supplied in **packs of 10**



Type	Order code	1+
S-hooks (10)	06-2152	4.76

RVFM

Force Table

This apparatus can be used to demonstrate the verification of the laws of composition and resolution of forces.

It is comprised of a machined aluminium table 40cm in diameter, on a heavy vertical support rod and tripod base.

A ring has four cords attached to it that can have masses hung from them. When the forces are balanced, the ring rests in the centre of the table. Each of the 4 cords pass over a pulley which guides them at the required angle and reduces friction on the edge of the table.

- 360° graduated scale
- 4 pulleys can be positioned at varying angles around the perimeter of the table



Type	Order code	1+
Force table	06-2193	107.05

Rapid
...where price meets quality

RVFM

Wooden Inclined Plane Apparatus



An inclined wooden plane ideal for experimenting with friction. The plane is hinged to the wooden base and has a pulley at one end.

- Size 600 x 75mm
- Metal linear scale fixed to edge of plane
- Vertical linear and angular 0 to 45° scale fixed to base
- Clamp also serves as an index

Supplied complete with:

- Metal roller 75 x 25mm (length x dia.)
- Wooden block
- Scale pan with cord

Type	Order code	1+
Inclined plane	06-2212	29.04

533957

RVFM

Metal Inclined Plane Apparatus

An inclined metal plane ideal for experimenting with friction. The plane is hinged to the metal base and has a pulley at one end.

- Size 600 x 75mm
- Metal linear scale fixed to edge of plane
- Vertical linear and angular 0 to 45° scale fixed to base

Supplied complete with:

- Pulley
- Roller
- Scale pan with cord

Type	Order code	1+
Inclined plane metal	06-2214	40.26

533958

RVFM

Moment of Force Apparatus



This apparatus gives students a visual understanding of the relationship between moment of force, the amount of force, and the length of the lever arm.

Differing masses can be balanced by varying their distance from the fulcrum.

Set includes:

- Metre rule
- 3x knife-edge clamps
- Aluminium support
- 2x mass hangers
- Slotted masses from 1g to 500g with storage rack

Type	Order code	1+
Moment of force	06-2216	80.27

533960



We bring
STEM to life

RVFM

Hooks Law Demonstration Apparatus

This Hooks Law apparatus consists of a stand supporting a spring with provision to hang masses from it.

- Extension can be measured on the 12cm long mirror scale for a range of masses



Supplied without masses.

Type	Order code	1+
Hooks law app.	06-2227	9.88

533961

RVFM

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	40.56

533965

RVFM

Projectile Apparatus/Falling Body Apparatus

This apparatus demonstrates that horizontal and vertical motion are independent of each other. It consists of a wooden block with a pivoted 'L' section spring-loaded metal launching bar with a trigger catch. When the catch is released, one ball drops vertically while the other is projected horizontally. Observation will show that both balls will hit the floor at the same time.

- Wooden block 190 x 58 x 30mm approx.
- Supplied with 2 steel balls
- Storage recess in the wooden block



Type	Order code	1+
Projectile apparatus	06-2153	12.09

533994

RVFM

Stepped Pulley and Axle

This 13cm diameter moulded wheel has 4 grooves of different diameters in the ratios 1, 3, 5 & 7. It is ideal for demonstrating how a change in diameter changes the performance of a system, e.g., torque and speed.



- Wide and flat bottomed grooves ensure an exact diameter for each step
- Each groove has a small hole to retain the end of a cord
- Back of the wheel is hollow to minimize mass and inertia
- Wheel is attached to a 14cm long rod/axle

Type	Order code	1+
Stepped pulley	06-2199	8.45

533996

RVFM

Friction Blocks & Surfaces

These friction blocks and surfaces can be used to illustrate the concept that friction depends on the nature and smoothness of materials.



The kit consists of a glass mirror with sandpaper affixed to one side, plus two wooden blocks, one plain and one with a mirror cemented to one face. Both static and sliding frictional forces between different surfaces can be compared and contrasted using this kit.

- Supplied complete with instructions

Type	Order code	1+
Friction surfaces	06-2213	5.34

534002

RVFM

Friction Rods



These friction rods are suitable for use for a range of projects in physics or electrostatics.

- Available in either ebonite or glass
- Size 300 x 12mm

Type	Order code	1+
Ebonite	52-2682	2.40
Glass	52-2683	1.79

550608



Friction Rods



A range of rods of differing materials for use in physics projects and electrostatics.

- Length 300mm

Material	Order code	1+
Ebonite	52-3633	1.73
Glass	52-3638	1.01
Perspex	52-3639	2.85
Nylon	52-3642	1.48
Polythene	52-3643	1.83

565662

RVFM

Rotational Platform

This heavy-duty rotating platform illustrates the concept of rotational inertia.

- The platform can easily withstand a weight of 80kg
- Grooved platform
- Solid, heavy metal legs ensure maximum stability
- Dimensions 330 x 330 x 85 mm approx.



Type	Order code	1+
Rotational platform	06-2217	39.95

534003

Motion, Motors & Accessories



Kinetic Gas Theory Demonstration Apparatus

This apparatus allows students to study the motion and behaviour of molecules in gases.

An electric motor running at 4 to 12V DC vibrates a small platform inside a transparent tube, so that a number of small steel balls is vibrated violently inside the tube.

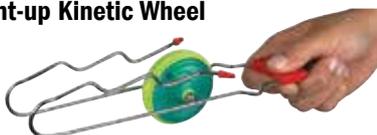
An increase in the violence of the vibration simulates an increase in gas temperature and an increase in the weight of the 'float' simulates an increase in gas pressure.

- Demonstrates kinetic gas theory
- Supplied with balls and 2 floats
- Includes instruction manual
- CE approved
- Eisco type PH0203



Type	Order code	1+
Kinetic theory app.	52-3415	25.49

RVFM Light-up Kinetic Wheel



An updated version of a classic toy from the '60s. The wheel is held to the track magnetically and runs along due to kinetic and potential energy, which means that only small wrist movements are required to keep it in motion.

- LED flashing light effect
- Pleasing, therapeutic motion
- Length 26cm

Type	Order code	1+
Light-up kinetic wheel	52-9864	3.26

RVFM Gyroscope

A well made classic Gyroscope that will apparently defy gravity and balance on the smallest point whilst spinning.

- Supplied with pull-cord and strand
- Detailed explanation and instructions
- Display box
- Height 11cm



Type	Order code	1+
Gyroscope	52-9890	10.75

RVFM Newton's Cradle

This classic 'executive toy' also demonstrates various physical principles. These include conservation of momentum, conservation of kinetic energy



and Newton's observation that 'action and reaction are equal and opposite'.

- When one of the steel balls is lifted and allowed to fall back at one end, one will swing out the same distance at the other end
- This causes the beginning of 'perpetual motion' which dies down only as a result of friction, gravity and other external forces
- Always an interesting process to watch
- Height 11cm
- Ball diameter approx. 14mm
- Weight of each ball approx. 12.5g

Type	Order code	1+
Newton's cradle	52-9880	6.25



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	213.51
Basic ripple tank	52-3383	71.46
Controller (52-3383)	52-3704	10.16

RVFM Vibration Generator and Accessories Set

A set of basic equipment for the study of vibration and resonance. The set includes a vibration generator, resonant vibration strips and a longitudinal wave spring.

The Vibration Generator is essentially a loudspeaker. A coil wound on a thin aluminium tube moves within a permanent magnetic field when an alternating current is applied to it, e.g., from your laboratory signal generator. The coil is supported by 2 guide control mechanisms for optimum performance.

Coupling the Vibration Generator to external equipment is facilitated by an 8 mm dia. aluminium pin connected to the coil. The pin is equipped with a 4mm hole for a banana plug connector to which various plates and springs, etc., can be attached.

- Set includes:**
- Vibration generator
 - Longitudinal spring for wave demonstrations
 - Resonant vibration strips



The vibration generator is powered by a laboratory signal generator, not included.

Technical specification	
Frequency range	0.1Hz to 5kHz
Amplitude	7mm @1Hz, decreasing with increasing frequency
Impedance	8Ω
Max. current	1.0A, fuse limited

Type	Order code	1+
Generator + accs.	52-2675	151.37

RVFM Square Chladni Resonance Pattern Plate

Used in conjunction with a vibration generator, this plate can be used to study sound waves and resonance. A thin layer of sand is spread over the plate and resonance patterns - **Chladni figures** - can be observed at certain frequencies.



- Plate resonances are audible
- Plate dimensions 140 x 140mm

See 52-2675 for a suitable vibration generator set.

Type	Order code	1+
Square Chladni plate	52-2696	8.95



Electrostatics Kit



This kit is ideal for small group experiments in electrostatics.

The set is built around the special, dual-purpose electrostatics, which in addition to being useful for general electrostatic experiments, is capable of performing measurements of the activity of weak radio-active materials. Positive and negative charges can be produced with the included acetate strips and woollen cloths.

A great variety of experiments can be performed including determining types of charge, measuring the amount of conducted or induced charge with the gold leaf electroscope or by using the polystyrene spheres as hollow conductors, and using the proof plane to investigate the distribution of charges on conductors.

- Kit includes:**
- 1x electroscope with top plate and hook electrode
 - 1x packet of gold leaves
 - 4x metallised polystyrene spheres
 - 1x reel of very fine nylon thread
 - 2x polythene plate, 75mm square
 - 1x electrophorus plate, 50mm diameter with insulating handle
 - 1x proof plane
 - 2x aluminium calorimeters
 - 1x cellulose acetate strip
 - 1x polythene strip with woollen rubber
 - 1x stirrup for suspending strip
 - **Supplied as a set**
 - **Eisco type PH0900**

Type	Order code	1+
Electrostatics kit	52-3634	22.42

**No minimum order value
UK mainland only**

TruMotion

3V, 13100 RPM DC Motor

A low-cost miniature DC motor with many applications including models, robotics and educational demonstration equipment.

- Operating voltage 1.5 to 4.5V DC
- Two flat sides make the motor ideal for mounting on a PCB
- Rotates counter-clockwise when viewed from shaft end
- Solder tag termination



Technical specification

Rated voltage	3V DC
No load current	0.34A max.
No load speed	16,400rpm ± 15%
Rated load	8.0 g.cm
Rated load current	1.07A max.
Rated load speed	13,100rpm ± 12%
Length excluding shaft	25mm
Diameter	20mm
Width across flats	15.1mm
Shaft length	9.4mm
Shaft diameter	2mm
Weight	17g approx.

MOQ 2

Type	Order code	2+	25+	100+
3V, 13,100 rpm	37-0140	0.588	0.461	0.346

061539

TruMotion

Miniature Motor 3V 5240rpm

A low-cost miniature motor offering a higher stall torque.

- Ideal for models, robotics, etc.
- Operating voltage 1.5 to 4.5V DC
- Rotates clockwise when viewed from shaft end
- Solder tag termination



Technical specification

Rated voltage	3V DC
No load current	0.13A max.
No load speed	6700rpm ± 15%
Rated load	10.0 g.cm
Rated load current	0.45A max.
Rated load speed	5240rpm ± 12%
Length excluding shaft	26.9mm
Diameter	23.8mm
Shaft length	8.6mm
Shaft diameter	2mm
Weight	28g approx.

Type	Order code	1+	25+	100+
3V, 5240 rpm motor	37-0142	0.85	0.63	0.578

061541

TruMotion

Miniature Motor 3V 8000rpm

A high torque miniature DC motor for higher power requirements.

- Operating voltage 1.5 to 6.0V DC
- Rotates clockwise when viewed from shaft end
- Solder tag termination



Technical specification

Rated voltage	3V DC
No load current	0.23A max.
No load speed	9000rpm ± 15%
Rated load	10.0 g.cm
Rated load current	0.63A max.
Rated load speed	8000rpm ± 12%
Length excluding shaft	30.5mm
Diameter	24.2mm
Shaft length	12mm
Shaft diameter	2mm
Weight	42g approx.

Type	Order code	1+	25+	100+
3V, 8000 rpm motor	37-0144	0.819	0.651	0.556

061542

RVFM

Solar Motor Worm Drive Gear Box

A worm drive gearbox in an aluminium housing powered by a solar motor.

- Shaft length 125mm approx.



Type	Order code	1+
Worm drive gearbox	06-1592	5.30

553715

RVFM

Self Adhesive Motor Mount

A push fit motor mount to suit our range of miniature motors.

- Base has self adhesive surface for easy mounting of the motor as required
- Colour may vary
- Supplied in packs of 10



Type	Order code	1+
Motor mount	37-0360	1.94

064468

RVFM

Motor Clip 21mm Diameter

Suitable for holding a motor to a flat surface.

- Ideal for use with motors with a diameter of 21mm



MOQ 3

Type	Order code	3+
21mm Motor clip	06-6054	0.321

079036

RVFM

Motor Clip

Suitable for holding a motor.

- Heat in hot water to soften for easier fitting
- Ideal for use with motors with a diameter of 21 and 23.8mm
- Paper packaging may be required with 21mm motors



MOQ 10

Type	Order code	10+
21/23.8mm dia. Motors	06-6052	0.107

079068

MFA/COMO DRILLS

Geared Motor Accessory Kit

A kit containing a useful selection of mechanical parts, ideal for the construction of motorised models, robots, buggies, technology projects, etc.

- Motorised gearbox
- Wheels
- Hardware
- Gears
- Rack and pinion



- Perforated metal sheet and strips
- Axles/shafts
- Nuts
- Bolts and washers
- Chain and sprockets
- Worm drive
- Toggle switch
- Size D 1.5V zinc-chloride battery and battery box

Type	Order code	1+	5+
Geared motor kit	37-1100	24.79	24.11

064471

RVFM

Submarine Motor

A submarine motor encased in a plastic housing with a rubber sucker for attachment.

- Motor pulls apart to insert battery
- Twisting the battery starts the motor
- Dimensions 120mm(L) approx.

Requires 1x AA battery (not included).

Type	Order code	1+
Submarine motor	06-6050	2.09

078967

Elisco

Demonstration Electric Motor

A working model of a simple DC electric motor. It has a two-pole armature wound with enamelled copper wire and a permanent magnetic field provided by a removable bar magnet.

The motor has a disc-type commutator with phosphor-bronze brushes and operates from a 6 to 8V DC supply. Electrical connection is by means of a pair of 4mm sockets.

- Requires a voltage input of 6 to 8V DC
- Connection via 4mm sockets
- Elisco type PH1238

Type	Order code	1+
Demonstration motor	52-3444	16.29

565591

RVFM

Clearbox Motor

Specially designed for use in schools, this clearbox motor has a virtually unbreakable polycarbonate gearcase and tough nylon gears.

- Motor will run between 1.5V and 6V DC
- Clear polycarbonate housing provides mounting for both the motor and gears
- Interchangeable gears give a range of speeds and motor torques
- Full instructions for calculating gear ratios etc., are included
- Output shaft is 4mm diameter and is suitable for Meccano and Fischertechnik wheels, gears and pulleys to be fitted directly
- Shaft extends 24mm from front, 54mm from rear

Type	Order code	1+
Clearbox motor	37-0161	7.95

300340

RVFM

Economy Gearbox and Motor

An economy gearbox with clear casing.

- Complete with 3V motor
- Helps pupils to understand the mechanics and movement of gears and motors
- Reduction ratio 40:1
- Output shaft diameter 4mm



Type	Order code	1+
Economy gearbox	37-0165	3.38

010056

CIC

2-in-1 Gearbox



A gearbox kit which contains:

- Electric motor (3-6V)
- 2 sets of gears giving either a 60:1 or 288:1 reduction (approx. 200 or 42rpm)
- Gearbox chassis and shafts

Type	Order code	1+
2-in-1 Gearbox	13-1020	3.30

064472

RVFM

Flexible PVC Tubing

This range of flexible PVC tubing is ideal for buggy and vehicle building.

- 3.5mm (internal) tubing is ideal for use with syringes in your pneumatics projects
- 4mm (internal) tubing makes great end stops, ensuring wheels remain in place on axles
- 5mm (internal) tubing is perfect for spacers, between wheels and chassis
- 6mm (internal) tubing, is essential when your vehicle has bigger axle requirements
- Low toxicity PVC
- Also useful for general purpose tubing and sleeving
- Supplied in **lengths of 25m**



Diameter tolerance $\pm 0.5mm$.

Type	Order code	1+
3.5mm clear	37-1289	6.94
4mm green	37-1291	8.13
5mm yellow	37-1293	9.95
6mm red	37-1295	14.66

300344

RVFM

Latex Balloons

These latex balloons can be filled either with air or helium. They are sold flat and ready for inflation, which should be done at room temperature.

- Diameter when fully inflated 228mm
- Supplied in **assorted colours**
- Supplied in **packs of 100**



The average float-time of latex balloons inflated with helium gas is approximately 12 hours, so inflate just before they are needed.

Pack size	Order code	1+
100	52-2708	14.46

550630

Rapid

Balloons

These packs of balloons offer great value for money.

- Available as round or long balloons in various colours
- Supplied in **packs of 100**



Type	Order code	1+
Round	06-9972	3.88
Long	06-9973	3.10

563496

Rapid

Balloon Pump

This standard balloon pump can be used to inflate balloons of all shapes and sizes - and there's no need for you to run out of puff!

- Length: 300mm

Colour supplied may vary.



Length	Order code	1+
300mm	06-9974	2.14

563497

RVFM

Flexible Propellers

Economy 3-blade plastic propeller with twistable blades which can be bent either way to produce a clockwise or anticlockwise airscrew.

- The flexible nature of the plastic also reduces the danger of injury due to accidental contact with the blades
- Fits tightly on to a 2mm spindle
- 100mm diameter
- **Supplied singly**



MOQ 4

Type	Order code	4+
3 blade 100mm, single	37-2207	0.236

094725

RVFM

Propellers

An essential resource for your Design & Technology classroom, these plastic propellers come in 2 different styles.

- Fit onto 2mm diameter spindles
- 2-blade: 150mm diameter
- 3-blade: 125mm diameter
- **Supplied singly**



MOQ 2

Type	Order code	2+
2-blade 150mm	06-0627	0.697
3-blade 125mm	06-0629	0.482

300338

RVFM

Mini Propeller for 2mm Shaft

A high speed, low torque propeller.

- Overall length approx. 88mm
- Fits tightly on to a 2mm shaft



MOQ 4

Type	Order code	4+
Mini propeller	06-6024	0.268

078914

RVFM

Polythene Fan

This 50mm economy polythene fan demonstrates twistable blades.

- Fits tightly onto a 2mm diameter motor spindle



MOQ 4

Type	Order code	4+
Polythene fan	06-0690	0.273

071895

TickiT

3-Blade Propeller

Set of 3-blade propellers from TickiT, suitable for use in model-making or on their own as a toy.

- Diameter 115mm
- Hole 2mm
- Supplied in **pack of 10**



Type	Order code	1+
Pack of 10	07-0001	3.49

563517

TickiT

Foam Washers

These foam washers from TickiT can be used in model-making and other construction projects to prevent wheels from falling off. They can be glued in place to secure gears, cams or pulleys to axles.

- Suitable for axles between 4mm and 6mm diameter
- Supplied in **packs of 100**



Type	Order code	1+
Pack of 100	06-9999	1.86

563515

RVFM

Cotton Reel Inserts

These cotton reel inserts are perfect for reducing the internal diameter of cotton reels, wheels or pulleys to 4mm or 5mm.

- Pack contains 50 of each size reducer, 4mm or 5mm
- Supplied in **packs of 100**



Type	Order code	1+
Cotton reel inserts pk 100	06-1188	4.80

072572

TickiT

Plastic Axle Brackets

These plastic axle brackets from TickiT can be used in model-making and other construction projects. They can be attached to a chassis with sticky pads or screwed via the 3mm fixing holes.

- Designed to fit maximum shaft diameter of 5mm
- Supplied in pack of 100



Type	Order code	1+
Pack of 100	07-0000	7.36

563516

RVFM

Wire Helix 100mm

Flat section **steel wire** supplied in a **helical coil**, suitable for use in the study of sound and waves in the physics lab - or simply for having fun at home.



- Length (closed) 100mm
- Diameter 75mm

Length (closed)	Order code	1+
100mm	52-2676	4.30

550602

RVFM

Mini Springy



A smaller version of the classic spring toy.

- Ideal for smaller hands
- Colour: silver or bronze
- Diameter 3.5mm

Colour supplied varies.

Type	Order code	1+
Mini Springy	52-9882	1.23

081514

RVFM

Slinky - The Classic Springy Toy

The classic metal toy that stretches, recoils and stretches again. Watch it walk down stairs as if it had a life of its own. Slinky is fun for children and nostalgic for adults.



- 75mm diameter
- 500mm long when closed

Type	Order code	1+
Slinky	52-0059	4.82

066621

eisco
Trust 1. Deliver 1. Learn

Wooden Metre Stick Ruler (Single)



Only
£3.20

Order code 52-3376

www.rapidonline.com

RVFM

Tornado in a Bottle

A simple plug-in plastic joiner enables water to pour from one bottle into another creating an impressive vortex if the top bottle is shaken with an orbital movement.



- Joiner fits most fizzy drinks bottles
- Bottles not included.

MOQ 3		
Type	Order code	3+
Tornado in a bottle	70-1516	0.375

081690

RVFM

Guinea and Feather Apparatus

This apparatus can be used to demonstrate that in a vacuum bodies of different density or mass fall at the same speed. It consists of an acrylic tube fitted with bungs at one end. A valve with stopcock at one end allows a vacuum pump to be attached, and the air evacuated from the tube. Inside the tube is a coin, and a piece of paper. When air is in the tube, the coin falls quickly but the paper is subject to air resistance and falls more slowly. With the air evacuated, the only force acting is gravity, so the two fall at equal rate, despite the difference in weight.

- Length 1000mm

Tube size	Order code	1+
600 x 50mm	52-2679	34.95

550605

RVFM

Mini Dynamics Trolley Set

A set of two trolleys that are designed for use in the demonstration of and experimentation in dynamics. Each trolley features a recessed rectangular well for accommodating extra weights, increasing the effective weight of the trolley.

- Single-piece virtually unbreakable ABS bodies
- Each trolley has wheels that easily snap-in and remove
- Includes attachable spring steel bumpers
- Dimensions of trolley 132 x 55mm
- Spring steel bumper is 78mm dia.

Type	Order code	1+
Dynamics trolley set	52-1216	11.34

081784

RVFM

Dynamics Trolleys

These identical **wooden dynamics trolleys** are mounted on 3 low-friction wheels with spring plungers. The trolleys can be stacked on top of each other by the use of the pins supplied.

- Supplied in pairs
- Length 300mm

Length	Order code	1+
300mm	52-2645	39.50

550677

RVFM

Maxwell's Wheel Momentum Demonstration Apparatus

Maxwell's Wheel apparatus demonstrates momentum, conservation of energy and torque. It consists of a large flywheel suspended by two strong cords. The cords are wound around the shaft of the wheel and then released.



The wheel unwinds the cords as it falls, and winds itself back up as momentum continues to spin the wheel. This process will continue for several oscillations, gradually coming to a stop as the wheel loses momentum and therefore travels less each time.

- Demonstrates momentum, conservation of energy and torque
- Instructions included

Type	Order code	1+
Maxwell's wheel	06-2209	23.48

533916

RVFM

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	46.40

533910

RVFM

Newton's 2nd Law of Motion Demonstration Apparatus

This apparatus demonstrates that 2 bodies will strike the floor at the same time even when their paths of flight and horizontal velocity components are different. The 2 balls are released simultaneously - 1 ball is released to drop vertically, the other is projected horizontally.



- Base
- Spring plunger
- 2 steel balls (1 solid, 1 pre-drilled)
- Instruction sheet

Type	Order code	1+
2nd law of motion	06-2201	10.70

533917

RVFM

Newton's 2nd Law of Motion Apparatus

An apparatus to demonstrate Newton's Second Law of Motion in a simple, yet accurate, way.



When the release lever is triggered, the internal spring accelerates one ball horizontally and releases the other

to fall vertically, showing that two balls dropped from the same height hit the ground at the same time even though one is traveling forward when they are released.

- Supplied complete with 2 balls and instructions

Support stand and clamp required, not included.

Type	Order code	1+
2nd law of motion	06-2202	13.25

RVFM Ballistics Demonstration Car



This apparatus demonstrates that the forward motion of a ball ejected vertically is the same as that of the vehicle from which it was ejected.

With the car in motion, the ball is ejected and lands back in the barrel, rather than being left behind.

- Ball-bearing wheels for low friction,
- Vertically mounted spring loaded barrel
- Two spring tensions
- Supplied complete with 25mm steel ball and release pin

Type	Order code	1+
Ballistics car	06-2207	32.13

RVFM Standard Lever Kit

This kit allows students to investigate levers and how they work. The set includes 5 graduated beams, each 600mm long, which are grooved across the centre of one side, at the fulcrum point, and at regular intervals along the other side.



Includes 4 fulcrums and 40 25 x 25mm metal squares to act as weights for balancing.

Length	Order code	1+
600mm	52-2692	56.24

RVFM 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	7.06

Gasses & Liquids

RVFM Drinking Bird

A classic toy that is really a heat engine!

The bird demonstrates the cooling effect caused by evaporation of water on its beak. The cooling causes a volatile liquid in the bird's body to condense, then evaporate again as it warms up, constantly changing the balance of the bird's body.



- Push the bird's head into water to begin the bobbing motion
- Continues to 'drink' as long as there is water in the container

The bird works best in warmer areas as it relies on there being a sufficient temperature difference between the bird's beak and its surroundings. Should the bird fail to bob, gently heating the glass bulb in the bird's tail with a hair-dryer on a low setting should suffice.

Type	Order code	1+
Drinking bird	06-6838	5.23

EISCO Whitley Bay Smoke Cell

The Whitley Bay smoke cell is used for the observation of 'Brownian' or random motion in smoke particles.



It consists of a box with flanges that allow it to be easily attached to a standard microscope. The box contains a smoke cell, a cylindrical condensing lens and a 12V, 3W festoon bulb. The apparatus is pre-set to focus the light at the correct height.

- Supplied with detailed instructions and a squeeze bottle type smoke generator
- 4mm electrical connections
- Box dimensions 90 x 46 x 20mm
- Eisco type PH0203B

Type	Order code	1+
Smoke cell	52-3425	17.99

RVFM Boyle's Law Indicator



This simple low-cost apparatus provides a means of demonstrating Boyle's law.

- Ideal for demonstrations
- Gives students literally a 'feel' for increase in pressure against volume

Please note that this product is for demonstration purposes and is not 100% accurate.

Type	Order code	1+
Boyle's law indicator	06-6068	11.23

Cochranes of Oxford

Hyman Fire Piston

The Hyman Fire Piston demonstrates the rise in temperature that is produced when a fixed mass of gas is compressed. In this apparatus the contained air is compressed by a hand-operated piston. The heat generated is sufficient to ignite a small quantity of tinder supported inside the transparent cylinder. Suitable tinder is included, but almost any organic material will work if dry enough, i.e. cotton, charcoal, tissue paper, etc.



The Hyman Fire Piston can also be used to demonstrate the need for oxygen to support combustion, by attempting to re-ignite a piece of part-burned tinder. Combustion will only occur if the piston is completely removed from the cylinder allowing a supply of fresh air to be introduced.

Additionally, a cloud can be formed in the cylinder by, having compressed moist air inside it, allowing a sudden decompression. The reduction in pressure lowers the temperature and immediately condenses the water vapour inside the cylinder.

- Demonstrates the rise in temperature when a fixed mass of gas is compressed
- Air is compressed by a hand-operated piston
- Heat generated is sufficient to ignite a small quantity of tinder placed inside the cylinder
- Suitable tinder included, but cotton, charcoal, tissue paper, etc., can also be used
- Can also be used to demonstrate the need for oxygen to support combustion
- Combustion will only occur if the piston is removed to allow fresh air in
- A cloud can be formed in the cylinder by allowing sudden decompression
- Reduction in pressure lowers the temperature and condenses the water vapour
- Includes 'fire piston', supply of tinder, lubricating oil, spare 'O' rings and full instructions

Type	Order code	1+
Hyman Fire Piston	06-7791	30.19

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	30.60

RVFM

Pascal's Vases Apparatus

Pascal's Vases Apparatus shows that the pressure of a liquid varies with depth and not with the shape of the vessel.

- Apparatus includes 4 vessels of different shapes and a stand
- Pressure is measured by placing weights in the scale pan
- Repeating the experiment with each 'vase' proves the theory



Type	Order code	1+
Pascals vases	06-2159	37.43

533943

Equality of Liquids Apparatus/
Pascal's Law Syringe

An apparatus consisting of a glass flask with holes in the bulbous part and a glass piston that slides in the straight part.

When filled with liquid, the piston is pushed into the apparatus, causing liquid to exit each hole with equal pressure regardless of the hole's position or direction.

- Also known as Pascal's Law syringe
- Eisco type PH0194



Type	Order code	1+
Pascal's Law syringe	52-3330	4.89

565523

RVFM

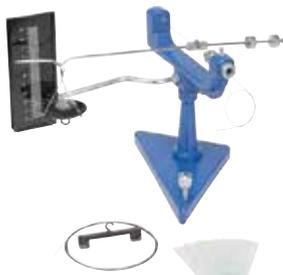
Surface Tension Balance, Searles

This Searles Surface Tension Balance can be used to demonstrate the surface tension of a liquid by allowing it to be shown on a graduated scale.

A horizontal frame is mounted on a rod fitted to a base and carries a

steel wire stretched across it, the tension of which can be adjusted by a tightening screw. A lightweight metal pointer with a counterpoise is attached to the centre of the wire by a clamp. A pan is hung from a notch in the pointer and has a hook at its underside from which can be suspended a light weight rectangular frame or a metal clip to hold a microslide edge. The tip of the pointer moves over the graduated scale.

- Supplied complete with rectangular wire frame, slide clip, six microslides, 3m of spare wire and full instructions.



Type	Order code	1+
Surface tension blince	06-2160	36.36

533950



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
- 2 bottles of coloured mineral oil
- PPE funnel
- Instruction manual
- Eisco type PH0150A



Type	Order code	1+
Boyle's law apparatus	52-3414	127.69

565573



Boyle's Law Simple Form

A simple apparatus for the demonstration of Boyle's law, consisting of an airtight graduated plastic syringe with a lubricated piston, mounted between two wooden blocks.

Weights can be stacked on the top platform, compressing the gas. The corresponding measurement of volume can be read from the syringe scale.

- Air-tight plastic syringe supported between wooden blocks
- Weight on the upper block produces pressure that compresses the gas
- Volume measurements can be read from the syringe scale
- Eisco type PH0145A



Type	Order code	1+
Boyles law simple	52-3349	8.88

565537

RVFM

Planck's Constant Apparatus

This apparatus is designed to determine the approximate value of Planck's constant, using a range of LEDs of known wavelength, to allow the electron/photon energy to be calculated. The apparatus includes 7 LEDs, covering the light range from deep blue at 470nm to near IR at 940nm, mounted on a box with 4mm sockets for attachment to a voltmeter and ammeter for voltage and current measurements. By monitoring the voltage at which each LED just begins to emit light, a graph of energy input as a function of light emitted frequency can be plotted and an approximate value of Planck's constant can be deduced.

- Requires a 9V DC power supply

Type	Order code	1+
Planck's constant apparatus	52-2639	39.13

565672

RVFM

Gas Jars

These glass gas jars have a base and a ground top flange.

- Height 150mm
- Diameter 50mm



Size	Order code	1+
150 x 50mm	52-2747	5.30

550634

RVFM

Gas Jar Covers

These gas jar covers are ground on one side.

- Diameter 65mm
- Supplied in packs of 5



Diameter	Order code	1+
65mm	52-2748	2.63

550635

RVFM

Magdeburg Pressure Disks

A practical vacuum/pressure demonstration set consisting of two plastic, 10cm diameter hemispheres.

Each hemisphere has a wooden handle firmly attached to it. One of the hemispheres has a raised edge to hold a rubber seal, while the other hemisphere has a stopcock for attaching to vacuum tubing. When the hemispheres are pushed together and evacuated using a vacuum pump they are hard to pull apart. Get 2 students to pull, then open the stopcock to let air in and the hemispheres will separate easily to the surprise of the students.

- Practical vacuum / pressure demonstration set
- Two 10cm dia. plastic hemispheres
- Evacuated hemispheres are hard to pull apart
- Hemispheres separate easily when stopcock opened



Type	Order code	1+
Magdeburg hemispheres	06-2236	22.29

533966

RVFM

Speed of a Bubble Set

A set of three rugged, sealed, transparent plastic tubes containing coloured fluids of three different viscosities.

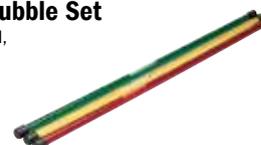
The bubble in each tube rises at a constant speed which depends on the type of fluid, the angle at which the tube is inclined and to some extent the temperature.

Students can measure the time it takes for the bubble to move from the bottom to the top of the three different tubes. Their observations will help them to link the mathematical concept of slope to the physical science concept of velocity.

- Supplied complete with instructions

Type	Order code	1+
Speed of a bubble set	06-2231	21.79

534081



RVFM

Vacuum or Pressure Apparatus

A rugged hand-operated piston pump with two nozzles - one that creates vacuum and the other that creates pressure.



- Creates pressure or vacuum
- Metal barrel

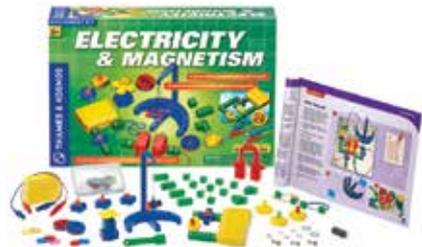
Type	Order code	1+
Vacuum / pressure	06-2245	13.06

537517

Magnets



Experiment Kit - Electricity & Magnetism



Understanding the Force of Electromagnetism!

Conduct more than 60 electrifying experiments with circuits and magnetic contraptions to learn about electricity and magnetism, and how these two fundamental properties are closely related. Children of eight years and up can safely and easily experiment with electric current and magnetic fields using the colourful snap-together blocks and components in this hands-on kit.

Build series and parallel circuits to light up a light bulb. Experiment with push buttons and on-off switches. Assemble circuits that include a spinning motor, two switches, and up to three light bulbs.

Conduct tests to see which materials are magnetic. Learn about the force of magnetism and magnetic poles. Magnetize a metal object. Use iron fillings to make invisible magnetic fields visible. Investigate magnetic force and direction with a magnetic pendulum device. Learn how a compass works and about Earth's magnetic fields. Conduct a series of experiments with a sturdy electromagnet.

Finally, put everything you have learned to good use by constructing a loudspeaker, an electromagnetic relay switch, and a Morse code telegraph key. The components are specially designed to make learning fun and accessible. The electrical blocks fit together with simple plug and socket connectors. Because the blocks are brightly coloured and have unique shapes, it is easy to follow the assembly diagrams to construct functional devices.

The 64-page, full-colour experiment manual guides you through experiments with easy-to follow diagrams.

- Conduct more than 60 electrifying experiments
- Build series and parallel circuits to light up a light bulb
- Experiment with push buttons and on-off switches
- Assemble circuits that include a spinning motor, switches and light bulbs
- Conduct tests to see which materials are magnetic
- Magnetize a metal object
- Use iron fillings to make invisible magnetic fields visible
- Investigate magnetic force and direction with a magnetic pendulum device
- Learn how a compass works and about Earth's magnetic fields
- Construct a loudspeaker, an electromagnetic relay switch and a Morse code telegraph key

- 64-page, full-colour experiment manual guides you through experiments with easy-to follow diagrams

Type	Order code	1+
Electricity & magnets	70-0354	32.13

534111



Ferrite Magnets (Blocks)

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



- Their low-cost, reliability and durability in use make them an ideal general purpose classroom resource
- 9 x 9 x 40mm
- Supplied in **packs of 20**

Type	Order code	1+
Ferrite block magnets	06-0584	6.60

072027



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**

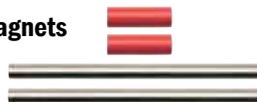
Type	Order code	1+
Large ferrite magnets	06-0586	8.53

072031



Alnico Rod Magnets

Permanent rod magnets with north end painted red.



- Available in 24 x 8mm and 100 x 6mm sizes
- Supplied in **pairs**

Type	Order code	1+
24x8mm magnet	06-5954	1.94

078886



Experiments for Magnetism Set



This is the perfect set for children to develop magnetic investigation.

- 16 experiments linked to **QCA Science Curriculum for Key Stage 1**
- Supplied with an A4 background information booklet

The kit is supplied with;

- Four wands
- 20 magnetic marbles
- Two plastic cased magnets
- A super magnet
- Set of floating ring magnets
- Small horseshoe magnet
- Compass magnet
- Supplied in a purpose made plastic moulded carry box for easy counting in and out
- Suitable for **Key Stage 1** (ages 5 to 7)

Type	Order code	1+
First experiments magnet	06-5984	33.33

078892



Magnet Kit



This magnet kit includes a selection of magnets and materials, assembled in a plastic tray for easy storage.

Kit contains:

- Alnico bars, alnico button magnets, ferrite blocks and rings, chrome steel horseshoe magnet, alnico horseshoe magnet and coloured squares of magnetic rubber
- Ideal as a classroom resource

Type	Order code	1+
Magnet kit	06-0590	31.00

072033



Colour Magnetic Wands

These plastic magnetic wands from Shaw Magnets

are ideal for use with primary school classes. Supplied in a range of bright colours, these wands can be used in conjunction with metallic chips and magnetic marbles to display the forces of magnetism.



- Wand length 190mm
- Supplied in **pack of 6**

Type	Order code	1+
Pack of 6	06-9991	6.20

563508



Wands and Marbles Set

This magnetic wand and marbles set from Shaw Magnets is ideal for use with primary school classes. This set includes 2 magnetic wands and 20 coloured plastic marbles.



- Wand length 190mm
- Marble diameter 15mm

Type	Order code	1+
2 wands, 20 marbles	06-9992	4.26

563509



Horseshoe and Ceramic Magnet Sets



A range of magnets and magnetic products, a must for every classroom.

- Horseshoe magnets supplied in **sets of 3**
- Super magnets supplied in **sets of 300**

Set contains:

3-piece horseshoe magnet set contains:

- 1 each: 75mm, 100mm & 125mm
- 300-piece magnet set contains:**
- 50x Disc magnets: Dia 14mm, Thickness 3mm
- 30x Ring magnets: Dia 17.75mm, Thickness 5mm
- 50x Ring magnets: Dia 21.1mm, Thickness 2.9mm
- 50x Ring magnets: Dia 19.9mm, Thickness 2.9mm
- 20x Ring magnets: Dia 17.8mm, Thickness 5mm
- 50x Square magnets: Dia 10mm, Thickness 5mm
- 50x Rectangular magnets: Dia 24.7mm, Thickness 10mm x 5mm

Type	Order code	1+
Horseshoe magnet set	06-0504	13.18
300-piece magnet set	06-0508	15.50

060042



Ceramic Disc Magnets

These disc magnets are suitable for all science applications.

- Available in 10 x 3mm, **pack of 50 pieces**
- Available in 14 x 3mm, **pack of 50 pieces**



Type	Order code	1+
10x 3mm pack of 50	06-5962	3.10
14x 3mm pack of 50	06-5966	3.68

078887



Neodymium Disc Magnets

Neodymium magnets have the greatest pulling force of all permanent magnets.

- Available in various sizes and a mixed pack containing 1 each of: 6mm dia. x 3mm, 10mm dia. x 4mm and 20mm dia. x 10mm



Type	Order code	1+
Mixed sizes set of 3	06-6012	5.81
10 x 4mm pack of 10	06-6014	6.20
15 x 4mm pack of 4	06-6016	3.88
20 x 10mm pack of 4	06-6018	19.38

078905



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	4.26
15 x 5 x 60mm	06-5975	6.98
15 x 10 x 50mm	06-5977	9.29
15 x 10 x 75mm	06-5979	13.95

501636



Alcomax Major Magnet

This is a very high-powered magnet from Shaw Magnets and is ideal for measuring flux density, demonstration of the moving coil galvanometer, the deflection of beams and particles and for magnetising other magnets.



- Size 110 x 103 x 50mm
- Supplied with keeper

Size (mm)	Order code	1+
110 x 103 x 50	06-9978	271.25

563499



Major Magnet

This impressive magnet is one of the most powerful available and is ideal for use in physics and other subjects involving magnetism.



- Strength 0.2945 Tesla

Strength	Order code	1+
0.2945 Tesla	52-2663	129.95

550590



Super Magnets

These incredible new super magnets, allow children to safely experience first hand, the force of neodymium, currently the world's strongest magnetic material.



- Housed in tough colour coded mouldings (red-North, blue-South)
- Rounded edges for safe handling
- Suitable for all ages
- Supplied as a **pair**

Type	Order code	1+
Super magnets	06-0526	11.62

070799

Free Delivery*

on all orders over £30 (excl. VAT)
(UK mainland only)

* See Terms & Conditions for full details - www.rapidonline.com/terms



Giant Horseshoe Magnet

Powerful magnets with North and South poles clearly marked are housed at the ends of this impressive giant horseshoe magnet from Shaw Magnets.

- Length 210mm



Length	Order code	1+
210mm	06-9989	3.49

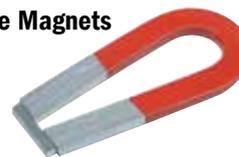
563506



Steel Horseshoe Magnets

Individual chrome steel horseshoe magnets from Shaw Magnets, supplied with keeper.

- Available in a range of sizes



Size	Order code	1+
75mm	06-9975	3.10
125mm	06-9977	3.96

563498



Alnico Horseshoe Magnets

This Alnico horseshoe magnet from Shaw Magnets is painted red.

- Supplied with keeper
- Length 25mm



Length	Order code	1+
25mm	06-9979	2.71

563501



Alnico Strong U Magnets

Red-painted strong Alnico cast U-shaped magnets from Shaw Magnets.

- Available in choice of sizes
- Supplied with keeper



Size (mm)	Order code	1+
30 x 20 x 20	06-9982	6.20
45 x 30 x 30	06-9984	13.18

563502



Ferrite Block Magnets

These ferrite block magnets from Shaw Magnets are ideal for use with reed switches or for general tasks.

- Size 50 x 19 x 6mm
- Supplied in **pack of 10**



Type	Order code	1+
Pack of 10	06-9986	1.94

563504



Ferrite Ring Magnets

These ferrite ring magnets are suitable for all sorts of applications that require a powerful magnet with a central hole.



- Ideal for general purpose use
- Available in 12 and 24mm diameters
- Supplied in **packs of 10**

Type	Order code	1+
12mm pack of 10	06-5972	0.85
24mm pack of 10	06-5974	1.32



Magnetic Marbles

These magnetic marbles are ideal as a basic introduction to magnetism for young children.



- Supplied in **tubs of 100** assorted colours

Type	Order code	1+
Magnetic marbles	06-6296	12.40



Magnetic Dots

Packs of self-adhesive round magnetic dots.



- Ideal for art and craft, design and technology and science projects
- Dimensions 12mm diameter
- Supplied in **packs of 300**

Type	Order code	1+
Magnetic dots	06-5992	3.88



Electromagnet

The Eisco PH0800A electromagnet consists of a U-shaped iron core of circular section, with armature and carrying hook. It is wound with insulated copper wire and provided with colour-coded 4mm connectors.



- For use on 4 to 6V DC
- **Eisco type PH0800A**

Type	Order code	1+
Electromagnet	52-3310	6.12



'Hercules' Demonstration Electromagnet

This electromagnet offers an amazing demonstration of how powerful magnetism can be. Powered by just one 9V PP3 battery, this small magnet has incredible lifting power of approximately 50kg.



- When switched on, an iron plate locks itself solidly to the bottom of the electromagnet core. Turning the switch off will release the load or hold it in the air, as required
- Karabiners are situated at the top and bottom of the device to make it easy to clip into position
- Battery and instructions included

Type	Order code	1+
Hercules electromagnet	06-0592	36.43



Ceramic Square Magnets

Multipole magnets with one strongly attractive face, ideal for attaching to metal surfaces.



- Ideal for fridge magnets, etc.
- Attach dimpled side to object to be held
- Dimensions: 19 x 19 x 5mm
- Available in **packs of 10 and packs of 20**

Type	Order code	1+
Pack of 10	06-5976	1.86
Pack of 20	06-5978	3.49



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	13.95



Magnetic Floating Ring Set

A set of five coloured magnetic rings with a plastic stand.



- Create a floating magnetic trick
- Children will achieve this by simply stacking the rings with like poles facing each other so they repel
- Dimensions 24mm diameter x 5mm width
- Suitable for **Key Stages 1 & 2** (ages 5 to 11)

Type	Order code	1+
Floating ring set	06-5980	4.08



Primary & Secondary Coil

This primary and secondary coil apparatus demonstrates the principle of Electromagnetic Induction and helps to explain the concept of a transformer. The Primary and Secondary coils are mounted on plastic spools with binding posts for easy connection. The primary coil slides inside the secondary coil. The set also includes a soft iron core for induction experiments.



- Primary coil has 480 turns
- Secondary coil has 3800 turns

Type	Order code	1+
Primary & secondary	06-2248	30.07



Electricity Demonstration Models

These models are ideal for demonstrating the working of an **electric motor** and a **dynamo**.



Type	Order code	1+
Electric motor	52-2642	36.99
Dynamo	52-2643	60.24



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	33.66



Lenz's Law Kit



This simple kit demonstrates a copper tube with viewing slot and contains one non-magnetised and one magnetised neodymium plug of identical sizes and weights, for demonstrating Lenz Law and the effect of eddy currents.

- Kit contains full supporting Teachers notes
- Suitable for **Key Stages 3 & 4** (ages 11 to 16)

Type	Order code	1+
Lenz's law kit	06-0597	9.70

Order online

Save time, and place your order at:

www.rapidonline.com

24 hours a day



Lodestone

This sample of naturally magnetic **iron ore** is supplied in a walnut-sized lump.

- Length 30 to 40mm approx.



Type	Order code	1+
Lodestone	06-9995	3.88

563511



Iron Filings Shaker

These iron filings are encased in a plastic shaker, ideal for magnetic and flux experiments.

- Contains approximately 225g



Type	Order code	1+
Iron filings shaker	06-0672	1.74

072047



Iron Filings Bubbles

Iron filings encased in a plastic bubble.

- Ideal for observing the effects of invisible magnetic fields
- Diameter: 85mm
- Supplied in **packs of 5 or 10**



Type	Order code	1+
Iron filings bubble pk 5	06-0674	4.26
Iron filings bubble pk 10	06-0678	8.53

072048



Iron Filings 250g Jars

These iron filings are ideal for magnetic field mapping and a host of other experiments with magnetism.

- Available in course or fine grades
- Supplied in **250g plastic jars**
- Eisco PH0799 series**



Grade	Order code	1+
Course	52-3696	3.05
Fine	52-3697	1.52

565682



Science Magnetism Tube

This giant magnet tube has a double wall with iron filings between two layers to show a 3 dimensional view of the magnetic field around the supplied magnet.

- The magnet is removable and the filings are safely encased
- Size: 130 x 90mm



Type	Order code	1+
Magnet tube	06-0598	12.40

072042



We bring
STEM to life



Magnetic Field Display

These magnetic field windows contain magnetic powder in a water based solution for showing magnetic field patterns.



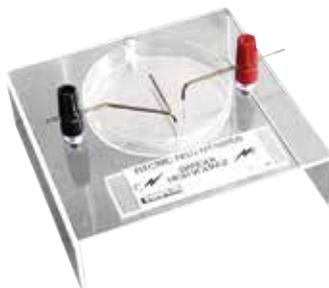
- When a magnet is present the particles of iron inside become slightly magnetised, so they attract each other and cluster into the lines that show the magnetic field patterns
- Size 225 x 130 x 15mm
- Includes 2x plastic cased magnets, 2x ferrite magnets and an information/instruction booklet
- Available with white background (**06-0680**) or transparent background (**06-0282**) for use with an overhead projector

Type	Order code	1+
White Background	06-0680	25.58
Transparent background	06-0682	25.58

072049



Electric Field Apparatus



This apparatus is ideal for demonstrating **electric fields** between various electrodes. Liquid paraffin is placed in the 90mm diameter petri dish and semolina or fine grass seed is sprinkled on the surface. Various electrode configurations can be arranged in the liquid and when a high voltage is applied via the 4mm terminals the **field pattern** is generated. The see-through base allows the pattern to be projected via an overhead projector system.

- Supplied without paraffin or semolina
- Dimensions (L x W x H): 150 x 150 x 60mm

A low current 0 to 5kV EHT supply is required (not supplied).

Size	Order code	1+
150 x 150 x 60mm	52-2660	65.80

550588



Gold Leaf Electroscope

This dual purpose **electroscope** has a metal plate to which a single gold leaf may be attached and is supported by an insulating bush in a metal case with 4mm socket earthing terminal. A scale is provided for measuring the deflection of the leaf.

- Packs of gold leaf available separately.



Type	Order code	1+
Electroscope	52-2662	16.10
Gold leaf (pack of 6)	52-2661	13.90

550589



Eisco 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	14.80
Gold leaves pack	52-3641	2.85

565683



Magnetic Followers

This magnetic **stirring bar** is suitable for use in chemistry and other science subjects to stir liquids etc.

- Encased in PTFE
- With centre rim
- Length 30mm



Length	Order code	1+
30mm	52-2709	1.94

550591



Magnetic Needle Stand and Needles

A range of magnetic needles and a suitable low-friction stand for use in the study of magnetic fields and compasses.

- Stand height 110mm
- Range of needle sizes
- All parts sold separately



Type	Order code	1+
Stand	52-3318	3.01
50mm needle	52-3319	0.807
75mm needle	52-3320	0.807
100mm needle	52-3321	1.32

565516



Compass Magnet

By placing this torpedo shaped magnet onto a flat surface or in a bowl of water, you can watch it hunt for magnetic north.



- Inside the casing there is a powerful neodymium magnet which finds the Earth's magnetic field and aligns itself
- Based upon one of the first principles of magnetism and emulating primitive compasses used by early explorers

Type	Order code	1+
Compass magnet	06-0588	4.65

072032



Compass Magnet and Bowl

Compass magnet complete with translucent plastic bowl.



- Plastic bowl marked with compass points
- Watch as the compass points to magnetic north

Type	Order code	1+
Magnet and bowl	06-6000	5.23

078900



45mm Compass

Tough plastic cased compass with lanyard.



- Marked with four compass points
- Full 360° scale around edge

Type	Order code	1+
45mm Compass	06-5996	1.32

078998



Basic Plotting Compass 16mm

A basic 16mm diameter plotting compass marked with the principal compass points.



The compasses provide a simple, visible method of demonstrating and mapping magnetic fields in a classroom environment.

- Glass face
- Aluminium case
- Diameter: 16mm
- **Sold singly**
- **Eisco type PH0820A**

Type	Order code	1+
Plotting compass	52-3695	0.296

565681



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	11.63

072045



Plotting Compass

These double sided plotting compasses can be viewed from both sides or used on an overhead projector.



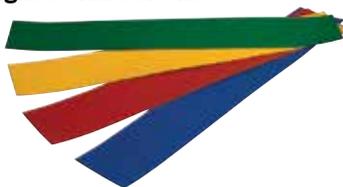
- Ideal to plot lines of magnetic force
- Size: 19mm diameter
- Supplied in **packs of 10**

Type	Order code	1+
Plotting compass	06-0670	3.73

072046



Magnetic Rubber Sheets



These magnetic rubber sheets can be used for a variety of different applications.

- Easy to cut with scissors into different shapes and designs
- Will stick to any magnetic metal surface
- Has a write-on, wipe-off surface for use with dry-wipe marker pens
- Supplied in **packs of 4** assorted colours: red, yellow, blue and green
- Sheet size: 300 x 50 x 0.6mm

Type	Order code	1+
Magnetic rubber sheets	06-0594	3.10

072037



Flexible Magnetic Sheet

A flexible 0.75mm thick magnetic material which attracts readily to steel and ferrous materials.



- Supplied in an A4 (210 x 297mm) sheet which can be easily cut into various sizes and shapes
- Ideal for attaching to the back of card or artwork to make moveable signs, notices or fridge magnets, collages, magnetic jigsaw puzzles, etc.
- Useful for fabricating custom design magnetic fasteners, cabinet or case closures
- Available plain or with self-adhesive backing

Type	Order code	1+	5+	10+	25+
Magnetic sheet - plain	37-2005	1.93	1.76	1.61	1.49
Magnetic sheet - s/a	37-2007	1.93	1.76	1.61	1.49

064796

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Materials & Properties



Archimedes' Principle Kit

A complete, self-contained kit that is ideal for demonstrating Archimedes' principle and for the exploration of the qualitative and quantitative concepts related to buoyancy.



- Contains all equipment needed for many experiments
- Regular shaped metallic solid
- Irregular shaped solid
- Beaker
- Displacement vessel
- Newton meter

Type	Order code	1+
Archimedes' princ. kit	52-1210	16.59

081871



Set of 6 Metal Cubes

This set of six 19mm metal cubes includes copper, brass, aluminium, mild steel, stainless steel and bronze cubes, and is ideal for experiments to demonstrate magnetic properties, mass and density investigations and classifications of different metals.



- Copper, brass, aluminium, mild steel, stainless steel and bronze cubes
- Demonstrate magnetic properties
- Classifications of different metals
- Ideal for mass and density investigations
- Supplied as a **pack of 6x 19mm cubes**

Type	Order code	1+
Metal Cubes Set (6)	06-0589	16.05

501649



12-Piece Science Metal Strips Set

This 12-piece metal strip set includes a strip of each of aluminium, brass, copper, bronze, nickel, mild steel, galvanized iron, magnetic and non-magnetic stainless steel, zinc, chrome and lead.

- All strips are marked with a letter to identify each metal - see Technical Details
- Ideal for experiments to demonstrate magnetic properties and classifications of metals
- Strip size: 50 x 25mm
- Supplied as a **set of 12 strips**

Technical specification

Letter	Metal	Letter	Metal	Letter	Metal
A	Aluminium	E	Nickel	I	Stainless steel - magnetic
B	Brass	F	Mild steel	J	Zinc
C	Copper	G	Galvanized iron	K	Chrome
D	Bronze	H	Stainless steel - non-magnetic	L	Lead

Type	Order code	1+
Metal strip set	06-0595	8.48

072038

RVFM

Brass Sheets

Economical brass sheets, ideal for cutting, shaping and bending.

- Superb rich brass finish
- 0.1mm thick sheets



Type	Order code	1+
A4	06-0744	3.90
A3	06-0746	6.40

066922

RVFM

Copper Sheets

These economical 0.1mm thick copper sheets are perfect for embossing, bending and cutting.

- Basic Design & Technology and Science resource



Type	Order code	1+
A4	06-0752	4.63
A3	06-0754	6.40

066924

RVFM

Aluminium Sheet

Aluminium sheet is an essential basic material for the Design & Technology and Science classroom or workshop.

- Aluminium sheets 0.9mm thick (± 0.1 mm tolerance)
- Size 500 x 500mm



Thickness	Order code	1+
0.9mm	06-0736	8.65

066920

RVFM

Aluminium Foil

Food grade Aluminium Foil ideal for cookery as well as experiments with metal.

- Available on 75 and 90m rolls



Type	Order code	1+
450mm x 75m	06-0921	9.17
500mm x 90m	06-0922	14.98

066924

RVFM

Cling Film

Standard PVC cling film for all your cooking and wrapping needs.

- Width 300mm (12in.)
- Length approx. 300m (1000ft.)



Type	Order code	1+
Cling film	52-9480	4.92

300424

RVFM

Slime

This slime is sold in toy shops as a fun material, but is in fact a polymer with very unusual characteristics worth investigating.

- Pack contains ingredients for making a useful quantity of slime
- Quantity is sufficient for two whole class experiments



Type	Order code	1+
Slime	06-8110	24.51

081678



Complete Rock and Fossil Collection



Dig into some serious fun with this fascinating fossil and rock collection. The collection features handpicked specimens, chosen for their interest, colour, texture and beauty.

12-piece rock sets:

- Includes an educational identification chart and activity guide
- Igneous rocks are produced by hot volcanic magma action
- Metamorphic rocks are transformed by intense heat and pressure
- Minerals combine with each other to make rocks
- Sedimentary rocks are formed by layers of deposited matter

Fossil set:

- Contains 9 fossils in a handy divided tray
- Includes guide, 4-colour insert card of photographed fossils, foam sheet and die-cut sheet of circle labels for fossils
- Average fossil length approximately 2.5cm
- Fossils included are: brachiopod, bryozoa, crinoid stem, gastropod, colony coral, ammonite, shark's tooth, fossil fern/plant matter and petrified wood
- Supplied as a **cost-saving set (52-9948) containing 4 rock sets plus a fossil set**

Type	Order code	1+
Complete collection	52-9948	48.52

081836

Palm Size Digital Multimeter

Only

£9.47

Order code 85-4080

www.rapidonline.com



Conductivity & Energy



Carbon Rod



A 140mm long carbon rod with a brass terminal for electrical connection.

- Length 140mm
- Diameter 15mm
- Eisco type PH0937

Type	Order code	1+
Carbon rod	52-3605	1.52

565644



Thermal Conductivity Rods



These metal rods are ideal for thermal conductivity experiments.

- Metal rods for thermal conductivity experiments
- Approximately 300mm long x 3mm diameter
- Individual metal types supplied in **packs of 10**
- Assorted metal types supplied in **packs of 6**

Material	Order code	1+
Assorted (6)	52-3352	5.30
Aluminium (10)	52-3656	7.10
Brass (10)	52-3657	9.14
Copper (10)	52-3351	8.67
Iron (10)	52-3659	6.32
Lead (10)	52-3660	8.47
Zinc (10)	52-3662	9.14

565539

RVFM

Iron Conductivity Rods

These **conductivity rods** are made of iron and are suitable for use for a variety of purposes in physics and other science lessons in the laboratory or the classroom.

- Length 300mm
- Diameter 3mm
- Supplied in **packs of 10**

Type	Order code	1+
Pack of 10	52-2596	3.13

565535



Conductivity Apparatus

Apparatus for demonstrating the thermal conductivity of different materials.

- Apparatus includes strips of iron, copper, aluminium and brass
- All metals stamped with their name
- Robustly mounted on a wooden ring
- Supplied complete with full teacher's notes

Type	Order code	1+
Conductivity apparatus	06-6008	4.46

078903



RVFM

Leslie's Cube

This **Leslie's Cube** has dull black, shiny black, white and copper sides and is ideal for use in experiments to show how objects emit heat.

- Dimensions (L x W x H): 100 x 100 x 100mm



Size	Order code	1+
100 x 100 x 100mm	52-2671	28.90

550598

eisco
The Best in Science

Leslie's Cubes

These Leslie's cubes have sides with different surface finishes. They are ideal for use in experiments to show how objects emit and absorb heat.



In use, the apparatus is filled with water which is maintained at boiling point by a Bunsen burner flame. Infra-red sensors, etc., can be used to compare the relative radiant heat output from each of the four faces.

- Top hole for filling and emptying
- Bung for thermometer
- **Eisco PH0411 series**

Size	Material	Order code	1+
100mm	Copper	52-3650	14.25
130mm	Tin	52-3649	8.16

565558

eisco
The Best in Science

Crookes Radiometer

This radiometer consists of a partly evacuated glass bulb approximately 70mm in diameter, containing a fine pivot which supports four light weight metal arms. One side of each vane is blackened, the reverse side is bright.



On exposure to sunlight, or a sufficiently bright incandescent light source, the vanes turn. The absorption of radiant energy by the blackened side of the vanes sets up a temperature differential with respect to the bright sides, causing net force to be exerted by the air molecules on the blackened side which makes the vanes rotate with their bright faces leading.

- Approx. 70mm diameter
- Mounted on round plastic moulded base
- **Eisco type PH0418A**

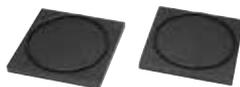
Type	Order code	1+
Crookes radiometer	52-3332	6.08

565525

RVFM

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	12.97

534082

Solar Power & Hydrogen Fuel

RVFM

1V, 150mA Solar Panel

Use these solar panels to build your own robots or other solar energy powered applications. Ideal for use for solar cars, solar motor kits and school projects.



- Solid, almost-unbreakable module
- Polycrystalline type, suitable for outdoor use
- Great for low power consumption projects
- Supplied with flying leads
- Output approximately 1V @ 150mA
- Can be wired in series or parallel to increase voltage or current
- Dimensions 60(L) x 30(W) x 2(D)mm
- Weight approx. 8g

Type	Order code	1+	25+
60 x 30mm solar panel	37-0438	3.29	3.11

080724

Truopto

Solar Cell Modules



These solar cell modules will gather natural or artificial light and produce an output voltage. The solar panels use crystalline silicon solar cells and have output leads soldered in place. The light weight and high efficiency of these modules make them suitable for a range of low voltage power generation applications.

- 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

Technical specification				
Order code	55-0010	55-0012	55-0014	55-0016
Voltage (V)	1.5	2.0	2.0	5.0
Current (mA)	250	250	500	230
Power (W)	0.37	0.5	1	1.15
Dimensions (mm)	90 x 50 x 3	90 x 60 x 3	90 x 105 x 3	90 x 125 x 3
Power tolerance (%)	±3	±3	±3	±3
Temperature coefficient (%/°C)	-0.45	-0.45	-0.45	-0.45

Voltage	Power	Order code	1+	5+	10+	25+
1.5V	0.37W	55-0010	3.70	3.38	3.13	
2V	0.5W	55-0012	4.85	4.72	4.31	3.99
2V	1W	55-0014	6.90	6.45	6.06	
5V	1.15W	55-0016	6.90	6.45	6.06	5.52

502676

Truopto

Solar Powered Light Module Kit

This simple, yet effective module demonstrates how solar panels can convert the sun's energy into electricity, how it can be stored and how that energy can be released and used when required.



In sunny conditions, the Poly-Silicon solar cell converts the sun's radiant energy into 1.8V of electricity which charges the Nickel Hydride rechargeable battery. As the sun's light reduces, so does the output of the solar panel. When the solar panel's output falls below approximately 0.7V, the circuit stops charging the battery and the captured energy remains in the battery. In darkness, the solar cell's output drops to zero which triggers the circuit to switch on the 2 LEDs to provide illumination.

The module is available both ready-assembled or as a kit of parts that can be assembled by students as part of a Design and Technology project.

- Practical demonstration of solar power
- Rechargeable battery: 1000mAh
- More than 20 hours illumination from fully charged battery
- Over-discharging protection
- Automatic light level detection
- Ideal for educational
- Available ready assembled or in kit form

Technical specification	
Main PCB dimensions	81 x 27.8 x 1.6mm
Solar panel dimensions	136.5 x 80mm
Solar panel output	1.8V, 1W
Controller IC	QX5252
LED driving current	15mA (average)
Working temperature	0 to +50°C
Storage humidity	5 to 95%

Type	Order code	1+
Assembled	55-0005	12.57
Unassembled	55-0006	11.31

500483

RVFM

Educational Solar Energy Kit



A complete kit of parts which provides the student or child with an introduction to solar energy. The kit comprises:

- 8x 500mV, 100mA solar cells in one panel
- Miniature DC motor
- Small fan
- Plus all tools and cables enabling the user to construct a working kit
- The solar cells provide an output of 3.2V and may be employed to drive a variety of other small components
- The kit also comes complete with an informative twelve page booklet explaining solar energy in considerable detail

Type	Order code	1+	10+	40+
Solar energy kit	37-0420	9.85	9.26	8.90

031204

No minimum order value
UK mainland only

RVFM

3V Solar Panel Battery Charger

A fully encapsulated assembly comprising eight individual cells producing an output of 3V, 100mA maximum.



- Can be used as a power source for low current equipment or for trickle charging AAA or AA size rechargeable batteries
- Fitted with a hinged mounting bracket
- Output is via a 1.8m cable, terminated with red and black crocodile clips and a 1.3mm walkman type DC power plug
- Dimensions: 95 x 65 x 7.5mm

Please note that, if mounted outdoors, the solar panel will require a waterproof housing, (not included). Good results can be obtained by mounting the solar panel in a window.

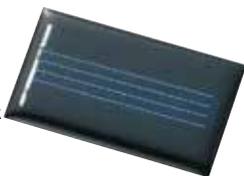
Type	Order code	1+
3V solar panel	42-0240	6.09

015893

CONRAD

Miniature Mono/Polycrystalline Solar Cells

These miniature solar cells from Conrad are available in mono or polycrystalline design. The mono-crystalline cells have a uniform dark colouring and comprise of a silicone mono-crystal. Polycrystalline cells have an identifiable crystalline structure, the mono-crystalline cells have a somewhat better degree of efficiency. Ideally suited for experiments, as well as providing a power supply, independent of the mains for small consumers or for charging batteries.



To reach the desired voltage and current, the module can be switched individually in parallel or in a series, simply via the corresponding soldering pads available on the back side.

- Ideal for experiments or power supply without mains
- Available in mono or polycrystalline design

Voltage	Current	Size (L x W)	Order code	1+	5+
Monocrystalline					
0.5V	100mA	26x46mm	49-4028	3.00	2.75
4.0V	35mA	39x35mm	49-4032	3.78	3.55
Polycrystalline					
5.0V	81mA	65x57mm	49-4033	8.36	8.13
9.0V	109mA	65x125mm	49-4034	13.92	
18.0V	40mA	90x75mm	49-4035	11.24	11.02

531940

eISCO

Solar Cell and Motor Demo Set



A range of solar units, ideal for demonstrating the conversion of solar energy into mechanical energy.

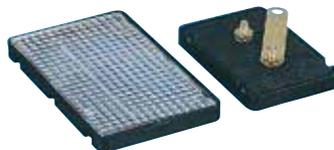
- Range includes solar cells, solar motors, LED and buzzer

Type	Order code	1+
Solar cell & motor	52-3353	24.47
Solar cell only	52-3354	13.78
Solar motor & fan	52-3355	9.55

565540

RVFM

Solar Cells



Fully encapsulated solar cell modules mounted in black polycarbonate cases.

- Output of 0.45V
- Fitted with threaded stud terminals and a copper busbar

Technical specification		Dimensions (mm)			Order code
Module type	Output current	Length	Width	Height	
G200	200mA	53	36	7.5	37-0432
G400	400mA	75	45	7.5	37-0434
G800	800mA	95	65	7.5	37-0436

Voltage	Current	Order code	1+	25+	100+
0.45V	200mA	37-0432	2.06	1.65	1.54
0.45V	400mA	37-0434	3.09	2.85	2.46
0.45V	800mA	37-0436	6.28	5.70	

064795

CIC

SolaF-1 Kit

Learn how motors and automotive transmissions work by constructing this motorised F-1 racing car. Choose from solar or battery power, by simply flicking a switch.



- All necessary parts included
- Easy to follow instructions
- Suitable for **Key Stages 2, 3 & 4** (ages 7 to 16)

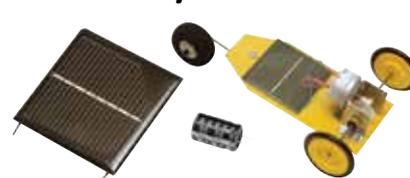
Requires 1x AAA battery (not included).

Type	Order code	1+
SolaF-1 kit	13-1070	11.90

070818

RVFM

Solar Power Project Pack



Contains project ideas and investigations based around a high-quality, low-cost solar module. Also in the pack are all the components required to build a solar powered buggy similar to the one shown here, plus an astonishing 10F super capacitor, which can be charged up from the solar panel and used to power lamps, motors, etc.

- Includes a photocopyable information booklet full of ideas and suggestions for using the solar module
- Buggy will run outdoors in sunlight or indoors with a bright lamp

Type	Order code	1+
Solar power project pack	70-1526	13.37

061692

THAMES KOSMOS

Experiment Kit - Solar Mechanics



Power Your Machines with the Sun's Energy!

Build more than 20 solar-powered models to learn about how solar cells convert energy from sunlight into mechanical energy. Conduct experiments with the solar cell to see how different placement angles, different light levels, different sources of light, and different loads affect its operation. Learn about solar power in a fun, hands-on way.

The kit includes a unique single-piece solar motor that is composed of a photovoltaic cell and an electric motor joined together in one compact unit. With this solar motor, you can power dozens of electric vehicles and devices. Build models including cars, trucks, planes, windmills, waterwheels, robots, and other vehicles.

- 60-page, full-colour experiment manual
- Step-by-step illustrated instructions for building projects and experiments

Type	Order code	1+
Solar mechanics	70-0345	18.99

524102

INVICTA EDUCATION

Renewable Energy Kit



Enable Teachers to demonstrate the generation of electricity using Wind, Solar and Water power.

- This portable unit comes in an easy to assemble kit format and includes four interchangeable dials to demonstrate the power being generated – meter, moving cogs, flashing lights and a siren
- The unit can be used indoors and outdoors
- Applicable to both Science and Geography studies
- This teaching resource is relevant to the National Curriculum and helps pupils understand the process of renewable and sustainable energy, and the environmental issues surrounding these forms of energy generation
- Suitable for **Key Stages 2, 3 & 4** (ages 7 to 16)
- Supplied as a kit

Type	Order code	1+
Renewable energy kit	52-0376	67.49

070843

10F -20+80% 2.5V Radial Green-Cap Double Layer Capacitor



Only
£1.62
Order code 50-7482
www.rapidonline.com

RVFM
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	20.30



Power House Sustainable Living Experiments



Sustainable Living in the 21st Century

The energy consumption of human civilization is growing. At the same time, the harmful environmental impact of our energy usage is becoming apparent. A massive global effort to adopt renewable energy and use our resources more sustainably has begun. To live sustainably, we must use Earth's resources at a rate at which they can be replenished, and thus provide for future generations to live as we have.

With this kit, you can learn about alternative energy and sustainable living by conducting 100 experiments and building energy related models. Build the Power House and then conduct experiments in and around the house. Learn about energy-efficient construction materials and passive house design. Experiment with heating, cooling, conduction, convection and insulation. Investigate the Earth's climate, the water cycle, and that inexhaustible power plant in the sky: the sun. Test passive solar collection methods with a solar collector. Hook up a photovoltaic solar panel to generate electricity from sunlight. Build wind turbines to extract energy from wind. Construct a greenhouse and learn about the energy conservation tricks used by plants.

Power House provides a comprehensive overview of the many forms of alternative energy, and makes environmental protection and energy conservation issues tangible with hands-on models.

- 64-page, full-colour experiment manual provides instructions, scientific explanations, and energy-saving tips
- Ages 10 and up

Type	Order code	1+
Sustainable living	70-0363	51.41

Sound



Tuning Forks Set 8

An eight-piece set of nickel-plated tuning forks with plain shanks. The forks are marked with their individual frequencies: C (256Hz), D (288Hz), E (320Hz), F (341Hz), G (384Hz), A (426Hz), B (480Hz) and C (512Hz).



- 8-piece set
- Supplied in wooden storage case
- Eisco type PH07388

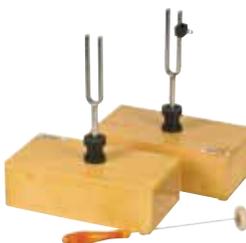
Type	Order code	1+
Tuning fork set	52-3342	21.95



Resonance Tuning Forks with Hammer

This apparatus can be used for demonstrating the production of beat frequencies.

It is comprised of two nickel-plated tuning forks mounted on individual sound boxes. The two forks both produce an 'A' note (440Hz) when struck with the mallet.



One fork is provided with an adjustable mass, by means of which the frequency of that fork may be shifted from the nominal 440Hz. When both forks are sounded at the same time, a clearly audible 'beat' is produced, its rate depending upon the difference in frequency between the two forks.

- Used to hear dissonance
- One fork adjustable
- Supplied complete with 2x tuning forks, 1x adjustable mass, 2x bases and mallet
- Eisco type PH0742A

Type	Order code	1+
Resonance apparatus	52-3446	13.27



Tuning Forks

A range of superior quality aluminium tuning forks with plain shanks and round stems.

- Ideal for school, college and laboratory use
- Eisco PH0737 series



Note	Frequency	Order code	1+
C	256Hz	52-3453	4.14
D	288Hz	52-3454	3.97
F	341Hz	52-3455	3.89
G	384Hz	52-3456	4.14
A	426Hz	52-3457	4.14
B	480Hz	52-3458	4.14
C	512Hz	52-3459	4.14

RVFM

8-Piece Tuning Fork Set

An 8-Piece Tuning Fork Set covering the octave from middle to high C.

- 1 each of 261.6 C, 293.7 D, 329.6 E, 349.2 F, 392 G, 440 A, 493.9 B and 523.2 C
- Supplied as a set of eight



Type	Order code	1+
Tuning fork set	06-2247	32.76



Resonance Apparatus with Telescopic Brass Tube

This resonance apparatus is comprised of two brass tubes that can telescope into each other, allowing the column of air within the tube to be varied between 300 and 530mm.

- Outer tube fits into base
- Eisco type PH0718B



Type	Order code	1+
Resonance tube	52-3436	26.51

RVFM

Transistor Oscillator Buzzers

A 1.5V miniature transistor oscillator buzzer with flying leads.

- Frequency 400Hz
- Sound output 75dB at 30cm
- Height 15.5mm
- Length 33.5mm
- Width 16.5mm
- Lead length 150mm
- Voltage 1.5V



Technical specification	
Operating voltage	1.3 to 2V
Current consumption	25mA
Sound output	75dB at 30cm

Type	Order code	1+	25+	100+
1.5V buzzer (leads)	35-0086	1.06	0.85	0.806

RVFM

Piezo Buzzer Miniature

A miniature piezo buzzer available with flying leads.

- Offers a high output with low power consumption



Technical specification	
Operating voltage	3-30V DC
Sound output	90dB at 50cm
Current consumption at 12V	10mA
Frequency	2.7kHz

Type	Order code	1+	25+	100+
Piezo buzzer	35-0115	1.37	1.05	0.942

RVFM

Electronic Buzzers



A range of compact, low-cost electronic buzzers.

- Available with either flying leads (10cm long) or PCB mounting pins
- 3V, 6V or 12V operating versions
- Resonant frequency is 400Hz
- Black ABS case material

Suitable for education and hobbyist use only.

Technical specification

Operating voltage	2V to 5V DC or 4V to 8V DC or 9V to 15V
Rated voltage	2V to 5V type 3V DC 4V to 8V type 6V DC 9V to 15V 12V DC
Max rated current	2V to 5V type 25mA @ 3V DC 4V to 8V type 30mA @ 6V DC 9V to 15V 30mA @ 12V DC
Min sound pressure level	2V to 5V type 70dB @ 3V DC/20cm 4V to 8V type 75dB @ 6V DC/20cm 9V to 15V 80dB @ 12 DC/20cm
Resonant frequency	400Hz ± 100Hz
Operating temperature	-20°C to +60°C
Weight	PCB type 10g with lead 8g PCB type 23 x 17 x 15mm with PCB pins on 7.6mm centres with lead 33.5 x 17 x 15mm with 100mm leads fixing centres 27.5mm, 2mm dia fixing hole
Dimensions	

Type	Order code	1+	25+	100+
3V Buzzer + lead	35-3592	0.978	0.825	0.735
3V PCB Mount buzzer	35-3594	0.978	0.825	0.735
6V Buzzer + lead	35-3596	0.978	0.825	0.735
6V PCB Mount buzzer	35-3598	0.978	0.825	0.735
12V Buzzer + lead	35-3610	1.05	0.882	0.827
12V PCB Mount buzzer	35-3612	0.957	0.807	

036772

RVFM

Absorber Plates Set



This set of **absorber plates** is supplied in a storage box. The set includes five 2mm thick lead plates and ten 1mm thick lead plates. The plates have been enamelled to protect fingers from lead contamination.

Aluminium plates also supplied: 2 x 3mm, 6 x 2mm and 4 x 0.5mm.

Type	Order code	1+
Absorber Plates Set	52-2697	45.90

550621

Order online

Save time, and place your order at:
www.rapidonline.com
 24 hours a day

Rockets

RVFM

Bottle Rocket Launcher

This unique plastic moulding turns a fizzy drink bottle into a squeezey or 'stomp rocket' launcher.

- Enables students to design and make educational kits
- Ideal for use in graphics and packaging projects
- The tubes also serve for rolling the paper rocket
- Rocket joiners are supplied complete with launch-tubes and nose cones in **sets of 10**



Bottles not included.

Type	Order code	1+
Bottle rocket launcher	70-1514	13.80

081689

RVFM

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+
Rocket launcher	70-1518	53.50
Nose cones (30)	70-1522	6.87
Rolling mandrel	70-1524	1.23

081691



Rocket Star Air-Powered Rocket

These Estes Rocket Star Air-Powered Rockets will give hours of enjoyment to kids of all ages!

Simply attach the foam launch legs to the foam launch base, apply the colourful decals to the two pre-assembled Rocket-Star air rockets, and you're ready to blast off!

- Includes 2 foam rockets 229mm (9in.) and 160mm (6.3 in.) tall
- Air-powered, no batteries needed
- Ready to Fly, just apply the colourful decals



- Sturdy rubber ball and air hose for launching
- Can reach heights of up to 15.2m (50 ft.)
- Estes type **D-ES1908**

Type	Order code	1+
Rocket star	70-0337	7.49

534047



Firestreak SST E2X Rocket

Prepare for lift-off. The **Estes Firestreak SST** rocket can be assembled in just 15 minutes and can soar to heights of more than **350 feet** - time after time. SST stands for Simple Snap Together - and that's all you need to do to get this model ready for the launchpad, making this one of the quickest model rocket kits you will ever build. At just over 10 inches, this **rocket** features an aerodynamically clean design and is sure to be one of the most reliable rockets in your fleet. This rocket is moulded in a bright purple colour and features easy to apply self-stick decals. A bright orange recovery streamer makes it easy to track and retrieve after launching.

- Part of the Estes E2X - Easy to Assemble - rocket series
- No painting or glueing necessary
- Length 10.2in (25.9cm)
- Diameter 0.86in (22mm)
- Plastic fins
- Recommended for ages 10 and up, with adult supervision for those under 12
- Manufacturer's part **D-ES0806**

Launch system, model rocket engines, igniters and recovery wadding are required - sold separately.

Type	Order code	1+
Firestreak	70-0311	5.79

539682



Riptide Rocket Launch Set

The Estes Riptide Launch Set contains almost everything you need for hours of high flying fun! This shiny rocket is completely assembled by specially trained craftsman, is ultra aerodynamic and has totally awesome highly reflective blue chrome coloured fins and nose cone.

The Riptide stands 45.7cm (18in.) tall. When launched on our standard engines, it can reach heights of over 180m (650ft.) and returns smoothly on a colourful 30cm (12in.) preassembled parachute.

Rip through the sky with your own Riptide!

The Launch System includes Astron II Launch Controller and Astron II Launch Pad.

- Includes Astron II launch controller and Astron II launch pad
- Length 18in (45.7cm); Diameter 1.35in (34mm)
- Plastic fins
- Self-stick decals
- Chrome components
- Recommended engines: B6-4 and C6-5
- Maximum altitude 675ft (183m)
- Recommended for ages 10 and up with adult supervision for those under 12
- Manufacturer's part **001403**

To launch, model rocket engines, starters and wadding are required.

Type	Order code	1+
Riptide	70-0313	17.24

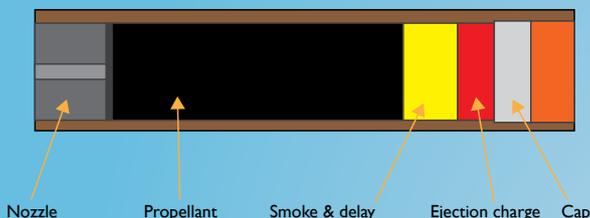
539685



HOW DOES A MODEL ROCKET MOTOR WORK?

A rocket motor provides thrust which is the force required to move a rocket off the launchpad and into the sky. It's a practical demonstration of Newton's Third Law of Motion which states that "for every action, there is an equal and opposite reaction". In the case of a rocket motor, the gas being forced from the back pushes the rocket in the opposite direction, up into the air.

Cut away drawing of a rocket motor



- 1) To launch a rocket motor, an igniter is inserted into the **nozzle**. When an electric current is passed through the igniter, it heats up and ignites the solid-fuel **propellant** inside.
- 2) As the **propellant** burns up, it produces rapidly expanding gas which creates pressure inside the motor body. This pressure escapes through the **nozzle** creating thrust.
- 3) Once the **propellant** is used up, the **smoke & delay** section is ignited. This produces smoke but no thrust and allows you to see the path of the rocket in the sky. The delay is usually denoted in seconds on the rocket motor – for example, a B6-4 motor has a 4 second delay.
- 4) Finally, once the **smoke & delay** is used up the **ejection charge** fires which produces hot gases that expand and push the **cap** out of the top of the motor. This force can be used to eject a recovery system such as a parachute.

The rocket motors provided by Rapid are permitted for use in the UK Youth Rocketry Challenge. This competition requires students to build and launch a rocket which must keep a predetermined payload in the air for a defined amount of time.

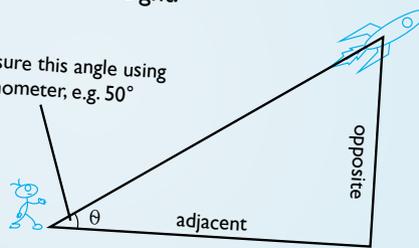
To find out more about the UK Youth Rocketry Challenge, visit

www.ukayroc.org.uk

How high did it go?

You can estimate the maximum altitude that your rocket reaches (known as the apogee) using trigonometry. All you need to know is the approximate distance from yourself to the launch pad and the approximate angle when looking up to the rocket as it reaches its maximum height:

Measure this angle using a clinometer, e.g. 50°



Known distance from the launch site – e.g. 150m

We know the adjacent and we want to find the opposite:

$$\tan \theta = \frac{\text{opposite}}{\text{adjacent}}$$

so ...

$$\text{opposite} = 150 \times \tan 50 = 178\text{m}$$

The Estes AltiTrak (70-0366) is a type of clinometer and is a really useful tool for helping you to quickly check the altitude.



Only
£11.78
Order code
70-0366

Order code	Estes type	pack size	Price	Impulse Newton-sec	Delay (sec)	Propellant weight (g)	Diameter (mm)	Notes
70-0382	A8-3	24	£49.95	2.5	3	3.12	18	All motor packs include igniters, igniter plugs and recovery wadding
70-0383	B6-4	24	£42.84	5	4	6.24	18	
70-0384	C6-5	24	£49.27	10	5	12.48	18	



Tandem-X - E2X/Skill 1 Rocket Launch Set

Please note: Rockets require suitable motors (available separately). With the **Estes Tandem X** model launch set you get two **rockets** for the price of one. This exceptional set features two extreme, high performance rockets with a launch system. So whether you are new to rockets or a seasoned veteran, a tandem launch can be an unforgettable experience.



The easy-to-assemble **Amazon** towers almost three feet high. With a tiger-striped body tube, pre-coloured plastic nose cone and fins and self-stick decals this rocket can be assembled easily in about an hour. When flown on standard engines, this huge rocket can reach heights over 650 feet. Recovery is via a colourful 18-inch pre-assembled parachute.

Meanwhile, the **Crossfire ISX** is a Skill Level 1 rocket that can be built in about a day. This 15.6in rocket features a totally streamlined shape with aerodynamic fins and nose cone. When launched with powerful Estes standard engines, it can soar to heights up to 1,200 feet. A pre-assembled 12-inch parachute returns the Crossfire back to earth to launch again and again.

Amazon

- Length 29.4in (74.7cm), diameter 1.33in (34mm)
- Plastic fins
- Self-stick decals
- Recommended engines: B4-2 (first flight), B4-4, B6-2, B6-4, C6-3, C6-5
- Maximum altitude 600 feet (183m)

Crossfire ISX

- Length 15.6in (39.6cm), diameter 0.98in (25mm)
- Laser cut wood fins
- Self-stick decals
- Recommended engines: A8-3 (first flight), B4-4, B6-4, C6-5, C6-7
- Maximum altitude 1150ft (350m)
- Includes Astron II launch controller and Astron II launch pad
- Recommended for ages 10 and up with adult supervision for those under 12
- Manufacturer's part **D-ES1469**

Please note: Rockets require suitable motors (available separately).

Type	Order code	1+
Tandem-X	70-0318	19.95

539689



Rocket Motors Blast-Off Flight Pack

The Blast-Off Flight Pack contains a bumper selection of 24 **engines** which can be used to power a range of model rockets from **Estes**. Offering high quality and proven reliability, these engines are considered to set the standard in the **model rocket** industry.



- 6 A8-3, 6 B6-4, 6 C6-5, 6 C6-3 engines
- 30 Igniters
- 75 Sheets of recovery wadding
- Manufacturer's part **D-ES1672**

Type	Order code	1+
Pack of 24	70-0381	49.27

539691



Rocket Motor Packs



These **Estes** model **rocket motor** bulk packs are available from Rapid in three ranges. Whether launching rockets as part of a school project or at a club meeting, these **Estes bulk packs** are a must. Suitable for use with Estes and other model rockets.

- Supplied in packs of 24 motors

Includes 24 rocket motors, 30 model rocket igniters, 24 reusable igniter plugs and 75 squares of recovery wadding.

Technical specification

Order code	Mfrs Part No.	Type
70-0382	D-ES1781P	A8-3
70-0383	D-ES1783P	B6-4
70-0384	D-ES1789P	C6-5

Type	Order code	1+
A8-3	70-0382	49.95
B6-4	70-0383	42.84
C6-5	70-0384	49.27

539686



Astron II Rocket Launch Pad with Controller

This launch controller is ideal for use with small and medium-sized model **rockets** from **Estes**. It is supplied with blast deflector, standoff stem, 2-piece 1/8 inch launch rod and launch rod cap. The launch direction may be adjusted up to 30 degrees from vertical and can accommodate a 3/16 inch (5mm) maxi launch rod (sold separately).



- Minor assembly required
- No tools or glue needed
- Supplied with 17ft (5.2m) of cable
- Manufacturer's part **D-ES2225**

Controller requires 4 x AA alkaline batteries (not included).

Type	Order code	1+
Astron II	70-0339	17.84

539688



Rocket Altitrak Altitude Tracker

You've successfully launched your **model rocket** - but how high did it travel? The **Altitrak** altitude tracker from **Estes** can provide you with the answer. Launch your rocket and then follow it in the sights of Altitrak until it begins to turn back towards the Earth, release the trigger and lock the reading - it's that easy!



- Use two Altitraks for greater accuracy
- Great for use in school science projects
- Manufacturer's part **D-ES2232**

Type	Order code	1+
Altitude tracker	70-0366	11.78

539701



Rocket Altimeter

This **altimeter** from **Estes** has a 4-digit LCD read-out and displays in a choice of imperial or metric units. A must for any serious modeller, this altimeter accurately measures model rocket launch altitudes from 0 to **9999ft** (0 to 3000m).



- Supplied in one fully assembled unit
- Can store up to 10 consecutive flights
- Includes replaceable alkaline battery
- Weight 0.42oz (12g)
- Manufacturer's part **D-ES2246**

Type	Order code	1+
Altimeter	70-0369	23.52

539703



Parachutes

These pre-assembled **parachutes** from **Estes** are designed to ensure that your model **rockets** are brought safely back down to earth.



- Available in a choice of 2 sizes

Diameter	Order code	1+
12in	70-0370	2.49
18in	70-0371	3.10

539704



Recovery Wadding

Flame resistant **wadding** is essential for use in most model **rockets** from **Estes** at launch time to protect the recovery mechanism.



- Contains 75 sheets of wadding - enough for 18 to 25 flights
- Manufacturer's part **D-ES2274**

Type	Order code	1+
Wadding	70-0373	2.99

539705



Solar Starters

These dependable **starters** for **model rockets** from **Estes** are easy to use and an essential ingredient for a successful flight. One starter is required for each rocket launch in order to ignite the engine.

- Supplied in packs of 6
- Manufacturer's part **D-ES2302**



Type	Order code	1+
Pack of 6	70-0374	2.99

539706

Flight

REELY

RTF Electric Dual-Rotor Helicopter



Get up, up and away with this amazing remote controlled dual rotor model helicopter from Reely.

- Ready to fly
- Radio remote control transmitter
- Flight battery
- USB charging cable
- Replacement rotor blades
- Operating instructions

Intended for indoor use only

Technical specification

Length	205mm
Main rotor diameter	195mm
Model type	RtF

Type	Order code	1+
Helicopter	51-2317	55.52



Wind Seeker Rubber Band Glider

It takes just a few minutes to put together the **Estes Wind Seeker** rubber band-powered glider - and then the sky is the limit. Suitable for use indoors or outdoors in calm weather.



- Length 19.7in (50cm)
- Wingspan 20in (50.8cm)
- Suitable for age 8 and up
- Manufacturer's part **A-ES4018**

Type	Order code	1+
Rubber band glider	70-0309	3.17



Felix 60 V2 Free Flight Glider

This lightweight free flight Felix 60 V2 Glider from Powerglow is virtually indestructible, so you can launch it into the air time after time for flight after swooping flight. Made from a very lightweight and flexible foam the Felix 60 V2 can be assembled and made ready to fly within seconds. You can colour your glider with almost any commercially available, water-resistant fibre pen.



- Launched by hand
- 600mm wingspan
- Suitable for age 3 and over

Technical specification

Age class	For ages 3 years and over
Clamping range	600mm
Manufacturer part no.	F2060
Weight	45g

Type	Order code	1+
Felix 60 V2	51-2271	12.14



Hand Glider

Model glider from Powerglow made of lightweight Flexipor, easily launched by hand.



- Suitable for age 6 and over
- Extremely robust and flexible
- Gliding flight and looping can be set by reconnecting the elevator
- Ready to fly in a few seconds
- No adhesive necessary
- Many different colour combinations
- Made in Germany

Technical specification

Age class	For ages 6 years and over
Wingspan	600mm
Manufacturer part no.	F8060

Type	Order code	1+
Hand Glider	51-2310	14.20

Astronomy



Optik Visomar 60/700 Junior Lens Telescope

If you've always wanted to know more about the night sky but can't tell the difference between the Plough and the Pleiades, then the Bresser Optik Visomar 60/700 Junior Lens Telescope could be just what you need. This telescopic lens means you can study the stars wherever you go. Conveniently packaged in a box, it is ideally suited for use on the go. Also included is a handy tripod, perfect for mounting your telescope.



- Impressive 262 x magnification
- Refracting telescope with 60mm lens diameter and 700mm focal length
- Includes three eyepieces

Product includes: 3 eyepieces (H-20/H-12, 5 and SR-4mm); height adjustable aluminum tripod; diagonal mirror for terrestrial operation; compass; erecting lens 1.5 x viewfinder; 5 x 24 Astronomy software; hard case.

Technical specification

Focal length	700mm
Magnification	35 - 262 x
Model (outdoor)	Telescope

Type	Order code	1+
Optik Visomar	51-2647	61.68



Optik Pollux 150/1400mm Telescope



The Bresser Optik Pollux 150/1400mm Telescope enables you to keep a close eye on a variety of objects occupying our night sky, aided by a large mirror coupled with high focal length. But while the specifications make this a real astronomy powerhouse, this telescope remains very portable so can be used almost anywhere you need to be to explore those new worlds, far far away.

- Catadioptric mirror system
- Fully coated
- Two eyepieces
- Adjustable aluminium tripod with accessory tray

Product includes: telescope; 2 x Plossl Eyepieces (PL-10mm and PL-25mm/e: 31.7mm); Astronomy software; 5 x 24 viewfinder; 2x Barlow lens; tripod; instructions.

Technical specification

Focal length	1400mm
Magnification	56 - 280 x
Mirror diameter	150mm
Model (outdoor)	Telescope
Aperture ratio	F9.3

Type	Order code	1+
Optik Pollux	51-2645	185.58



Reflector Telescopes

Whether you are considering embarking on a career as an astronomer or just fancy taking a closer look at the stars in the night sky, then take a close look at this range of reflector telescopes from National Geographic. These high-quality telescopes are available in a range of sizes and styles.



Technical specification

Order code	Mftrs part no.	Magnification	Lens/mirror diameter	Focal length
51-3007	90-10000	40-600x	60mm	800mm
51-3010	90-15000	18-117x	76mm	350mm

Mftrs part	Magnification	Order code	1+
90-10000	40-600x	51-3007	103.95
90-15000	18-117x	51-3010	75.57

BRESSER®

Optik 20x-60x60 Spotty Telescope

If you're looking for discovery in the woodlands, the Bresser Optik 20-60x60 Spotty Scope is ideal, as it provides the perfect device for bird watching and natural observation.



This impressive scope also allows the user to carry out automatic astronomical observations, while the fully tempered visual appearance provides a sharp picture rich in contrast. But that's not all, as there are a number of excellent features, including the simple zoom adjustment, porro prism system, extendable sun visor, water-resistant rubber-coated cable wire, 360° rotating view and a metallic table stand with swivelling handle. Supplied with a sturdy bag to protect the spotting scope from dirt and dust, along with a stand, dust excluder, pouch with carrying strap and user manual.

- Black colour
- 20x-60x zoom adjustment
- Fully hardened lens
- Extendable sun visor
- 355 x 110 x 100mm (L x W x H)
- 29m/1000m field of vision
- 60mm lens diameter
- 880g weight
- Manufacturer's part **8820100**

Type	Order code	1+
Spotty telescope	49-0167	39.99

Cochranes of Oxford

Solar System Orrery



The Cochranes Orbit Orrery is a model of our solar system and includes a model of the Sun, which lights up, and the planets as far out as Pluto. The Earth is complete with its moon. The planets can be moved around the Sun by hand, and the Moon moved around the Earth.

- Ideal for demonstrating the shape and motions of our solar system
- Includes a model of the Sun, which lights up, and the planets as far out as Pluto
- The Earth is complete with its moon
- Planets can be moved around the Sun by hand, and the Moon moved around the Earth
- Height: 10cm
- Diameter of largest orbit (Pluto): 40cm
- Great for discussions of planet names, structure of the solar system, orbits around the Sun, Earth and its Moon, etc.

Takes 2x AA batteries, not included.

Type	Order code	1+
Orbit Orrery	52-7143	22.58

BRESSER®

Optik Junior Astro Planetarium with Motor

This Bresser Optik Junior Astro Planetarium with Motor does an ideal job in displaying the beauty of the night sky on your wall or ceiling.

The two projection discs show more than 8000 constellations and celestial bodies, while the super-bright LED can project from a distance of up to 3m. By setting the date and the time, you can simulate the sky at night exactly as it was from a past date or special occasion. Equipped with two motors to rotate the projected image onto the ceiling, sending shooting stars flying through the room.



- More than 8000 celestial objects
- With 2 motors for a moving image
- Shooting star function
- 3x 1.5V DC (AA battery)
- Clock adjustable to day and time
- More than 8000 celestial objects stored on two projection screens
- Moving projection image with two built-in motors
- Shooting star function in 40 second cycles
- Very bright LED projector
- Projection angle and distance adjustable (up to 3m)
- Automatic power off after 30, 60 or 120 minutes
- Includes batteries and user manual
- Manufacturer's part **8847100**

Type	Order code	1+
Planetarium	49-0173	54.59

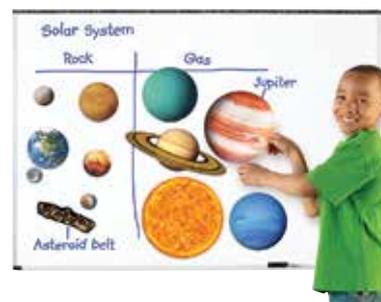
Help

Visit our online help centre

www.rapidonline.com/help

Learning Resources®

Giant Magnetic Solar System



Most children love learning about the planets and this Giant Magnetic Solar System from Learning Resources will really capture their attention. These full-colour magnets can help you model all the concepts of the solar system, simply by using a whiteboard. The magnets include the 8 main planets, plus Pluto, the sun, the moon and the asteroid belt.

- Set of 12 magnets
- Largest magnet 25cm diameter
- Suitable for ages 5+
- Manufacturer's part **LER 6040**

Type	Order code	1+
Solar system	06-8960	13.70

CIC

Solar Powered Solar System

This Solar-Powered Solar System Kit is ideal for young astronomers and model-makers as they build, paint, then watch their own Solar System come to life, powered by solar energy. Planets orbit around the solar-powered 'Sun' that drives a motor moving the planets in realistic orbits. This excellent educational solar kit provides hands-on learning about how solar power drives a motor. The kit comes complete with 6 colours of opaque acrylic paint, plus a paintbrush.



- Solar-Powered Solar System Kit
- Build and paint your own working Solar System model
- Powered by solar energy
- Planets orbit around the solar-powered 'Sun'
- 6 colours of acrylic paint, plus a paintbrush
- Great exercise in science and creativity
- Solar battery and colour table included

Type	Order code	1+
Solar System Kit	06-9346	12.49

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

Cochranes of Oxford

Helios Orrery and Star Dome



This Helios Orrery and Star Dome model from Cochranes can be set up as either a basic orrery or an orrery with a star dome. Look through the dome to see the stars visible from earth for your latitude and the time of year. See how the stars and constellations have fixed locations in space and how the planets orbit the Sun. The dome shows all the major stars and constellations around the ecliptic and over the Northern hemisphere.

- The following subjects can be studied with the Orrery and Star Dome model:
- The Planets in their orbits (length of a year, inferior and superior planets and more)
- The Moon and its phases
- 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?

Takes 4x D size batteries, not included.

Type	Order code	1+
Orrery and Star Dome	52-7145	452.02

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

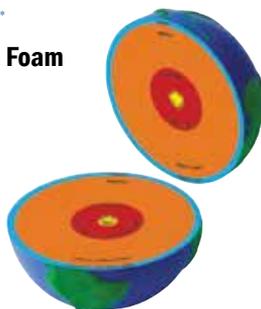
Type	Order code	1+
Orbit Tellurium 2	52-7141	206.38



Cross-Section Foam Earth Model

This hands-on model makes illustrating the mysteries of the earth easy.

- Outside of model shows oceans and continents
- The two hemispheres separate to show the four main layers of the earth: crust, mantle, outer core and inner core, their temperatures and depths
- Easy for students to handle and examine
- Manufactured from soft foam
- Includes fact-filled activity guide
- Size 12.7cm diameter
- Suitable for **Foundation Stage** (ages 4 to 5)



Type	Order code	1+
Cross-section Earth model	52-9932	9.49



Magnetic Globe Set

This two piece set comprises of a rubberised ball representing the earth. This has a strong magnet moulded within to create an invisible exterior magnetic field similar to that of the Earth. Also supplied is a hand held magnet called a magnetic field finder which is a



type of three dimensional compass. When the magnetic field finder is placed near to the globe, it tilts and orientates itself to clearly show the strength direction of the magnetic flux anywhere around the Earth ball. A really magical way to see and understand the Earth's three dimensional magnetic field pattern.

- Supplied complete with globe, magnetic field finder and full teacher and pupil instructions
- Makes learning both fun and interesting

Type	Order code	1+
Magnetic globe set	06-8406	17.83



Inflatable Solar System Set



A set of models of the Sun, planets and the earth's Moon that will encourage students to learn about the position, order, size and shape of the contents of the solar system. When the lesson is finished simply hang everything from the ceiling.

- Made from durable washable plastic
- Hanging hooks provided
- Can be deflated for easy storage
- Supplied complete with foot-pump repair kit and activity guide
- Suitable for **Key Stages 1 & 2** (ages 5 to 11)

Technical specification					
Planet	Diameter	Planet	Diameter	Planet	Diameter
Sun	580mm	Moon	130mm	Uranus	230mm
Mercury	150mm	Mars	150mm	Neptune	230mm
Venus	190mm	Jupiter	360mm	Pluto	130mm
Earth	190mm	Saturn	280mm		

Type	Order code	1+
Solar system set	06-5936	28.49

Light & Optics



Lens Cleaning Tissue Paper Pack of 100 Sheets

Cleaning tissues suitable for cleaning laboratory lenses, prisms and mirrors as well as optical parts in cameras, spectrometers, microscopes, etc.



- Sheet size 90 x 145mm
- Supplied in **books of 100 sheets**
- Eisco type **CH0629**

Type	Order code	1+
Lens cleaning tissue	52-3447	2.59



Digital Stopclock

Only
£9.71

Order code 85-1451

www.rapidonline.com



Pin Hole Camera



The concept of the pin-hole camera is centuries-old. This model consists of a telescopic wooden box with a pinhole in one end. Light rays passing through the pinhole are projected as an image on a translucent plate. Students view this image through a hole in the other end and can change the image size by changing the length of the box.

- Demonstrates the behaviour of light
- Eisco type **PH0592**

Type	Order code	1+
Pin hole camera	52-3687	17.14



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	22.42
PSU 240V AC	52-3613	153.23
Spectrum tubes		
Argon	52-3615	13.27
Carbon dioxide	52-3616	13.27
Helium	52-3617	13.27
Hydrogen	52-3618	13.27
Iodine vapour	52-3619	13.27
Krypton	52-3620	13.27
Neon	52-3621	13.27
Nitrogen	52-3622	13.27
Oxygen	52-3623	13.27
Sulphur	52-3624	13.27
Xenon	52-3625	13.27

RVFM

Digital Xenon Stroboscope
Standard Version

This **digital xenon stroboscope** is a lightweight, sturdy and compact instrument which features a digital, variable flashing rate adjustment and external triggering facility. The bright xenon tube makes it ideal for educational uses for such as wave, motion and vibration experiments.



- Specifications 60 to 18,000rpm, 1 to 300Hz
- External triggering signal
- Power supply 240V AC, 50 Hz
- Dimensions (L x H x W): 215 x 140 x 150mm
- Supplied with mains lead

Size	Order code	1+
215 x 140 x 150mm	52-2677	225.00

- 1x Pair of metal supports
- 2x Lens supports: 4cm and 7.5cm
- 5x White board screens, each 10 x 12.5cm with a millimeter scale along one side
- 12x paraffin candles

Type	Order code	1+
Optical bench set	06-2242	14.26

RVFM

Laser - Standard Version

This effective **laser** emits an intense monochromatic **red beam** of wavelength 630 to 640nm at 0.9mW (Class II operation). Typical beam divergence is approximately 1 millirad. The laser beam can be modulated by applying an external digital or analogue waveform to the 3.5mm jack socket on the rear panel.



Type	Order code	1+
Laser, Standard Version	52-2655	229.00

eISCO

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	61.24

RVFM

Complete Optical Bench Set



An economical, yet effective Optical Bench Set that provides accurate demonstrations of basic optical principles.

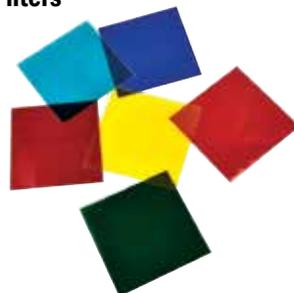
The complete system includes:

- 1x Optical bench-double-sided metre stick
- 1x Object and marker
- 1x Screen support
- 1x Candle holder

eISCO

Primary and Secondary
Coloured Filters

Sets of six coloured plastic sheets. Three sheets feature primary colours, three feature secondary colours.



- Coloured plastic sheets with or without mounts
- Supplied as sets of 6

Type	Order code	1+
50x50mm, mounted	52-3686	4.89
100x100mm, unmounted	52-3694	4.28

RVFM

Colour Paddles - Pack of 6



A pack of 6 transparent colour paddles in different colours. The paddles are ideal for colour identification and for demonstrating the effects of mixing colours.

- Hole in the handle allows paddles to be strung together in sets
- Length of each paddle 150mm
- Supplied as a **pack of 6**

Type	Order code	1+
Colour paddles (6)	52-0887	2.53

RVFM

Newton's Colour Disc

This apparatus demonstrates the discovery, made by Newton, that white light is made up of seven individual colours. The apparatus consists of a pulley mounted on a metal stand. The seven-coloured disc is driven by a belt connected to a hand-driven wheel. When the disc is rotated fast, the eye is unable to distinguish between individual colours and perceives it as white.



- Demonstrates that white light is made up of 7 individual colours
- When rotated fast, the eye is unable to distinguish colours and sees white

Type	Order code	1+
Newton's colour disc	06-2243	12.02

eISCO

Newton's Colour Disc

Newton's colour disc demonstrates the discovery, made by Newton, that white light is composed of all the spectral colours. By rotating a multi-coloured disc at high speed, the individual colours can be seen to merge into white.

The apparatus consists of a 175mm diameter multi-coloured disc mounted on a metal stand. The disc is driven by a belt connected to a driving wheel, fitted with a crank handle.

- Disc diameter 715mm
- **Eisco type PH0582A**

Type	Order code	1+
Newtons colour disc	52-3677	18.34

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	40.81



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, 24W, B15 bulb
- 1x slit plate
- 2x aluminium blanking plates
- Supplied with instructions
- **Eisco type PH0602A**

Power supply not included.

Type	Order code	1+
Ray box	52-3678	13.23



LED Light Box & Optical Set



A comprehensive light and optics set including a 3-beam ray box and a selection of lenses and prisms, teacher's notes and 9 pupil work cards.

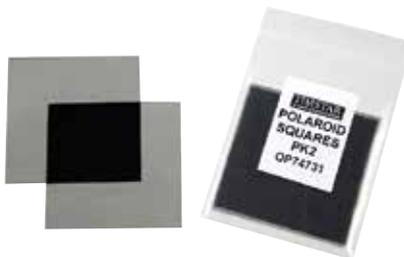
The set is ideal for advanced study of light and optics and includes experiments to show: refraction and reflection through various shaped prisms and lenses, the splitting of light into rainbow colours, how internal reflection is used in fibre-optic cables and the appropriate lenses to use to correct long and short-sightedness.

- Ray box beams can be individually switched to white or red light
- Set includes clear, concise teacher's notes and separate work cards, providing a course to follow
- Powered by 3x AAA batteries
- Suitable for children from 8 years

Type	Order code	1+
Light box & optics	06-7091	69.75



Polarising Filter Squares



These unmounted **polarising filter squares** are suitable for class work on polarised light.

- Size 150 x 150mm
- Supplied in packs of 2

Size	Order code	1+
150 x 150mm	52-2665	53.01



MES (E10) G3½ 11mm Lamps

A range of miniature MES lamps in a wide range of voltages.

- 11mm diameter, 23mm overall length



Technical specification				
Voltage (DC)	Current	Power	Nominal Life (hrs)	Order code
1.5V	300mA	0.45W	50	41-0130
2.5V	200mA	0.5W	100	41-0120
3.5V	200mA	0.7W	100	41-0132
3.5V	300mA	1.05W	1000	41-0125
6.0V	60mA	0.36W	10000	41-0105
6.0V	100mA	0.6W	100	41-0136
6.5V	150mA	0.6W	70	41-0138
6.5V	300mA	0.97W	70	41-0140
12.0V	100mA	1.2W	50	41-0142
12.0V	200mA	2.4W	3000	41-0110
24.0V	125mA	3W	50	41-0146

MOQ 10 - In Multiples of 10

Type	Order code	10+	100+	500+	1000+
1.5V MES Lamp	41-0130	0.139	0.093	0.081	0.078
2.5V MES Lamp	41-0120	0.139	0.093	0.081	0.078
3.5V MES Lamp	41-0132	0.139	0.093	0.081	
3.5V MES Lamp	41-0125	0.139	0.093	0.081	0.077
6.0V MES Lamp	41-0105	0.116	0.104	0.093	0.077
6.0V MES Lamp	41-0136	0.127	0.104	0.093	0.082
6.5V MES Lamp	41-0138	0.127	0.104	0.093	
Spare bulb 6.5V	41-0140	0.127	0.104	0.093	0.082
12V 100mA MES Lamp	41-0142	0.185	0.127	0.104	0.092
12V 200mA MES Lamp	41-0110	0.116	0.104	0.093	0.077
24V MES Lamp	41-0146	0.232	0.161	0.127	



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	5.51



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.

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	194.09

Order online

Save time, and place your order at:
www.rapidonline.com
 24 hours a day

RVFM

Direct Vision Spectroscope



This **spectroscope** can be used for fast and efficient examination of spectral composition of white light. The spectroscope consists of a metal tube with drawn out focussing and an adjustable slit fitted with achromatic objective glass and a 3-element prism.

Type	Order code	1+
Spectroscope	52-2652	26.85

550582

RVFM
Spectroscope

The really intriguing aspect of this device is the use of a common place CD or DVD replacing either an expensive prism or specially made diffraction grating. The performance of this ultra-low cost spectroscope is comparable with instruments costing much more.



It clearly shows Fraunhofer lines in the spectrum arising from natural light and distinctive emission bands from artificial sources such as sodium lamps. Differences between fluorescent lighting tubes, e.g., white light or 'warm' light types, can be easily identified by their distinctive emission bands.

The spectroscope is made from virtually indestructible polypropylene and supplied in flat pack form, taking about 30 seconds to assemble. It comes with a CD but can be used with any CD (or a DVD for higher resolution).

- Uses a CD or DVD instead of an expensive prism or diffraction grating
- Clearly shows Fraunhofer lines in various spectrums
- Made from virtually indestructible polypropylene
- Supplied in flat pack form
- Supplied with a CD
- Can be used with a DVD for higher resolution

Type	Order code	1+
Spectroscope	06-1590	4.23

553713

RVFM

Double Convex Lenses

Double **convex dioptre lenses** made from optically worked soda glass with ground edges.

- Available with diameter of 38mm or 50mm and with focal length of 50mm or 100mm



MOQ 2		
Diameter	Order code	2+
38mm	52-2687	1.09

Price each		
Diameter	Order code	1+
50mm	52-2688	1.37

550612

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eisco

Wooden Lens Holder

A wooden holder with a V-shaped slot for supporting lenses or mirrors up to 76mm in diameter.

The holder consists of an upright 100mm high, mounted on a 100 x 50mm rectangular base. An index mark is engraved on each end of the base for easy distance measurements.

- Holds convex or concave lenses
- Dimensions: 100 x 100 x 50mm
- Eisco type PH055A



Type	Order code	1+
Wooden lens holder	52-3682	1.83

565676

RVFM

Lens Holders

This **wooden** frame has a V-shaped slot designed to hold **lenses** measuring up to 80mm in diameter.



Size	Order code	1+
Up to 80mm diameter	52-2689	1.70

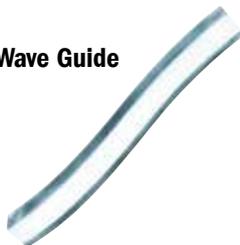
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eisco

Acrylic Light / Wave Guide Demonstrator

An 'S' shaped 220 x 20mm acrylic bar which can be used in conjunction with a ray box to demonstrate total internal reflection.

- Helps students understand principles of optical communications
- Bottom of bar is white to aid visibility
- Size 220 x 20 x 20mm
- Eisco type PH0587



Type	Order code	1+
Light guide demo	52-3668	5.51

565663

RVFM

S-Shape Acrylic Block



This **acrylic block**, in the form of a shallow **S-shape**, is ideal for demonstrating total internal reflection as part of an optical or other physics project.

- Dimensions (L x W x D): 220 x 20 x 20mm

Size	Order code	1+
220 x 20 x 20mm	52-2691	7.40

550615

eisco

Rectangular and Semi-Circular Glass Blocks

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

- Range of shapes



Type	Order code	1+
Rectangular	52-3315	3.46
Semi-circular	52-3316	2.24

565514

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	19.91

565544

eisco

Acrylic Prisms

Acrylic prisms in a variety of shapes and sizes.

- Ideal for experiments with light refraction and other optical studies



Type	Order code	1+
Trapezoid	52-3669	7.45
Equilateral set of 3	52-3680	4.08

565664

RVFM

Hollow Glass Prism

This hollow **glass prism** can be filled with specific liquids in order to carry out **refraction** experiments.

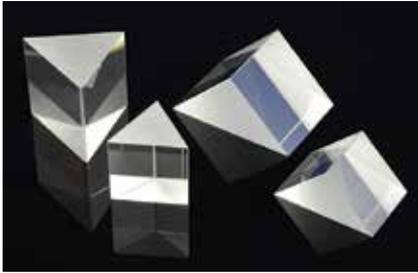
- Side length 50mm



Size	Order code	1+
50 x 50 x 50mm	52-2667	3.99

550594

RVFM
Equilateral Prisms



This equilateral clear glass **prism** is ideal for use in the laboratory and classroom during physics and other science lessons.

- Length and height 38mm
- 60° x 60° x 60°

Dimensions	Order code	1+
38 x 38mm	52-2707	4.98

eisco
Acrylic Lenses Set



Optical lens sets of six acrylic lenses. The lenses have ground and polished faces and ground edges. Each set includes one of each of: double convex, plano-convex, converging concave-convex, diverging concave-convex, double concave and plano-concave.

- Acrylic lens sets
- Available in sets of 38mm or 50mm diameter
- Wooden storage box with hinges and latch
- **Eisco PH0538 series**

Lens diameter	Order code	1+
38mm	52-3683	8.16
50mm	52-3684	10.16

eisco
Glass Lenses Set

An optical lens set of six 50mm diameter glass lenses. The lenses have ground and polished faces and ground edges. The set includes one of each of: double convex, plano-convex, converging concave-convex, diverging concave-convex, double concave and plano-concave.



- Glass lens set
- Lens diameter 50mm
- Wooden storage box with hinges and latch
- **Eisco type PH0538A**

Type	Order code	1+
Glass lens set	52-3681	11.19

eisco
Acrylic Lenses, Double Concave and Double Convex

Double concave and double convex lenses made from clear Acrylic.

- One plane surface is frosted
- Approximate length 85mm
- **Eisco PH0577 series**



Type	Order code	1+
Double concave	52-3666	6.43
Double convex	52-3667	5.40

RVFM
50mm Diameter Double Concave Spherical Lenses

Double-concave spherical lenses in a range of focal lengths.

- Clear glass
- Ground edges
- Diameter 50mm
- Supplied **singly**



Order code	Focal length (mm)	Power
52-0339	50	+20D
52-0341	100	+10D
52-0343	150	+6.6D
52-0345	200	+5D
52-0355	250	+4D
52-0357	300	+3.3D
52-0359	500	+2D
52-0361	1000	+1D

Focal length	Order code	1+
50mm	52-0399	2.18
100mm	52-0341	1.16
150mm	52-0343	1.01
200mm	52-0345	1.01
250mm	52-0355	1.01
300mm	52-0357	1.01
500mm	52-0359	1.01
1000mm	52-0361	1.01

RVFM
50mm Diameter Double Convex Spherical Lenses

Double-convex spherical lenses in a range of focal lengths.

- Clear glass
- Ground edges
- Diameter 50mm
- Supplied **singly**



Order code	Focal length (mm)	Power
52-0363	50	+20D
52-0365	100	+10D
52-0367	150	+6.6D
52-0369	200	+5D
52-0371	250	+4D
52-0377	300	+3.3D
52-0379	500	+2D
52-0381	1000	+1D

Focal length	Order code	1+
50mm	52-0363	1.60
100mm	52-0365	1.02
150mm	52-0367	1.02
200mm	52-0369	1.02
250mm	52-0371	1.02
300mm	52-0377	1.02
500mm	52-0379	1.02
1000mm	52-0381	1.02

eisco
Plastic Mirrors 150 x 100mm



These Eisco plastic mirrors are ideal for science experiments dealing with reflection, symmetry and other light-related topics.

- Size 150 x 100mm
- Safe and durable
- Ideal for use by younger children
- Supplied **singly**
- **Eisco type PH0517A**

Type	Order code	1+
Plastic mirrors	52-3363	0.807

eisco
Unmounted Plane Glass Mirrors Packs of 10

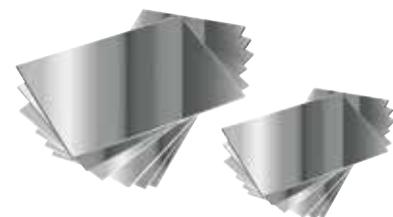


Silvered plane glass mirrors with a protective coating.

- Range of sizes
- Supplied in **packs of 10**

Size	Order code	1+
75 x 25mm	52-3688	2.34
75 x 50mm	52-3689	3.26
100 x 75mm	52-3690	5.06
150 x 25mm	52-3691	3.57
150 x 50mm	52-3692	5.00
150 x 100mm	52-3693	8.12

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	18.60
A6	07-0007	4.65

Rapid

Plastic Convex/Concave Mirrors

These double-sided plastic **convex/concave mirrors** have a protective peel-off film.

- Size 100mm²
- Teachers' notes included
- Supplied in packs of 10



Type	Order code	1+
Pack of 10	07-0008	5.81

563921

EISCO
Trust & Deliver & Learn

Diffraction Gratings

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

- Eisco PH0624 series



Lines/mm	Order code	1+
100	52-3670	17.32
300	52-3461	17.32
600	52-3671	17.32
1000	52-3672	17.32

565665

RVFM

Diffraction Gratings Slide



Set of **gratings** mounted on a single slide with three 16 x 19mm apertures, designed for use as a **diffraction slide**.

- Gratings measure 100, 300 and 600 lines/mm
- Overall dimensions (L x W): 90 x 30mm

Dimensions	Order code	1+
90 x 30mm	52-2694	24.56

550618

RVFM

Diffraction Gratings



These **diffraction gratings** are ideal for use in studying light beams etc in the laboratory or classroom.

- Mounted in 50 x 50mm slide holders
- Available with either 300 or 600 lines

Type	Order code	1+
300 lines	52-2653	14.90
600 lines	52-2654	17.69

550633

Electricity

RVFM

Charge Indicator

This charge indicator allows easy and rapid investigation of electrostatic charges. When it is moved towards a charged object, one or other of the LEDs will light up - red indicates that the object is positively charged and green indicates that it is negatively charged.



When, for example, a polythene rod is rubbed using a piece of cloth, the green LED comes on when it is brought near the polythene, and red near the cloth. This demonstrates how negative charge has been transferred from the cloth to the rod.

- Red LED indicates positive charge
- Green LED indicates negative charge

Requires a PP3 9V battery, not included.

Type	Order code	1+
Charge indicator	06-1586	19.23

553709

Rapid

Electricity Class Pack



A cost-saving classpack containing a selection of commonly used electrical accessories.

- Cost saving over buying parts separately
- Popular parts can be topped up
- Packed in a Grattells storage tray with lid
- Please see individual product descriptions for full details
- Supplied as a **pack**

Classpack contains:

Order code	Quantity	Description
41-0125	10	3.5V bulbs
18-0125	5	2x AA battery holders
41-0070	5	Bulb holders
37-0140	5	Motors
18-0105	5	Battery snaps
17-0350	1	Crocodile leads (Pack of 10)
01-0102	5	Wire
75-0180	5	Toggle switch
76-0100	5	Slide switch
78-0115	5	Push on/off switch
78-0112	5	Push to make switch
35-3610	5	Buzzer
14-0430	1	Grattells tray
14-0436	1	Lid for tray

Type	Order code	1+
Electricity classpack	70-1012	37.83

078013

Rapid

Electrical Essentials Kit



A cost-saving classpack containing a selection of essential electrical accessories.

- Cost saving over buying parts separately
- Popular parts can be topped up
- Packed in a Grattells storage tray with lid
- Please see individual product descriptions for full details
- Suitable for **Key Stages 2, 3 & 4** (ages 7 to 16)
- Supplied as a **pack**

Classpack contains:

Order code	Quantity	Description
17-0350	1	Crocodile leads (Pack of 10)
21-0100	1	12-Way connecting block
18-0546	3	Battery clips
18-1092	6	AA zinc chloride batteries
37-0342	1	Pulley black 10mm
86-0405	1	100 x 3mm flat blade screwdriver
86-0455	1	75 x No.1 Phillips screwdriver
37-0144	3	Miniature 3V motors
35-3596	3	Buzzers 6V
01-0108	1	Stranded wire pack
34-5926	1	Band pack
14-0430	1	Grattells tray (shallow)
14-0436	1	Lid for tray
76-0100	3	Slide switches
75-0057	3	Round rocker switches
75-0730	3	Rectangular rocker switches
41-0070	12	MES bulb holders (screw connection)
37-0344	1	Pulley black 20mm
37-0346	1	Pulley black 30mm
37-0348	1	Pulley black 40mm
18-0563	3	2x AA battery holders
18-0129	3	C size battery holders
18-1444	3	C size batteries
18-0150	3	1x AA battery holders
85-0230	1	Light duty wire cutter
60-0515	3	Reed switches

Type	Order code	1+
Electrical essentials kit	70-1014	27.10

078024

EISCO
Trust & Deliver & Learn

Demonstration Dynamo with Hand Pulley

This working model dynamo is mounted on a 200 x 125mm base plate, which also supports a 125mm diameter hand-driven pulley. The pulley is coupled, via a rubber belt, to a smaller pulley on the dynamo shaft, providing a step-up ratio of rotational speed.



Electrical output is via a pair of 4mm sockets and a light emitting diode is provided as a simple output indicator. The model can also be used as a motor when connected to a 6 to 8V DC supply (not included).

- Electrical output via 4mm terminals
- LED output indicator
- Can be used as a demonstration motor (requires 6 to 8V DC power supply)
- Includes instruction manual
- Eisco type PH1246

Type	Order code	1+
Demonstration dynamo	52-3443	37.18

565590



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	26.51
37	52-3336	26.51
55	52-3334	26.51
125	52-3335	26.51



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	153.23
Hand only	52-3636	112.36



Magnet Electricity Kit

Covering the needs of the National Curriculum Science for **Key Stages 1 & 2**, this unique set uses the force of magnets to make all connections between bulbs, switches, motors and buzzers.



- Connections are made using transparent wires, to show the copper core and bases are clear, allowing pupils to observe the path of electricity, right to the component
- Kit includes 6x bases, 2x MES bulbs and holders, 1x festoon bulb, 1x buzzer, 1x push-to-make switch, 1x motor, 10x Magleads, 2x crocodile clips, length of resistance wire, battery magnets and teachers notes
- Suitable for **Key Stages 1 & 2** (ages 5 to 11)
- Supplied as a **pack**

Requires 3x C cells, (not included).

Type	Order code	1+
Magnetic connections kit	17-1506	38.75



Demonstration Transformer

This low voltage demonstration transformer has various coils to show the AC voltage step-up and step-down abilities of transformers.

- Must be used with a low voltage AC source
- Eisco type PH0976A



Type	Order code	1+
Demo transformer	52-3609	43.88



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 600 turns, I max: 2.5A mainly used to create the transformer primary
 - One coil of 1200 turns, I max: 1.25A with intermediary 400 and 800 turns outputs
 - One coil of 6000 turns, I max: 0.2A with intermediary 2000 turns output
 - One coil of 72 turns, I max: 12A with intermediary 6, 30, 54 and 66 turns outputs
- Power supply cable
- Magnetic core section: 40 x 40mm
- Length 150mm
- Height 170mm

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	128.67	
Turns	Current	Order code	1+
Coils			
50	4A	52-3474	32.17
100	2A	52-3475	27.53
200	1A	52-3477	27.53
1000	0.3A	52-3476	27.53
1000	1A	52-3480	28.55
2000	0.05A	52-3478	28.55



National Grid Simulation Apparatus



Electricity in our homes is 240V, so why not transmit it at this voltage, rather than the 11,000V to 400,000V used on overhead power lines? The answer is energy loss - this is much greater at low voltages, hence electricity is transported around the country at very high voltages. This apparatus is a 'scaled-down' version which demonstrates the principle at safe voltages.

- Touchproof, locking high voltage connectors
- Clear lids allow pupils to see how it works and trace the circuit
- Indicators for low and high voltage
- Resistance wires can be connected to either the high or low voltage for comparison of lamp brightness and energy losses
- By gripping the insulated cables, students can feel when and where the energy is being lost, mainly as heat
- Complete with two boxes (transmit and receive), insulated resistance wires, two mounted SBC lamps and full instructions

Please see order code 52-0044 for a suitable power supply.

Type	Order code	1+
Grid simulation	06-7634	138.97
Replacement wires	06-7635	18.67

eisco
TECHNICAL EDUCATION EQUIPMENT

Transformer Accessory Set No. 1

This accessory set can be used to demonstrate that step down transformers can produce currents that are large enough to weld metals or boil water.



- Eisco type **PH0850ACC**

Type	Order code	1+
Accessory set	52-3488	35.75

565607

eisco
TECHNICAL EDUCATION EQUIPMENT

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	43.88
Scale - 1V	52-2999	7.99
Scale - 0 to 1A	52-3339	7.99

565608

LEDs

Rapid

Education LED Pack



A considerable range of LEDs and LED related products are neatly packaged in this classroom kit.

- All the pieces come in re-sealable polythene bags
- Offers a significant saving over separately bought items
- Storage box with compartment tray and lid
- Dimensions of the box: 43cm x 31cm x 7cm
- Suitable for all ages
- Total number of components = 680
- Supplied as a **pack**

Kit contains:	Order code
1x 5mm red LED (pack 100)	55-1790
1x 5mm green LED (pack 100)	55-1792
1x 5mm yellow LED (pack 100)	55-1794
25x Flashing 5mm red LED	55-0140
25x Flashing 5mm green LED	55-0142
25x Flashing 5mm yellow LED	55-0144
1x 3mm red LED (pack 100)	55-1770
1x 3mm green LED (pack 100)	55-1772
1x 3mm yellow LED (pack 100)	55-1774
1x LED tester	55-0000
1x Miniature LDR	58-0134
1x Shallow tray	14-0430
1x Tray lid	14-0436
1x Insert 8 compartment	14-0443
Total no. of components = 680	

Type	Order code	1+
Education LED pack	13-0122	44.63

065946

Truopto

Miniature 3mm LEDs

A range of industry standard 3mm round LEDs housed in a diffused coloured package.

- Viewing angle 60°
- Supplied in packs of **100** or **1000**



Technical specification

Colour	Wavelength (nm)	Lum. int. (mcd) @ I _f (20mA)	I _f max. (mA)	V _f typ. (V)	V _f max. (V)	Order code
Red	690	10	50	2	2.4	55-1770/55-1778
Bright red	643	100	30	1.7	2.6	55-1776/55-1784
Yellow	590	50	50	2	2.4	55-1774/55-1782
Green	572	28	20	2.2	2.5	55-1772/55-1780
Blue	470	80	30	3.3	3.8	55-1762
White	x: 0.31, y: 0.30*	120	30	3.3	3.8	55-1766

* Chromaticity coordinates

Price per pack of 100

Colour	Order code	1+	10+	25+
Red	55-1770	7.98	6.18	5.47
Bright red	55-1776	6.97	5.36	4.73
Yellow	55-1774	8.89	6.97	
Green	55-1772	9.26	6.97	6.14
Blue	55-1762	14.66	11.81	
White	55-1766	14.66	11.81	

Price per pack of 1000

Colour	Order code	1+	5+
Red	55-1778	56.60	47.67
Bright red	55-1784	47.67	40.51
Yellow	55-1782	64.05	52.13
Green	55-1780	64.05	52.13

064821

Truopto

Standard 3mm Water Clear LEDs

A range of high power, industry standard 3mm LEDs in various colours. These LEDs are particularly suitable for automotive dashboard lighting and general backlighting purposes.

- Water clear lens
- Viewing angle 30°
- Superior weather-resistance
- Made from UV resistant epoxy
- Suitable for PCB or panel mounting applications

Technical specification

Colour	Wavelength (nm)	Lum. int. (mcd) @ I _f (20mA)	I _f max. (mA)	V _f typ. (V)	V _f max. (V)	Order code
Red	625	3000	50	2	2.4	55-0066
Yellow	590	3000	50	2	2.4	55-0068
Green	525	8400	30	3.3	3.8	55-0070
Blue	470	4200	30	3.3	3.8	55-0072
White	x: 0.31, y: 0.30*	7000	30	3.3	3.8	55-0076
Warm white	x: 0.45, y: 0.41*	5800	30	3.3	3.8	55-0074
Pink	x: 0.40, y: 0.21*	2180	30	3.3	3.8	55-0078

* Chromaticity coordinates

Colour	Order code	MOQ 5 - In Multiples of 5			
		5+	10+	1000+	5000+
Red	55-0066	0.113	0.098	0.05	0.036
Yellow	55-0068	0.113	0.098	0.05	
Green	55-0070	0.304	0.192	0.14	
Blue	55-0072	0.251	0.156	0.116	
White	55-0076	0.424	0.292	0.228	
Warm white	55-0074	0.502	0.333	0.248	
Pink	55-0078	0.262	0.21	0.148	

062217

Truopto

Standard 5mm LED

A range of industry standard 5mm diameter LEDs housed in a coloured diffused lens package.

- Suitable for PCB or panel mounting applications
- Viewing angle 60°
- Cathode is shorter lead
- Supplied in **packs of 100** or **1000**



Technical specification

Colour	Wavelength (nm)	Lum. int. (mcd) @ I _f max. (20mA)	I _f max. (mA)	V _f typ. (V)	V _f max. (V)	Order code
Red	700	10	15	2.2	2.8	55-1790/55-1798
Bright red	643	100	30	1.7	2.6	55-1796/55-1804
Yellow	590	20	50	2	2.4	55-1794/55-1802
Green	570	30	30	2.1	2.8	55-1792/55-1800
Blue	470	68	30	3.3	3.8	55-1754/55-1766
White	x: 0.31, y: 0.30*	100	30	3.3	3.8	55-1758/55-1766

* Chromaticity coordinates

Price per pack of 100

Type	Order code	1+	10+	25+
Red	55-1790	5.32	4.96	4.47
Bright red	55-1796	6.97	5.57	
Yellow	55-1794	9.26	7.27	
Green	55-1792	9.26	7.27	6.59
Blue	55-1754	14.62	11.90	
White	55-1758	14.98	12.21	

Price per pack of 1000

Type	Order code	1+	5+
Red	55-1798	55.78	43.38
Bright red	55-1804	54.48	46.30
Yellow	55-1802	62.55	52.13
Green	55-1800	59.58	50.65
Blue	55-1756	101.75	84.64
White	55-1760	99.26	82.59

061374

Circuit Components

shaw
magnetics

Magileads Magnetic Leads



Magileads are electrically conductive wires, with tiny magnets fitted at either end, which are used to provide an instant and effective electrical connection. For children presented with a battery, bulb and a couple of Magileads, making a circuit could not be easier.

- No stripping, cutting or use of any sort of mechanical joint is required
- Great primary school product
- Supplied in **packs of 10**

Type	Order code	1+
MagLeads 150mm	17-1500	6.19
MagLeads 300mm	17-1502	6.60

066008

RVFM
Crocodile Lead Pack



A pack of 460mm long crocodile clip leads. Available in either a **pack of 10** leads in 5 colours, or a **pack of 20** leads in red and black.

- Terminated at each end with a vinyl covered crocodile clip
- Ideal for use as test clips

Type	Order code	1+	10+
Assorted pack 10	17-0350	2.44	1.98
Red/black pack 20	17-0345	4.59	3.97

TruConnect

4mm Stackable Plugs

These 4mm plugs have a 4mm socket in the rear providing an in-line stacking facility.



- The lead wire is clamped in position by a screw
- Nickel plated brass insert with stainless steel plug spring
- 10A rating
- Spare screws are available

MOQ 2				
Type	Order code	2+	100+	500+
Black stackable plug	17-0400	0.655	0.494	0.428
Blue stackable plug	17-0405	0.655	0.494	
Green stackable plug	17-0410	0.655	0.494	
Red stackable plug	17-0420	0.655	0.494	0.428
White stackable plug	17-0425	0.655	0.494	
Yellow stackable plug	17-0430	0.655	0.494	

Price each				
Type	Order code	1+	5+	10+
Spare screws (Pack of 25)	17-0398	1.06	0.883	0.79

RVFM
MES Lampholder (E10)

A robust MES lampholder with cross head screw connections.

- Spring loaded contact
- Diameter 10mm
- Fixing centres 23mm
- Black ABS



MOQ 5 - In Multiples of 5					
Type	Order code	5+	25+	100+	500+
MES Lampholder	41-0070	0.485	0.312	0.254	0.211

RVFM
MES (E10) Lamp base

A miniature MES lampholder terminated by solder tags at the base of the holder.

- Will accept all MES lamps
- 10.6mm diameter, 12.8mm high



MOQ 10 - In Multiples of 10					
Type	Order code	10+	100+	500+	1000+
MES Lamp base	41-0090	0.116	0.07	0.066	0.062



**MES (E10) G3½
11mm Lamps**

A range of miniature MES lamps in a wide range of voltages.

- 11mm diameter, 23mm overall length



Technical specification				
Voltage (DC)	Current	Power	Nominal Life (hrs)	Order code
1.5V	300mA	0.45W	50	41-0130
2.5V	200mA	0.5W	100	41-0120
3.5V	200mA	0.7W	100	41-0132
3.5V	300mA	1.05W	1000	41-0125
6.0V	60mA	0.36W	10000	41-0105
6.0V	100mA	0.6W	100	41-0136
6.5V	150mA	0.6W	70	41-0138
6.5V	300mA	0.97W	70	41-0140
12.0V	100mA	1.2W	50	41-0142
12.0V	200mA	2.4W	3000	41-0110
24.0V	125mA	3W	50	41-0146

MOQ 10 - In Multiples of 10					
Type	Order code	10+	100+	500+	1000+
1.5V MES Lamp	41-0130	0.139	0.093	0.081	0.078
2.5V MES Lamp	41-0120	0.139	0.093	0.081	0.078
3.5V MES Lamp	41-0132	0.139	0.093	0.081	
3.5V MES Lamp	41-0125	0.139	0.093	0.081	0.077
6.0V MES Lamp	41-0105	0.116	0.104	0.093	0.077
6.0V MES Lamp	41-0136	0.127	0.104	0.093	0.082
6.5V MES Lamp	41-0138	0.127	0.104	0.093	
Spare bulb 6.5V	41-0140	0.127	0.104	0.093	0.082
12V 100mA MES Lamp	41-0142	0.185	0.127	0.104	0.092
12V 200mA MES Lamp	41-0110	0.116	0.104	0.093	0.077
24V MES Lamp	41-0146	0.232	0.161	0.127	

TruOhm

Preset Potentiometer Kit



A pack containing a total of 110 miniature horizontal preset potentiometers.

- Each value individually packed
- A total of 13 different values

See www.rapidonline.com for suitable storage cabinets.

Technical specification				
5 x 100R	10 x 1K	15 x 10K	15 x 100K	10 x 1M
5 x 200R	10 x 2K	5 x 20K	5 x 200K	
5 x 500R	10 x 5K	10 x 50K	5 x 500K	
Type	Order code	1+	5+	
Preset potentiometer kit	13-0225	10.86	9.06	



1N4148 Signal Diode

Standard high speed switching diode, housed in a DO-35 package.

- Supplied loose or in small quantities (taped)

Technical specification				
V _{rev} max. (V)	I _{av} max. (mA)	V _f @ I _m (V)	P _{av} max. (mW)	
100	200	1	500	
MOQ 100 - In Multiples of 10				
Type	Order code	100+	250+	1000+
1N4148	Taped 47-3309	0.0194	0.0158	0.0099
MOQ 500 - In Multiples of 500				
Type	Order code	500+	1000+	
1N4148	Loose 47-3307	0.0073	0.0058	

TruOhm

CR25 Carbon Film Resistor Kit



CR25 TruOhm CR25 series carbon film resistor kit containing 1000 pieces supplied in 8 packs containing 0.25W 5% Carbon Film Resistors.

These range from 4.7R to 10M, equalling a total of 63 different values throughout the resistor range provided.

- Values ranging from 4.7Ω through to 10MΩ
- A total of 63 different values
- Supplied in 8 packs

See **Storage/Packing Equipment** section for suitable storage cabinets.

Technical specification					
10 x 4R7	10 x 150R	15 x 1K2	30 x 10K	15 x 68K	25 x 470K
10 x 10R	15 x 180R	15 x 1K5	15 x 12K	10 x 82K	10 x 560K
10 x 15R	20 x 220R	10 x 1K8	15 x 15K	30 x 100K	10 x 680K
10 x 22R	20 x 270R	25 x 2K2	15 x 18K	20 x 120K	5 x 820K
10 x 33R	20 x 330R	20 x 2K7	20 x 22K	15 x 150K	20 x 1M
20 x 47R	10 x 390R	20 x 3K3	15 x 27K	15 x 180K	10 x 2M2
10 x 56R	30 x 470R	15 x 3K9	20 x 33K	20 x 220K	5 x 3M3
10 x 68R	20 x 560R	25 x 4K7	10 x 39K	15 x 270K	10 x 4M7
10 x 82R	20 x 680R	20 x 5K6	30 x 47K	15 x 330K	5 x 6M8
20 x 100R	10 x 820R	15 x 6K8	20 x 56K	10 x 390K	20 x 10M
10 x 120R	30 x 1K	10 x 8K2			
Type	Order code	1+	5+		
CR25 0.25W Resistor kit	13-0200	15.78	13.28		

TruOhm

CR50 Carbon Film Resistor Kit



A pack containing a total of 1000 0.5W 5% carbon film resistors.

- A total of 58 different values

See www.rapidonline.com for suitable storage cabinets.

Technical specification					
10 x 4R7	10 x 120R	10 x 820R	20 x 5K6	10 x 39K	15 x 330K
15 x 10R	10 x 150R	30 x 1K	15 x 68K	30 x 47K	10 x 390K
10 x 15R	10 x 180R	15 x 1K2	10 x 8K2	20 x 56K	25 x 470K
10 x 22R	20 x 220R	15 x 1K5	40 x 10K	15 x 68K	10 x 560K
10 x 33R	20 x 270R	10 x 1K8	15 x 12K	10 x 82K	10 x 680K
20 x 47R	20 x 330R	25 x 2K2	15 x 15K	40 x 100K	25 x 1M
10 x 56R	10 x 390R	20 x 2K7	15 x 18K	20 x 120K	10 x 2M2
10 x 68R	30 x 470R	20 x 3K3	20 x 22K	15 x 150K	15 x 4M7
10 x 82R	20 x 560R	15 x 3K9	15 x 27K	20 x 220K	
20 x 100R	20 x 680R	30 x 4K7	20 x 33K	15 x 270K	
Type	Order code	1+	5+		
CR50 0.5W Resistor kit	13-0260	11.85	9.92		



We bring STEM to life

Rapid

Education Electrical Kit

This respectable sized kit contains a wide range of high quality electrical consumables suitable for even the most ambitious students.



- Cost saving over buying components separately
- Ideal for tight school budgets
- Great resource for all ages
- Dimensions of box: 43cm x 31cm x 7cm
- Total components = 105
- Supplied as a pack

Kit contains:	Order code
Electronic buzzer + 10cm lead	35-3596
30x Push to make switch	78-0100
3x Crocodile leads (pack 10)	17-0350
5x Medium torque motor	37-0142
10x 6V LES lamps	41-0105
10x Bulb holders	41-0070
1x Shallow Tray	14-0430
1x Tray lid	14-0436
1x Tray insert	14-0440

Type	Order code	1+
Electrical kit	13-0114	28.47

MQQ 10 - In Multiples of 10				
Colour	Order code	10+	100+	500+
Push to make				
Black	78-0118	0.185	0.163	0.15
Red	78-0100	0.185	0.163	0.15
Blue	78-0119	0.185	0.163	0.15
Green	78-0120	0.185	0.163	0.15
White	78-0121	0.185	0.163	0.15
Yellow	78-0122	0.185	0.163	0.15
Push to break				
Black	78-0105	0.185	0.163	0.15
Red	78-0123	0.185	0.163	0.15

Rapid

Essential Tool Pack

Your chance to buy a selection of essential hand tools, whilst also making a substantial saving.



- Supplied in a handy Grattnell's storage tray with clip-on lid
- Total number of tools = 18

Classpack contains:

3x Economy side cutter	85-0205
3x Economy snipe nose plier	85-0225
3x Light duty wire stripper	86-0350
3x Flat blade screwdriver 100 x 3mm	86-0405
3x Slotted screwdriver 100 x 5.5mm	86-6416
3x Pozidriv screwdriver 75mm x Pz1	86-6424
1x Shallow tray	14-0430
1x Tray lid	14-0436

Type	Order code	1+
Tool pack	13-0130	30.60



NTC Disc Thermistors

A range of miniature disc thermistors for general purpose applications such as temperature measurement and thermal compensation circuitry.

- The thermistors are clearly coded and have a wide working temperature range of -30°C to $+125^{\circ}\text{C}$ and a tolerance of 10%



Technical specification

Resistance at 25°C	Approx. resistance @ 100°C	Max. current @ 25°C	B-Constant	Thermal time constant	Order code
100Ω	11Ω	-	3200°K	20s	61-0398
300Ω	24Ω	115mA	3500°K	22s	61-0400
1kΩ	90Ω	70mA	3800°K	22s	61-0405
5kΩ	300Ω	30mA	3950°K	21s	61-0410
20kΩ	1kΩ	20mA	4250°K	23s	61-0415
100kΩ	5kΩ	10mA	4400°K	24s	61-0420

MQQ 5

Type	Order code	5+	25+	100+	500+
100Ω	61-0398	0.40	0.299	0.239	0.201
300Ω	61-0400	0.264	0.204	0.151	0.14
1kΩ	61-0405	0.299	0.239	0.173	0.149
5kΩ	61-0410	0.299	0.239	0.173	0.149
20kΩ	61-0415	0.299	0.239	0.173	0.149
100kΩ	61-0420	0.264	0.204	0.151	0.14



Standard Toggle Switches

Low-cost standard size toggle switches.

- Complete with On/Off plate
- Rated at 250V 1.5A
- Panel cut-out 12mm
- These switches are not recommended for industrial applications



MQQ 5 - In Multiples of 5

Type	Body dim.	Order code	5+	10+	100+	500+
SPST	25 x 14 x 14	75-0180	0.726	0.674	0.621	0.558

Price each

Type	Body dim	Order code	1+	10+	100+
DPDT	28 x 18 x 14	75-0185	0.863	0.799	0.756

RVFM

Miniature Slide Switches

A miniature slide switch with solder tag connections and break before make DPDT contacts.

- Suited to a wide range of miniature electronic equipment
- Contacts rated at 0.3A, 125V AC
- Fixing centres 19mm
- 2x M2 fixing holes



MQQ 10 - In Multiples of 5

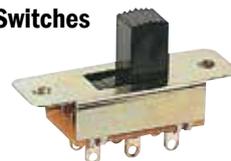
Type	Order code	10+	100+	500+	1000+
DPDT slide switch	76-0100	0.232	0.162	0.128	0.103

RVFM

Standard Slide Switches

Standard slide switches with solder tag connections and break before make DPDT contacts.

- Also available in centre off
- Suited to a wide range of miniature electronic equipment
- Contacts rated at 0.3A, 125V AC
- Fixing centres 28mm



MQQ 5 - In Multiples of 5

Type	Order code	5+	100+	500+	1000+
DPDT Standard slide	76-0105	0.268	0.224	0.186	
DPDT Centre off slide	76-0110	0.25	0.196	0.162	0.153

RVFM

Miniature Push-button Switches



A range of low-cost, miniature push to make and push to break switches that are available in various button colours.

- Ideal for school projects and prototyping
- Non-locking
- Rated 125V AC 250mA
- Panel cut-out 7mm
- Dimensions 28mm long, ϕ 10.5mm

Note: These switches are not recommended for industrial applications.



Sub-miniature Toggle Switches

A range of low-cost panel mounting sub-miniature toggle switches.



- Excellent value
- Ideal for use where space is at a premium
- SCI MTE series

Technical specification

Contact rating	3A, 125V, 1.5A 250V AC
Contact resistance max.	20mΩ
Insulation resistance min.	100MΩ @ 500V DC
Dielectric strength	1000V AC 1 min
Operating temperature	-20°C to +85°C

Type	Order code	1+	25+	100+	500+
2P SPST On-Off	75-0095	0.797	0.632	0.535	0.482
3P SPDT On-On	75-0096	0.766	0.607	0.515	
6P DPDT On-On	75-0097	0.807	0.632	0.567	



Miniature Toggle Switches

These miniature toggle switches from TAIWAY are available in single pole.

- Contact rating - 5A 125VAC, 2A 250VAC
- 50,000 make and break cycles at full load
- Solder lug terminations
- Epoxy terminal seal
- Silver plated contacts



Technical specification

Contact resistance	10mΩ max @ 2-4VDC
Insulation resistance	1,000 MΩ min
Dielectric strength	1,500V RMS @ sea level
Operating temperature	-30°C to +85°C

Materials

Case	Diallylphthalate UL94V-0
Toggle handle	Brass, chrome plated
Bushing	Brass, nickel plated
Housing	Stainless steel

Contacts	Function	Order code	1+	25+	100+
SPDT		75-0211	1.56	1.29	1.11
SPDT	Centre-Off	75-0212	1.60	1.49	1.30

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Laboratory Resistance Units

Single resistors encased in easy-to-use plastic enclosures with 4mm terminals. These resistance units are useful for physics classroom demonstrations or experiments in electricity and electronics laboratories.



- Connect to other resistance units or circuit elements with standard 4mm leads (not included)
- Can be used with 4mm stackable plug leads, spade terminals or bared wires
- Overall dimensions: 50 x 50 x 40mm
- **Eisco PH1143 series**

Resistance	Order code	1+
1 Ohm	52-3481	2.65
2 Ohms	52-3483	1.62
5 Ohms	52-3486	2.65
10 Ohms	52-3482	2.65
20 Ohms	52-3484	2.65
50 Ohms	52-3487	2.54
200 Ohms	52-3485	2.54

VOLTCRAFT® VC130 Digital Multimeter Classpack of 16



A classpack of 16 Voltcraft VC130 Digital LCD Multimeters in a deep Grattnell's Tray with lid.

See order code **55-9059** for full details of the Voltcraft VC130 Digital LCD Multimeter.

- Perfect storage solution for classroom multimeters
- Multimeters are held in place by a slotted foam sheet

Type	Order code	1+
VC130 Classpack 16	86-1090	203.48

RVFM Lo-Volt Power Supply



This **lo-volt power supply** unit provides voltages of 2, 4, 6, 9, 12 or 14V AC or unsmoothed DC at 4A continuously, or up to 5A for periods of 1 hour. Voltages are selected by means of a rotating switch on the front panel. In any case of overload, including direct short, a current sensing circuit-breaker mounted on the front panel will operate and disconnect the output voltage. Outputs are taken from colour coded 4mm sockets mounted on the front panel. An illuminated on/off switch is mounted on the rear panel adjacent to a fused appliance inlet.

- Housed in robust metal case with a durable powder coated finish
- Supplied with mains lead and instructions
- Dimensions (L x W x H): 179 x 190 x 85mm
- Weight 2.8kg

Type	Order code	1+
Lo-volt Power Supply	52-2641	151.49



We bring STEM to life



DC Lab 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	77.95

RVFM Galvanometer

This **galvanometer** is suitable for DC only with 4mm terminals, 35-0-35mV.



Type	Order code	1+
Galvanometer	52-2644	25.50

RVFM Low Voltage Premium Joulemeter



This premium **joulemeter** is capable of measuring energies from 1mJ to 9999J or power from 1mW to 200W in AC or DC circuits.

- Two ranges available selected by switch labelled mJ/mW and J/W
- Auto-ranging 4-digit display will give direct readings of energy or power
- Maximum current input 10A
- Maximum voltage 20V DC, 14V AC
- All electrical connections via 4mm sockets

Max. power	Order code	1+
200W	52-2672	217.63

Power Supplies & Meters



Moving Coil Ammeters and Voltmeters

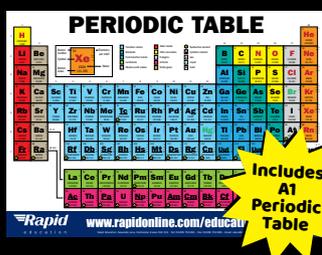
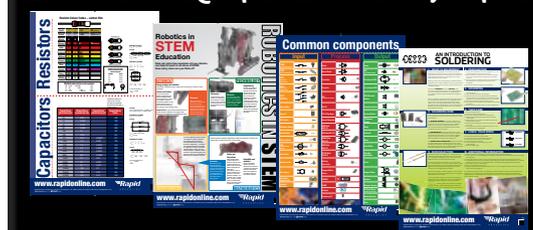
A range of economical, fully enclosed moving coil Ammeters and Voltmeters with square clear acrylic front covers.



- Range of scales
- Ammeters and voltmeters
- Ideal for the physics laboratory
- 2.5% accuracy
- Scale length 60mm
- Overall size 125 x 80 x 80mm
- Zero adjustment
- Standard terminals - take 4mm plugs or stripped wires
- **Eisco PH1074 & PH1080 series**

Type	Range	Order code	1+
Ammeter	0 to 1A	52-3495	5.06
Ammeter	0 to 2A	52-3496	5.06
Ammeter	0 to 5A	52-3497	5.06
Ammeter	0 to 1A / 5A	52-3498	5.40
Voltmeter	0 to 5V	52-3499	5.06
Voltmeter	0 to 6V	52-3500	5.06
Voltmeter	0 to 15V	52-3501	5.06
Voltmeter	0 to 30V	52-3502	5.06

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ELECTROSDOUND

Low Voltage Power Supplies



Compact power supplies 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.

Powerswitch model has a knob for voltage selection, Powerlock model has a keyswitch for voltage selection. 4 units will fit in a shallow GrateNells tray.

- Output is protected by a push button cut-out
- Powerswitch model has a knob for voltage selection
- Powerlock model has a keyswitch for voltage selection
- Supplied with a moulded lead and mains plug

Type	Order code	1+
Powerswitch single	52-0044	92.50
Powerlock single	52-0046	114.20

066616

ELECTROSDOUND

Spider Power Supply Unit



Specially designed for Education use, this unit has 4 pairs of terminals, allowing four groups to use the supply simultaneously.

- Switched output of 1.5V, 3V, 4.5V and 6V DC at 1A
- Smoothed and regulated
- Output terminals accept 4mm plugs, crocodile clips or bared wire
- Colour coded output terminals
- Fitted with fixed mains lead
- Power on and output on indicated by the Spider's eyes. One eye goes out under short circuit conditions - "If he winks call your teacher"
- Voltage 230V AC 50Hz
- Current 0.5A

Type	Order code	1+
Spider	52-0050	59.90

066618

RVFM

Geiger Counter

A robust, portable and compact Geiger counter unit capable of detecting alpha, beta and gamma radiation and recording events on a resettable digital counter. It has an integral Geiger-Muller (GM) tube which is maintained at high voltage by a small electronic inverter. Events register as audible clicks as well as a visible count on the LCD display.



- Robust, portable and compact
- Detects alpha, beta and gamma radiation
- Events register as audible clicks
- Records events on a resettable LCD digital counter
- Integral Geiger-Muller (GM) tube
- Internal high voltage electronic inverter

Powered by a single alkaline PP3 battery, not included.

Type	Order code	1+
Geiger counter	06-1577	270.00

553700

Devantech

Ultrasonic Range Finder SRF05



The SRF05 is a new design of ultrasonic range finder and features an extended detection range. Two operational modes are available, single pin for trig/echo or 2-pin for compatibility with the SRF04.

The input trigger is a 10µs min. TTL level pulse and the echo pulse is a positive TTL level signal, with the width proportional to the object range.

- Based around a PIC processor
- Only requires a single 5V DC power supply
- Typical current consumption of 30mA
- Maximum range is a long 4m
- New design minimises pin usage host controller
- Ideal for low cost robotic applications

Technical specification

Voltage requirement	5V DC
Current	typical 4mA
Frequency	40kHz
Range	max. 4m
	min. 1cm
Input trigger	10µs min, TTL level pulse
Echo pulse	Positive TTL level signal, width proportional range
Dimensions	43 x 20 x 17mm

Type	Order code	1+	3+	6+
Ultrasonic range finder	78-1085	16.72	16.10	14.86

082276

INVICTA

Anemometer



This unique design gives a direct reading of wind speed, without the need to count revolutions. The low and high calibrations register ms⁻¹ and the Beaufort scale.

- Clever indication on handle
- May be hand-held or permanently fixed
- Complete with product guide.
- Size 28 x 19cm

Type	Order code	1+
Anemometer	52-1580	14.62

122165

Brannan

Brannan Rain Gauge

200mm rainfall measure graduated in both mm and inches.



Type	Order code	1+
Rain gauge	52-0038	3.75

066613

INVICTA

Rain Gauge

An inexpensive and accurate rain gauge, graduated in millimetres. The gauge can be used free-standing or with the provided detachable spike. A lid prevents spillage for when the gauge is carried.

- Complete with product guide
- Size 16 x 8cm



Type	Order code	1+
Rain gauge	52-1604	5.57

122175

Rapid

30V Power Supply
2.5A PS3025

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