



2024

PRODUCT CATALOGUE

- KITS: TECHNOLOGY, INTRODUCTORY MICROCONTROLLERS, SOLAR PROJECTS, SUB-SYSTEMS & GEARBOXES
- SOLAR CHALLENGE KITS
- PRIMARY TECHNOLOGY, STEM KITS & CLOCK MAKING
- CLOCK & PEN COMPONENTS
- STEM & GENERAL INTEREST KITS
- PHYSICS
- ARDUINO COMPATIBLE
- ELECTRIC MOTORS, TECHNOLOGY & ELECTRONIC COMPONENTS
- LABORATORY EQUIPMENT AND LABWARE
- SOLDERING EQUIPMENT
- TOOLS...AND MORE.



18 April 2024

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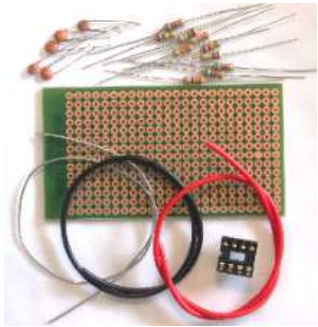



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SCORPIO ELECTRONICS, TECHNOLOGY & SOLAR KITS

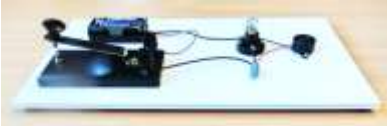
A USEFUL INTRODUCTION TO ELECTRONICS




For electronics books suitable for the classroom, please see "BOOKS & RESOURCES" section.

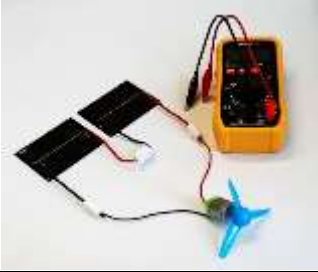

KIT NAME	CODE	Solder	Electrical	Electronic	PCB	Programma-ble	PRICE (each)	
							1-49	50+
SOLDER PRACTICE KIT	SOLDPRAC	•	•	•	•		4.74	4.43
	<p>The <i>SOLDER PRACTICE KIT</i> consists of a small Protoboard (PCB-PROTO) and a selection of basic electronic components.</p> <p>- It can be used by students to practice and hone their soldering skills – without the risk of damaging an expensive kit.</p> <p>This kit provides the means to learn soldering and de-soldering skills, and provides the opportunity to learn component identification and values. With 336 solder points you can practice soldering components and wires to gain proficiency in soldering.</p>							
ELECTRONIC DICE	ELDICE	•	•	•	•	•	15.95	15.35
	<p>The <i>PICAXE ELECTRONIC DICE</i> uses a Picaxe microcontroller. Using coding to program the Picaxe microcontroller you can randomly generate a LED Display to show one of six LED combinations simulating the display of a thrown dice.</p> <p>The dice works by switching Light Emitting Diodes (LEDs) on and off in the pattern of dots found on a traditional dice. The microcontroller is the 'brain' of the dice. It can be programmed to switch things on and off in any sequence. The microcontroller in the dice can switch the LEDs on and off to show numbers between one and six.</p> <p>As the 'diagonal' pairs on LEDs in the dice always light at the same time, they can be switched on and off by the same microcontroller output.</p> <p>NOTE: A Jiffy case is available separately if required (JIFCASELD)</p>							
PROTOBOARD	PCB-PROTO	•	•	•	•		1.39	1.39
	<p>The 336 hole <i>PROTOBOARD</i> is a small Circuit board that allows you to design your own simple circuits.</p> <p>Dimensions: 68mm x 38mm.</p>							
BREADBOARD – 170 POINTS	BRBRD170		•	•	•		5.56	5.56
	<p>The solderless mini <i>PROTOTYPE BREADBOARD</i> has 170 tie points (17 holes x 10 rows). It has a self-adhesive back and is compatible with Arduino® projects. Multiple breadboards can be connected together.</p>							

<p>BREADBOARD – 400 TIE POINTS</p> 	<p>BRBRD400</p> <p>400 hole solderless breadboard, 8.5cm x 5.5cm. A great solution for prototyping electronics. No soldering required means it can be reused many times for many different projects, allowing for experimenting with circuit design. Many electronics systems can be prototyped using breadboards, from small analog or digital circuits through to complete CPUs.</p> <p>Has a standard double-strip in the middle and two power rails on both sides which can be pulled off easily to make the breadboard as thin as 3.5cm and stick it onto an Arduino Protoshield. The breadboard also be cut in half with a saw to create 2 tiny breadboards, or "snap" these breadboards together either way to make longer and/or wider breadboards.</p> <p>Standard 2.54mm spacings. All ICs, transistors, diodes, leds and passives can be used on this breadboard. Uses solid hook up wire for interconnections. Boards are keyed to enable easy expansion.</p> <p>9.7mm thick, including sticky foam on the bottom.</p>	<p>•</p> <p>•</p> <p>•</p>	<p>8.35</p>	<p>8.35</p>
<p>INTRODUCING ELECTRONICS</p> 	<p>INTROELEC</p> <p>INTROELEC10</p> <p>Kit includes components such as bulbs, battery holders, switches, resistors and lots more. It promotes experimentation, testing and recording observations. No soldering or tools required. Suitable for groups with 2-3 students.</p> <p>Class pack of 10 INTROELEC10 available includes copy of "<i>EASY ELECTRONICS</i>" book and comes in a handy plastic storage container.</p> 	<p>•</p> <p>•</p> <p>•</p>	<p>29.93</p> <p>264.10</p>	<p>29.93</p> <p>264.10</p>

Designed for use with "*EASY ELECTRONICS*" (**BOOKEASYELEC**) book by Charles Platt.

<p>INTRODUCTION TO ELECTRIC CIRCUITS & SOLAR KITS</p>		<p>Mechanical</p>	<p>Electrical</p>	<p>Electronic</p>	<p>Alternative Energy</p>	<p>Hours to Construct</p>	<p>PRICE (each)</p>	
<p>NO SOLDER REQUIRED</p> <p>A great way for students to be introduced to a hands-on approach to electric circuits.</p>							<p>1-49</p>	<p>50+</p>
<p>KIT NAME</p>	<p>CODE</p>							
<p>MORSE CODE KIT</p> 	<p>MORSE</p> <p>Morse code is a form of binary on-off code that has been used for communication since 1844. The kit provides a basic Morse code set – a tapping key, a buzzer, an indicator light and a battery holder.</p> <p>This kit is also an example of a simple circuit.</p> <p>When you have two sets, by using longer lengths of hook up wire, you have the ability to "talk" (communicate) with a friend at another table or in another room.</p>		•	•		1-2	16.31	15.80





INTRODUCING SIMPLE CIRCUITS	SIMPCIRC		•	•			15.48	15.00
INTRODUCING SIMPLE CIRCUITS (CLASS PACK OF 10)	SIMPCIRC10		•	•			142.23	
	<p>The <i>SIMPLE CIRCUIT</i> kit allows you to introduce students to electricity. By using the supplied components students can experiment with basic circuits, simple circuits, as well as learning about series and parallel circuits.</p> <p>The kit can be expanded by adding additional components, such as a motor and propeller, and a buzzer.</p> <p>The <i>SIMPLE CIRCUITS CLASS PACK</i> comes in a handy plastic storage container.</p>							
SIMPLE CIRCUITS EXTENSION KIT 1	SIMPCEXT1		•	•			9.75	9.75
	<p>Additional electrical components - fan, motor with wires and mini buzzer, - to connect to the components used in the <i>INTRODUCING SIMPLE CIRCUITS</i> kit to experiment further with basic electric circuits.</p> <p>A metal clamp has been provided to raise the fan above the desk / platform to allow the fan to freely spin around.</p>							
SIMPLE CIRCUITS EXTENSION KIT 2 - EM	SIMPCEXT2		•	•			2.72	2.72
	<p>Using some of the components from the <i>INTRODUCING SIMPLE CIRCUITS</i> kit, this extension kit allows you to build your own basic electromagnet.</p> <p>This extension kits supplies the following items: 1 x 4AA Battery Holder, 1 x Nail, 1.5 metres hookup wire and 15 paper clips.</p> <p>Together with the <i>INTRODUCING SIMPLE CIRCUITS</i> kit, this kit is perfect for both classroom and home-based schooling.</p> <p>Batteries not included.</p>							
SIMPLE CIRCUITS BUNDLE SET	SIMPCIRCBUND						24.68	24.68
<p>SPECIAL BUNDLE PRICE: Purchase <i>INTRODUCING SIMPLE CIRCUITS</i> kit (<i>SIMPCIRC</i>) + <i>SIMPLE CIRCUITS - EXTENSION KIT 1</i> (<i>SIMPCEXT1</i>) + <i>SIMPLE CIRCUITS - EXTENSION KIT 2 - EM</i> (<i>SIMPCEXT2</i>) in one order.</p>								

INTRODUCING SOLAR ENERGY	SOLARINTRO	22.25	22.25
INTRODUCING SOLAR ENERGY (CLASS PACK OF 10)	SOLARINTRO10	210.00	
	<p>The <i>INTRODUCING SOLAR ENERGY</i> kit allows students to investigate the operation and properties of solar cells, and see how electricity is generated by them. By using the supplied components together with a multimeter, students can experiment with Series and Parallel circuits, and carry out simple experiments with sound and motion.</p> <p>Class pack of 10 supplied in handy storage container.</p> <p>NOTE: <i>Multimeter not included – but is required for carrying out experiments with this kit. Propeller colour supplied may differ from illustration.</i></p>		

PRIMARY LEVEL KITS

THE BLUE BROTHERS – THE FAMILY OF 4 KIDS

A great way for primary school students to be introduced to a hands-on approach to STEAM technology & solar projects. All mechanical and electrical components, as well as the platform, are supplied. These kits have been designed so that the students not only assemble the vehicles, but also provide opportunities to investigate areas of science such as electric circuits, solar energy and velocity.

KIT NAME	CODE	Mechanical	Electrical	Electronic	Alternative Energy	Hours to Construct	PRICE (each)	
							1-19	20+
 <p>The youngest member of the Blue family who's not quite sure what it wants to be yet...so we're leaving it to you to make it more colourful!</p>	BLUEY	•					6.01	5.81
 <p>Every family has an airhead – <i>BREEZY</i> wants to be a pilot, but he's not there yet...! A basic four-wheeled vehicle that uses a battery operated motor-driven propeller to make it move. This vehicle can also be used to experiment simple concepts of electric circuits in physics!</p>	BREEZY	•	•	•			11.50	11.18
 <p>The hoon in the Blue family – racing everywhere he goes! A four-wheeled powered vehicle at its simplest which can help introduce students to basic electric circuits.</p>	BLUEBIRD	•	•	•			9.80	9.50
 <p>This boy's the environmentalist in the family! A four-wheeled solar powered vehicle at its simplest. This vehicle illustrates a basic electric circuit where electricity is generated from a solar panel to power motor. These cars can be used to perform basic experiments relating to solar energy.</p>	BLUESKY	•	•	•	•		23.38	22.69
<p>SOLAR WHEELS 70D</p> <p>As used in the Blue Brothers kits. Pack of 10.</p>	SW70D						18.95	

SCORPIO TECHNOLOGY KITS – CONTENTS & SELECTION

TECHNOLOGY KIT CONTENTS

Our kits contain all the **electrical, electronic and mechanical** components needed to build the device (only). The teacher supplies readily available material for wiring, making body parts, etc. – ***NO BODY PARTS OR WIRES ARE INCLUDED*** in the kits. Each order includes comprehensive instructions / Teaching Unit.


TECHNOLOGY KIT SELECTION

The legend (to the right of each kit description) shows how we have graded the kits. These are a guideline only – construction times can vary considerably, depending on the student's existing knowledge, skills and experience, and the amount of resources and design input expected.

Overviews for all of our kits can be obtained from our website. Otherwise, you can phone or email us, to send you a FREE copy of the teaching unit for any kits that you may be interested in.


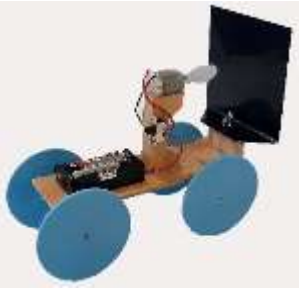

INTRODUCTORY KITS

(NOTE: NS = NO SOLDER VARIANT)

KIT NAME	CODE	Solder	No Solder	Mechanical	Electrical	Electronic	PCB	Program-mable	Alternate Energy	Hours to Construct	PRICE (each)	
											1-49	50+
BALANCE PLANE	BALAN	●		●	●					5-8	6.77	6.58
BALANCE PLANE - No Solder	BALAN-NS		●	●	●						7.69	7.48
	In this project a beam is used, with an electric motor and a propeller on one end and a battery holder on the other end. It is placed in a balanced state, on a vertical upright. This beam is designed to be rotated about its central point, in a horizontal plane, by the motor-driven propeller. NOTE: The No-solder version has a motor and switch with wires pre-soldered to them, with twist-on connectors to join the wires.											



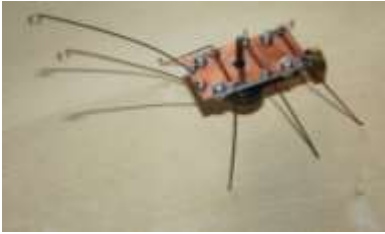
INTRODUCTORY KITS

(NOTE: NS = NO SOLDER VARIANT)

KIT NAME	CODE	Solder	No Solder	Mechanical	Electrical	Electronic	PCB	Program- mable	Alternate Energy	Hours to Construct	PRICE (each)	
											1-49	50+
BELT DRIVEN CAR	BELTCAR	•		•	•					6-8	7.46	7.12
BELT DRIVEN CAR–No Solder	BELTCAR-NS		•	•	•						8.22	7.99
	This is a four-wheeled vehicle at its simplest. Motive power is provided to the rear axle by an electric motor-driven belt (a rubber "O" ring). A number of these cars can be raced, and have the potential to be added to, to drive faster! Also, car bodies can be built, and decorated in the Art class! (see our Website – Kits in Action for some examples). NOTE: <i>The No-solder version has a motor and switch with wires pre-soldered to them, with twist-on connectors to join the wires.</i>											
BLUE FIN FAN CART	BLUEFIN	•		•	•					2-4	14.46	13.89
	The <i>BLUE FIN FAN CART</i> is a simple four wheeled, propeller driven device with a sail that can be adjusted or removed to test the theory of Newton's 3rd Law of Motion. The propeller is driven by a small battery powered electric motor.											
BUBBLE BLOWER – No Solder – G4	BUBBLE-NS-G4		•	•	•					8-10	12.15	11.55
	This device takes the "puff" out of bubble making! This device is designed to automatically blow bubbles! One motor, driving through a gearbox, constantly rotates 6 wire hoops, which continuously dip into a vessel holding the bubble mixture. The propeller (driven by a second electric motor) blows air into the hoops, producing a constant stream of bubbles. (see our Website – Kits in Action for a 3D printed example). PLEASE NOTE: - <i>The original version of the Bubble Blower kit has been phased out and has been replaced by the v2 model containing an unassembled gearbox and is now found in the Intermediate Kits section.</i> - <i>Bubble Blower – No Solder – will continue with the GFOURSD gearbox and motor replacing the original – only while stocks last of that Gearbox assembly (please contact us for stock quantities of the No Solder version before placing your order).</i>											
BUBBLE BLOWER V2	BUBBLEV2											
BUBBLE BLOWER V2 – No Solder	BUBBLEV2-NS											
PLEASE NOTE: <i>The original version of the Bubble Blower kit has been phased out and has been replaced by the v2 model containing an unassembled gearbox and is has been relocated to the Intermediate Kits section.</i>												

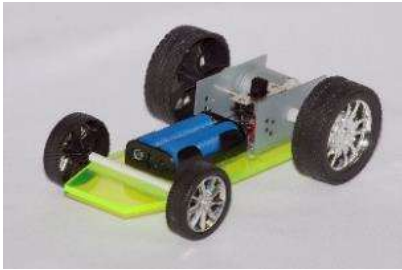


INTRODUCTORY KITS

(NOTE: NS = NO SOLDER VARIANT)

KIT NAME	CODE	Solder	No Solder	Mechanical	Electrical	Electronic	PCB	Program- mable	Alternate Energy	Hours to Construct	PRICE (each)	
											1-49	50+
 <p>BUGGY 2WD ROBOT</p>	BUGGY2WD	•		•	•						22.57	22.57
<p>This kit is compatible with Arduino.</p> <p>The <i>ROBOT 2WD BUGGY</i> has 2 independently driven wheels and a castor at the rear, It is a fun project that is aimed at expanding the students' knowledge and experience of programming. Includes double ended screw driver.</p> <p>Requires 4 x AA batteries (not included).</p> <p>NOTE: Robot Buggy suitable for PICAXE is also available. See "<i>ROBOT BUGGY</i> - Code: BUGGY."</p>												
CAPTIVE AEROPLANE	CAPTIVE	•		•	•					5-7	6.17	6.00
CAPTIVE AEROPLANE – NS	CAPTIVE-NS		•	•	•						7.11	6.90
	<p>A small aeroplane is built from plastic or wood. It is driven by a propeller, which is powered by a small electric motor. The aeroplane is suspended from an overhead point and flies in a circle.</p> <p>The basic <i>CAPTIVE AEROPLANE</i> is a very simple model to construct. This has a lot of scope for combining two different areas of study: technology and art (with a bit of woodwork thrown in!). The aeroplane is a simple model to make. However the components and ideas can be used to make other devices. For example: A witch on a broomstick A flying pig (see if pigs can really fly?)</p> <p>NOTE: The No-solder version has a motor and switch with wires pre-soldered to them, with twist-on connectors to join the wires.</p>											
JUMPING BUG	JUMPBUG	•		•	•					1-3	7,74	7.74
	<p>Make a fun novelty <i>JUMPING BUG</i> using a simple clockwork mechanism with an eccentric cam. This project also allows you to practice your soldering skills.</p>											




INTRODUCTORY KITS

(NOTE: NS = NO SOLDER VARIANT)

KIT NAME	CODE	Solder	No Solder	Mechanical	Electrical	Electronic	PCB	Program- mable	Alternate Energy	Hours to Construct	PRICE (each)	
											1-49	50+
LO-RIDER	LORIDER	•		•	•					2-4	10.95	10.65
	This is a basic four wheeled vehicle, with both front and rear wheels on fixed axles. This vehicle: <ul style="list-style-type: none"> • Is capable of forward and reverse motion (direction of travel being controlled by a two-way switch) • Pre-assembled gearbox with a choice of two gearbox ratios (at the construction stage). <p>NOTE: Limited stock available. Will be discontinued once sold out.</p>											
PROPELLED CAR	PROPC	•		•	•					5-7	7.11	6.90
PROPELLED CAR – No Solder	PROPC-NS		•	•	•						8.06	7.84
	This vehicle is a simple four wheeled vehicle with a difference – motive power is a motor driven propeller. The propeller is driven by a small battery powered electric motor <p>NOTE: The No-solder version has a motor and switch with wires pre-soldered to them, with twist-on connectors to join the wires.</p>											
SINGLE LED TORCH	LEDTORSING	•		•	•	•				2-4	7.26	7.03
	This Project enables a single AA battery - that produces 1.5 volts - to power a LED that usually requires 3.2 volts to operate. This is a good example of frugal energy. <p>The kit provides all the parts to make the circuit, and a key ring so that you can hang up the torch.</p>											


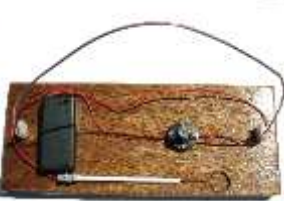

INTRODUCTORY KITS

(NOTE: NS = NO SOLDER VARIANT)

KIT NAME	CODE	Solder	No Solder	Mechanical	Electrical	Electronic	PCB	Program- mable	Alternate Energy	Hours to Construct	PRICE (each)	
											1-49	50+
SOCCER 'BOT	SOCCER	•		•	•					7	8.01	7.81
SOCCER 'BOT – No Solder	SOCCER-NS		•	•	•						8.63	8.38
	<p>The <i>SOCCER 'BOT</i> is a simple electro-mechanical device that responds to a wired hand held controller, which is used to steer the device, using two push button switches to move forwards, left or right.</p> <p><i>SOCCER 'BOT</i> can be used to play a game of soccer between two or more participants.</p> <p>The front of the <i>SOCCER 'BOT</i> has a “scoop” (a crescent shaped cut-out), that enables a tennis ball to be “captured” and pushed towards the goal. The scoop is shallow enough to allow a competitor to knock the tennis ball out of control, then capture the ball and try to score.</p> <p>NOTE: The No-solder version has a motor and switch with wires pre-soldered to them, with twist-on connectors to join the wires.</p>											
SOLAR CAR (BASIC)	SOLARB	•		•	•				•	10-15	26.72	25.79
SOLAR CAR (BASIC) – No Solder	SOLARB-NS		•	•	•				•		27.70	26.92
	<p>The <i>SOLAR CAR - BASIC</i> is a simple four-wheeled vehicle, driven by an electric motor, powered by a solar panel. Power to the wheels is transferred from the motor by gears. This car will run on a smooth level surface from 25% sunlight upwards.</p> <p>The solar panel consists of one large section producing 2.0 Volts and 0.9 Amps of electricity, under a 100% sunlight condition.</p> <p>Suitable for introducing the concept of solar power to students.</p> <p>NOTE: The No-solder version has a motor and switch with wires pre-soldered to them, with twist-on connectors to join the wires.</p>											
SOLAR CAR V2	SOLARV2	•		•	•				•	10-15	20.80	20.22
	<p>The <i>SOLAR CAR V2</i> is a basic four-wheeled vehicle, driven by an electric motor, powered by a purpose-designed solar panel. Power to the wheels is transferred from the motor by gears. This car will run on a smooth level surface from 25% sunlight upwards.</p> <p>The Solar panel consists of two sections, each of 1.5 Volts and 0.35 Amps, which can be connected in series or parallel, to suit changing light conditions.</p>											

INTRODUCTORY KITS

(NOTE: NS = NO SOLDER VARIANT)

KIT NAME	CODE	Solder	No Solder	Mechanical	Electrical	Electronic	PCB	Program- mable	Alternate Energy	Hours to Construct	PRICE (each)	
											1-49	50+
STEADY HAND GAME	STEADYSEC	●			●	●				2-4	12.54	11.58
	The <i>STEADY HAND GAME</i> is a simple game for students to make and assemble that illustrates simple electric circuits. The aim of the game is for the student to avoid touching the wire with the hand held loop. Touching the wire with the loop will result in the buzzer sounding and the LED lighting up. The game makes use of the fact that electricity will only flow around a complete circuit - it will stop flowing the moment the circuit is broken. The idea is to try not to complete a circuit, so that a buzzer does not make a sound or an LED does not light up.											
STEADY HAND GAME – NO SOLDER	STEADY-NS		●		●	●				2-4	9.46	9.17
	The <i>STEADY HAND GAME</i> is a simple game for students to make and assemble that illustrates simple electric circuits. The aim of the game is for the student to avoid touching the wire with the handheld loop. Touching the wire with the loop will result in the globe lighting up.											
WHIRLY	WHIRL	●		●	●					5-7	7.27	7.04
WHIRLY – No Solder	WHIRL-NS		●	●	●						8.08	7.84
	This model consists of a single rotating beam that has an electric motor with a propeller, mounted at one end. A battery holder is on the other end of the beam and counter-balances them. The beam is mounted on an “axle” (shaft) at the beams’ centre of gravity. When the <i>WHIRLY</i> is switched on, the motor spins the propeller, thus rotating the beam around its axle. NOTE: The No-solder version has a motor and switch with wires pre-soldered to them, with twist-on connectors to join the wires.											

SUGGESTED SPARE PARTS FOR INTRODUCTORY KITS: SEE APPENDIX E

INTRODUCTORY MICROCONTROLLERS: PAT'S PROJECTS using Programmable Picaxe 14M2

MICROCONTROLLERS: PAT'S PROJECTS



WHAT ARE PAT'S PROJECTS?

PAT'S PROJECTS are based around making and using a Picaxe 14M2 Programmable microcontroller. These projects (and many more) were developed by Pat McMahon – a Senior Technology teacher at Diamond Valley College in Melbourne. Over more than 10 years, Pat has taught microcontrollers and programming to thousands of students from year 7 to 10 as well as hundreds of technology teachers – usually through DATTA Vic. Workshops. Pat has been fortunate to have shown his students' work overseas, and has received 5 Australian, State and Regional awards for Innovation and Excellence.




Scorpio Technology are very pleased to work with Pat and to be able to make this (introductory) range of Pat's Projects available to many more teachers around Australia, who can gain the benefits of Pat's work and knowledge.

- ✓ The basic unit is a Microcontroller which has 10 LEDs and a piezo buzzer. This allows the students to make the microcontroller and program a "Lights and Sounds" display.
- ✓ Once the microcontroller has been made, the same microcontroller can then be used to run a number of different projects – these are all ADD-ONS that allow the student to remove the LEDs and reuse the microcontroller to run e.g. The Hexapod, the Animated Disc or the Robot Buggy. **The ADD-ONS will ONLY WORK with a microcontroller – not on their own.**
- ✓ All of the Add On projects will run by programming the Microcontroller using the Free (downloadable) Picaxe Editor.
- ✓ A Picaxe Download cable (PICUCAB) IS REQUIRED to download programs from your computer & can be purchased from us.
- ✓ All of the kits can also be controlled using an Infra-Red remote - by getting the Infra-Red Add-On kit.

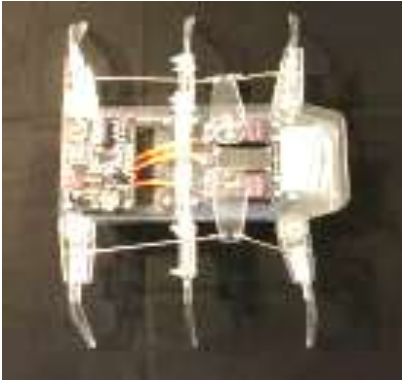



PAT'S MICROCONTROLLER PROJECTS (Programmable)

KIT NAME	CODE	Solder	No Solder	Mechanical	Electrical	Electronic	PCB	Programmable	Alternate Energy	Hours to Construct	Hours to programme	PRICE (each)	
												1-19	20+
PAT'S MICROCONTROLLER	PATSMICRO	•		•		•	•	•		1-2	1-2	29.06	27.17
	<i>PAT'S 14M2 MICROCONTROLLER</i> kit is an introductory PICAXE 14 pin Microcontroller. It is aimed at introducing programming to younger students, however, it is also capable of performing complex tasks enabling the construction of sophisticated projects once its operation is understood. It is a complete unit on its own, with 10 LEDs and a Piezo sounder. <i>PAT'S 14M2 MICROCONTROLLER</i> has the added advantage that it can be used to control a variety of "add-on" projects, for example the Animated LED Disc and the Hexapod Robot.												
PAT'S MICROCONTROLLER – NO LEDs AND BUZZER	PATSMICRONLB	•		•		•	•	•		1-2	1-2	23.38	23.06
	<i>PAT'S 14M2 MICROCONTROLLER</i> without the 10 LEDs and Piezo sounder. Ideal for use with the ADD ON PROJECTS .												

PAT'S MICROCONTROLLER PROJECTS (Programmable)

KIT NAME	CODE	Solder	No Solder	Mechanical	Electrical	Electronic	PCB	Programmable	Alternate Energy	Hours to Construct	Hours to programme	PRICE (each)		
												1-19	20+	
<p>The following kits will ONLY operate with PAT'S MICROCONTROLLER (NOT on their own), but do NOT include a Microcontroller – these are ADD ON PROJECTS for using with PATS MICROCONTROLLER.</p>														
ANIMATED DISC	PATSDISC	•		•		•	•	•		4-10	1-4	9.49	-	
	<p>This project – the <i>ANIMATED LED DISC</i> is an Add-on project that is designed to be used with <i>PAT'S 14M2 MICROCONTROLLER</i>.</p> <p>It is aimed at expanding the students' knowledge and experience of programming that was introduced by building the microcontroller. This kit replaces the 10 LEDs supplied in the original kit, by making a mountable display that has 10 arms (6 LEDs per arm).</p> <p>The kit consists of an On-Off switch and 60 LEDs in 5 different colours, to be arranged in 10 rows. When the disc has been completed the Microcontroller can be programmed to have each row illuminate separately, flash through the rows in sequence or however the designer chooses to program it.</p>													
BASKETBALL COUNTER	PATSCOUNT	•		•		•	•	•		4-10	1	27.80	-	
	<p>This project – <i>PAT'S BASKETBALL COUNTER</i> is an Add-on project that is designed to be used with <i>PAT'S 14M2 MICROCONTROLLER</i>.</p> <p>It is aimed at expanding the students' knowledge and experience of programming that was introduced by building the microcontroller. This kit uses a 7 Segment display to indicate the number of points scored using a practice basketball game.</p> <p>This disc can be programmed for manual control, or can be controlled by use of <i>PAT'S INFRA RED</i> Add-on kit.</p> <p>This kit consists of an indoor Basketball set (Backboard Size 36 L x 26cm W; Hoop Diameter 19cm; Basketball Diameter 10cm), a 2.3" 7 segment display (counter), a microswitch (with a lever extension) and attaching parts. Every time you score, the display records the increasing goal tally. (The set may vary from the photo).</p>													
INFRA RED ADD ON	PATSIR	•				•	•	•		<1	1-2	14.53	13.91	
	<p>This Infra Red Controller is an "Add-on" kit that is designed to be used with <i>PAT'S 14M2 MICROCONTROLLER</i>.</p> <p>This kit provides all the necessary components to convert the Microcontroller to be controlled remotely. It consists of an Infrared remote and the additional parts that need to be soldered to the Microcontroller.</p>													

PAT'S MICROCONTROLLER PROJECTS (Programmable)



KIT NAME	CODE	Solder	No Solder	Mechanical	Electrical	Electronic	PCB	Programmable	Alternate Energy	Hours to Construct	Hours to programme	PRICE (each)		
												1-19	20+	
HEXAPOD ROBOT	HEXAPODBOT	•		•	•	•	•	•		4-15	1			
 <p>This provides all the parts needed to build a 6 legged walking robot, which can go forward, in reverse, left and right. The legs are driven by 3 servo motors.</p> <p>This project – the <i>HEXAPOD ROBOT</i> - is an Add-on project that is designed to be used with <i>PAT'S 14M2 MICROCONTROLLER</i>. It is a fun project that is aimed at expanding the students' knowledge and experience of programming that was introduced by building the original microcontroller. This kit replaces the 10 LEDs supplied in the original kit, by mounting the microcontroller onto a <i>HEXAPOD ROBOT</i> base.</p> <p>This kit is available in either clear acrylic or Plywood:</p> <p>PLYWOOD HEXAPOD – price includes 3 servo motors, all linkages and fasteners etc. (Code: HEXAPODBOTPLY)</p> <p>ACRYLIC (CLEAR) HEXAPOD – price includes 3 servo motors, all linkages and fasteners etc. (Code: HEXAPODBOTACR)</p>														
													54.02	-
													59.69	-
ROBOT BUGGY	BUGGY	•		•	•	•	•	•		2-6	1	24.64	-	
 <p>This project – the <i>ROBOT BUGGY</i> is an Add-on project that is designed to be used with <i>PAT'S 14M2 MICROCONTROLLER</i>. The <i>ROBOT BUGGY</i> has 2 independently driven wheels and a castor at the rear, with LEDs at the front and rear. Includes a small secondary PCB that allows it to reverse as well as turning. It is a fun project that is aimed at expanding the students' knowledge and experience of programming that was introduced by building the original microcontroller.</p> <p>NOTE: This kit replaces the 10 LEDs supplied in the original kit, by mounting the microcontroller onto a buggy base.</p>														
MOTOR DRIVERS (suit Collector current – up to 0.5A)	LCMDRIVE	•				•				1	1-2	1.58	-	
 <p>These parts are required if you plan to use the <i>MICROCONTROLLER</i> to drive small electric motors with a collector current less than 0.5 Amp.</p>														
MOTOR DRIVERS (suit High Collector current – 1.2A)	HCMDRIVE	•				•				1	1-2	3.78	-	
 <p>These parts are required if you plan to use the <i>MICROCONTROLLER</i> to drive small electric motors with a collector current between 0.5 Amp and 1.2 Amps.</p>														


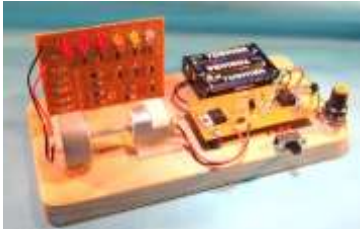

Save an extra \$5.00 per kit if bundled with PATSMICRO or PATSMICRONLB. Offer applies to HEXAPODBOTPLY or HEXAPODBOTACR, when purchased in one order.

... WITH MORE TO COME(keep checking our website and Newsletters)

INTERMEDIATE KITS



(NOTE: NS = NO SOLDER VARIANT)

KIT NAME	CODE	Solder	No Solder	Mechanical	Electrical	Electronic	PCB	Program- mable	Alternate Energy	Hours to Construct	PRICE (each)	
											1-19	20+
ADJUSTABLE POWER SUPPLY	POWADJ	•			•	•	•			6-7	26.12	25.36
	The <i>ADJUSTABLE POWER SUPPLY</i> kit consists of a Printed Circuit Board, a Digital Panel meter for measuring both Voltage and Current and a Voltage adjustment control. The voltage can be adjusted from 1.2 volts upwards. The <i>ADJUSTABLE POWER SUPPLY</i> kit can operate from either an AC or DC plug pack with a voltage range between 12 to 18 volts. It has a control switch that allows adjustment of the voltage to the required level, before connecting the <i>ADJUSTABLE POWER SUPPLY</i> to whatever you wish to power											
ADJUSTABLE POWER SUPPLY BUNDLE PACK 1	POWADJBUND1	•		•	•	•	•			6-7	57.67	---
	Adjustable Power Supply Kit, 12V DC, 1A Power Pack, Enclosed Metal Case (case illustrated in photo)											
ADJUSTABLE POWER SUPPLY BUNDLE PACK 2	POWADJBUND2	•		•	•	•	•			6-7	66.08	---
	Adjustable Power Supply Kit, 16VAC 1.25A Unregulated Power Supply Power Pack with Bare Ends, 2.1mm DC Power Line Connector Plug, Enclosed Metal Case (case illustrated in photo).											
BUBBLE BLOWER V2	BUBBLEV2	•		•	•					8-11	11.50	11.10
BUBBLE BLOWER V2 – No Solder	BUBBLEV2-NS		•	•	•					8-11	12.65	12.05
	This device takes the “puff” out of bubble making! This device is designed to automatically blow bubbles! One motor, driving through a gearbox, constantly rotates 6 wire hoops, which continuously dip into a vessel holding the bubble mixture. The propeller (driven by a second electric motor) blows air into the hoops, producing a constant stream of bubbles. (see our Website – Kits in Action for a 3D printed example). PLEASE NOTE: - The original version of the Bubble Blower kit has been phased out and has been replaced by the v2 model containing an unassembled gearbox. - The No-solder version has a motor and switch with wires pre-soldered to them, with twist-on connectors to join the wires.											

DRAGSTER	DRAG	•		•	•				10-14	10.42	10.12
DRAGSTER – No Solder	DRAG-NS		•	•	•					11.24	10.92
	<p>The <i>DRAGSTER</i> is a simple motorised vehicle, for students to design and construct. It is powered by a small electric motor, and students are able to select the vehicle's gearing, dependent upon the speed and acceleration required.</p> <p>The vehicle has been designed to provide an easy introduction to electro-mechanical devices. It is also intended that a number of <i>DRAGSTERS</i> can be used to compete in a class environment. This puts the additional requirement on students to look into the effects of gearing on speed and acceleration, and to consider these factors in their vehicle design.</p> <p>NOTE: The No-solder version has a motor and switch with wires pre-soldered to them, with twist-on connectors to join the wires.</p> <p>SUGGESTED SPARE PARTS: See <i>Appendix E</i></p>										
DRAGSTER RACING KIT	See – Test Equipment										
ELECTRICITY GENERATION DEMONSTRATOR	ELGENDEM	•		•	•	•	•		6-7	17.50	16.99
	<p>The <i>ELECTRICITY GENERATION DEMONSTRATION</i> kit is designed to show that: (1) a generator being turned at speed will generate electricity and (2) increasing the generators revs (rpm - revolutions per minute) increases the electrical output. This is easily demonstrated, as this kit lights up LEDs –as the motor's rpm increases, lights up more LEDs: a good visual demonstration.</p>										
EXPLORER	EXPLORER	•		•	•	•	•		22-24	19.41	18.86
	<p>The <i>EXPLORER</i> is a small autonomous vehicle that changes its direction of travel when it bumps into an object. Two independent motors drive the <i>EXPLORER</i>, each through its own gearbox. The front of the <i>EXPLORER</i> has a bumper bar, which is used to actuate either one or both of the pairs of the bumper bars' microswitches.</p> <p>Each pair of microswitches controls the rotation of the wheel on the opposite side. When one pair is triggered, the corresponding wheel drives backwards, to get the <i>EXPLORER</i> away from the object. The freely swinging trailing wheel introduces a random element to the direction it turns, as well as providing stability. A flashing lamp indicates the approach of the <i>EXPLORER</i>.</p>										




INTERMEDIATE KITS

(NOTE: NS = NO SOLDER VARIANT)

KIT NAME	CODE	Solder	No Solder	Mechanical	Electrical	Electronic	PCB	Program- mable	Alternate Energy	Hours to Construct	PRICE (each)	
											1-19	20+
FERRIS WHEEL V3	FERRISV3	•		•	•	•				12-16	11.10	10.80
FERRIS WHEEL V3 - No Solder	FERRISV3-NS		•	•	•	•				12-16	11.85	11.50
	<p>The <i>FERRIS WHEEL</i> project allows the student to design and construct their own working version of the popular fairground ride. The project leaves plenty of opportunities for the student to use their imagination and display their design and construction skills. It is powered by a low speed motor gearbox powered by a 3 volt battery pack. It can be operated momentarily by a pushbutton switch. It also allows the student extra scope to add additional buildings (ticket box, etc) and lighting and sound to the project using additional circuitry.</p> <p>NOTE: The No-solder version has a motor and switch with wires pre-soldered to them, with twist-on connectors to join the wires.</p> <p>PLEASE NOTE: These v3 versions of the Ferris Wheel kits with unassembled gearboxes are replacing the v2 models containing an assembled gearbox.</p>											
FERRIS WHEEL V2	FERRISV2	•		•	•	•				12-15	10.59	10.29
FERRIS WHEEL V2 - No Solder	FERRISV2-NS		•	•	•	•				12-15	11.35	11.00
	<p>The <i>FERRIS WHEEL</i> project allows the student to design and construct their own working version of the popular fairground ride. The project leaves plenty of opportunities for the student to use their imagination and display their design and construction skills. It is powered by a low speed motor gearbox powered by a 3 volt battery pack. It can be operated momentarily by a pushbutton switch. It also allows the student extra scope to add additional buildings (ticket box, etc) and lighting and sound to the project using additional circuitry.</p> <p>NOTE: The No-solder version has a motor and switch with wires pre-soldered to them, with twist-on connectors to join the wires.</p> <p>PLEASE NOTE: The v2 versions of the Ferris Wheel kits will be phased out and will be replaced by the v3 models containing an unassembled gearbox.</p> <p>Ferris Wheel V2 & Ferris Wheel V2 – No Solder – while stocks last (please contact us for stock quantities before placing order).</p>											

INTERMEDIATE KITS

(NOTE: NS = NO SOLDER VARIANT)

KIT NAME	CODE	Solder	No Solder	Mechanical	Electrical	Electronic	PCB	Program- mable	Alternate Energy	Hours to Construct	PRICE (each)	
											1-19	20+
HOVERCRAFT	HOVER	•		•	•					2-4	10.82	10.52
	<p>One motor, driving a small propeller is enough to make this <i>HOVERCRAFT</i> glide along a smooth surface on a bed of air!</p> <p>The kit comes with both narrow and wide trays, which provides a choice of how big to make the hovercraft.</p>											
INTELLIGENT LINE TRACKING CAR	LINETRACKER	•		•	•	•	•			2-4	23.47	---
	<p>The <i>LINE TRACKER</i> is an Intelligent Line Tracking Vehicle that can follow a dark track either drawn, printed or taped on a white background. Light produced by two LEDs is reflected onto two LDR's. The LDR's are the controlling circuits inputs. This information is used to control the operation of the <i>LINE TRACKER</i> to keep it following the along the track. Batteries not included.</p>											
INTRO SOLAR CAR	SCRINT	•		•	•				•	6-10	49.77	48.76
	<p>The <i>INTRO SOLAR CAR</i> is a four-wheeled vehicle, driven by Scorpio Technology's High Performance electric motor. The power source is two purpose-designed solar panels. Power to the wheels is transferred from the motor by gears. This car will run on a smooth level surface from 25% sunlight upwards.</p> <p>Each Solar panel produces 2.0 Volts and 0.9Amps, and they can be connected in series or parallel.</p> <p>By building and experimenting with this car students will gain a significant insight into renewable energy, and also the advantage of low friction wheels.</p>											

INTERMEDIATE KITS

(NOTE: NS = NO SOLDER VARIANT)

KIT NAME	CODE	Solder	No Solder	Mechanical	Electrical	Electronic	PCB	Program- mable	Alternate Energy	Hours to Construct	PRICE (each)	
											1-19	20+
INTRO SOLAR BOAT	SBTINT	•		•	•				•	6-10	36.37	35.63



This kit contains all the components needed to construct a functional solar powered boat propulsion system. This unit includes instructions on how to assemble these components together with suggested ideas for hull construction in order to build a complete basic boat that works.

By building and experimenting with this boat students will gain a significant insight into renewable energy in the form of electricity from solar, basic electricity, motors and energy conversion from solar power to motion of their boat.

SEE THE SOLAR CHALLENGE SECTION FOR MODEL SOLAR BOAT COMPETITION KITS

JOUSTER												
WITH ASSEMBLED 6 BAND PCBs	JOUST with PCBIR6-A	•		•	•	•	A S M			9-11	26.11	25.45
With UNASSEMBLED 6 BAND PCBs	JOUST with PCBIR6-UN	•		•	•	•	U N			11-13	23.46	22.80
With UNASSEMBLED GEARBOX & ASSEMBLED 6 BAND PCBs	JOUSTU with PCBIR6-A	•		•	•	•	A S M			12-14	26.11	25.45
With UNASSEMBLED GEARBOX & UNASSEMBLED 6 BAND PCBs	JOUSTU with PCBIR6-UN	•		•	•	•	U N			12-14	23.46	22.80

NOTE 1: The Jouster kit includes the *IRCU*. The *IRCU* does **NOT** need to be purchased separately.

NOTE 2: 6 BAND IR is available in both the ASSEMBLED and UNASSEMBLED variants.






The *JOUSTER* is a small agile vehicle that is controlled and steered by infrared remote control. There is a receiver PCB assembly mounted on the vehicle and a Transmitter in a hand held control box. The *INFRARED CONTROL UNIT (IRCU)* can transmit on 6 bands, which allows 6 *JOUSTERS* to be operated at the same time, by selecting one of the bands.

The *JOUSTER* has two independent motor driven gearboxes, each driving one wheel. The remote control unit controls the vehicle through the use of push button switches – for each motor there are 2 push button switches, one to apply forward and the other to apply reverse motions. If both forward motion buttons are pushed simultaneously the vehicle travels forward in a straight line. However, if one forward push button switch and one reverse switch are pushed, the vehicle turns on the spot!

The infrared controls are for indoor use only – it is not suitable for outdoor use. It requires line-of-sight and can operate up to a distance of approximately 20 metres.




INTERMEDIATE KITS

(NOTE: NS = NO SOLDER VARIANT)

KIT NAME	CODE	Solder	No Solder	Mechanical	Electrical	Electronic	PCB	Program- mable	Alternate Energy	Hours to Construct	PRICE (each)	
											1-19	20+
LED TORCH	LEDTOR	•		•	•	•				6-8	20.35	19.71
 <p>The <i>LED TORCH</i> is an electronic flashlight kit which has 19 ultra-bright LEDs and 3 PCBs.</p> <p>This is an ideal project for anyone with a 3D printer, as you can design and print the end caps and the torch body.</p> <p>This flashlight kit can be used to teach students a variety of skills – component identification, soldering and assembly being the primary ones.</p> <p>NOTE: care is required due to the small components that are soldered onto the PCBs. The use of a temperature controlled soldering station is recommended.</p> <p>NOTE: If a body is required (other than 3D printed):</p> <ul style="list-style-type: none"> for the torch body a PVC pipe with an inner diameter of 40mm can be used. 												
LED TOUCH LAMP	LEDTLK	•		•	•	•	•			10-15	35.57	34.48
 <p>The <i>TOUCH SENSOR LAMP</i> works by connecting the input to a metal plate or metal object. When the plate or object is touched the switch will operate and turn on a LED strip or LED array of your design.</p> <p>This means that a touch sensitive lamp can be designed.</p> <p>This circuit enables the student to explore the design and control of a wide range of lamp designs. Ideal for use across many areas – wood, plastics or metal.</p>												
LUMA LED DESK LAMP	LUMA	•		•	•	•	•			12-18	18.46	17.88
 <p>The <i>LUMA LED DESK LAMP</i> has a cantilever and is an articulated design. Students may use the included design or use it as a starting point for their own design. The project is suitable for different secondary year levels and abilities.</p> <p>This is a hands-on STEM project that incorporates the concepts of sustainability and reuse (repurposing) of materials.</p>												


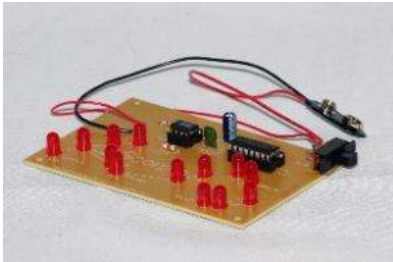

INTERMEDIATE KITS

(NOTE: NS = NO SOLDER VARIANT)

KIT NAME	CODE	Solder	No Solder	Mechanical	Electrical	Electronic	PCB	Program- mable	Alternate Energy	Hours to Construct	PRICE (each)	
											1-19	20+
MARK'S MONSTER	MARK	•		•	•					8-10	9.82	9.53
MARK'S MONSTER – No Solder	MARK-NS		•	•	•						10.60	10.30
	<p><i>MARK's MONSTER</i> is a small agile vehicle that responds to a wired hand held controller, which is used to steer the vehicle, using two push buttons to move forwards, left or right.</p> <p><i>MARK's MONSTER</i> has two independent motors and gear-drives, each controlled by its own push button switch. If both buttons are pushed simultaneously the vehicle travels forward in a straight line, but if only one push button switch is pushed the car turns in the desired direction.</p> <p><i>NOTE: The No-solder version has a motor and switch with wires pre-soldered to them, with twist-on connectors to join the wires.</i></p> <p>(See <i>MARK'S MONSTER PLYWOOD BODY</i> for body & controller parts).</p>											
MARK'S MONSTER PLYWOOD BODY	MMPLYBP	•		•	•						6.17	6.17
	<p>Available for <i>MARK's MONSTER</i> is a pack of plywood parts, providing the pieces required for:</p> <ul style="list-style-type: none"> - The body - The handheld controller 											
MR. WALKER	MRWALK	•		•	•					14-18	8.78	8.53
	<p><i>MR WALKER</i> is a walking robot with waving arms and glowing eyes. The walking motion is achieved by cams and linkages and uses an easily constructed motor and gearbox assembly.</p>											

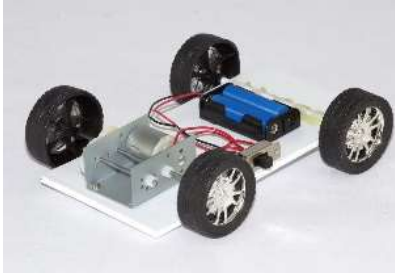


INTERMEDIATE KITS

(NOTE: NS = NO SOLDER VARIANT)

KIT NAME	CODE	Solder	No Solder	Mechanical	Electrical	Electronic	PCB	Program- mable	Alternate Energy	Hours to Construct	PRICE (each)	
											1-19	20+
ROBOBUG	ROBOBUG	•		•	•	•	•			10-14	18.40	17.87
	<p>The <i>ROBOBUG</i> is a small light-sensing robot that can be controlled (steered) by shining a small torch or your mobile phone (as the light source) on to its sensors.</p> <p>When light is shone onto one of the sensors, the motor controlled by that part of the circuit starts, causing the robot to change direction. If light is shone onto both sensors the robot will move forward in a straight line.</p>											
SCORPIO CONSTELLATION	SCOR	•			•	•	•			2-3	11.03	10.70
	<p>Scorpio is an appealing member of the zodiac. It is one of the oldest constellations and was known as far back as the Sumerian civilizations, over 5,000 years ago. The constellation Scorpio contains the stars Antares, Graffias, Dschubba, Sargas, Shaula, Jabbah and Lesath.</p> <p>The <i>SCORPIO CONSTELLATION</i> PCB has an LED positioned on the location of each of the major stars in the Scorpio constellation. The LEDs flash in a set sequence.</p> <p>NOTE: We have two project sheets available that use the Scorpio Constellation as a basis for alternative projects. They are available to download from our website. See our on-line "Project Sheets" section.</p>											
SEEKER V2 YELLOW	SEEKERV2YEL	•		•	•	•	•			16-22	45.62	44.25
	<p>The <i>SEEKER V2 YEL</i> is a three wheeled vehicle. Depending on your design you can have the two drive wheels mounted at either the front or rear of the vehicle. Each wheel is driven by a separate gearbox/motor. The third wheel is a castor mounted wheel, allowing the vehicle to change its direction of travel easily.</p> <p>The <i>SEEKER V2 YEL</i> is controlled by two light dependent resistors (LDR's) mounted at the front of the vehicle. When the LDR's encounter a change in light level caused by an object or changed lighting, one or both LDR's will react and cause the <i>SEEKER V2 YEL</i> to reverse and turn away from the object. The reverse time for each motor can be adjusted to your requirements.</p> <p>A PCB and a variety of electronic components are responsible for the control of the vehicle.</p>											



INTERMEDIATE KITS

(NOTE: NS = NO SOLDER VARIANT)



KIT NAME	CODE	Solder	No Solder	Mechanical	Electrical	Electronic	PCB	Program- mable	Alternate Energy	Hours to Construct	PRICE (each)	
											1-19	20+
SIMPLE VEHICLE	SIMPLE	●		●	●					10-15	13.62	13.24
	<p>This project requires the student to design and build a <i>SIMPLE VEHICLE</i>. This is the most basic vehicle possible, and is suitable to introduce students to Technology and Electrical components. After completion of the vehicle, it can be used for a variety of experiments (physics or otherwise) or even paired with another vehicle for racing and performance tests.</p> <p>This is a basic four wheeled vehicle, with both front and rear wheels on fixed axles. This vehicle:</p> <ul style="list-style-type: none"> • Is capable of forward and reverse motion (the direction of travel being controlled by a two-way switch) • Has a choice of three gearbox ratios when assembling the gearbox. 											
SOLAR CAR (ADVANCED)	SOLDV	●		●	●	●	●		●	15-20	33.49	32.49
	<p>The <i>ADVANCED SOLAR CAR</i> is a four-wheeled basic vehicle, driven by an electric motor and powered by a purpose designed solar panel.</p> <p>This vehicle has a 4 piece solar panel, and also has a <i>SOLAR PANEL POWER CONTROLLER – LOW VOLTAGE (SPPC-LV)</i>, which helps your vehicle to achieve maximum performance, by the use of an electronic circuit (device).</p> <ul style="list-style-type: none"> • The 4 piece panel allows for a lot experimentation with series and parallel wiring and differing power outputs. <p>Motion from the motor to the wheels is transferred by the use of gears.</p>											
STOMPER	STOMPER	●		●	●					16-22	14.63	14.19
	<p>The <i>STOMPER</i> is a six legged device that is driven by two electric motors through a number of gears. It is controlled by two two-way switches, each controlling the legs on one side.</p> <p>This project requires the student to build a <i>STOMPER</i> – a simple robotic device. The student will learn and use a variety of skills – in marking out, cutting materials, drilling, assembling and soldering.</p> <p>There is a lot of scope in the design of the body, legs and size, as well as being able to use a variety of manufacturing techniques.</p>											


INTERMEDIATE KITS

(NOTE: NS = NO SOLDER VARIANT)

KIT NAME	CODE	Solder	No Solder	Mechanical	Electrical	Electronic	PCB	Program- mable	Alternate Energy	Hours to Construct	PRICE (each)	
											1-19	20+
WIND GENERATOR	WINDGEN	•		•	•	•	•		•	5-10	10.30	10.05
	<p>The <i>WIND GENERATOR</i> project allows the user to construct a model Wind Generator that can be used to demonstrate how wind energy is used to create electrical energy.</p> <p>By connecting the printed circuit board (with a graduated LED display) to the generator, it allows visual monitoring of the Wind Generator's electrical output.</p> <p>(We stock Anemometers with LCD display to measure wind speed and temperature - CODE: ANEMOLCD).</p>											
WIND-UP TORCH	WINDT	•		•	•	•	•		•	20-26	19.20	18.63
	<p>The <i>WIND-UP TORCH</i> provides light, using 3 super bright LEDs. The torch has a 3 stage gearbox connected to a small DC generator, which is turned by hand.</p> <p>The power provided by this generator is used to charge a small Lithium ion battery. The battery provides power for illumination, and a switch allows selection of low level lighting (a single LED) or a bright light (3 LEDs).</p> <p>When discharged, the battery is recharged by turning the handle for approximately one minute.</p> <p>The components provided for the <i>WIND-UP TORCH</i> include a Printed Circuit Board, the circuitry components, the generator, gears and other components to construct the gearbox. To complete the project, the student is required to design and make the torch's housing and handle</p>											

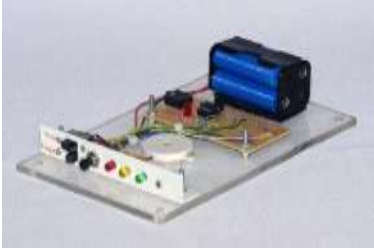


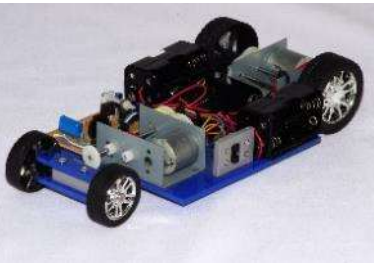
ACCESSORIES FOR INTERMEDIATE KITS

JIFFY CASE (to suit WIND-UP TORCH) 	JIFCAS	4.95	3.95	LED PENLIGHT	PENLT	4.50	---
This Jiffy Case is the perfect size to fit the <i>WIND-UP TORCH</i> into. Dimensions 130mm (L) x 67mm (W) x 43mm (H)		(1-19)	20+		Narrow beam pen light – useful for guiding the <i>ROBOBUG</i> . 2 X AAA batteries must be purchased separately. (Colour may vary from that shown).		


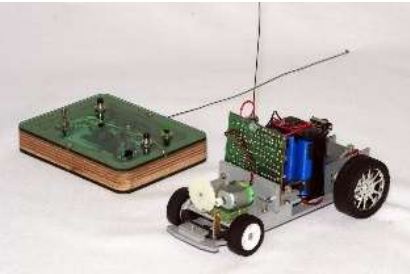
JIFFY CASE 83 X 54 X 31MM	JIFCASELD	3.75	3.00
	<p>Dimensions (approx.) 83mm x 54mm x 31mm. This jiffy case is suitable to mount the Protoboard (PCB-PROTO) onto, using the 8mm Spacer (SPACER8).</p> <p>Suits <i>ELECTRONIC DICE</i>.</p>	(1-19)	20+

Scorpio Technology also stocks a variety of tools and soldering equipment for students to use to assemble our range of kits.

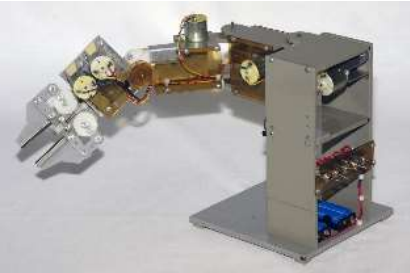


ADVANCED KITS

KIT NAME	CODE	Solder	No Solder	Mechanical	Electrical	Electronic	PCB	Program-mable	Alternate Energy	Hours to Construct	PRICE (each)	
											1-19	20+
BEEPA	BEEPA	•		•	•	•	•	•		30	31.04	30.10
	<p>The <i>BEEPA</i> project provides an introduction to microcontrollers, programming and electronics. <i>BEEPA</i> can be programmed to light three LEDs, produce sound from a piezo transducer, respond to pushbutton presses and respond to the light level.</p> <p>The kit allows a lot of experimentation, and the Teaching unit details a number of small programs that can be written to try out <i>BEEPA</i>'s many functions.</p>											
BEETLE	BEETLE	•		•	•	•	•	•		20-30	49.59	48.11
	<p><i>BEETLE</i> is a six-legged user programmable device. When it hits an object, <i>BEETLE</i> backs away, turns around and continues in another direction, imitating the actions of a real beetle. <i>BEETLE</i> also changes direction when it doesn't bump into anything for some time.</p> <p><i>BEETLE</i> has a lever arm microswitch at either end to detect an obstruction. It is driven by two motors, each with its own gearbox, and is controlled by a PICAXE-08M2 microcontroller.</p> <p>NOTE: A Picaxe Download cable is required (PICUCAB).</p>											
DIZZY	DIZZY	•		•	•	•	•	•		20-30	49.59	48.11
	<p><i>DIZZY</i> is a two-wheeled user programmable vehicle. When it hits an object, <i>DIZZY</i> backs away, spins around quickly (hence its name) and continues in another direction. <i>DIZZY</i> also changes direction when it doesn't hit anything for some time.</p> <p><i>DIZZY</i> has a lever arm microswitch at each end that detects an obstruction. It is driven by two electric motors, each with its own gearbox, and is controlled by a PICAXE-08M2 microcontroller. The prototype <i>DIZZY</i> was built using recycled CDs, but the concept has scope for individual variation, including the use of 3D printing.</p> <p>NOTE: A Picaxe Download cable is required (PICUCAB).</p>											
FOLLOW WHITE LINE VEHICLE	FWLV	•		•	•	•	•			35-45	29.62	28.75
	<p>The <i>FOLLOW WHITE LINE VEHICLE</i> follows a white line taped to a dark surface.</p> <p>Light reflected from the tape is picked up by two Light Dependent Resistors. The reflected light gathered by the Light Dependent Resistors is used to control the steering motor. If the vehicle steers off the track and less light is picked up by one Light Dependent Resistor the steering motor is operated to steer the vehicle back to towards the line until the amount of light picked up by the Light Dependent Resistors is the same. In this way the vehicle is able to steer along the line.</p>											




ADVANCED KITS

KIT NAME	CODE	Solder	No Solder	Mechanical	Electrical	Electronic	PCB	Program- mable	Alternate Energy	Hours to Construct	PRICE (each)	
											1-19	20+
FORKLIFT 	FORKLIFT	●		●	●	●	●			40-50	50.53	48.62
<p>The <i>FORKLIFT</i> is a motorised vehicle that can drive, steer and lift a load. These motions are controlled by a tethered control box.</p> <p>This unit details the construction of our prototype <i>FORKLIFT</i>, which is 300mm long x 140mm wide x 250mm high. The design and size of the vehicle depends on the student's choices in design and construction.</p> <p>The major aspects of this project are planning, design, component identification, part manufacture, maximizing effective use of materials, assembly, testing and evaluation.</p>												
RADIO CONTROLLED VEHICLE (includes RCU) with ASSEMBLED PCBs	RCV with PCBRCT-A	●		●	●	●	ASM			30-35	29.98	29.07
RADIO CONTROLLED VEHICLE (includes RCU) with UNASSEMBLED PCBs	RCV with PCBRCT-UN	●		●	●	●	UN			33-38	29.98	29.07
 <p>The <i>RADIO CONTROLLED VEHICLE (RCV)</i> is a motorised vehicle, controlled and steered by remote control. There is a receiver PCB (Printed Circuit Board) mounted on the vehicle and a transmitter PCB in a hand held control box.</p> <p>This remote control unit controls the vehicle's forward and reverse motion, as well as the steering.</p> <p>The vehicle is driven by a gearbox/motor assembly, and steered by an electric motor through a steering rod and a steering link.</p> <p>The radio transmission distance is approximately 25 metres, and under favourable conditions can be greater.</p> <p>The <i>RCV</i> is controlled by a switchable 2 band Radio Control. This allows 2 cars to run at the same time. The <i>RCV</i> has forward and reverse motion, can be steered either left or right, and has a „Turbo“ button (to increase the speed). It is driven through a multi-ratio gearbox – the student has to calculate the ratio and assemble the gearbox & motor. <i>RCV</i> includes the Radio Control PCBs and control unit and is available in 2 variants.</p> <p>Specify which version is required – Assembled or Un-assembled PCBs.</p> <p>NOTE: If buying a class set of <i>RCVs/RCUs</i>, we recommend buying one set with assembled PCBs, for visual comparison and testing of PCBs if required.</p>												

ADVANCED KITS

KIT NAME	CODE	Solder	No Solder	Mechanical	Electrical	Electronic	PCB	Program- mable	Alternate Energy	Hours to Construct	PRICE (each)	
											1-19	20+
ROBOT ARM KIT	ROBARM	•		•	•					50-60	46.93	45.51
	<p>The <i>ROBOT ARM</i> is a five-axis pick-and-place manipulator. The axes provide the following functions: gripper, gripper rotation, wrist, forearm and arm. Each of the axes is driven by an electric motor. The <i>ROBOT ARM</i> is controlled by five two-way switches and is powered by four AA batteries.</p>											
ROBOT-ARM CONTROLLER	ROBARMCONT	•		•	•	•	•	•		30+	50.11	48.44
	<p>This is a CONVERSION KIT for the <i>ROBOT ARM</i>.</p> <p>One use for the <i>CONTROLLER</i> is to enable the five motors in the <i>ROBOT ARM</i> to be controlled using position feedback. The Teaching unit details the use of the <i>CONTROLLER</i> with the <i>ROBOT ARM</i>.</p> <p>The central control element for the <i>CONTROLLER</i> is a Picaxe-40X microcontroller. The <i>CONTROLLER</i> may be incorporated into initial design of the <i>ROBOT ARM</i> or may be used to convert the <i>ROBOT ARM</i> at a later date. The <i>CONTROLLER</i> may also be used for mechanisms that require up to six axes of motor control with position feedback. Other devices may also be connected to the unused inputs and outputs.</p> <p>NOTE: This (conversion) option allows building the <i>ROBOT ARM</i> as a mechanical project, then converting and programming it as an Electronics project.</p>											
ROBOT ARM WITH CONTROLLER	ROBARMWTC	•		•	•	•	•	•		60-80	91.12	88.38
	<p>The <i>ROBOT ARM WITH CONTROLLER</i> is a five-axis pick-and-place manipulator controlled by a Picaxe microcontroller.</p> <p>The axes provide the following functions: gripper, gripper rotation, wrist, forearm and arm. Each of the axes is driven by an electric motor. The <i>ROBOT ARM WITH CONTROLLER</i> is powered by four AA batteries.</p> <p>The <i>CONTROLLER</i> enables the five motors in the <i>ROBOT ARM</i> to be controlled using position feedback. The central control element for the <i>CONTROLLER</i> is a Picaxe-40X microcontroller.</p>											

ADVANCED KITS

KIT NAME	CODE	Solder	No Solder	Mechanical	Electrical	Electronic	PCB	Program- mable	Alternate Energy	Hours to Construct	PRICE (each)	
											1-19	20+
SEEKER V2	SEEKERV2	•		•	•	•	•			22-28	33.27	32.27
	<p>The <i>SEEKER V2</i> is a three-wheeled vehicle. Each front wheel is driven by a separate gearbox/motor. At the rear is a swivel mounted trailing wheel, allowing the vehicle to change its direction of travel easily.</p> <p>The direction of travel of the vehicle is controlled by two LDRs (Light Dependent Resistors). When an object is approached, or shade is encountered, the <i>SEEKER</i> will reverse and change its direction of travel. There is a PCB and a significant number of electronic components controlling the vehicle.</p>											
WANDERER V2	WANDV2	•		•	•	•	•			23-29	33.27	32.27
	<p>The <i>WANDERER</i> is a three wheeled vehicle. Each front wheel is driven by a separate gearbox/motor. The rear has a swivel mounted trailing wheel, allowing the vehicle to change its direction of travel easily.</p> <p>The <i>WANDERER</i> is controlled by micro switches mounted at the front of the vehicle and activated by a bumper bar. When it encounters an object one or both microswitches will operate and cause it to reverse and turn away from the object. There is a PCB and a significant number of electronic components controlling the vehicle.</p>											
WOMBATV2	WOMBAT V2	•		•	•	•	•			17-19	26.25	25.48
	<p>The <i>WOMBAT</i> is a line-following device. An electronic circuit senses the line and changes the speed of each wheel so that <i>WOMBAT</i> follows the line. Contains 2 gearboxes and the PCB.</p>											

MORE SCORPIO TECHNOLOGY KITS ON THEIR WAY SOON...!

Scorpio Technology also stocks a variety of tools and soldering equipment for students to use to assemble our range of kits.

PROJECT SHEETS

Project Sheets are now available for various designs we've developed, but are not planning to sell as kits. Most of the components to complete these projects are available from Scorpio Technology and are available to download from our website:

<https://www.scorpiontechnology.com.au/project-sheets>

Several of these projects are suitable for home education requirements.

The following project sheets are currently available:

Hybrid Solar Car

Battler

Cooking with Solar Energy

Solar Chargers

Scorpio Rear Bike Lamp

Scorpio Christmas Tree

Waving Hand

Protoboard Projects:

LED Flasher

Amazer

ZIF Socket PICAXE Programmer

Explorer Time Delay

Nerve Tester Game

Rudolph's Red Nose

Solar Night Light



Scorpio Rear Bike Light



Nerve Tester







Amazer

We plan to progressively add more on our website.

SOLAR PROJECT KITS

Useful kits to help introduce solar energy and renewable resources to your students.

KIT NAME	CODE	Solder	No Solder	Mechanical	Electrical	Electronic	PCB	Program- mable	Alternate Energy	Hours to Construct	PRICE (each)	
											1-19	20+
SOLAR HOUSE KIT	SOLHOUSEK		●	●	●				●	4-8	55.97	-
	The <i>SOLAR HOUSE</i> kit is designed to introduce students to the concept of solar power and how solar power can be used to run electrical appliances and fittings in a house. The house is open on one side for easy viewing. This kit provides the: <ul style="list-style-type: none"> - corflute panels, cloth tape and plan for making the house - solar and electrical components to simulate a solar panel running a ceiling fan and 2 downlights, and includes the wiring 											
SOLAR HOUSE PROJECT – COMPONENTS KIT	SOLCOMP		●	●	●				●	1-3	29.93	-
	The <i>SOLAR HOUSE PROJECT - COMPONENTS</i> kit is designed to introduce students to the concept of solar power and how solar power can be used to run electrical appliances and fittings in a house. This kit provides the solar and electrical components to simulate a solar panel running a ceiling fan and 2 downlights: <ul style="list-style-type: none"> - Solar panel with wires - Electric motor and propeller - 2 LEDs, a switch and wiring 											
SOLAR HOUSE PROJECT - CORFLUTE	SOLCORHOUSE		●						●	1-3	29.93	-
	This kit allows you to make a model solar house (open on one side for easy viewing) to use together with the <i>SOLAR HOUSE PROJECT - COMPONENTS</i> kit (which is used to simulate a solar panel running a ceiling fan and 2 downlights). Includes the corflute panels, cloth tape and plan for making the house. (Solar panel sold as part of Solar House Project – Components (SOLCOMP) or Solar House Kit (SOLHOUSEK). This is an illustration of a completed house using the corflute).											
PROJECT BOARD KIT	SOLPROJBRD		●	●	●				●	1-3	3.90	-
	A corflute project board that allows students to observe electricity produced by a solar panel. For use with the components supplied in the <i>SOLAR HOUSE PROJECT KIT</i> (SOLCOMP). This kit can be used as an alternative to the complete Solar House. The photo illustrates the an assembled <i>SOLAR PROJECT BOARD</i> with <i>SOLAR HOUSE PROJECT KIT</i> .											

SOLAR CHALLENGE KITS

Kits designed to help your students to make competitive boats and cars for participating in the Model Car and Boat Challenges.

Before starting to build:

Download the current Regulations for the MODEL SOLAR CAR appropriate to your state:

Victoria: STUDENT DESIGNED CAR

<https://www.modelsolar.org.au/the-challenge/regulations>

NSW SUNSPRINT


<https://www.sunsprint.com.au/>




Tasmania SOLAR CAR





<http://www.tassolarchallenge.org/>

You can also find a lot of **technical information and ideas** on the Victorian and Tasmanian websites.

If you require **help or advice**, feel free to contact your state's Solar Committee or Scorpio Technology.





KIT NAME	CODE	Solder	No Solder	Mechanical	Electrical	Electronic	PCB	Programmable	Alternate Energy	Hours to Construct	PRICE (each)	
											1-19	20+
CHALLENGERV2	CHALLENGERV2	●		●	●	●	●			10-15	202.19	---
 <p>Provides the mechanical and electronic parts to build the chassis for a Student Designed Car (Advanced). Includes carbon fibre tubes, axle bracket and Faulhaber mounting kits, wheels, guide rollers, brass pinion gears and <i>PICAXE 08M2 SOLAR PANEL POWER CONTROLLER (PICSPPC08M2)</i>.</p> <p>PLEASE NOTE: The <i>PICSPPC08M2</i> is supplied with a blank <i>PICAXE</i> chip, that requires programming (see Note b), however, pre-programmed chips are also available upon request when ordering.</p> <p>That solar car can be used to compete in the Model Solar Car Challenges held in various states around Australia.</p> <p>The <i>CHALLENGERV2</i> kit does not include either solar panels or the electric motor – these can be purchased separately.</p> <p>NOTES:</p> <p>a. This kit assumes use of the <i>FAULHABER 2232</i> electric motor (<i>SMFAU</i>) which is seen as “the” motor to use for this competition.</p> <p>b. A <i>PICAXE</i> download cable (<i>PICUCAB</i>) is required to download the program to the <i>PICSPPC08M2</i>.</p> <p>One DVD with instructions is supplied with each order. The DVD contains pdf instructions – Adobe Acrobat is required. Alternately a USB stick can be supplied or the files uploaded to the cloud.</p>												

CHALLENGER SOLAR CAR KIT SM403	CHALLENGERSM403	●	●	●	●	●	10-15	202.19	---	
<p>This kit is the same as the <i>CHALLENGERV2</i>, except that this kit has the <i>SM403 MOTOR MOUNTING KIT</i>, to allow the competitors to use the SM403 motor. This provides a more economical way to enter the designed cars section and can later be upgraded to the higher performing Faulhaber motor, by swapping the motor mounting kit.</p> <p>One DVD with instructions is supplied with each order. The DVD contains pdf instructions – Adobe Acrobat is required. Alternately a USB stick can be supplied or the files uploaded to the cloud.</p>										
ADVANCED SOLAR BOAT	SBTADV	●	●	●				34.56	33.54	
	<p>This kit contains the hull material, electrical and mechanical parts to use as the basis for building a competitive Advanced level solar powered boat.</p> <p>NOTE: The motor and solar panel are NOT included in this kit.</p> <p>One DVD with instructions is supplied with each order. The DVD contains pdf instructions – Adobe Acrobat is required. Alternately a USB stick can be supplied or the files uploaded to the cloud.</p>									
JUNIOR SOLAR BOAT	SBTJUN	●	●	●				5.7	35.60	34.83
	<p>This kit contains most of the components needed to construct a functional solar powered boat for participating in the Model Solar Boat Challenge – Junior Division. The kit provides a motor that complies to the regulations, low friction propeller shaft, 2 propellers (2 and 3 blade) to experiment with and the corflute platform.</p> <p>This unit includes instructions on how to assemble these components together.</p> <p>By building and experimenting with this boat students will gain a significant insight into renewable energy.</p>									
SHERIDAN CAR KIT	SHERIDAN	●	●	●				8-12	83.75	---
	<p>This kit was developed as an introduction to the Victorian Model Solar Vehicle Challenge Car competitions.</p> <p>By constructing and racing this Kit Car students will gain the knowledge and expertise necessary to enable them to go on and design, build and race solar powered model cars of their own design.</p> <p>This kit contains all the components and material necessary to make the <i>SHERIDAN</i> car - except for a solar panel, and its wiring. The kit includes the plans and material for making the body.</p> <p>DVD with instructions supplied. The DVD contains pdf instructions – Adobe Acrobat is required. (Alternately a USB stick can be supplied or the files uploaded to the cloud or emailed instructions can be provided on request when ordering).</p> <p>PLEASE NOTE: To be eligible to compete in the event held at Scienceworks (or selected venue), the car must be made using only the components supplied in the kit of parts in the year of the regulations.</p>									

ALUMINIUM TRAY KIT FOR SOLAR 26	TRAY26	•	•	2-3	22.43	---
	<p>Aluminium tray with banana plugs, banana panel mounts, hook-up wire and other components to mount the <i>SOLAR PANEL NO. 26</i> (SOLAR26).</p> <p>Suitable for use when racing model solar cars in competition.</p> <p>NOTE: Solar Panel sold separately.</p>					
ALUMINIUM TRAY (TO SUIT SOLAR26)	TRAYAL				12.85	---
	<p>Aluminium Tray used in <i>ALUMINIUM TRAY KIT FOR SOLAR 26</i> (TRAY26) also available to purchase separately.</p>					
AXLE BRACKET KIT	AXBTK	•	•	1-2	8.16	---
	<p>The <i>AXLE BRACKET KIT</i> is used to clamp together 6.0mm diameter carbon fibre tubes. Using these allows a frame to be created – this kit provides enough parts for 4 pieces of carbon fibre to be clamped into a rectangle. This then forms the base of a Solar car.</p>					
AXLE FRAME KIT	AXFRK	•	•	1-2	24.59	---
	<p>The <i>AXLE FRAME KIT</i> is used to make a simple rectangular frame, and consists of an <i>AXLE BRACKET KIT</i> and 2x 6.0mm diameter carbon fibre tubes.</p>					
FAULHABER MOUNTING KIT	FAUMMK	•	•	1	6.71	---
	<p>The <i>FAULHABER MOUNTING KIT</i> is used to attach the motor mounting bracket and the motor to one Carbon fibre tube. This kit provides the parts (brackets, screws, nuts and bolts) to assemble an adjustable mount for a Faulhaber 2232 motor. This mounting system provides adjustment to allow a number of different pinion gears to be used for best performance, as sun levels change during the competition.</p>					

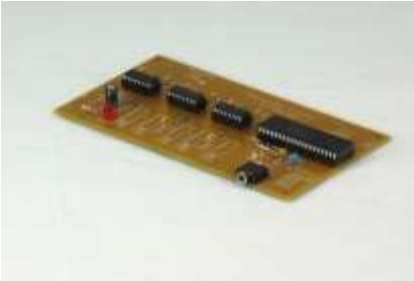

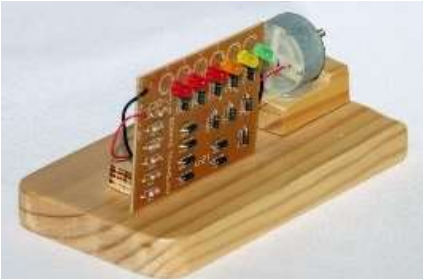
SOLAR CHALLENGE KITS

(continued...)

KIT NAME	CODE	Solder	No Solder	Mechanical	Electrical	Electronic	PCB	Programmable	Alternate Energy	Hours to Construct	PRICE (each)		
											1-19	20+	
 <p>The <i>FAULHABER MOTOR AND MOUNTING KIT</i> consists of:</p> <ul style="list-style-type: none"> - 1x <i>FAULHABER MOUNTING KIT</i> - 1x Faulhaber 2232 Electric motor 	FAUMOTK		•		•						1	130.00	---
 <p>The <i>SM403 MOUNTING KIT</i> is used to attach the motor mounting bracket and the motor to one Carbon fibre tube. This kit provides the parts (brackets, screws, nuts and bolts) to assemble a SM403 motor to a chassis. Adjustment is by moving the motor up or down, allowing different gears to be used.</p>	SM403MMK		•	•						0.5	6.98	---	
 <p>The <i>SM403 MOTOR AND MOUNTING KIT</i> consists of:</p> <ul style="list-style-type: none"> - 1 X <i>SM403 MOTOR MOUNTING KIT</i> - 1 X ST-403 T1 Electric Motor 	SM403MOTK		•		•					0.5	15.70	---	
 <p>This kit provides all the parts required to assemble a wiring harness for wiring the No. 26 Solar Panel (<i>SOLAR26</i>) in series and parallel. This is wired up to either a Toggle switch or a large Slide switch – which have centre-off position. Thus, the switch is used to switch between S (Series)-Off-P (Parallel).</p>	HARNESS26		•		•					1-2	9.07	---	



SUBSYSTEM KITS

A subsystem is a kit that is not a complete project on its own but is used as a part of a system.

KIT NAME	CODE	Solder	No Solder	Mechanical	Electrical	Electronic	PCB	Program- mable	Alternate Energy	Hours to Construct	PRICE (each)	
											1-19	20+
CONTROLLER	CONTROLLER	•		•	•	•	•	•		30	40.99	39.38
	<p>The <i>CONTROLLER</i> is a general-purpose microcontroller, and may be used to control up to six small DC motors with simple position feedback.</p> <p>The central control element for the <i>CONTROLLER</i> is a Picaxe-40X microcontroller.</p> <p>Other devices may also be connected to the unused inputs and outputs.</p> <p>The <i>CONTROLLER</i> is suitable for many other applications, including the <i>ROBOT ARM</i>.</p>											
FRONT WHEEL & STEERING	FRONT			•						--	4.61	4.47
	<p>The <i>FRONT WHEEL AND STEERING LINKAGE</i> kit provides the basic parts for a steering system. These are the same components used in both the <i>RADIO CONTROLLED VEHICLE</i> and the <i>FOLLOW THE WHITE LINE VEHICLE</i>.</p>											
GENERATOR OUTPUT MONITOR	GOM	•			•	•	•			2-3	8.39	8.13
	<p>The <i>GENERATOR OUTPUT MONITOR</i> project allows the user to monitor the output of a turbine or generator. 6 graduated LEDs give an indication of the Turbine's output. The kit includes the generator.</p> <p>HINT: when paired with the <i>MOTOR SPEED CONTROLLER</i> this is ideal for demonstrating power generation.</p>											


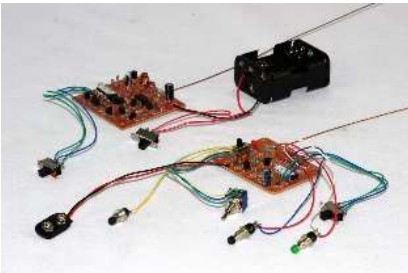
SUBSYSTEM KITS

A subsystem is a kit that is not a complete project on its own but is used as a part of a system.

KIT NAME	CODE	Solder	No Solder	Mechanical	Electrical	Electronic	PCB	Program- mable	Alternate Energy	Hours to Construct	PRICE (each)	
											1-19	20+
INFRARED CONTROL UNIT – 6 BAND												
With ASSEMBLED PCBs	IRCU with PCBIR6 -A	•		•	•	•	ASS			4-6	17.77	17.27
With UNASSEMBLED PCBs	IRCU with PCBIR6-UN	•		•	•	•	UN			6-8	15.12	14.62
 <p>The <i>INFRARED CONTROL UNIT</i> consists of the Transmitter and the Receiver assemblies (the PCBs with all their electronic components soldered in place), and all other parts required to operate the unit. The <i>INFRARED CONTROL UNIT</i> can transmit on six (6) bands, so that 6 different devices can be operated at the same time, by selecting different bands, using the band selection switch.</p> <p>The Transmitter is used to transmit commands to the Receiver, which is mounted on a vehicle or whatever device you choose to make.</p> <p>On each band the Transmitter can send up to four signals, e.g. to control 2 motors to go forward and reverse. <i>IRCU</i> consists of the Transmitter and Receiver PCBs, switches and battery holders.</p> <p>The <i>IRCU</i> is for indoor use only and will not operate outdoors. It can operate up to a distance of approximately 20 metres.</p> <p><u>Specify which version is required.</u></p>												
<p>NOTE: If buying a class set of <i>JOUSTER/IRCU</i>, we recommend buying one set with assembled PCBs, for visual comparison and testing purposes.</p>												
MOTOR SPEED CONTROLLER	MSC	•			•	•	•			2-4	8.39	8.13
 <p>The <i>MOTOR SPEED CONTROLLER</i> controls the speed of DC motors or acts as a light dimmer.</p> <p>Powering an electric motor directly from a battery or power supply will only allow a motor to function at a constant speed. The speed of the motor is directly related to the voltage of the battery or power supply. The <i>MOTOR SPEED CONTROLLER</i> circuit allows the user to adjust the speed of a motor from anywhere between a stopped state up to full speed. The same system can be used as a light dimmer for a 6Volt bulb.</p> <p>The circuit uses Pulse Width Modulation (PWM) to control the speed of a motor. The way Pulse Width Modulation is used to control motor speed is explained later in this Teaching Unit. This circuit will work with any motor sold by <i>Scorpio Technology</i>. This kit does not contain a motor nor a light bulb.</p> <p>HINT: when paired with the <i>GENERATOR OUTPUT MONITOR</i> and a motor (e.g. MOT17) this is ideal for demonstrating power generation.</p>												




SUBSYSTEM KITS

A subsystem is a kit that is not a complete project on its own but is used as a part of a system.

KIT NAME	CODE	Solder	No Solder	Mechanical	Electrical	Electronic	PCB	Program- mable	Alternate Energy	Hours to Construct	PRICE (each)	
											1-19	20+
OLED MODULE	OLED	●			●	●	●	●		2-4	42.47	42.47
 <p>Once you have seen an <i>OLED</i> display in use you will never want to use an LCD again! <i>OLED</i> has a much brighter display, much better viewing angle and lower current consumption than backlit LCDs means that <i>OLEDs</i> are set to become the new LCDs! The Serial <i>OLED</i> module allows PICAXE projects to display messages on a yellow on black <i>OLED</i>.</p> <ul style="list-style-type: none"> • Uses a pre-programmed PICAXE 18M2 chip to provide control of the screen. • Interface via a single serial line <p>Can be connected to <i>PAT'S MICROCONTROLLER</i> to extend the possible usages.</p>												
RADIO CONTROLLED UNIT With ASSEMBLED PCBs	RCU with PCBRCRT-A	●			●	●	ASS			2-5	20.98	20.35
RADIO CONTROLLED UNIT With UNASSEMBLED PCBs	RCU with PCBRCRT-UN (<i>unassembled PCBs are currently out of stock</i>)	●			●	●	UN			5-10	20.98	20.35
 <p>The 27.145 MHz <i>RADIO CONTROL UNIT (RCU)</i> - consisting of the transmitter and the receiver PCB assemblies - enables you to control whatever device you are constructing.</p> <p>The transmitter PCB is used to transmit 3 commands to the receiver PCB, which is mounted on a vehicle or other device of your making.</p> <p>The radio transmission distance is up to 25 metres, and under favourable conditions it may be more.</p> <p>The <i>RADIO CONTROL UNIT (2 BAND)</i> can be used to control a variety of devices. It operates at 27MHZ with two switchable Bands to allow 2 units to be used at the same time. It transmits to a distance of 25+ metres. The RCU kits contain the Receiver & Transmitter PCBs, all the switches and the battery holders.</p> <p><i>RCU 2 BAND KIT</i> is available in 2 variants—Specify which version is required - Assembled or Unassembled PCBs.</p> <p>NOTE: <i>If buying a class set of RCVs/RCUs, we recommend buying one set with assembled PCBs, for visual comparison and testing purposes.</i></p>												

SUBSYSTEM KITS

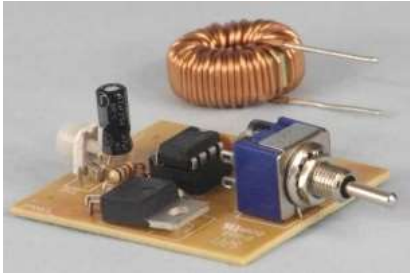
A subsystem is a kit that is not a complete project on its own but is used as a part of a system.

KIT NAME	CODE	Solder	No Solder	Mechanical	Electrical	Electronic	PCB	Program- mable	Alternate Energy	Hours to Construct	PRICE (each)	
											1-19	20+
REVERSE PCB KIT	REVPCB	•				•	•			1	6.43	6.43
	<p>This kit provides all the components needed to make and mount a reversing PCB to interface with <i>PAT'S MICROCONTROLLER</i> . It consists of the PCB, a L293 motor driver, a 16 pin IC socket, 2 PCB spacers and nuts and bolts.</p> <p>NOTE: The <i>ROBOT BUGGY</i> (Code: <i>BUGGY</i>) has this kit included.</p>											
PCB-REVERSE AND IC L293MC SET	REVDRIVE	•				•	•			1	6.02	6.02
	<p>These 2 components together (a small reversing PCB and the L293 motor driver) allow you to add a reversing function to <i>PAT'S MICROCONTROLLER</i>, for use with the <i>BUGGY2WD</i>.</p> <p>NOTE: The <i>ROBOT BUGGY</i> (Code: <i>BUGGY</i>) has the REVPCB kit included.</p>											
PICAXE08M2 SOLAR PANEL POWER CONTROLLER	PICSPPC08M2	•		•	•	•	•		•	3-5	29.15	27.11
	<p>The <i>PICAXE08M2 SOLAR PANEL POWER CONTROLLER</i> controls a solar panel's output voltage to its maximum power point voltage irrespective of load. This results in the transfer of all the available solar panel power to the load.</p> <p>Depending on the load characteristics this circuit can provide a significant multiplication of the current available from the solar panel into the load.</p> <p>For a motor this means increasing its torque, especially useful when a car is accelerating from a standing start. This feature also allows a motor to start and operate at a much lower light intensity than is possible with the motor directly connected to the solar panel. The unit automatically sets the appropriate control voltage on start up.</p> <p>While it was specifically designed to operate with a Scorpio No. 26 Solar panel it will operate with any solar panel that has an open circuit voltage between 7.0 volts and 10.0 volts and a short circuit current between 0.1 amp and 1.0 amp.</p> <p>PLEASE NOTE: The <i>PICSPPC08M2</i> is supplied with a blank <i>PICAXE</i> chip that requires programming. A <i>PICAXE</i> download cable (PICUCAB) is required to download the program to the PICSPPC08M2. Pre-programmed chips are also available on</p>											

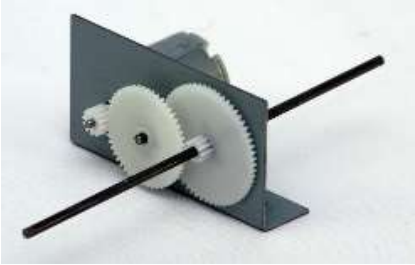


SUBSYSTEM KITS

A subsystem is a kit that is not a complete project on its own but is used as a part of a system.

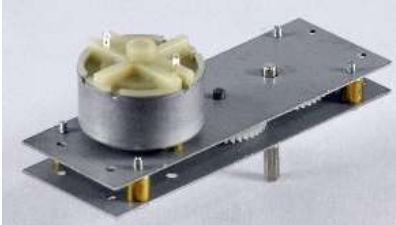

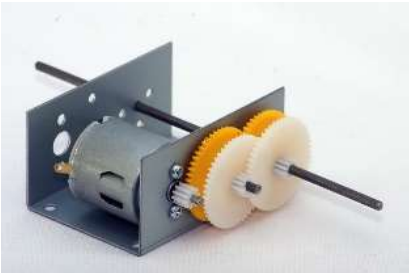
KIT NAME	CODE	Solder	No Solder	Mechanical	Electrical	Electronic	PCB	Program- mable	Alternate Energy	Hours to Construct	PRICE (each)	
											1-19	20+
SOLAR PANEL POWER CONTROLLER	SPPCS	•		•	•	•	•		•	3-5	14.84	14.54
	SPPCL	•		•	•	•	•		•	3-5	14.84	14.54
<p>The <i>SOLAR PANEL POWER CONTROLLER</i> multiplies the solar panel's starting current for motors. Normally, powering an electric motor directly from a solar panel can be quite inefficient, especially during start up and at low motor speeds.</p> <p>The <i>SPPCS</i> / <i>SPPCL</i> allows the motor to start and operate at a much lower light intensity than is possible with the motor directly connected to the solar panel.</p> <p>This <i>SPPCS</i> / <i>SPPCL</i> circuit holds the output of the solar panel at its maximum power voltage point. Thus it is able to substantially boost the starting current available to the motor.</p> <p>NOTE: <i>This circuit regulates the input voltage rather than the output voltage.</i></p> <p>Energy consumption by the circuits is 0.04 W (approximately). The <i>SPPCS</i>'s / <i>SPPCL</i>'s weight is approximately 45 grams (including the inductor).</p> <p>The two <i>SPPC</i>'s will work with any solar panel or combination of solar panels whose Voltage Open Circuit (VOC) voltage is:</p> <ul style="list-style-type: none"> • For the <i>SPPCS</i>: between 13 and 23 volts • For the <i>SPPCL</i>: between 6.5 and 12 volts <p>NOTE: <i>A rated 12V panel at VOC will be higher than 12V</i></p>												



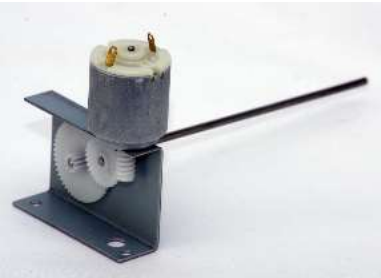
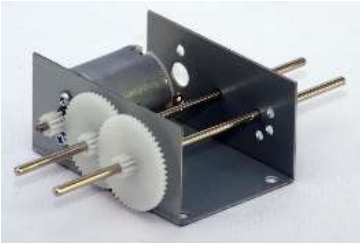

SUBSYSTEM - GEARBOXES

KIT NAME	CODE	Requires Assembly	Assembled	Motor	First Ratio	Second Ratio	Third Ratio	Fourth Ratio	PRICE (each)	
									1-19	20+
BASIC GEARBOX & MOTOR	GBASIC	●		MOT17	50:12	21:12			5.87	5.68
	<p>The <i>BASIC GEARBOX AND MOTOR KIT</i> is a very versatile and easy to assemble gear box. The unit is compact and comparatively strong, and can be used in many applications – anywhere where rotary motion is required. For example, it can be used in isolation (i.e. to drive or steer a model vehicle), it can have a gear fitted (to interface with other mechanisms), or it can drive a pulley and belt assembly.</p> <p>The gearbox can be used to drive a wheel or pulley through a single shaft, or the gearbox can be configured to drive two wheels through a longer double-sided configuration. This provides two possible configurations of the gearbox, and these are specified.</p>									
FOUR RATIO GEARBOX (Changeable)	GFOURSA-1:12 GFOURB-1:32 GFOURC-1:84 GFOURD-1:236	●		3.0V	1:12	1:32	1:84	1:236	8.10	7.87
	<p>This pre-assembled Gearbox / Motor is available in 4 ratios. Its advantage is that later on any of the other ratios can be obtained by moving some of the gears. The axle shaft width is 150mm.</p> <p>NOTE: Specify ratio required.</p> <p>IMPORTANT: Ratio can only be changed a limited number of times with care, but cannot be changed once lubricated. It is better to work out the desired ratio before starting the project, to avoid the need to change gears later on.</p>									
FOUR RATIO GEARBOX -SINGLE SIDED (Changeable)	GFOURSA-1:12 GFOURSB-1:32 GFOURSC-1:84 GFOURSD-1:236	●		3.0V	1:12	1:32	1:84	1:236	6.93	6.70
	<p>As per the above <i>FOUR RATIO GEARBOXES (CHANGEABLE)</i>, but the shaft projects only 1 way. The end of the shaft is approximately 11cm from the gearbox.</p> <p>NOTE: Specify ratio required.</p> <p>IMPORTANT: Ratio can only be changed a limited number of times with care, but cannot be changed once lubricated. It is better to work out the desired ratio before starting the project, to avoid the need to change gears later on.</p>									

SUBSYSTEM - GEARBOXES

KIT NAME	CODE	Requires Assembly	Assembled	Motor	First Ratio	Second Ratio	Third Ratio	Fourth Ratio	PRICE (each)	
									1-19	20+
GEARBOX AND MOTOR/GENERATOR KIT	GREDD	•		GENDC	---	---	---	60:1	7.92	7.68
	<p>The <i>GEARBOX & MOTOR/GENERATOR KIT</i> provides electric power, through a 3 stage gearbox connected to a small DC generator. This can be turned by hand, connected to a water wheel, a windmill or whatever else the student decides upon.</p> <p>This gearbox is used in the <i>WIND-UP TORCH</i>.</p>									
INTERMEDIATE GEARBOX KIT	GINTER	•		MOT17	1:4	1:16	1:64	1:256	7.63	7.40
	<p>The <i>INTERMEDIATE GEAR BOX</i> kit provides a choice of 4 gear ratios. Before starting, the desired ratio must be determined, as this defines the parts to be used, and the assembly procedure.</p> <p>The gearbox can be used on its own, or as a "building block" for a motorised system or vehicle.</p>									
MULTI-RATIO ADVANCED GEARBOX KIT	GADVAN	•		#	1:5	1:18	1:64	1:228	6.56	6.36
MULTI-RATIO GEARBOX KIT	GMULTI	•		#	1:5	1:25	1:125	1:625	6.56	6.36
	<p>The <i>MULTI-RATIO</i> and the <i>MULTI RATIO ADVANCED GEARBOX</i> Kits provide a choice of 4 gear ratios to choose from. There are also different motor options available (which must be purchased separately).</p> <ul style="list-style-type: none"> Before starting assembly, the desired motor option and the gear ratio must be selected, as this defines the parts to be used, the assembly side and the assembling procedure. <p>NOTE: Three different motors are available – the motor must be selected before starting assembly and must be purchased separately. This gearbox kit can be used with either the MOT17, MOT22 or the high-performance MOT30 motors (<i>sold separately</i>).</p>									

SUBSYSTEM - GEARBOXES

KIT NAME	CODE	Requires Assembly	Assembled	Motor	First Ratio	Second Ratio	Third Ratio	Fourth Ratio	PRICE (each)	
									1-19	20+
SHALLOW GEARBOX KIT	GSHALL	•		MOT17	1:30	1:125			5.87	5.69
	<p>The <i>SHALLOW GEAR BOX AND MOTOR</i> kit is an easy to assemble gearbox, and provides a choice of 2 gear ratios. The unit is compact and allows the designer to utilise narrow spaces. It can be used in many applications where rotary motion is required. For example, it can be used in isolation (to drive or steer a model vehicle), or as part of a system, (to drive a pulley and belt assembly).</p> <p>The gearbox can be used to drive, for example, one wheel or pulley through a single-sided shaft, or two wheels by using a longer shaft protruding through both sides.</p>									
TWO RATIO GEARBOX KIT	GTWORKIT	•		#	1:5	1:25	---	---	6.56	6.36
	<p>This <i>TWO-RATIO GEARBOX</i> provides a choice of 2 gear ratios. The choice of ratios available at the "Output" shaft are:</p> <ul style="list-style-type: none"> • Single reduction (shaft A) = 1:5 • Double reduction (shaft B) = 1:25 <p>This version is an unassembled kit that provides the parts to build one of the two options above. Before building you must choose which of the motors will be used. The choice of motors is: MOT17, MOT22 or the high performance MOT30 (<i>sold separately</i>).</p> <p>Minimum order quantity for this kit: 50 units.</p> <p>NOTE: The <i>TWO RATIO GEARBOX</i> kit with assembled gearbox has been discontinued.</p>									
VERSATILE GEARBOX KIT – 6 SPEED	GVERS6	•		MOT22	1:22	1:48	1:88	1:192	6.56	6.36
	<p>The <i>VERSATILE GEARBOX KIT</i> has a choice of one of six ratios, and provides a broad range of ratios (3 low range and 3 high range) – the 4 ratios shown to the right, as well as 1:242 & 1:290.</p> <p>NOTE 1: The pre-assembled <i>JOUSTER</i> and <i>BUBBLE</i> gearboxes are 2 of the possible variants.</p> <p>NOTE 2: A faster or higher powered version of this gearbox can be achieved using a MOT17 motor.</p>									

SUBSYSTEM - GEARBOXES

KIT NAME	CODE	Requires Assembly	Assembled	Motor	First Ratio	Second Ratio	Third Ratio	Fourth Ratio	PRICE (each)	
									1-19	20+
WIND UP CLOCK MECHANISM	BUGBOX		•	--	--	--	--	--	3.21	2.93



A small wind up clockwork mechanism and key, with an eccentric cam. Great for making our *JUMPING BUG* project (project sheet available upon request).

- This project is a great fun end of year project or as an introduction to soldering.






COMING IN 2024 TO SCORPIO TECHNOLOGY:



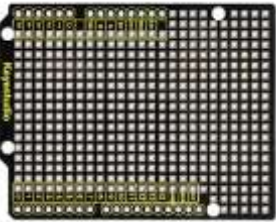
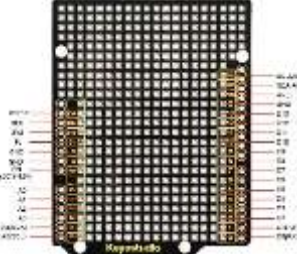


- NEW & EXCITING SCORPIO TECHNOLOGY KITS
- MORE PROJECT SHEETS TO CHOOSE FROM
- MORE ARDUINO COMPATIBLE COMPONENTS & KITS
- AN EXPANDING RANGE OF PHYSICS TEACHING ASSETS
- AN EXPANDING RANGE OF LAB EQUIPMENT
- NEW PRIMARY STEM KITS FOR HOME OR SCHOOL


...and much more!








MICROCONTROLLERS – ARDUINO COMPATIBLE & OTHERS






Scorpio Technology offers a range of Arduino compatible kits and components for sale. We do not provide a coding library for any of these items, as there are many readily available libraries on the internet.

ITEM NAME	CODE	PRICE	ITEM NAME	CODE	PRICE
SMART HOME KIT FOR ARDUINO  	SMARTHOUSE <i>THE MOST COMPLETE SMART HOME KIT!</i> This universal kit by Keyestudio is compatible for Arduino R3. Up to 14 DIY projects. This kit has 14 sensors modules and board for Arduino IDE. with selected sensors to detect temperature, humidity, sound, light, infrared, motion, flame vibration digital touch, air pressure and many other commonly used sensor modules. Downloadable detailed tutorial on the Keyestudio website available. The website (http://wiki.keyestudio.com) provides step-by-step instruction, detailed circuit connection graph/video, verified sample code and library package which saves time for the user.	122.00	BUGGY 4WD ULTRASONIC ROBOT CAR V2.0 	BUGGY4WDUNOUS Robot Car Starter Kit by Keyestudio for Arduino UN0 R3 Control, Bluetooth IR Remote Control, Line Follow, Ultrasonic Obstacle Avoiding, Robotic Programming for both kids and adults. 15 learning projects, from simple to complex, will guide you how to make a smart 4wd robot on you own and introduce the detailed knowledge about sensors and modules. An excellent kit for robotics and Arduino. Comes with HM-10 Bluetooth supporting Android and iOS system; driver shield V2 based on L298P solution, with PH2.0 connectors. It is an integration solution for robotics learning and suitable for educational settings. Downloadable software & tutorials.	127.00
SMART TURTLE ROBOT FOR ARDUINO 	TURTLESM This small turtle robot V3.0 is a learning application development system of microcontroller. It's based on ARDUINO microcontroller series atmega-328. It has functions such as line tracking, obstacle avoidance, infrared remote control and Bluetooth wireless remote control. This kit contains many interesting programs. It can also be expanded to have external circuit module to have other functions. This kit is designed to help you learn Arduino. You can learn Arduino MCU development ability while having fun at the same time. Downloadable instructions. Features three line tracking modules, detecting black and white line, high precision, can also be used in fall prevention.	99.50	BUGGY 4WD SMART ROBOT CAR CHASSIS KIT 	BUGGY4WDKIT This 4WD dual-part smart car body for Arduino includes 4 gear motors that allow you to connect external control board, drive board and other sensor elements to build your own smart car. To facilitate the speed measurement, it adds 2 speed encoders as well. The <i>BUGGY 2WD ROBOT</i> car (Code: BUGGY2WD) is the 2WD version of this smart car. Comes with pre-drilled acrylic perspex chassis for mounting sensors, control boards etc. Ages: 14+.	38.00




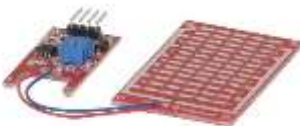
<p>BUGGY 2WD ROBOT</p> <p>BUGGY2WD</p>  <p>This kit is compatible with Arduino. The <i>ROBOT 2WD BUGGY</i> has 2 independently driven wheels and a castor at the rear. It is a fun project that is aimed at expanding the students' knowledge and experience of programming. Includes double ended screwdriver.</p> <p>Requires 4 x AA batteries (not included).</p> <p>(NOTE: ROBOT BUGGY suitable for PICAXE is also available. See "<i>ROBOT BUGGY</i> - Code: BUGGY)</p>	<p>22.57</p>	<p>BASIC STARTER KIT V2.0 – NO BOARD</p> <p>UNOSTARTV2-NB</p>  <p>This Basic Starter V2.0 upgraded kit by Keyestudio has been developed specially for those who are interested in Arduino. It contains a set of Arduino's most common and useful electronic components. This basic starter kit does not contain an UNO board.</p> <p>It offers downloadable software and detailed online tutorials including project introduction, connection diagram, source code and more. Learn about Arduino from basic projects to more complex projects. This kit provides the opportunity to control the physical world with sensors.</p> <p>See downloadable tutorial: https://wiki.keyestudio.com/Ks0402(403_404)_keyestudio_Basic_Starter_V2.0_Kit_for_Arduino</p>	<p>44.00</p>
<p>KEYESTUDIO UNO PROTOTYPE CIRCUIT BREAKOUT BOARD PCB</p> <p>UNOPROTO</p>  <p>After solder the pin headers of 2.54mm pitch on the through-holes of PCB, it can be seamlessly plugged into UNO R3 controllers. It also comes with four 3mm fixed holes for tight mounting.</p> <p>For easy use, other components can be directly soldered on the PCB through-holes to complete various prototype circuits. A tiny breadboard can be stuck on the prototyping area to complete various circuit experiments using jumper wires.</p> <p>Features: High quality double-sided PCB All holes are plated through. Material: high quality FR-4 PCB Hole Diameter: 1.0mm Comes with four 3mm fixed holes</p> <p>The pins need to be soldered.</p> 	<p>3.40</p>	<p>KEYESTUDIO MULTI-PURPOSE SHIELD V2</p> <p>UNOMULTISHLD</p>  <p>Multi-purpose Shield V2 (MPS) is a learning board based on the Arduino and Arduino compatible UNO R3. It mounts on top of the UNO R3. Download the program from the internet to be able to carry out the experiments.</p> <p>The Teaching Unit lists 7 simple experiments to carry out to familiarise yourself with the MPS. There are extended ports on the shield to help you to complete other experiment.</p> <p>Features</p> <ul style="list-style-type: none"> • Compatible with the popular controllers on the market, such as UNO R3 and MEGA2560. • Using 6-channel LED indicator to show the working condition of the program for modulating the program conveniently. • Switching functions with 3-channel keyswitch. • One reset button • Using revolving potentiometer to do analog input. • Alarming and making sound by use of passive buzzer module. • Using 4 bit LED Segment Displays to display data. 	<p>15.90</p>

<p>L298N STEPPER DC MOTOR DRIVER SHIELD EXPANSION DEVELOPMENT BOARD</p>	<p>L298N</p>	<p>15.15</p>	<p>PAT'S MULTI-PURPOSE SHIELD 8 PROJECTS COMPONENTS</p> <p>PATSMULTI8COMP</p>	<p>29.60</p>
 <p>For Arduino projects. The L298N Motor Driver Module is a high power dual H-bridge motor driver module. It was designed for driving inductive loads such as relays, solenoids, DC and Stepper Motors. It is capable of driving 2 DC motors or 1 stepper motor (you can drive two DC motors with your board, controlling the speed and direction of each one independently). The L298N Motor Driver Module - Features & Specifications:</p> <ul style="list-style-type: none"> • Operating Voltage 5V to 12V • Motor Supply Current (Maximum): 2A • Logic Voltage: 5V • Driver Voltage: 5-35V • Driver maximum current 2A per bridge (channel) or 4A max (with external powersupply) • Current sensing 1.65V/A • Maximum Power (W): 25W • Heatsink for better performance 		 <p>Pat McMahon has developed 8 different experiments for students to familiarise themselves with working with the <i>KEYESTUDIO MULTI-PURPOSE SHIELD V2</i> (MPS) and UNO R3. The components required for this are: Temperature sensor, Ultrasonic module, 2 x Servo motors, RGB LED, Thumb Joystick, IR Receiver, Dupont cable and Infra Red IR Wireless Remote Control Module.</p> <p>PATSMULTI8COMP provides the set of components for use with the Multi-Purpose Shield V2.</p> <p>The MPS is available separately (Code: UNOMULTISHLD), or it can be bundled with the components for the experiments (Code: PATSMULTI8BUND)</p>		
<p>PAT'S UNO 20 LED – 5 TUNE</p>	<p>PATSUNO20LEDTUNE</p>			<p>12.75^{ea} (1-19 kits)</p>
 <p><i>PAT'S UNO 20 LED - 5TUNE</i> kit is a simple and fun project for younger students to make. This project is about making and programming this “Add on shield” or “Hat” to fit neatly on top of an Arduino UNO R3. The shield consists of a prototype PCB which has 20 LEDs and a Piezo sounder soldered directly to it. It plays 5 tunes and flashes the 20 LEDs in turn.</p> <p>NOTE: The components are soldered directly to the blank shield, rather than using a breadboard and connecting wires. This project is suited to students who have already experimented with the UNO's basic commands and are ready to expand their knowledge and expertise.</p> <p><i>An UNO R3 Development board & upload cable (Code: UNOR3CH340G), 4AA Battery Holder with cover, switch and 2.1mm DC Plug (Code: BH4AAUNO), 4 X AA Alkaline batteries and approximately 60mm red multi strand hook up wire are also required.</i></p>				<p>12.25 (20+ kits)</p>
<p>PAT'S MULTI-PURPOSE SHIELD 8 PROJECTS BUNDLE</p>	<p>PATSMULTI8BUND</p>			<p>39.50</p>
 <p>Pat McMahon has developed 8 different experiments for students to familiarise themselves with working with the <i>KEYESTUDIO MULTI-PURPOSE SHIELD V2</i> (MPS) and UNO R3. The components required for this are: Temperature sensor, Ultrasonic module, 2 x Servo motors, RGB LED, Thumb Joystick, IR Receiver, Dupont cable and Infra Red IR Wireless Remote Control Module.</p> <p>The MPS has been bundled with the components for the experiments.</p> <p>The MPS is a learning board based on the Arduino and Arduino compatible UNO R3. It mounts on top of the UNO R3. Download the program from the internet to be able to carry out the experiments.</p> <p>Our Teaching Unit lists 8 simple experiments to carry out to familiarise yourself with the MPS. There are extended ports on the shield to help you to complete other experiment.</p>				




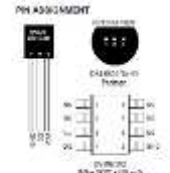

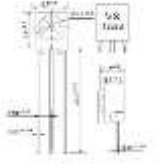





<p>MB102 830-TIE POINT BREADBOARD WITH 65 JUMPER CABLE WIRES</p>	<p>BRBRD830J</p>	<p>14.05</p>	<p>UNO R3 ATMEGA328P-AU DEVELOPMENT BOARD WITH CABLE</p> <p>UNOR3CH340G</p>	<p>16.40</p>
 <p>MB102 Solderless Breadboard with 830 Tie Points compatible with Arduino. Dimensions: 16.5 x 5.5 x 0.85mm (approx.). 1 terminal strip with 630 Tie Points 2 x 100 Point distribution strip. This board has self-adhesive on the back.</p> <p>65 Jumper Cable wires, of varying length: 110mm, 160mm, 200mm & 240mm.</p>			 <p>The UNO R3 development board is an open-source microcontroller and is Arduino-compatible. It has easy-to-use hardware and software, to allow students to experiment with the UNO R3 controlling different sensors, vehicles or other devices, and to program the board to suit those applications. UNO R3 boards are also able to read an input and turn it into an output. The Shield design makes adding expansion boards easy.</p> <p>This board includes a USB type B Cable.</p>	
<p>UNO R3 DEVELOPMENT BOARD & PROTOTYPE SHIELD SET</p>	<p>UNOR3DEVBRD</p>	<p>42.00</p>	<p>MEGA 2560 R3 DEVELOPMENT BOARD WITH CABLE</p> <p>MEGA2560R3</p>	<p>38.80</p>
 <p>Pack containing an UNO R3 Development Board, Prototype Shield, 400 tie-point breadboard, 65 jumper wires and USB cable.</p>			 <p>Specifications: Microcontroller: ATmega2560 Operating Voltage: 5V Input Voltage (recommended): 7-12V Input Voltage (limits): 6-20V Digital I/O Pins: 54 (of which 14 provide PWM output) Analog Input Pins: 16 DC Current per I/O Pin: 40 mA DC Current for 3.3V Pin: 50 mA Flash Memory: 256 KB of which 4 KB used by bootloader SRAM: 8 KB EEPROM: 4 KB</p>	
<p>37-IN-1 SENSOR KIT</p>	<p>37SENSOR</p>	<p>59.55</p>		
 <p>The <i>37-IN-1 SENSOR KIT</i> contains a 830 tie points Breadboard, jumper wires, and 37 sensors. This Arduino compatible kit's 37 individual modules can be used to create many interesting experiments. The sensors are controlled using a microcontroller.</p> <p>This is a great package to gain hands on experience with a broad range of different sensors. Once you have gained experience with these, you can move on and use these for larger projects or vehicles.</p>				
<p>UNO BREADBOARD AND STARTER KIT</p>	<p>UNOSTARTBRBRDJ</p>	<p>47.19</p>	<p>65 PIECE JUMPER CABLES – MALE TO MALE</p> <p>WIREJU65MM</p>	<p>6.50</p>
 <p>Good Quality Starter Kit with UNO R3& download cable for Arduino® projects Step Motor / Servo /1602 LCD / Breadboard/ jumper Wire.</p> <p>Includes 830 tie point Breadboard, mini Breadboard shield and Breadboard, 15 LEDs (5 each of yellow, red and green), 2 buzzers, LM35 Temperature sensor and lots more.</p>			 <p>65Pcs Mixed Color Male to Male Solderless Flexible Breadboard Jump Cable Wires. No soldering required. Useful in a multitude of Arduino project. Length: 11cm - 24cm</p>	






<p>UNIVERSAL EXPERIMENTAL PLATFORM WITH UNO R3, 400 TIE POINT BREADBOARD & ACRYLIC BOARD</p>	<p>UNOR3BRBRD400</p>	<p>35.00</p>	<p>INFRARED IR WIRELESS REMOTE CONTROL MODULE</p> <p>IRREMOTEMOD</p>	<p>5.10</p>
 <p>Includes: 1 x UNO R3 1 x Cable 1 x 400 Tie Point Breadboard 1 x Transparent Acrylic Substrate (base) 4 x Nuts 4 x Screws 4 x Silicone pads</p>			 <p>Ultra-thin Infrared IR Wireless Remote Control Module Kits For Arduino. Infrared wireless remote control kit consists of: 38KHz IR remote control, with 17 function keys, range of up to 8 meters; Infrared receiver modules; Infra red transmitting LED.</p>	
<p>HC-05 BLUETOOTH MASTER MODULE</p>	<p>BTHC05</p>	<p>11.59</p>	<p>HC-05 BLUETOOTH MASTER MODULE WITH WIRING HARNESS</p> <p>BTHC05-WH</p>	<p>17.12</p>
 <p>6pin anti-reverse, integrated Bluetooth serial pass-through module, wireless serial. The HC-05 can be configured as either a Master or a Slave device, whereas its brother, the HC-06, can only be used as a Slave device.</p> <p>Add bluetooth to your project with the <i>HC-05 BLUETOOTH MASTER MODULE</i> and get access to a simple Rx/Tx pipeline through classic bluetooth protocol. The HC-05 module itself is mounted onto a breakout board which provides easy, breadboard friendly 0.1" headers for Power, Ground, TX, RX, and enable pins. The breakout board also provides a 3.3V regulator so you can power it with 5V from an Arduino or other 5V board. Range - With a range of 30ft (~10m) Frequency: 2.4GHz ISM band Warning: do not connect the power to the signal Pin, it will directly burn out the module! Input voltage no more than 7V!</p>			  <p>6pin anti-reverse, integrated Bluetooth serial pass-through module, wireless serial. The HC-05 can be configured as either a Master or a Slave device, whereas its brother, the HC-06, can only be used as a Slave device. This is identical the BTHC05, but with wiring harness.</p> <p>Add bluetooth to your project with the <i>HC-05 BLUETOOTH MASTER MODULE</i> and get access to a simple Rx/Tx pipeline through classic bluetooth protocol. The HC-05 module itself is mounted onto a breakout board which provides easy, breadboard friendly 0.1" headers for Power, Ground, TX, RX, and enable pins. The breakout board also provides a 3.3V regulator so you can power it with 5V from an Arduino or other 5V board. Range - With a range of 30ft (~10m) Frequency: 2.4GHz ISM band Warning: do not connect the power to the signal Pin, it will directly burn out the module! Input voltage no more than 7V!</p>	

<p>HC-06 BLUETOOTH SLAVE MODULE BTHC06</p>	<p>11.40</p>	<p>HC-06 BLUETOOTH SLAVE MODULE WITH WIRING HARNESS BTHC06-WH</p>	<p>17.12</p>
 <p>4pin anti-reverse, integrated Bluetooth serial pass-through module, wireless serial. The HC-05 can be configured as either a Master or a Slave device, whereas its brother, the HC-06, can only be used as a Slave device.</p> <p>Warning: do not connect the power to the signal Pin, it will directly burn out the module! Input voltage no more than 7V!</p>		 <p>4pin anti-reverse, integrated Bluetooth serial pass-through module, wireless serial. With wiring harness. The HC-05 can be configured as either a Master or a Slave device, whereas its brother, the HC-06, can only be used as a Slave device.</p> <p>Warning: do not connect the power to the signal Pin, it will directly burn out the module! Input voltage no more than 7V!</p>	
<p>SOIL MOISTURE SENSOR FOR UNOR3 SENSMOIST</p>  <p>A simple water sensor that can be used to detect soil moisture. Can be used in module plant waterer device, and the plants in your garden no need people to manage.</p> <p>Chipset: LM393 Operating voltage: 3.3V - 5V Dual output mode - analogue output more accurate. With power indicator (red) and digital switching output indicator (green).PCB Panel dimensions (approx.): 30 x 15mm Soil probe dimensions (approx.): 60 x 30mm Cable length (approx.): 210mm DO: Digital output interface (0 and 1) AO: Analog output interface</p>	<p>5.20</p>	<p>HC-SR04 MODULE HCSR04</p>  <p>Ultrasonic Ranging Module uses sonar to determine the distance to an object. Provides 2cm-400cm non-contact measurement function, the ranging function can reach to 3mm.</p> <p><i>Arduino compatible.</i></p> <p>Includes ultrasonic transmitters, receiver & control circuit. Working Voltage: DC 5V Working Current: 15mA Working Frequency: 40Hz Dimensions: 45x20x15mm</p>	<p>5.35</p>
<p>HC-SR04 MODULE BRACKET BRKTHCSR04</p>  <p>Mounting bracket for Ultrasonic Ranging Module HC-SR04 (HCSR04).</p> <p>Includes 2 x screws & 2 x nuts for mounting. Acrylic. Dimensions: 51 x 15 x 34mm</p>	<p>0.62</p>	<p>ACTIVE BUZZER FOR STARTER KIT BUZZERACT</p>  <p>The active buzzer is widely used as a sound making element on computer, printer, alarm, electronic toy, telephone, timer, etc. It has an inner vibration source. Simply connect it with 5V power supply, it can buzz continuously. This active buzzer is found in the Basic Starter Kit V2.0 (Code: UNOSTARTV2-NB).</p>	<p>2.10</p>

<p>BREADBOARD – 400 TIE POINTS</p>	<p>BRBRD400</p>	<p>8.35</p>	<p>DIGITAL TEMPERATURE & HUMIDITY SENSOR</p> <p>SENSTEMPHUM</p>	<p>9.56</p>
	<p>400-hole solderless breadboard, 8.5 x 5.5 x 0.97cm thick (including sticky foam on the bottom). A great solution for prototyping electronics. No soldering required so it can be reused many times for many different projects, allowing for experimenting with circuit design. Many electronics systems can be prototyped using breadboards, from small analogue or digital circuits through to complete CPUs.</p> <p>Has a standard double-strip in the middle and two power rails on both sides which can be pulled off easily to make the breadboard as thin as 3.5cm and stick it onto an Arduino protoshield. It can also be cut in half with a saw to create 2 tiny breadboards, or "snap" these breadboards together either way to make longer and/or wider breadboards.</p> <p>Standard 2.54mm spacings. All ICs, transistors, diodes, LEDs and passives can be used on it. Uses solid hook up wire for interconnections. Boards are keyed to enable easy expansion.</p>		 <p>High quality DHT11 module with cable. Can detect and measure relative humidity and temperature of the surrounding environment. Can be used for Arduino projects. Suitable for remote weather stations, home environment control systems, farm or garden monitoring systems. Digital output form.</p> <p>Humidity measurement range: 20% - 90%RH Humidity measurement error: +/-5%RH Temperature measurement range: 0-60 degrees Celsius Temperature measurement error: +/-2 degrees Celsius Working Voltage: 5V DC Size (approx.): 30 x 13 x 8mm</p>	
<p>BREADBOARD – 170 TIE POINTS</p>	<p>BRBRD170</p>	<p>5.56</p>	<p>ARDUINO RAINDROP SENSOR MODULE</p> <p>SENSRAIN</p>	<p>8.95</p>
	<p>The solderless mini <i>PROTOTYPE BREADBOARD</i> has 170 tie points (17 holes x 10 rows). It has a self-adhesive back and is compatible with Arduino® projects. Multiple breadboards can be connected together.</p>		 <p>This Arduino compatible rain sensor module is suitable for an Arduino weather project. It can be used to detect rain. Featuring adjustable sensitivity and LED indicator, It can be separated into a sensor and control board in order to keep the important bits dry. TTL level output can drive 100mA - adequate for a small relay or buzzer. 5V power supply required. Dimensions (board): 50 x 35 x 1mm Dimensions (controller): 47 x 26 x 6mm Dimensions (wire): 75mm</p>	

<p>TRANSPARENT ACRYLIC BASE FOR UNO & BREADBOARD</p>	<p>UNOACRBRD</p>	<p>12.95</p>	<p>40 PIN MALE TO FEMALE RIBBON CABLE – 20CM</p>	<p>WIREJU40PMF</p>	<p>6.40</p>
	<p>Transparent mounting plate for use with Arduino UNO R3s and 400 tie-point breadboard. Comes with: 1 x transparent base 4 x nuts 4 x screws 4 x silicone pads 4 x nylon support blocks</p> <p>NOTE: Item supplied may vary slightly from photo.</p>			<p>20cm multi-coloured Breadboard Jumper Wires Male to Female Dupont-style crimp cable for Arduino projects. This is a 40-pin standard 2.54mm pitch housing connector. 1 pin-1 pin male to female. Pull them apart as you need them.</p> <p>Suitable for DIY experiment / electronic projects / Arduino breadboard / PC motherboard / PCB projects.</p>	
<p>LILYPAD LEDS – WHITE</p>	<p>LEDWLP</p>	<p>4.50</p>	<p>LILYPAD SLIDE SWITCH MODULE</p>	<p>SSWLP</p>	<p>3.10</p>
	<p>Strip of 5 white LilyPad LEDs, allowing you to snap the LEDs apart and sew onto clothing, etc. - washable (e-textile technology).</p> <p>5.5mm x 12.5mm x 0.8mm (approx.).</p>			<p>Simple On/Off switch or to control LEDs, buzzers, sensors, etc. Can also be sewn onto clothing – washable (e-textile technology).</p>	
<p>LILYPAD PUSH BUTTON MODULE</p>	<p>PUBUTLPM</p>	<p>3.10</p>	<p>LILYPAD CR2032 COIN CELL BATTERY HOLDER MOUNT MODULE</p>	<p>BHCR2032LP</p>	<p>3.48</p>
	<p>LilyPad Button Board Module for Arduino DIY kits. Can be sewn onto clothing – washable (e-textile technology). Momentary push button (i.e. button closes when you push it and opens when you release it). 8x16mm 0.8mm PCB.</p>			<p>The LilyPad Coin Cell Battery Holder has a small slide switch installed on the board, in-line with the power so you can shut off your project and save batteries. This slide switch is the same as on the LilyPad Slide Switch Board, so it's not easy to accidentally turn off or on.</p> <p>Holds a CR2032 coin cell battery and gives you four connection points (two positive and two negative) for sewing into your project. Dimensions: 2.9x2.8x0.58mm.</p>	
<p>PLUG TO PLUG JUMPER LEADS 40 PCE</p>	<p>PLJUMPLD40</p>	<p>7.95</p>	<p>SOCKET TO SOCKET JUMPER LEADS 40 PCE</p>	<p>SOCJUMPLD40</p>	<p>7.95</p>
	<p>A pack of 40 jumper leads of various colours for prototyping. Ideal for Arduino®, Raspberry Pi & DIY projects. Each flexible lead has pins to suit breadboards or PCB headers.</p> <p>Overall length 20cm.</p>			<p>A pack of 40 jumper leads of various colours for prototyping. Ideal for Arduino®, Raspberry Pi & DIY projects. Each flexible lead has pins to suit breadboards or PCB headers.</p> <p>These sockets also fit LED legs, thus eliminating the need to solder.</p> <p>Overall length 20cm.</p>	

<p>40 PIN STRIP FOR UNO R3 PIN40</p>  <p>2.54mm single row male pin header strip for prototype shield. Pin length: 11mm.</p> <p>Compatible for Arduino® projects.</p>	<p>1.00</p>	<p>IC SOCKET 20 PIN STRIP PIN20</p>  <p>2.54 strip tin PCB panel IC breakable 20 pin header socket round female pin header.</p> <p>Compatible for Arduino® projects.</p>	<p>0.90</p>
<p>TEMPERATURE SENSOR DS18B20 SENSDS18B20</p>   <p>DS18B20 temperature sensor To-92 package. This digital thermometer provides 9 to 12-bit (user configurable) temperature readings which indicate the temperature of the device. It does not require any external components to work. 1-wire interface requires only one port pin for communication. Can be powered from data line itself - no need for external power source. Power supply range: 3.0 - 5.5V. Measuring range: -55°C to +125°C (±0.5°C Accuracy). Conversion time: <750ms (12-bit temperature to digital word).</p>	<p>3.40</p>	<p>INFRARED RECEIVER DIODE FOR STARTER KIT DIOIRRRSK</p>    <p>Spare IR Receiver for Basic Starter Kit V2.0 (Code: UNOSTARTV2-NB). 3 pins.</p>	<p>3.80</p>
<p>HEADER STRIP 3 PINS HEADST3P</p>  <p>3 Way 2.54mm Header Strip. Compatible for Arduino® projects.</p>	<p>0.20</p>	<p>JUMPER WIRE CABLE – 5CM – MALE TO FEMALE WIREJU3FMFCAB</p>  <p>5cm Male to Female 2.54mm 3pin Breadboard Dupont Wire Ribbon Jumper Cable for Arduino.</p>	<p>0.55</p>
<p>10CM 2.54MM 3 PIN FEMALE FLAT RIBBON WIRE JUMPER CABLE TO BARE WIRE WIREJU3PFCAB</p>  <p>Suitable for prototyping.</p>	<p>0.55</p>	<p>HEADER STRIP – 40 PIN – FEMALE HEADST40F</p>  <p>Connector type : Female Header Pin type : Straight Number of pins: 40 Number of rows : Single Pitch : 2.54mm Gender : Female</p>	<p>0.90</p>



TILT BALL SENSOR	SENSSW520D	1.70	CLIP-ON BATTERY CONNECTOR – 9V -2.1MM DC CABLE PLUG 0.3M	BCLIPUNO	5.95
	Spare Tilt Sensor for Basic Starter Kit V2.0 (Code: UNOSTARTV2-NB).			9V battery snap to centre positive 2.1mm DC connector lead. Arduino compatible. Plug type: 5.5 x 2.1mm DC Cable length: 300mm	
USB CABLE A-B FOR ARDUINO	UNOCAB	2.50	BATTERY HOLDER – 4 X AA WITH SWITCH & 2.1MM DC PLUG	BH4AAUNO	6.65
	USB 2.0 A to B Male/Male type cable. Suitable to run a Arduino compatible controller from your computer or other 5V source. 30cm long cable.			Fits 4xAA Batteries With cover and On-Off switch. Arduino compatible DC Cable 2.1mm plug (centre positive). 150mm cable	
BATTERY HOLDER – 6 X AA WITH SWITCH & 2.1MM DC PLUG	BH6AAUNO	7.74			
	Fits 6xAA Batteries With cover and On-Off switch Arduino compatible DC Cable 2.1mm plug. 150mm cable				

CLOCK COMPONENTS

Requirements to make a CLOCK (using a QUARTZ MOVEMENT)

- 1 X Clock or Pendulum Movement
- 1 x Clock face / body materials
- 1 x Hour and Minute hands + 1 x Second hand
- 1 x Numerals or Dots or Bars

Optional / ideas: Pendulum (to suit pendulum movement), hanger bracket, movement cover, etc.

QUARTZ CLOCK MOVEMENTS		THREADED LENGTH (L)	SHAFT LENGTH (H)	Max clock face thickness		POSSIBLE USES	QTY	PRICE** (each)	
CODE	DESCRIPTION			HEX NUT (T)	EXT. NUT (TE)				
	MSSS	Very short shaft	5	13	3	---	CD, card, canvas	1 - 19 20 - 49 50 - 99 100+	11.97 11.12 10.26 9.37
	MSS	Short shaft	7	15	5	6	Plywood, Perspex sheet		
	MS	Standard Shaft	9	17	7	9	Thin board		
	ME	Extended shaft	12.5	21	10	12	Paling, board, tile		
	ME-HB	Extended shaft with moulded hanger bracket	12.5	21	10	12	Paling, board, tile		
	ML***	Long shaft	15	22	13	15	Red gum		
MR	Reverse movement	13	19	10	12	Novelty (i.e. where the clock is seen in a mirror)	Each	6.69	
			** While stocks last						
	MP	Pendulum movement Includes a hanger bracket and Heavy Duty battery. <i>Alkaline batteries are not recommended.</i>	12.5	21	10	12	Imitation Grandfather clock, Box / case	1 - 4 5 - 9 10+	14.98 14.63 14.31
	PENDOP	Pendulum operator	The Pendulum operator converts any of the clock movements to a pendulum movement. Used when the MP's movement shaft is not a suitable length.			Any clock using a Pendulum		1 - 4 5 - 9 10+	7.33 7.06 6.75

Each movement is supplied with a second hand (see section regarding selecting second hands), rubber washer, brass washer and a hexagon nut.

**Prices are for the quantity of each particular type of movement - NOT the total quantity of movements purchased.

ALL other items (incl. hour and minute hands) are to be ordered separately.
NOTE: If the order does not specify a movement type, ME will be supplied.
 All the movements use an AA battery (Battery not included - except with MP).

***MLs currently out of stock – more expected June

ALL MOVEMENTS ARE GUARANTEED FOR 5 YEARS.


















HOUR & MINUTE AND SECOND HANDS

ITEM	QUANTITY	1 - 19 sets	20 - 49 sets	50 - 99 sets	100+ sets	ADDITIONAL SECOND HANDS
HOUR & MINUTE HANDS	PRICE	2.05	1.84	1.67	1.44	0.75

NOTE: Prices are for the quantity of each particular set of hour and minute - NOT the total quantity of hands purchased.

Dimensions shown (mm) indicate the length of the hands from the centre of the holes. If the hands are too long, they can be trimmed with scissors. The hands have a protective film which should be peeled off.

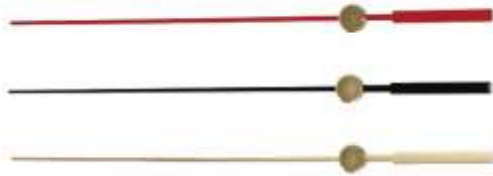
NOTE. If the order for hands does not specify an item number, H2140 will be supplied. If no colour is specified, Black will be supplied (i.e. H2140B).

						
CODE	H211	H219	H227	H231	H233	H240
HOUR HAND (mm)	72	60	32	50	65	72
MINUTE HAND (mm)	102	90	46	72	100	102
COLOUR	B,G	B,G	B,G	B,G	B,G	B,G
SECOND HAND (mm) & COLOUR	102 R	90 R,B,G	57 R,B,G	72 R	102 R	102 R
						
CODE	H241	H257	H270	H277	H2140****	H2212
HOUR HAND (mm)	55	39	91	44	62	32
MINUTE HAND (mm)	79	50	127	63	95	45
COLOUR	B,G	B,G	B,G	B,G	B,G	B,G
SECOND HAND (mm) & COLOUR	72 R	57 R,B,G	102 R	72 R	102 R	57 R,B,G
						Colour Codes: R: Red B: Black G: Gold <i>Photos not to scale</i>
CODE	H2282	H2291	H2351	H2361	H2382	
HOUR HAND (mm)	38	45	31	25	21	
MINUTE HAND (mm)	53	62	40	34	30	
COLOUR	B,G	B,G	B	B,G	B,G	
SECOND HAND (mm) & COLOUR	57 R,B,G	72 R	40 R	37 R	37 R	

*** H211G, H219B, H219G, H270B & H277G are currently out of stock. New shipment expected March / April, 2024.

****H2142B/G have been replaced by H2140B/G. H2140 has shorter hour & minute hands than H2142

SECOND HANDS



CODE	COLOUR	LENGTH
SH37R	R	37mm
SH40R	R	40mm
SH57R/B/G	R, B, G	57mm
SH72R	R	72mm
SH90R/B/G	R, B, G	90mm
SH102R	R	102mm

Colour Codes:
B: Black
R: Red
G: Gold

Second Hands are included in the price of the Movements, however additional second hands can be ordered.

NOTE: For Hour & Minute Hands that are supplied with either 57mm or 90mm Second Hands, please choose from red, black or gold Second Hands. If no colour is specified on order, red Second Hands will be supplied.




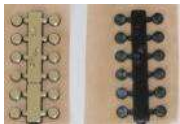
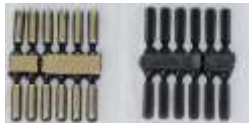
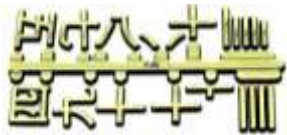


CLOCK ACCESSORIES

					
ITEM NAME	MOVEMENT COVER	EXTENSION NUT	CD WASHER	HANGER BRACKET	USING THE SUPPLIED HEXAGON NUT
CODE	MOVCL	ENUT5	WASHCD	HANG-BKT Suits movements: ME, MSSS, MR	
PRICE (each)	1.45	0.48	0.27	0.49	
				HANGER BRACKET – ROUND SILVER SHAFT HANG-BKT-RS Suits movements: ML, MS, MSS	
				0.49	USE AN EXTENSION NUT for 2.0mm thicker material

CLOCK NUMERALS

When ordering, state **TYPE, FINISH and SIZE**: If not specified, **NUMA-15mm Black** (i.e. **NUMA15B**) will be supplied.

These are moulded plastic numerals, approx. 1-1 ½ mm thick, with self-adhesive and a backing sheet. However, during storage, the adhesive on the back may deteriorate. If so, you can apply one of the commercially available adhesives, such as Selley's „Superglue” (Brush-on) or one of the spray on adhesives – eg. Fuller's „Permanent Bond”.

ITEM NAME	CODE	SIZE	FINISH	PRICE (each – for 1 type only)				
				1 - 19	20 - 49	50 - 99	100+	
	NUMERALS - ARABIC	NUMA	Set of 12 Arabic Size: 10, 12, 15, 20, 25 mm	G : Gold or B : Black	3.68	3.55	3.43	3.28
	NUMERALS - ARABIC	NUMA	Set of 12 Arabic Size: 12, 15 & 18 (approx.) LIMITED QUANTITIES	W : White	3.68	3.55	3.43	3.28
	NUMERALS - ROMAN	NUMR	Set of 12 Roman Size: 10, 12, 15, 20, 25 mm	G : Gold or B : Black	3.68	3.55	3.43	3.28
	NUMERALS - DOTS	NUMD	Set of 12 Dots Size: 4.5, 8 & 10 mm	G : Gold or B : Black	2.58	2.45	2.30	2.18
	NUMERALS - BARS	NUMB	Set of 12 Bars Size: 10, 12 & 19 mm	G : Gold or B : Black	2.58	2.45	2.30	2.18
	NUMERALS - CHINESE CHARACTERS	NUMC	Set of 12 Chinese characters. Size: 12 & 20 mm LIMITED QUANTITIES	G : Gold	3.33	3.19	3.07	2.94
	NUMERALS - HEBREW	NUMH	Set of 12 Hebrew characters. Size: 20 mm (approx.) LIMITED QUANTITIES	G : Gold	3.33	3.19	3.07	2.94
	NUMERALS - PARTIAL SUNBURSTS - ARABIC	NUMSUNA	Set of Part Sunbursts – Arabic Numerals Size: 75, 100 & 125 mm (Price varies according to the size) LIMITED QUANTITIES	G : Gold	3.64			
					4.16			
					4.68			



NUMERALS –
PARTIAL
SUNBURSTS –
OLD ENGLISH

NUMSUNOE

Set of Part Sunbursts – Old English

Size: 75, 100, 125 mm
(Price varies according to the size)

G: Gold

3.64

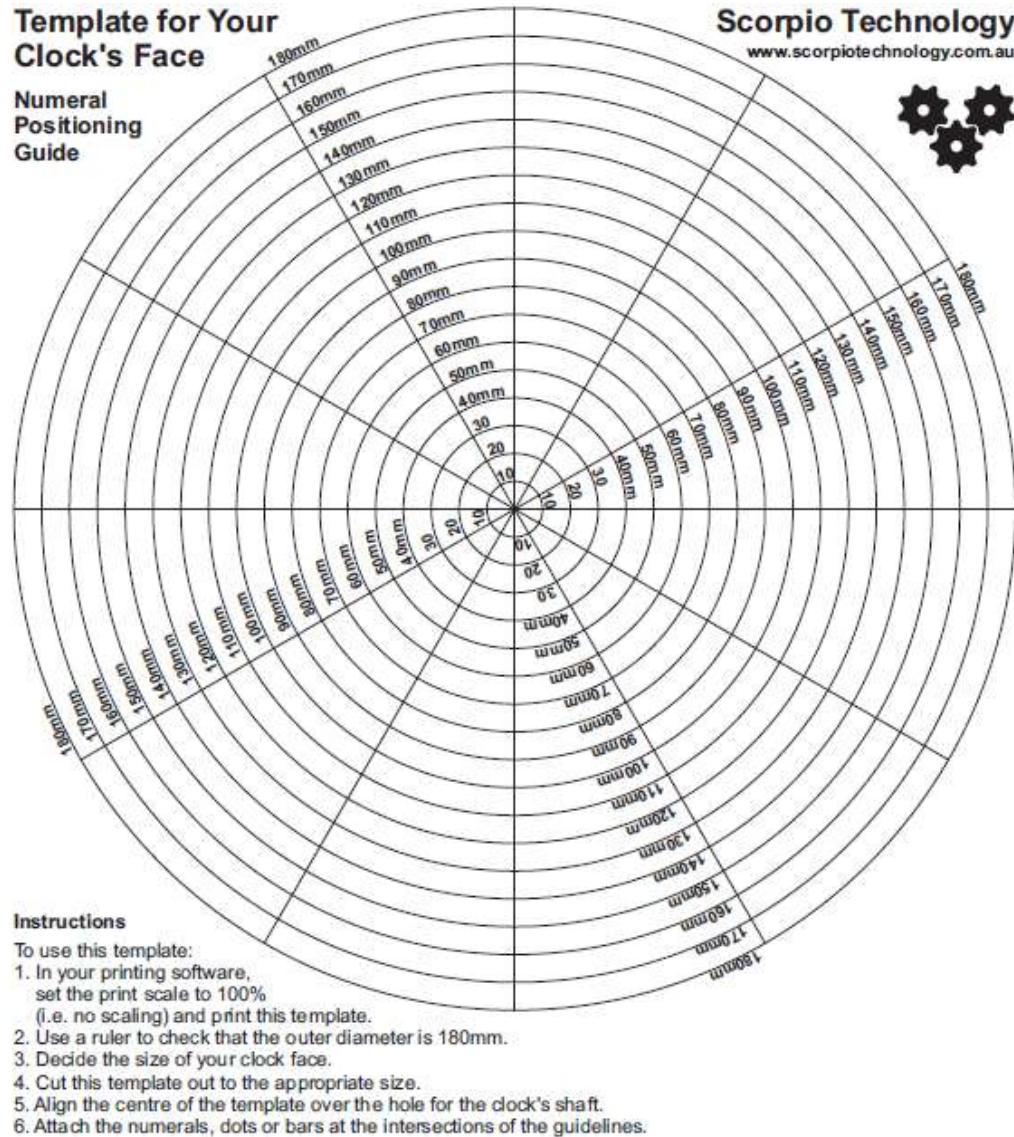
4.16

4.68

LIMITED QUANTITIES

PHOTOS NOT TO SCALE


IF REQUIRED, WE CAN EMAIL YOU A COPY OF OUR “NUMERAL POSITIONING GUIDE”.



DECORATIVE CLOCK DIAL CORNERS


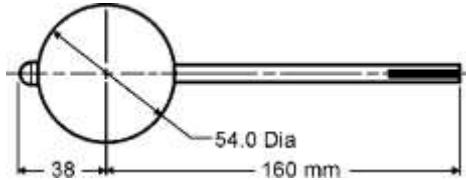

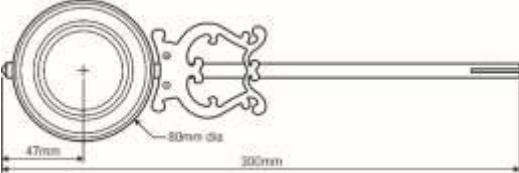


When ordering, state TYPE and SIZE:

These are moulded plastic gold on black plastic decorative clock dial corners, approx. 1-1 ½ mm thick, with self-adhesive and a backing sheet. However, during storage, the adhesive on the back may deteriorate. If so, you can apply one of the commercially available adhesives, such as Selley's „Superglue” (Brush-on) or one of the spray on adhesives – eg. Fuller's „Permanent Bond”.


	ITEM NAME	CODE	DESCRIPTION	SIZES (approx.)	PRICE (per set)
	CLOCK DIAL CORNERS - SCROLL	DECSCROLL	Set of 4. Gold on Black. <i>LIMITED QUANTITIES</i>	30 x 30 x 42mm	3.00
				50 x 50 x 70mm	3.50
				60 x 60 x 84mm	4.00
	CLOCK DIAL CORNERS - CLASSIC	DECCCLASSIC	Set of 4. Gold on Black. <i>LIMITED QUANTITIES</i>	48 x 48 x 65mm	3.50
				61 x 61 x 84mm	4.00
	CLOCK DIAL CORNERS - HEART	DECHEART	Set of 4. Gold on Black. <i>LIMITED QUANTITIES</i>	25 x 25 x 34mm	3.00
				50 x 50 x 67mm	3.50

PENDULUMS & PENDULUM RODS

NOTE: To shorten the pendulum: remove the bob, cut the shaft and re-assemble.

PENDULUMS	ITEM NAME	CODE	PRICE (each)					
			1 - 4	5 - 9	10+			
	PENDULUM A	PENDUA	 <p>PENDULUM ROD 170mm long (as used in PENDUA) Code: PENDUR</p>			6.21	6.02	5.84
	PENDULUM B	PENDUB	 <p>PENDULUM ROD 270mm long (as used in PENDUB) Code: PENDURL</p>			12.68	12.21	11.72
PENDULUM RODS	PENDULUM ROD SIZE	CODE	PRICE (each)					
	170mm long	PENDUR	3.91					
	270mm long	PENDURL	4.83					
<i>NOTE: Photos not to scale.</i>								

CLOCK FACE

	A round Clock Face – a 25cm Diameter Clock face with a hole in the middle (to suit our movements). Made from 3mm thick Plywood and ready to paint	CLPLYF	5.56		
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RESIN ART CLOCK PROJECT






The *RESIN ART CLOCK* is a **Materials & Technologies Specializations focused project** which allows students to create a personalized clock face using coloured Epoxy Resin. Students can mix, pour and manipulate the resin into the desired patterns to create a unique clock face, of their own design. This clock making project is suitable for students in years 8 to 12 in a supervised environment.



Available in class packs for 10 students ([RESART10](#)) or 20 students ([RESART20](#)).

- More information is available in the online Overview.

Coming Soon: Resin Art Clock Kit ([RESARTSING](#)) for hobbyists or Home Education settings. See details below.

ITEM NAME	CODE	DESCRIPTION	PRICE
 RESIN ART CLOCK PROJECT – 10 STUDENTS	RESART10	This kit contains enough 25cm clock faces, movements, hands, hangers and numerals for 10 clocks. It includes 1.0L of resin and 6 x 10g colour packs. The colours are: Dark Blue; Light Blue; White; Black; Gold; Green.	290.00
 RESIN ART CLOCK PROJECT – 20 STUDENTS	RESART20	This kit contains enough 25cm clock faces, movements, hands, hangers and numerals for 20 clocks. It includes 2.0L of resin and 8 x 10g colour packs. The colours are: Dark Blue; Light Blue; White; Black; Gold; Purple; Green; Red.	560.00
 RESIN ART CLOCK KIT	RESARTSING (MICAXXXX)	The <i>RESIN ART CLOCK KIT</i> allows you to create a personalized clock face using coloured Epoxy Resin. This kit includes one clock kit, 25cm clock face, 100ml Epoxy resin, disposable gloves, stirrers and a choice from 5 different resin colour palletes. <i>Palletes to choose from (pick one from the following):</i> 1. MICAOCEAN (Blue) = Navy Blue / Teal Blue / White 2. MICAGREEN (Green) = Aqua Green / Gold / Teal Blue 3. MICAPURPLE (Peacock) = Purple / Pink / Aqua Green 4. MICABLACK (Red) = Black / Gold / Red Wine 5. MICAPASTEL (Pastel) = Baby Pink / Lilac / Baby Blue COMING SOON - contact us prior to ordering, please.	38.50

DISPOSABLE CUPS (FOR USE WITH RESIN ART PROJECTS)

ITEM NAME	CODE	DESCRIPTION	PRICE
 DISPOSABLE CUP – 60ML	CUP60	Non-toxic, recyclable, waterproof lined 60ml capacity cup for holding liquids up to 24 hours. Single use with graduated lines from 5ml to 60ml in 5ml increments. Medical grade and TGA registered. Pack of 20.	2.20
 DISPOSABLE CUP – 250ML	CUP250	Disposable, high quality insulated 250ml cup. Can also be used for hot or cold drinks. Pack of 10.	1.30

Scorpio Technology stocks a wide variety of disposable gloves and masks for use with the Resin Art Clock . Please see our **“SAFETY WEAR”** section.

DISPOSABLE SYRINGES – PLASTIC (FOR USE WITH RESIN ART CLOCK OR OTHER ART PROJECTS)



CAPACITY	CODE	DESCRIPTION	QTY PER PACK	PRICE
1ml	GE4296-01	All purpose plastic disposable syringe. No needle. Luer Slip and eccentric nozzle. Pack of 100.	100	20.90
2ml	GE4297-01		100	16.50
3ml	GE4298-01		100	12.10
5ml	GE4299-01		100	14.30
10ml	GE4300-01		100	24.20
20ml	GE4301-01		100	48.40

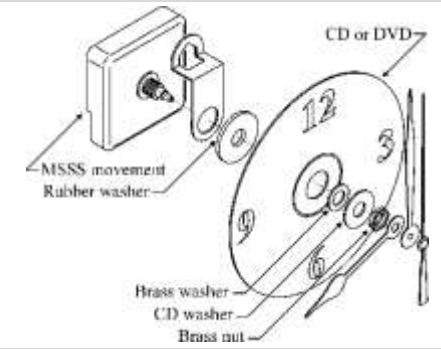
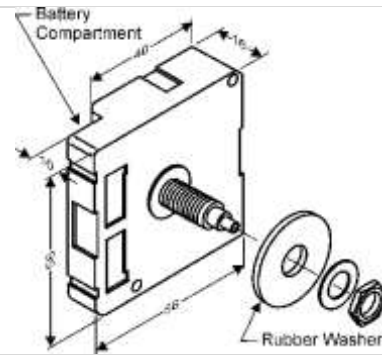
HOW IT GOES TOGETHER:

QUARTZ CLOCK MOVEMENT

This is a 56mm square AA battery operated movement, and is inserted from the back of the clock's face, with the hands and numerals being put on once the movement is mounted

NOTE: More Clock design information is in our Clock Teaching unit, which is supplied with every Clock order.

- We can also provide a Numeral Positioning Guide.

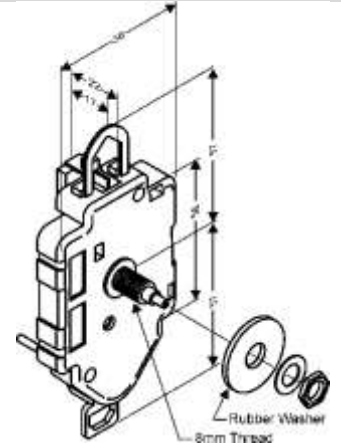


THE PENDULUM MOVEMENT

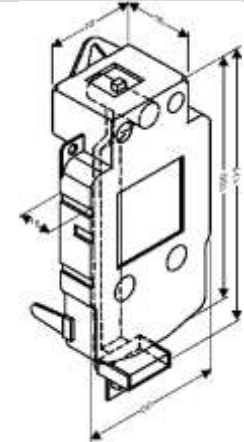
The quartz Pendulum movement incorporates both the movement and pendulum in one unit

THE PENDULUM OPERATOR

A Pendulum Operator is designed so that it can be used with any of the movements, to take advantage of different shaft lengths. The selected movement is assembled into the operator (remember to allow for the thickness of the pendulum operator's case, as this reduces the usable shaft length by approximately 1mm)



PENDULUM MOVEMENT



PENDULUM OPERATOR

INSERT CLOCKS

AN Insert Clock (sometimes called a “fit up clock”) is a complete clock, but without a body. It consists of the movement, clock face, hands, glass and bezel (surround or outside ring). They range in size from a bezel diameter of 36mm to 130mm.

For these clocks you need to make a suitable clock housing which allows the clock to be inserted from the front into an appropriate sized hole in the clock’s body. The advantages of using an insert clock include: - the attractive finished appearance of the clock, and: - the smaller inserts can be used in places where the quartz movement won’t fit.

Photos below not to scale.



ICS36



ICS36GG



ICS38GW



ICM56



ICM56GG



ICMT63



ICLC80



ICLG80



ICLLC130



ICLLG130

CODE	BEZEL DIA.	BEZEL COLOUR	FACE COLOUR	BATTERY TYPE	BATTERY	APPROX. HOLE SIZE	PRICE** (each)			
							1-4	5-9	10-19	20+
ICS36	36mm	Gold	White	Button Cell	Included	33mm dia.				
ICS36GG	36mm	Gold	Gold	Button Cell	Included	33mm dia.	16.16	15.20	14.24	13.29
ICS38GW	38mm	Gold	White	Button Cell	Included	36mm dia.				
ICM56	56mm	Gold	White	“N” type	Not included	52mm dia.	15.68	15.00	14.27	13.54
ICM56GG	56mm	Gold	Gold	“N” type	Not included	52mm dia.				
ICMT63	63mm	Gold	White	“N” type	Not included	58mm dia.			13.78	
ICLC80	80mm	Chrome	White	AA	Not included	76mm dia.			17.86	
ICLG80	80mm	Gold	White	AA	Not included	76mm dia.				
ICLLC130	130mm	Chrome	White	AA	Not included	82mm dia.			26.96	
ICLLG130	130mm	Gold	Gold	AA	Not included	82mm dia.				

** Prices are for the quantity of each particular type of insert clock- NOT the total quantity of insert clocks.

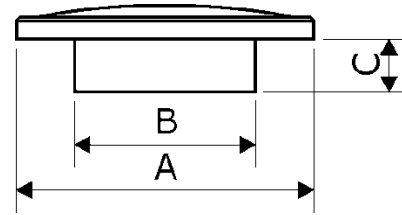
INSERT CLOCK – GENERAL INFORMATION

INSERT CLOCK DIMENSIONS

A – The overall diameter of the outside of the clock insert (the bezel).

B – the inserts' mounting diameter. This dimension shows the diameter of the counter-bore that the insert will fit into.

C – the mounting depth. This dimension is measured from the back of the bezel to the back of the insert's housing. This is how deep a counter-bored insert mount hole should be.

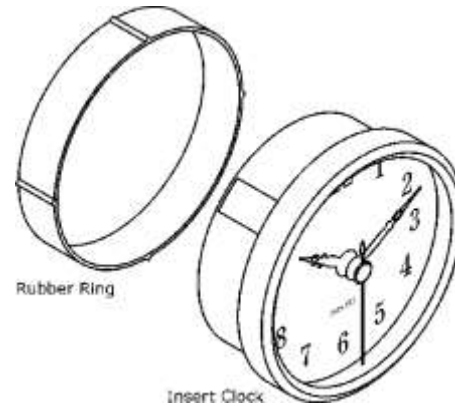


INSERT CLOCK MOUNTING TYPE

Rubber Ring Mounting System

This mounting style usually has a rubber ring with flanges, which helps to hold the insert clock in place in the counter-bored hole.

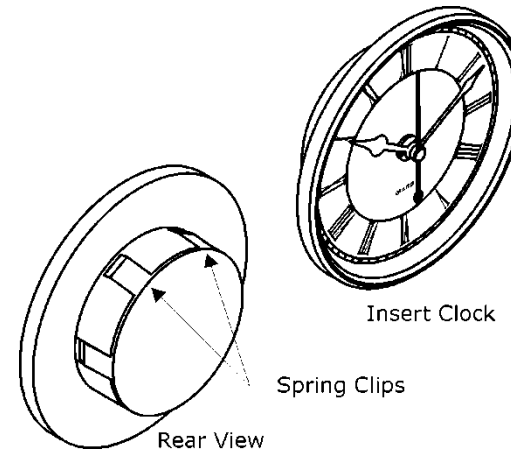
Note that rubber rings will vary depending on the insert clock chosen.



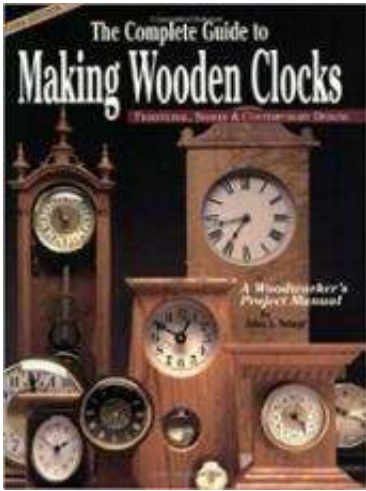
Friction Fit Mount System

This mounting style uses metal or plastic clips which will help to hold the insert in the hole. These clips can also be used to hold the insert clock in place if the hole has been drilled through.

Note: This style is popular with caravan makers, who make a through hole in the bulkhead and push the insert clock through it.



CLOCK MAKING TEACHING AIDS & PUBLICATIONS



ITEM NAME	CODE	PRICE
THE COMPLETE GUIDE TO MAKING WOODEN CLOCKS	BOOKWOODCL	50.59
		
<p>By John A. Nelson.</p> <p>This book shows how to make beautiful timber clocks. Each clock has been photographed in colour, has instructions and plans. Suitable for a range of skill levels.</p>		

PENS AND PEN COMPONENTS




Requirements to make a TURNED PEN (using PEN COMPONENTS)



- 1 x Set of Pen components
- 1 x Mandrel (for turning the material on a lathe)
- 1 x Material for the Pen's body (wood or acrylic)

Optional / ideas: 1 x Pen holder & material to make a desk set; 1 x Presentation pouch


PEN COMPONENTS			Qty./ Pack	PRICE PER PACK			
				1-4 Pkts.	5-9 Pkts.	10-19 Pkts.	20+ Pkts.
	ITEM NAME	CODE					
	PEN COMPONENTS	PNCOMP	5	21.29	19.57	17.86	17.04
	PEN REFILLS - RED	PENREFR	1	0.68			
		Replacement refills for the turned pens					

ACCESSORIES FOR USE WITH TURNED PENS AND WOODWORKING HARDWARE

ITEM NAME	CODE	PRICE (each)
MANDREL	MANDREL	30.99
	For turning a pen, from wood or other materials. This mandrel is required for turning the pen material pieces in a lathe when our sets of Pen components are used.	
ACRYLIC PEN BLANKS	PENBLANK	4.54
	For turning to make a pen's body. This Acrylic pen blank can be turned on a lathe in a similar fashion to timber. Gives the choice of a different looking pen – this a grey / purple swirling patterned blank. Size: 19mm (diameter) x 127mm (long)	
PEN POUCHES	POUCH	1.04
	Pen pouches for turning a pen into gift! These pouches are of black velour with a closing drawstring at the end.	

<p>PEN CLIP</p> 	<p>PENCLIPAUS Australia themed Pen Clip.</p> <p>This clip is for use with the pen components in place of the supplied clip. Great for turning the pen into a present for overseas visitors.</p>	0.66
<p>PEN CLIP – PLAIN HANDLE</p>	<p>PENCLIPPL HANDLE</p>	0.73
	<p>U-shaped pull handle. Mild steel. 64mm (wide) with two 3.5mm screw holes (screws not included).</p> <p>Sold in pack of 10.</p> <p><i>NOTE: We stock a wide variety of screws. Please check "Fasteners".</i></p>	6.02

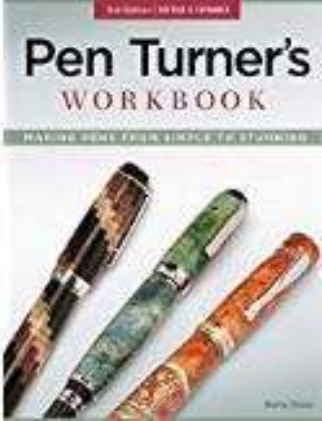
PENS & PEN HOLDERS

ITEM NAME	CODE	Qty./ Pack	PRICE		
			1 - 4	5 - 9	10+
PEN HOLDERS – BLACK	PNHB	5	9.20	8.77	8.47
PEN HOLDERS – GOLD	PNHG	5	9.20	8.77	8.47
 <p>Pen holder with Gold base. <i>PNHB</i> with black trumpet or <i>PNHG</i> with gold trumpet. Pen holders are supplied with 12mm long screws (included in the price)</p>					
PEN HOLDER SCREWS	CODE	LENGTH	Qty./ Pack	PRICE \$	
	SCRPH15	15mm	5	0.47	
	SCRPH18	18mm			
For thicker materials these longer screws are also available.					

BATTERIES






CODE	BATTERY SIZE	TYPE	Qty./ Pack	PRICE PER PACK
BATTAA	AA	Toshiba, Heavy Duty	4	3.90
BATTN	N Type	Super Heavy Duty <i>NOTE: Clearance item. Pack Best Before date 10/2020.</i>	2	2.72






PEN TURNING TEACHING AIDS & PUBLICATIONS

ITEM NAME	CODE	PRICE
THE PEN TURNER'S WORKBOOK: MAKING PENS FROM SIMPLE TO STUNNING	BOOKPENTURN	44.26
	<p>By Barry Gross.</p> <p>This stunning book shows a large variety of techniques and ideas to make beautiful lathe turned pens. The book is full of close-up photos showing step by step instructions.</p> <p><i>An excellent resource.</i></p>	





CLIP CIRCUIT, WOODEN CONSTRUCTION & GENERAL INTEREST KITS



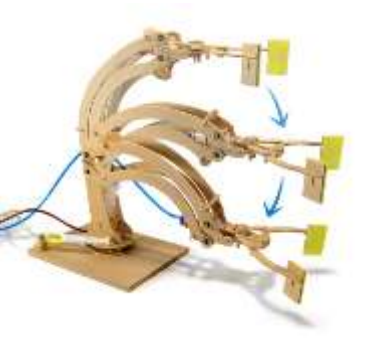

CLIP CIRCUIT & SNAP-ON CIRCUITS





ITEM NAME	CODE	PRICE	ITEM NAME	CODE	PRICE
14-IN-1 SNAP-ON ELECTRONIC PROJECT KIT	KJ8976	19.95	698-IN-1 SNAP-ON ELECTRONICS PROJECT KIT	KJ8985	86.95
 <p>A simple and fun snap on electronic project kit to engage young minds. Various experiments on circuits, motors, switches and more. Some of the projects include lamps and fans in both series and parallel circuit with variable controls; there is also a flying saucer project that really flies.</p> <ul style="list-style-type: none"> • Learn whilst building 14 electronic experiments • No tools or soldering required • Components simply snap together 			 <p>Build 698 projects to demonstrate various theories of electronics. A great educational tool. Components easily snap together so building a circuit simple and safe. No soldering required. Requires 4 AAs. Supports STEM learning. Suitable for ages 8+.</p> <p>Projects are described in a detailed instruction manual which illustrates each component and how they are connected, in an easy to follow format, suitable for primary age children.</p> <p>Requires 4 x AA batteries.</p>		
STARTER LAB 14 EXPERIMENTS	HJ020				17.00
 <p>An Electronic Kit for children! Easy to build electronics kit - all the components simply clip together No soldering required Using both Parallel and Series Circuits, all pieces of the kit are colour coded and marked to show how the current travels 14 experiments in all – one for each day of the fortnight Suitable for ages 7+ Required 2 AA batteries (<i>not included</i>) RUN OUT STOCK – WHILE STOCKS LAST.</p>					
ELECTROLAB 80 EXPERIMENTS	HJ0080				36.05
 <p>Kit features components that clip together, no soldering required All pieces are colour coded and marked to show how current travels The graphics on each component show its electronic symbol The included “easy to use” 26 page instruction manual details 80 educational experiments Experiments include doorbells, alarms, flash lights and more Easy to build electronics kit for ages 7 to 12 Required 4 AA batteries (<i>not included</i>) RUN OUT STOCK – WHILE STOCKS LAST.</p>					
NOISY LAB	HJ0021				20.39
 <p>Each piece has a function: switches, speakers, battery packs, etc. They are all colour coded and numbered to easily identify each and clip together Graphics on each component show its electronic symbol Create sounds & an assortment of sound effects that you can control using a variety of switches For ages 7 to 12 Requires 2 AA batteries (<i>not included</i>) RUN OUT STOCK – WHILE STOCKS LAST.</p>					






ADVANCED LAB 180 EXPERIMENTS	HJ0180	58.97
	<p>The Advanced Lab kit comes with an easy-to-use instruction manual for 180 experiments No electronic experience necessary Recommended age from 7 years+ with adult supervision Powered by 4 AA batteries (<i>not included</i>) RUN OUT STOCK – WHILE STOCKS LAST.</p>	
HELICA FAN CAR	HJ0031	21.60
	<p>Each piece has a function: switches, motors, battery packs, etc. All colour coded & numbered for easy identification Graphics on each component show its electrical symbol to help illustrate how the current travels through the circuit built Easy to build electronics kit for ages 7 to 12 Components clip together 4 electronics experiments Requires 2 AA batteries (<i>not included</i>) RUN OUT STOCK – WHILE STOCKS LAST.</p>	
AIRBOAT	HJ0030	20.39
	<p>Each piece has a function: switches, motors, battery packs, etc. Easy to build electronics kit for ages 7 to 12 Components clip together 4 electronics experiments No experience necessary Requires 2 AA batteries (<i>not included</i>) RUN OUT STOCK – WHILE STOCKS LAST.</p>	
INTELLIGENT ROVER ROBOT	HJ1100	69.00
	<p>Over 100 experiments including alarms, flashing lights & sounds Also features infrared control & radar detector, allowing the creation of remote control vehicles which can intelligently avoid obstacles Includes easy to use 20 page manual Easy to build electronics kit for ages 7 to 12 Components clip together Requires 4 AA batteries (<i>not included</i>) RUN OUT STOCK – WHILE STOCKS LAST.</p>	
FM RADIO SNAP-ON ELECTRONICS PROJECT KIT	KJ8978	9.95
	<p>Build a fully functional selectable FM radio with this simple snap on kit. For children 7 years and older, this kit allows them to learn about electronics whilst having fun. All parts simply clip together and are easily taken apart to be reused for other experiments over and over again. 2 X AA batteries required (<i>not included</i>). DISCONTINUED – RUN OUT STOCK – WHILE STOCKS LAST.</p>	

PATHFINDERS WOODEN MECHANICAL KITS




ITEM NAME	CODE	PRICE
STEM CLASS KIT	WM6717	350.00
	<p>Get your students asking questions and solving problems then applying them to our everyday life. Take the design process from conception to an end product, learning new skills along the way.</p> <p>This Pathfinder STEM class pack includes a teacher info booklet with lesson plans and ideas, plus a 15 page photocopyable student handbook with info about the history of hydraulics machines.</p> <p>Great for use in the study of: Lever & simple machines; fluid dynamics; engineering; and design & technology.</p> <p>Teachers need only scissors, glue and cardboard to get their class inventing with parts for 30 students in pairs to build over 15 machines with an average of 4 pistons per machine.</p> <p>All pieces are pre-cut and pre-drilled for easy and very sturdy construction.</p> <p>Suitable for beginner model makers.</p> <p>Precisely cut and ready to assemble with timber slot construction.</p> <p>Has an excellent, easy to read and understand building manual with clear illustrations.</p>	
DA VINCI CATAPULT	WM6703	39.00
	<ul style="list-style-type: none"> • See how far you can hurl clay balls & other objects with your catapult! • Designed by Leonardo da Vinci, but never constructed as a full scale machine • Pre-cut natural wood & plywood pieces • Detailed instruction manual • Ages 8+ 	
DA VINCI WOODEN BRIDGE	WM6718	23.50
	<ul style="list-style-type: none"> • The Leonardo Emergency Bridge • One of Leonardo Da Vinci's many designs • Bridge designed to be set up and dismantled easily by armies • Dimensions (approx.): 22.5cm x 10cm 	
DA VINCI HELICOPTER	WM6705	39.00
	<p>Leonardo da Vinci developed concepts for a giant air screw late in the 15th century. This working model uses a bevel gear, also from his drawings, to spin the canopy and support structure, illustrating the way Leonardo thought flight might be possible.</p> <p>A fun and inspiring project from one of the greatest minds of history.</p> <p>Easy to make from pre-cut and pre-drilled sustainable timber. Finished model size is 38cm high by 23 cm wide.</p>	

HYDRAULIC GEARBOT	WM6723	45.00
	<ul style="list-style-type: none"> • Hydraulic operated & geared catapult • Relatively easy to assemble • Instruction manual included information about the different gears • Can be used to launch small objects (popcorn, marshmallows, etc.) • “2016 Toy of the Year Award” for building kits (Creative Child Magazine) • Ages 8+ 	
HYDRAULIC MINI MACHINES KIT	WM6706	52.95
	<ul style="list-style-type: none"> • This kit contains 4 hydraulics kits in one mini-Mega box of fun. Kits included are: Mini Scissor Lift, Mini Platform Lifter, Mini Cherry Picker, and Mini Excavator. It's almost like getting 2 free kits! • These kits provide hours of interesting building and thoughtful use – building blocks, moving Lego people around the house, and for those who want to give their mouse the ride of his life! • Most models stand between 18 and 24 cm high when fully extended and can hold things like a glass of milk, toys, false teeth and other fun items! 	
HYDRAULIC ROBOTIC ARM	WM6710	45.00
	<ul style="list-style-type: none"> • Robotic articulated arms can be found in factories all over the world • Model uses a battery of independent hydraulic circuits to provide absolute control over the arm pincers ... grip, lift, twist, lower and release • Integrate the arm into other construction sets while learning the basics of hydraulics and robotics • Contains 66 pieces • Model size: 200mm x 600mm x 340mm • Made of sturdy pre-cut plywood with an MDF base it is easy to assemble and designed to give our budding engineers a start • Ages: 8+ 	
MEGA BUILDER CRANE	WM6730	42.95
	<p>Assemble a working crane model complete with levers to lift and move objects with this Mega Builder Crane wooden kit.</p>	





ROMAN CATAPULT WOODEN KIT	WM6731	39.00
	<p>The Roman catapult improved on the medieval design by the addition of torsion springs.</p> <p>Originally invented by the Greeks over 2000 years ago and widely used by the Romans in battles and sieges, the Catapult had many different methods of firing. During the Roman Empire the catapult was refined and improved. This model represents a smaller version of a common catapult style of the time.</p> <p>Based on drawings and written records, this Catapult re-creates the way in which tension powered siege engines worked and can fire the small clay balls (included) and other soft projectiles over 15 feet!</p>	39.00
ROMAN ONAGER WOODEN KIT	WM6732	39.00
	<p>The Roman Onager catapult is a version of a Mangonel which uses a sling bucket to launch. The Onager was a powerful siege engine used by the Roman army during the late Roman Empire in battle and to lay siege to city walls and fortifications in their territories around the Mediterranean Sea and beyond. Its name comes from the Latin word for 'wild ass' – when it launched its payload it would have had a strong recoil kick resembling the native donkey of Persia (who knew?).</p> <p>This Onager re-creates the way in which torsion-powered siege engines worked. It can fire a small clay ball (included) and other soft projectiles over 15 feet! Like all Pathfinders' kits, it is a fun and interesting kit to build and it really works! Model size 40cm long x 28 cm high.</p>	20.00
STRAUSS TRUNNION BASCULE BRIDGE	WM6708	20.00
	<ul style="list-style-type: none"> • A replica of the Joseph Strauss design that was made all over North America in the 1920's and 1930's. Great to use for school bridge studies and to learn more about interesting linkages • Well known bridges of this type are the Johnston Street (Blue Bridge) in Victoria, B.C., Wishka River bridge in Washington, the Ashtaula Bridge in Ohio, the Cherry Street bridge in Toronto and the Third Street Bridge in San Francisco. • Sized to fit wooden train sets, this bridge is an elegant reminder of the cool truss bridges that used to be built years ago and are still in use! • This kit will bring a new level of sophistication to playing with wooden cars and trains. Gives you the chance to be creative! 	28.00
SWING BRIDGE	WM6709	28.00
	<ul style="list-style-type: none"> • Truss design • Once assembled, turn the handle to swing the centre of the bridge 360° • Designed to fit wooden train sets • Natural plywood pieces • Comprehensive instruction manual included • Requires 1 – 2 hours to assemble 	






<p>TROJAN HORSE</p> 	<p>WM6733</p> <p>Ancient Greek legends have many references to the Trojan Horse – a huge wooden horse that was left in Troy – with warriors inside. When it was brought into the walled city, the warriors came out (late at night when everyone was asleep) and took over and opened the doors to the entrances – allowing the Greek warriors hiding in the area, outside the city’s walls, to overrun the city.</p> <p>Based on drawings and written records, this Trojan Horse model allows you to re-create one of the most epic tales of ancient Troy – although on a much smaller scale.</p> <p>Suitable for beginner model maker.</p> <p>Ages: 8+</p>	<p>54.00</p>
<p>SKY SURFER AIRPLANE LAUNCHER</p> 	<p>WM6735</p> <p>The world’s coolest airplane launcher, from <i>Pathfinders</i>, tested in science centers across this nation and with kids of all ages – has arrived!</p> <p>Launch planes from 3 to 16 metres (approx.) – and more (especially if you are standing near a cliff, and the plane goes over...)! Launch planes in a repeatable and consistent way - perfect for budding engineers (and even real ones) to test and evaluate their designs!</p> <p>Build takes about 30 minutes.</p> <p>Includes 20 page booklet with plane designs, ideas, paper and card.</p> <p>Suitable ageswh: 14+.</p> <p>41cm long.</p>	 <p>39.95</p>
<p>DA VINCI AERIAL SCREW MINIATURE</p> 	<p>WM6745</p> <p>The Da Vinci Aerial Screw Miniature is an iconic image that defines an artist and inventor well ahead of his time. This working model has a canopy that spins on the support structure, illustrating a way Leonardo thought flight might be possible!</p>	<p>25.00</p>
<p>DA VINCI CROSSBOW WOODEN MINIATURE</p> 	<p>WM6740</p> <p>The da Vinci Crossbow Miniature is a working re-creation of his 15th Century design. The Giant Crossbow is one of Leonardo’s most epic weapons. He made drawings of many crossbow styles, and this one was designed to launch stone balls, instead of arrows, like most crossbows. We don’t know if it was ever made, but it sure was big!</p>	<p>25.00</p>



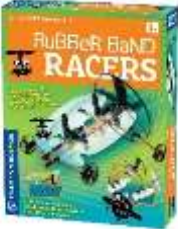


CREATOR WOODEN KITS (HEEBIE JEEBIES)

ITEM NAME	CODE	PRICE
DYNAMO GENERATOR - CREATOR	HJ1891	29.95
 <p>The image shows the packaging for the Dynamo Generator kit, which is a wooden hand-crank generator. The box is blue and white with the word 'DYNAMO' prominently displayed. Next to the box is the assembled wooden generator, which has a hand crank on the side and a small LED light attached to the front.</p>	<p><i>Build your own 10cm tall hand-crank wooden generator. Turn the handle and watch the LED light up (no battery or solar panel required)!</i></p> <p>This kit works on the basic principles of electromagnetic induction. A great STEM project.</p> <p>Contains 50 pieces. Recommended for ages 12 - 14.</p>	
SCRIBBLEBOT - CREATOR	HJ1894	25.50
 <p>The image shows the packaging for the ScribbleBot kit. The box is green and white with the word 'SCRIBBLEBOT' in large letters. It features an illustration of the drawing robot, which has a central motor and three arms holding colored pencils. The box also shows some examples of the patterns the robot can create.</p>	<p><i>Build your own drawing robot which uses vibration and spin generated by a motor, to create your works of art!</i></p> <p>This kit is easy to build with easy-to-follow illustrated instructions. Fantastic STEM project for ages 8+. The height and angle of the coloured pencils can be adjusted to make different patterns.</p> <p>Includes: baseplate, cover, motor with 3 arm supports, 3 pen holders, 3 brushes, 3 pens, nuts & screws.</p>	
WIND WALKER WIND POWERED STRANDBEEST	HJ1803	29.95
 <p>The image shows the packaging for the Wind Walker kit. The box is brown and white with the words 'WIND WALKER' and 'STRANDBEEST' on it. It features an illustration of the wind-powered robot, which has a large, multi-bladed turbine on top and a body that looks like a small insect or walker. The box also shows some details of the robot's construction.</p>	<p>The original Wind Walker Strandbeest, <i>Rigide Properans</i>, was designed by Theo Jansen in 1995 and used the wind flowing through its turbines and the amazing engineering design, to power it.</p> <p>This kit version is a great STEM project for kids ages 8+. Contains 130 pieces and, this too, moves by wind power.</p>	







FORCES, MOTION & ENERGY – FLIGHT, ROCKETS & RACERS

ITEM NAME	CODE	PRICE
AIR + WATER POWER	SN555001	69.95
	<p>Build your own models powered by air and water pressure to learn about the laws of physics. This unique kit allows you to build two different air-and-water-powered systems: water-jet propelled cars and hydro-pneumo (which simply means air pressure and water pressure) powered engines. The hydro-pneumo system uses a self-contained air-and-water turbine system as a motor.</p> <p>Construct 15 models including a truck, excavator, radar car, tank, antique car, helicopter, motorbike, backhoe, rocket car, forklift, roadster, propeller plane, grinder, and cutting machine. The water-jet propelled cars are a fun outdoor activity, while the self-contained hydro-pneumo powered models are fun both indoors and out. Compete with your friends to see whose water-jet propelled car and hydro-pneumo car goes the farthest!</p> <p>This <i>Thames & Kosmos</i> set contains 165 building pieces and comes with a 48-page color instruction book.</p> <p>Ages: 8+.</p>	
AERO DANCER	SN5550035	39.00
	<p>From Thames & Kosmos, build a zany inflatable tube dancer that uses the physics of flowing air to perform its eye-catching moves. Like the air dancers and tube men you may have seen around your town, this motorized device uses a blower motor and a fabric tube to slink, shimmy, and shake around. Assemble the model to learn about its inner mechanisms, including fan and electric circuit, complete with battery, motor, and switch. Conduct four fun additional experiments that demonstrate principles in air pressure, air flow, and aerodynamics. Make a ball float on a stream of air, practice your aim in a game of air basketball, and launch balls into the air with the air cannon. This hands-on kit brings physics to life as it demonstrates the power of air pressure at work. An eight-panel, full-color manual guides your model building with step-by-step illustrated instructions is included.</p> <ul style="list-style-type: none"> • Build your own tube dancer--over 1 foot tall! • Learn about gears and circuits as you assemble your tube dancer's fan--complete with battery, motor, and switch. • Conduct physics experiments with air pressure, air flow, aerodynamics, and fluid dynamics. • Includes fun, hands-on activities and challenges like air basketball, a floating ball trick, and air cannon. • An eight-panel, full-color manual guides model building with step-by-step illustrated instructions. <p>9V battery required (<i>not supplied</i>).</p>	
SIMPLE MACHINE – INCLINED PLANE	WDSM10	49.00
	<p>This wooden machine is elegantly designed and easy for students to use. It comes with a built in mass but the cart has a shallow indent for adding additional mass if needed. Student can study several different simple machine concepts off of this one apparatus. Supplied with manual. Click here to view manual.</p> <p>Size: 42 x 9 x 5 cm. Weight : 700 g.</p>	
SIMPLE MACHINE – GEAR TRAIN	WDSM11	63.00
	<p>This wooden machine has a sturdy wooden construction ideal for classroom use. This apparatus can model how gears work at a basic level to make work easier. Supplied with manual. Click here to see manual.</p> <p>Size: 39 x 9 x 15 cm. Weight: 1 kg.</p>	

<p>SIMPLE MACHINE – PULLEY</p>  <p>WDSM12</p> <p>This wooden machine has a sturdy wooden construction ideal for classroom use. This apparatus can model how the use of several pulleys increases one's mechanical advantage. Students can use this both qualitatively and quantitatively and its design lends itself easily to inquiry based activities. Supplied with manual. Click here to see manual. Size: 16 x 9 x 41 cm. Weight: 800 g.</p>	<p>41.50</p>	<p>SIMPLE MACHINE – SCREW</p>  <p>WDSM20</p> <p>This wooden machine has a sturdy wooden construction ideal for classroom use. The large block mounted around the head of the screw gives students additional leverage so they can easily break eggs or squish other objects with the screw that would be difficult to break with their bare hands. The square top also makes it easy to measure the distance top of the screw is turned vs. the distance the screw is sent into the board. Supplied with manual. Click here to see manual. Size: 20 x 10 x 11 cm. Weight: 680 g.</p>	<p>41.50</p>
<p>SIMPLE MACHINES</p>   <p>SN665069</p> <p>An excellent introduction to the study of mechanical physics. Learn all about simple machines and how they're used to make complex tasks easier to do.</p> <p>You will investigate all six classic simple machines — wheels and axles, levers, pulleys, inclined planes, screws, and wedges — as well as gears, through 26 model-building exercises. Start off with simple models to gain a firm understanding of the basic principles and then move on to larger, more complex models to push the machines harder and see how they can work together. Includes a specially designed spring scale so you can measure how the machines change the direction and magnitude of forces, making work easier to do.</p> <p>With this durable, modular construction system, you can see how the same basic elements combine in different ways to form each machine. The models can be assembled and disassembled again and again; combine the pieces to create your own configurations.</p> <p>Includes a 32-page, full-colour manual with examples of simple machines in action in everyday life.</p> <p>Ages: 8+.</p>	<p>52.00</p>	<p>STEM SIMPLE MACHINES ACTIVITY SET</p>  <p>LER2824</p> <ul style="list-style-type: none"> • Explore 6 simple machines with hands-on activities and experiments • Build and use tools for amazing discoveries • Boost brains into high gear and design solutions for real-world problems • Measure, record and compare data to draw conclusions • Includes 10 double-sided activity cards for hands-on learning • Comprehensive activity guide with reproducible materials included • 19 piece set <p>Suitable ages 5+</p>	<p>49.95</p>

<p>THE AERO CAR HJ1800</p>  <ul style="list-style-type: none"> • Build an air powered car • Get a second car and race your friends • Learn about air compression • Easy to build • 16cm long • Ages 8+ 	25.75	<p>AIR POWER ENGINE CAR FS631</p>  <ul style="list-style-type: none"> • No motors or batteries needed • Built in pump & pressure meter • When the air chamber the compressed air can be released & drive the vehicle up to 50 metres in 35 seconds 	42.75
<p>RUBBER BAND RACERS SN550020</p>  <p>A great little STEM kit from Thames & Kosmos, Rubber Band Racers is physics fun with five rubber band powered models. Using ultralight plastic and bamboo parts, build a helicopter, fan boat, airplane, car, and catamaran. Learn how the elastic material stores energy and then releases it to move the models. Manual included. Recommended ages: 8+</p>	32.95	<p>LIQUIFLY – ROCKET LQ5000</p>  <ul style="list-style-type: none"> • Flies over 30 metres Pump NOT included 	29.50
<p>TIN CAN CABLE CAR FSG3358</p>  <p>Recycle a soft drink can to make an unique able car install it in your bedroom & watch it run to & fro across the room</p>	29.85		

CODING AND ROBOTICS KITS





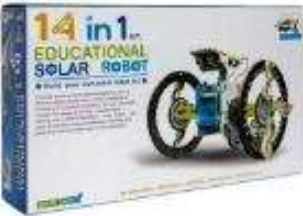

ITEM NAME	CODE	PRICE
GAME CODER	SN620141	215.00
	<p>This <i>Thames & Kosmos</i> kit Introduces the user to programming in a fun, step-by-step way. Learn to code by playing a video game!</p> <p>An Arduino-compatible gamepad connects wirelessly to your tablet. Using the gamepad and four interchangeable sensor modules, you play through a video game app on your tablet. In each level of the game, you have to learn a piece of the Arduino programming language and how to use it in order to solve puzzles and challenges and move forward in the game. In this way, you progressively learn the basics of coding. Soon you will be able to write programs on your computer using the four sensors and invent new applications.</p> <p>Following instructions in the 64-page, full-color experiment manual, create cool projects such as a light-sensitive drawer alarm and a LED disco light that reacts to the movements of your fingers.</p> <p>Ages 10+.</p>	
FRILLED LIZARD ROBOT KIT WITH IR SENSOR	KJ8968	48.00
	<p>A super smart frilled lizard with artificial intelligence. It has an infrared sensor that is programmed to 'escape' or 'follow-me'. Once the infrared sensor is activated in the 'escape' the robot will automatically act shocked by spreading its frill, dropping its jaw, illuminates its bicolour LED eyes and will scamper away from you until it reaches a safe place. If the infrared sensor is switched to the 'follow-me' mode using the 2 way function switch, then the robot will assess danger by bluffing the attacker (unfurling and shaking its frill). When the robot does not sense danger it will proceed to follow you like a pet lizard.</p> <p>Assembly required.</p>	
ROBOTICS: SMART MACHINES	ROBSMARTM	180.95
	<ul style="list-style-type: none"> • Students can have a simple & fun, customizable introduction to robotics • Build 8 motorised machines controlled by programs and an ultrasonic sensor • Programs can be coded using an easy, visual programming app on a tablet or smartphone, which connects to the robot models vis a wireless Bluetooth connection • The ultrasonic sensor works on the same principal as a sonar and robots can be programmed to behave based on the feedback coming from the ultrasonic sensor • Requires a tablet or smartphone running iOS or Android with Bluetooth support • Contains 194 building pieces <p>• 64 page, full-colour step-by-step illustrated manual included.</p>	
T4 TRANSFORMING SOLAR ROBOT	FS617	32.55
	<ul style="list-style-type: none"> • Kit transforms into 4 different robots using interchangeable pieces • Make a walking robot, rhino beetle, T-Rex & drill vehicle • Powered by the sun <p>WHILE STOCKS LAST!</p>	









- Recycle a can as the body of this cute little robot he walks along in a silly motion
- Maybe use a VB can to give him a reason to walk a little funny



SOLAR POWER, GREEN POWER & ALTERNATIVE ENERGY SCIENCE KITS

ITEM NAME	CODE	PRICE	ITEM NAME	CODE	PRICE
WIND POWER V4.0	SN627929	86.00	HYDROPOWER	HYDROP	69.95
 <p>A 4TH Gen wind turbine kit from <i>Thames & Kosmos!</i> Assemble a realistic wind turbine complete with electric generator and adjustable rotor blades that are designed with complex aerodynamic curves to look and work like modern-day wind turbine blades. Then, conduct experiments to optimize the turbine's performance by adjusting the angle of the blades and discover how to use the wind turbine to light up an LED and charge a rechargeable battery. Convert the generator into an electric motor and assemble a small electric car to demonstrate a tangible application for the stored electricity. Full-color, 32-page manual offers illustrated instructions and scientific information. Ages: 8+ Requires: 2 x AA Rechargeable batteries.</p>		 <ul style="list-style-type: none"> • Award winning <i>Thames & Kosmos STEM</i> kit • Discover the power of water and build a watermill, sawmill and hammer mill to harness the energy of moving water • Investigate the real-life applications of moving water such as hydroelectric dams to produce electricity • Construct a hydroelectric power station to generate electricity and light a LED • 12 experiments • 32-page manual • Suitable for ages 8+ 			
SOLAR MECHANICS	SN665068	59.95	ALTERNATIVE ENERGY SETS BUNDLE	SNALTENSET	205.00
 <ul style="list-style-type: none"> • Build more than 20 solar-powered models to learn how to convert energy from sunlight into mechanical energy • <i>Thames & Kosmos</i> educational kit • Conduct experiment with solar cell • Learn about solar power in a fun, hands-on way • Includes unique single-piece solar motor composed of a photovoltaic cell & an electric motor joined together in once compact unit • 60pg colour experiment manual. Ages 8+ <i>Discontinued by manufacturer – limited stock</i> 		 <p>Set of 3 Thames & Kosmos' alternative energy STEM kits: SN627929 <i>WIND POWER</i> SN665068 <i>SOLAR MECHANICS</i> HYDROP <i>HYDROPOWER.</i></p> <p>Great value!</p> <p>NOTE: Only 2 sets left.</p>			
14-IN-1 EDUCATIONAL SOLAR ROBOT	FS615	43.95	4M – WIND TURBINE	FSG3378	31.50
 <ul style="list-style-type: none"> • An amazing solar powered robot that can be transformed into 14 different robot models Powered by the sun – requires no batteries 		 <ul style="list-style-type: none"> • 4M Green Science Eco-Engineering kit. • Teaches how vital renewable energy technology works. • Watch the turbine catch the wind's energy and turn it into light! • 34cm blade span (when constructed). • Ages 8+. 			

<p>4M – ECO-TECH BULB</p> <p>FSG3426</p>  <p>Power up this ingenious overhead lamp with gravity to light up your surroundings. You can also bring it with you and crank the handle to create a dynamo torch. Contains 1 set plastic parts, 1m rope, 7 screws, 1 set of foam strip and detailed instructions. By 4M Green Science. Required, but not provided in this kit: a small cross head screw and plastic bottle. Ages 5+.</p>	<p>35.25</p>	<p>4M – SOLAR PLANE MOBILE</p> <p>FSG3376</p>  <p>Easy to assemble with no batteries required. 4M Green Science Model. Build this solar powered aircraft mobile. Take it out in the sunshine and watch it glide around. Ages 8+.</p>	<p>29.95</p>
<p>SOLAR POWERED ROVERS</p> <p>SN550030</p>  <p>The sun's energy can be used to do some pretty astonishing things!</p> <p>Get ready to explore the amazing capabilities of solar energy by building your own solar-powered vehicles and devices with this Thames & Kosmos kit.</p> <p>Using a system of ultralight bamboo rods, plastic gears, and a powerful solar panel, you'll build five different motorized models that that move using electricity generated directly from sunlight. Construct three types of solar cars, a solar fan, and a solar robot. Perform science experiments with each model to learn about gear ratios, solar cells, and more. The ultralight materials make your models speedy and durable while the modular gearing system lets you test out three different gear ratios.</p> <p>Recommended ages: 8+.</p>	<p>35.00</p>	<p>TRANSPARENT SOLAR CELL DOLLY</p> <p>100013C</p>  <ul style="list-style-type: none"> • Discover how sunlight can be converted to energy • Experiment with changing the angle of the solar panel, adding weight, running it uphill, and running it on rough & smooth surfaces • Good for standard motion labs as well as lessons on energy and alternative energy • Runs on solar power or batteries; switch to solar drive, battery drive, or battery charge! • Adjustable panel • Includes Teacher's Guide & reproducible Student Handout • 12cm long <p>Battery not included</p>	<p>55.00</p>
<p>WINDMILL GENERATOR</p> <p>FSG3267</p>  <p>Build this amazing wind generator from 4M Green Science and learn about renewable energy.</p> <p>Watch the LED glow as it is powered by free energy from the wind. No batteries required.</p> <p>Ages: 5+.</p>	<p>28.00</p>	<p>SALT WATER ENGINE CAR</p> <p>FS752</p>  <p>This is an environmentally friendly car engine. Just add a few drops of salt water to start running the car's engine. See how a V8 engine works.</p>	<p>35.00</p>

MUDWATT – CLASSIC KIT

MW1003




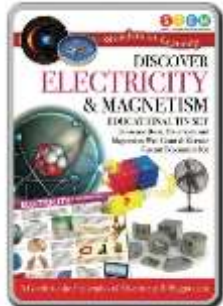


55.00



- Grow your own living fuel cell
- Build a micro-powered blinker & clock
- Kit covers multiple areas of STEM curriculum -Energy, engineering, chemistry, microbiology and sustainability
- Learn how to apply scientific method – from basic to advanced experiments
- Use a free App to measure power produced and track the microbe growth

RUN OUT STOCK - Only 1 remaining

ELECTRICITY & MAGNETISM KITS

ITEM NAME	CODE	PRICE	ITEM NAME	CODE	PRICE
 <ul style="list-style-type: none"> Simply add your own lemon to turn this kit into an amazing lemon-powered clock Discover the science of batteries (it has none) Only uses the chemical power of the lemon 	FSG3306	10.30	 <ul style="list-style-type: none"> This KidzLabs kit contains a super magnet set that can be transformed to perform 10 fun experiments and games Make a super power horse shoe magnet or a magnet wand So many great ways to experiment with magnets Ages 8+ 	FSG3291	27.75
 <ul style="list-style-type: none"> 4m Eco-Engineering Green Science Model. Discover how super-fast maglev trains work with this amazing maglev model. The model train zooms smoothly along its special track using the power of magnetism 	FSG3379	25.95	 <ul style="list-style-type: none"> This <i>Wonders of Learning</i> set provides a captivating insight into a variety of principles of electricity and magnetism and how we have harnessed electromagnetism to create some of the everyday devices we know so well. Kit includes a 32-page reference book, wall chart and an electric circuit experiment kit. 	SN5724	24.00
  <p>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, with this <i>Thames & Kosmos</i> set. Children eight and up can safely and easily experiment with electric current and magnetic fields using the colorful snap-together blocks and components in this hands-on kit.</p> <p>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.</p> <p>Conduct tests to see which materials are magnetic. Learn about the force of magnetism and magnetic poles. Magnetize a metal. Use iron filings 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.</p> <p>Finally, put everything you have learned to good use by constructing a loudspeaker, an electromagnetic relay switch, and a morse code telegraph key.</p> <p>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 colored and have unique shapes, it is easy to follow the assembly diagrams to construct functional devices.</p> <p>Includes a 64-page, full-color experiment manual guides you through experiments with easy-to-follow diagrams.</p>	SN620417				85.95

MAGNET SET





FS019






11.85












- 8 pieces
- Great introduction to magnets
- Ages 6+

WEATHER & METEOROLOGY



ITEM NAME	CODE	PRICE	ITEM NAME	CODE	PRICE
WEATHER STATION – DIGITAL – WITH DISPLAY	XC0432	249.00	WEATHER STATION WITH MINI LCD DISPLAY	XC0400	169.00
 <p>The wireless 5-in-1 sensor by Digitech contains a self-emptying rain collector for measuring rainfall, anemometer, wind vane, temperature and humidity sensors. It is fully assembled and calibrated for easy installation. It sends data by a low power radio frequency signal (917MHz band) to the main display unit up to 150m away (line of sight). The main display shows all the weather data received from the 5-in-1 sensor outside. It remembers the data for a time range for you to monitor and analyse the weather status for the past 24 hours. It has advanced features such as the HI/LO Alert alarm which will alert the user when the set high or low weather criteria are met. The barometric pressure records are computed to give users forthcoming weather forecast and storm warning. Day and date stamps are also provided to the corresponding maximum and minimum records for each weather detail. The system also analyses the rainfall rate, and shows daily, weekly and monthly records. Wind-speed is expressed in Beaufort Scale, and readings such as wind-chill, heat Index, dew point, and comfort level are also provided.</p>		 <p>Keep a weather station in the house to get a quick and accurate view of various weather parameters. This unit by Digitech records temperature, wind chill, wind speed/direction, dew point, humidity and more. It also features alarm modes for temperature, humidity, wind chill and more. Easy to setup, just place the weather sensors outside and keep the LCD inside as a free-standing unit or mounted on a wall. Data will be transmitted wirelessly to the display unit over distances up to 100m. It features an LED backlight for greater reading clarity in poor light. Instruction sheet included.</p> <p>Specifications:</p> <ul style="list-style-type: none"> • Windchill: -40°C to 65°C (-40°F to 149°F) • Records min/max temperature • Weather alarm mode: Temperature, humidity, wind chill, dew point, rainfall, wind speed • Wind speed: km/h, mph, m/s, knots, Beaufort • Wind direction • 12 or 24 hour time display • Time alarm • Optional power supply for base station <p>NOTE: This item does NOT come with a pole. Requires 5 x AA Alkaline batteries (not included).</p>			
WEATHER STATION	FSG3279	27.00	WEATHER SCIENCE	FSG3402	27.00
 <p>Observe and record the weather with your own multi-functional weather station. This 4M Green Science kit features a wind vane and anemometer, a thermometer and a rain gauge. Also experiment with the greenhouse effect and create a terrarium in a bottle. Ages: 8+</p>		 <ul style="list-style-type: none"> • Learn the science behind the various weather phenomenon with this 4M Green Science kit • Create a misty cloud, conduct experiments with acid rain, explore the impact of global warming • Build a water recycling model 			



<p>RAIN GAUGE – WIRELESS WITH LCD UNIT</p> <p>XC0430</p>  <p>This Digital Rain Gauge with Temperature by Digitech has a wireless self-emptying rain collector for measuring rain fall and temperature. The wireless rain collector sensor transmits data by using a low power radio frequency to the display main unit that can be located up to 150m away (line of sight). The display unit stores the data over a time range to allow you to monitor and analyse the weather status for past 24 hours. It has advance features such as the HI/LO Alert alarm to alert you while the set high or low weather criteria are met. The system also analyse rainfall in terms of rain rate, hourly, daily, weekly, monthly and yearly records for your convenience. With Radio-controlled / Atomic clock feature built-in, the system is truly a remarkable personal but professional rain gauge for your own backyard.</p> <p>Features:</p> <ul style="list-style-type: none"> • Total Hourly, Daily, Weekly, Monthly and Yearly rainfall display • Data logger stores and gathered data to display rainfall • Graphical histogram display to show variation of rainfall pattern • SINCE function to display TOTAL rainfall from a customised date • Real time clock display with Atomic Radio Controlled function • 150 m sensor transmission range • Data retention storage even during batteries changes • High / Low Alert function • Alarm function with ice-alert function <p>Note: Requires 6 x AA batteries (not included).</p>	<p>129.00</p>	<p>ANEMOMETER - CUP</p> <p>1055043</p>  <p>Wind speed anemometer working model. Mounted on a low friction bearing and consisting of 3 black plastic & 1 red plastic cup. 210mm x 180mm (h) Anemometer is sensitive at wind speed of 1.5km/h. Student can determine the wind speed quantitatively by counting the number of rotations. Student worksheet included.</p> <hr/> <p>WIRELESS IN & OUT THERMOMETER AND HYGROMETER</p> <p>XC0322</p>  <p>An advanced thermometer/hygrometer capable of measuring indoor and outdoor temperature, as well as relative indoor humidity. The large easy to read LCD acts as a receiver unit for a separate outdoor sensor unit. It will record max and minimum temperatures for quick referral and conveniently displays the time of day. Ideal for temperature or humidity sensitive environments such as museums, greenhouses, or to check if your home and office is too dry or moisture laden. The LCD receiver unit is capable of receiving information from up to 3 sensor units, which are available separately (see XC0324)</p> <p>Specifications:</p> <ul style="list-style-type: none"> • Transmission frequency: 433.92MHz • Transmission range: Up to 100m open air • Sensor dimensions: 51(H) x 63(W) x 25(D)mm <p>Download Manual</p>	<p>28.00</p> <hr/> <p>59.95</p>
<p>WIND VANE</p> <p>HSVANE</p>  <ul style="list-style-type: none"> • Wind vane on stand • Compass directions (north, south, east, west) denoted by large letters • Approximate height: 21cm • A useful tool in teaching wind measurement <p>Can be used in conjunction with the Cup Anemometer (Code: 1055043) or with a handheld <i>ANEMOMETER - LCD WIND SPEED GAUGE</i> (Code: ANEMOLCD)</p>	<p>38.00</p>	<p>FITZROY STORM GLASS</p> <p>HJ6185</p>  <ul style="list-style-type: none"> • Predict the weather! • The storm glass was popularised by Admiral Robert Fitzroy after his historic voyage on the HMS Beagle <p>28cm tall</p>	<p>29.95</p>

<p>WEATHER STATION – WIRELESS DIGITAL WITH COLOUR LCD DISPLAY & WIFI</p> <p>XC0440</p>  <p>Get your own local weather forecast with this professional Wi-Fi weather station. The feature-rich system is supplied with a wireless 5-in-1 outdoor sensor to measure rainfall, wind speed, wind direction, temperature, and humidity, as well as a high-precision hygro-thermo sensor to measure humidity and temperature. Both sensors send data by a low power radio frequency signal (917MHz band) to the multi-colour main display unit up to 150m away (line of sight).</p> <p>The backlit display can be desk or wall-mounted, and shows you the local forecast, high/lows, totals and averages for virtually all weather variables, without a PC. Connect it to your Wi-Fi network to be able to upload the weather data to wunderground.com and weathercloud.net, where you can access and upload your weather data freely. The time and date will be kept accurate as well, thanks to the internet time server.</p>  <p>With calibration and moon phase features, this system is truly a remarkably personal yet professional weather station for your own backyard.</p> <p>Includes a 5v 1A mains power adapter with a 1.8m cable and MicroUSB connector to power the main display. Power for weather station: 5 x AA Back up battery for console: CR2032. (not supplied)</p> <p>Download Manual</p>	<p>359.00</p>	<p>WIRELESS WEATHER STATION WITH OUTDOOR SENSOR</p> <p>XC0366</p> <p>This multifunction weather station features moon phases for the Australian/NZ region, an external temperature / humidity, barometric sensor, (which really should be on an outside windowsill so that you can easily access it for battery change). It has fantastic time logging.</p> <p>NOTE: <i>It does not have wind speed/direction.</i></p>  <p>Features:</p> <ul style="list-style-type: none"> • Clock, clock alarm/snooze • Calendar, including Day announcement • Barometer trend log • Weather forecast icons • Moon phase display (with tide indication) • Sunrise/sunset time display • Temperature / humidity display • Temperature alert alarm • All-in-all excellent value for money • Transmitter frequency 433MHz <p>Download Manual</p>	<p>99.95</p>
<p>SENSOR THERMOMETER – SPARE TO SUIT XC0322</p> <p>XC0324</p>  <p>Replacement Thermometer Sensor to Suit XC0322 WIRELESS IN AND OUT THERMOMETER AND HYGROMETER.</p>	<p>25.95</p>	<p>HYGROMETER – HAIR – PLASTIC 0-100%</p> <p>GE2835-01</p>  <p>Range: 0 to 100% RH Accuracy: +/-4% RH Divisions: 1%RH Weight: 12g Diameter: 50mm</p>	<p>11.00</p>

<p>MASON'S HYGROMETER – RED SPIRIT -5 – 50°C</p> <p>GE2795-01</p>  <p>Wet/Dry thermometer used to measure the relative humidity of the atmosphere. It consists of a thermometer with a bulb that is wet or moist and one that is kept dry. The relative humidity is calculated from the difference in readings of the thermometers when water evaporates from the wet bulb, decreasing its temperature.</p>	<p>13.20</p>	<p>WHIRLING HYGROMETER – BLUE SPIRIT -5 – 50°C</p> <p>GE2866-01</p>  <p>Compact Psychrometer - The Compact Whirling Hygrometer instrument incorporates a 'slide rule' type calculator to determine the relative humidity percentage. The body of the instrument slides away into the handle providing complete protection when not in use. Fitted with environmentally friendly LO-tox™ filled glass tubes.</p> <p>Specifications: Temperature Range: -5 to +50°C / 0 to 120°F Humidity Range: -5 to +50°C Divisions: 0.5°C or 1.0°F Accuracy: +/-1°C</p>	<p>170.00</p>
<p>WIRELESS DIGITAL WEATHER STATION WITH COLOURFUL LCD DISPLAY AND WIFI</p> <p>XC0440</p>  <p>FEATURES</p> <ul style="list-style-type: none"> • 5-in-1 outdoor sensor • 1 x Hygro-Thermo Sensor • Upload Weather Data • Automatically uploads weather data to online weather services • Up to 150m range • Indoor & Outdoor Temperature (°C or °F) • Min/Max Records • Indoor & Outdoor Hygrometer • Wind Speed (m/s, km/h, mph, or knots) • Wind Direction • Feels Like • Wind Chill 		<p>Get your own local weather forecast with this professional Digitech Wi-Fi weather station.</p> <ul style="list-style-type: none"> • Dew Point • Heat Index • Rainfall (in or mm) • Rain Fall Rate • Barometric Pressure (hPa, inHg, or mmHg) • Moon Phase • Time/Date Display • High/Low Alarms • 12 Hour Forecast • Rainfall & Barometer Histogram • Temperature / Humidity trend • Alarm with Snooze • Comfort Indication 	<p>340.00</p>

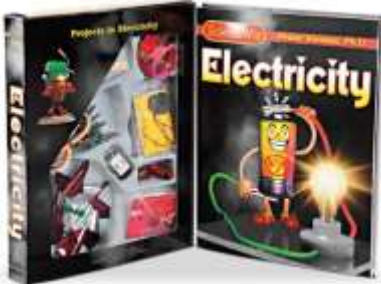

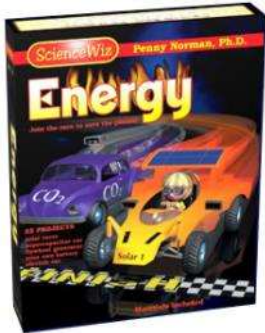
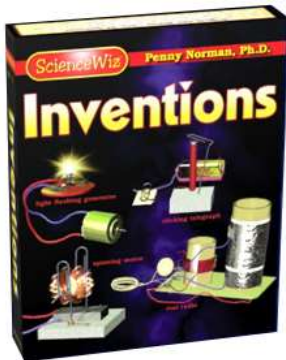
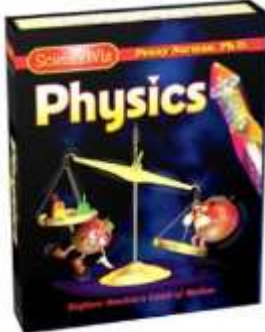
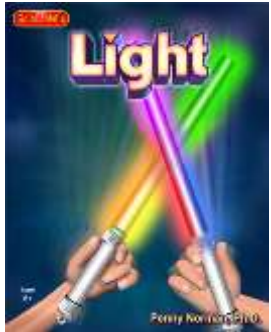
PHYSICS & ENGINEERING FOR THE YOUNG



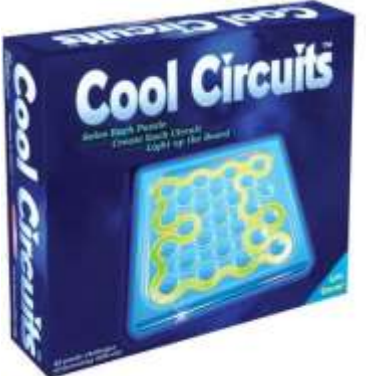
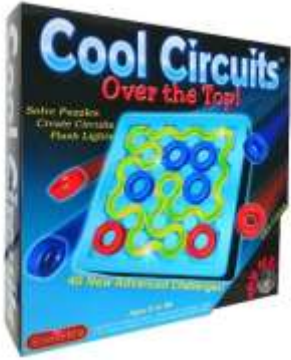
ITEM NAME	CODE	PRICE	ITEM NAME	CODE	PRICE
AERO DANCER	SN550035	39.00	ARCHITECTURAL ENGINEERING	SN625416	120.00
 <p>From Thames & Kosmos, build a zany inflatable tube dancer that uses the physics of flowing air to perform its eye-catching moves. Like the air dancers and tube men you may have seen around your town, this motorized device uses a blower motor and a fabric tube to slink, shimmy, and shake around. Assemble the model to learn about its inner mechanisms, including fan and electric circuit, complete with battery, motor, and switch. Conduct four fun additional experiments that demonstrate principles in air pressure, air flow, and aerodynamics. Make a ball float on a stream of air, practice your aim in a game of air basketball, and launch balls into the air with the air cannon. This hands-on kit brings physics to life as it demonstrates the power of air pressure at work. An eight-panel, full-color manual guides your model building with step-by-step illustrated instructions is included.</p> <ul style="list-style-type: none"> • Build your own tube dancer--over 1 foot tall! • Learn about gears and circuits as you assemble your tube dancer's fan--complete with battery, motor, and switch. • Conduct physics experiments with air pressure, air flow, aerodynamics, and fluid dynamics. • Includes fun, hands-on activities and challenges like air basketball, a floating ball trick, and air cannon. • An eight-panel, full-color manual guides model building with step-by-step illustrated instructions. <p>9V battery required (<i>not supplied</i>).</p>			 <p>Soaring spires, towering arches, fascinatingly complex curves and angles! Build your foundation in architectural design with this fascinating STEM experiment kit from Thames & Kosmos that explores the engineering principles behind planning and developing buildings and structures. Through model building exercises you play the role of architect and engineer as you piece together an array of models, from small, basic structural elements like trusses, arches, and domes, to giant complex models of real-world buildings. Try building Australia's own Sydney Opera House, or put the Eiffel Tower on display in your living room or school! With 20 guided model builds, you can construct stadiums, skyscrapers, a Ferris wheel, and more.</p> <p>By getting hands-on with these exercises, you'll develop an understanding of how architectural engineers apply scientific principles to their designs and how the buildings and structures of the 21st-century push materials and engineering to the limits. The full-colour 44-page manual guides your journey while encouraging independent exploration. What is the tallest tower, the most voluminous dome, or the longest bridge you can build with the modular building pieces? How will you use what you learn to further your architectural journey?</p> <p>Recommended ages: 8-14. Pieces: 308.</p>		

<p>PHYSICS PRO V2.0</p>	<p>SN625314</p>	<p>159.00</p>	<p>KIDS FIRST INTRO TO ENGINEERING</p> <p>SN576002</p>	<p>54.95</p>
	<p>A <i>Thames & Kosmos</i> STEM kit with 211 parts, allowing you to conduct 17 experiments building small models and then build 14 larger models in a series of workshops.</p> <p>Build some spectacular models and devices, such as a wind tunnel, pneumatic shocks, and a hydraulic lift.</p> <p>Begin your study of more advanced topics in physics, including fluid dynamics, energy, oscillation, hydraulics, and Pneumatics. You will investigate how air and water rest and flow, what they can carry and how they move.</p> <p>Learn why a streamlined shape lets a car drive faster and how power plants convert a current of water into electrical current.</p> <p>Includes 96-page full colour experiment manual.</p> <p>Ages: 10+</p>		 <ul style="list-style-type: none"> • Intro to Engineering welcomes young children to the field of engineering with 25 experiments and building projects in five sections. • Suitable for ages 5 - 7. • By engaging in hands-on activities, children will learn how engineers apply their scientific and technical knowledge to design machines and devices. • Begin with basic engineering concepts to more complex experiments. <p>Complete 48-page guidebook with step-by-step, hands-on experiments & building projects.</p>	
<p>DISCOVER PHYSICS STEM KIT</p>	<p>SN5723</p> <ul style="list-style-type: none"> • This <i>Wonders of Learning</i> set provides a captivating insight into a variety of scientific ideas and theories about the properties of matter and energy. • Kit includes a 32 page reference book, wall chart and a Pressure-powered car experiment kit. <p>Stored in a convenient tin container.</p>	<p>24.00</p>		
<p>KIDS FIRST ROBOT ENGINEERING</p>	<p>SN567009</p> <p>A both fun & educational kit from Thames & Kosmos for the young budding scientist or engineer (or for those young inquisitive minds).</p> <p>Read the funny story of two inquisitive kids, Ty and Karlie, and build simple, non-motorized models of the robots they construct and fix during their adventure to an automated candy factory. During this zany outing, Ty and Karlie build various robots to perform tasks and solve problems in the factory. The robots have moving parts, wheels, and gears, so kids can learn firsthand about simple machines and gear trains. As you follow the story, you can build models of the ten robots featured in the story. Large, colorful plastic building pieces make it easy for small hands to put the models together. In the story, the kids build robots with arms that rotate, turn, and spin. They fix a robotic arm and other specialized robots that complete specific tasks inside the factory. They construct a robotic drone that flies through the factory to coat the candies in sprinkles, wheeled robots that zoom across the factory floor, a taffy-pulling robot, and a funny gum-kneading robot. From each humorous segment of their silly adventure, the kids learn something new about robots and machines. This 53-piece science kit combined with the beautifully illustrated storybook provides an engaging way to teach simple engineering concepts to preschool-age kids. Start laying the groundwork for strong STEM related skills and comprehension. This kit helps develop fine motor skills, science and math skills, visual-spatial skills, and reasoning and concept development skills.</p> <p>Comes complete in a sturdy storage case and 32 page manual.</p> <p>Suitable ages: 3+.</p>			<p>79.00</p>

SCIENCEWIZ KITS AND SCIENCEWIZ GAMES & PUZZLES

A great choice for mastering science. Award winning kits by Dr. Penny Norman. Superb manuals (40pp) which develop concepts in a systemic way while reinforcing the Scientific Method. The included material will ensure that your classes will be up and running with minimum preparation.

ITEM NAME	CODE	PRICE	ITEM NAME	CODE	PRICE
ELECTRICITY	SW7800	38.50	CHARGE	SW7814	38.50
	<p>18 Activities and 4 Bonus Projects!</p> <ul style="list-style-type: none"> • Spin motors and pinwheels • Light lights & buzz buzzers • Send coded messages & test what conducts • PLUS make a glowball, solve circuit mysteries & construct a light dimmer. 			<p>Build 6 different devices. Complete 15 Activities with these devices</p> <ul style="list-style-type: none"> • Spew a glitter fountain • Make your hair stand on end with electrostatic CHARGE! • Generate large sparks with an electrostatic generator • Spin an electrostatic motor • Explore & detect plus & minus charges • Propel objects with an electrostatic generator 	
ENERGY	SW7805	38.50	INVENTIONS	SW7901	38.50
	<p>22 Activities</p> <ul style="list-style-type: none"> • Build a solar car • Launch a supercapacitor car • Make an electric car • Spin a flywheel generator • Build a battery to light an LED • Do a kinetic chain reaction • Store potential energy on your head • Discover how solar cells work • Focus the sun's energy with lenses. 			<p>4 Major projects to build</p> <ul style="list-style-type: none"> • A spinning motor • A clicking telegraph • A light flashing generator • A real radio. 	
PHYSICS	SW7806	38.50	LIGHT	SW7802	38.50
	<p>24 Activities</p> <ul style="list-style-type: none"> • Launch bottle rockets • Perform tricks with inertia • Stay in motion with a floating hover puck • Zoom a jet car • Build your own spring meter • Spin water upside down • Assemble and use a balance scale • And much more.... 			<p>25 Activities including:</p> <ul style="list-style-type: none"> • Split light into a cascade of rainbows • Make a kaleidoscope • Mold lenses • Make a microscope and telescope • Capture a shadow • Construct a pinhole camera • Bounce, bend and blend light • Play the "I Spy" game with mirrors • Solve filter puzzles <p>Requires a 1.5 V battery (not supplied)</p>	

<p>MAGNETISM</p> 	<p>SW7801</p> <p>This should be one of your child's first science kits. The large, color-coded magnets should be played with at an early age. The first 15 activities explore which metals stick to magnets, magnetic poles, attraction and repulsion, magnets through materials, and temporary magnets. The kit includes high quality, color-coded, ceramic magnets.</p> <p>Activities in the first part of the book</p> <ul style="list-style-type: none"> - Draw with iron filings - Discover what sticks to magnets - Levitate and bounce rings - Make a duck swim - Create a temporary magnet and much more... <p>Sometime between second and third grade, children should revisit this book, repeat their favorite activities, and do the more advanced projects in the later sections such as constructing a compass; exploring compass directions and discovering how motors work.</p> <p>Requires one D cell battery (not supplied).</p>	<p>38.50</p>	<p>COOL CIRCUITS JR.</p> 	<p>SW7857</p> <p>Introducing an enticing new twist on Cool Circuits . . . Lay down a puzzle card, add on the bright orange barriers, solve the challenge by making a loop, and watch the board light up! 40 different challenges ranging from student to expert.</p> <p>Features: Includes a set of 40 NEW challenges an intriguing new release that adds orange barriers which limit your choices but require enfolded solutions. Comes with light up board, 6 barriers, 8 fluorescent 3-D puzzle pieces and 40 challenge cards.</p> <p>This puzzle emphasises spatial reasoning and abstract thinking. Can you solve them all?</p> <p>Ages 6+.</p>	<p>42.00</p>
<p>COOL CIRCUITS</p> 	<p>SW7850</p> <p>40 challenges: Lay down a puzzle card, solve the challenge by making a loop, and watch the board light up!</p> <p>Cool Circuits™ has 40 different challenges ranging from student to expert. Can you solve them all? Comes with light up board, 8 fluorescent, 3D puzzle pieces and 40 challenge cards.</p> <p>This puzzle emphasizes spatial reasoning and abstract thinking.</p> <p>Ages: 8+</p>	<p>42.00</p>	<p>COOL CIRCUITS OVER THE TOP</p> 	<p>SW7858</p> <p>New challenges, includes 40 unique, advanced puzzles.</p> <p>The addition of orange and blue barriers creates a NEW level of challenges!</p> <p>Can you solve them all?</p> <p>Comes with light up board, fluorescent 3-D puzzle pieces and super cool challenge cards.</p> <p>This puzzle emphasizes spatial reasoning and abstract thinking.</p> <p>Ages: 8+</p>	<p>42.00</p>

SNAP CIRCUITS


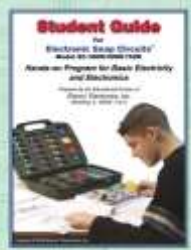
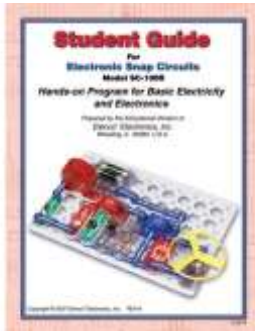
What is the difference between **SNAP** and **CLIP CIRCUITS**?

Well, not a lot really apart from some cosmetic labelling of the componentry. **SNAP CIRCUITS**, however, is more of a traditional educational approach with specific learning outcomes stated in the form of objectives for every project in the included manual. For example OBJECTIVE: **“To show how a fuse is used to break all current paths back to the voltage source”**. The next experiment will have another objective and so on. In addition, the optional Student and Teacher guides test and reinforce key concepts along the way.

The special interest kits for both products are invaluable as a source of enrichment and extension.

NOTE: REDUCED TO CLEAR SO HURRY UP AND GET A BARGAIN - WHILE STOCKS LAST!

SNAP CIRCUITS CURRICULUM STYLE & SPECIAL INTEREST KITS BY ELENCO

ITEM NAME	CODE	PRICE
	EXTREME 750 EXPERIMENTS SC750 <ul style="list-style-type: none"> • The Model SC-750R is an in-depth exploration of the electronic components included with the SC-750 Snap Circuits Educational Experiments • Ideal for students to grasp the basic principles of electronics • Includes 138 Pages of educational curriculum • Includes real world applications and problem solving quizzes • The Teacher Guide includes quizzes for students to test their knowledge. <p>ONLY 1 LEFT IN STOCK!</p>	190.00
	STUDENT GUIDE FOR SC300/SC500/SC750 SCG753307 <ul style="list-style-type: none"> • Complete Student Guide for Models SC300, SC500 & SC750 • Enhance your learning with detailed explanations and quizzes • 137 full-colour pages covering all 750 Snap Circuits projects! • Ideal for ALL Snap Circuit models. 	7.50
	STUDENT GUIDE FOR SC100 SC753294A <ul style="list-style-type: none"> • Snap Circuits Student Guide for SC100/SC100R • Junior Student Guide has 48 colour pages for an enhanced learning experience because it teaches electronics • Includes quizzes to verify learning. 	7.50



- Complete Teachers Guide for SC100R, SC300R, SC500 & SC750R

SNAP CIRCUITS DELUXE CASE

SNAPCASE7

50.00



- Heavy duty plastic case with 2 custom printed foam inserts for housing Snap Circuit components and parts
- Makes identifying missing parts much easier
- Also a separate small case to hold the smaller loose parts.

LIMITED STOCK ONLY.

COMBO PACK - UPGRADE KITS & COMPUTER INTERFACE KIT

SCUC70/73

70.00



- Triple combo pack
- Contains Computer Interface Kit *CI-73*, *UC-70* for upgrade from SC-300 to SC-750 & *UC-50* kit for upgrade from SC-300 to SC-500
- The *CI-73* Computer Interface kit allows the SC-300 or SC-500 set to interface with a computer! With this module, you will learn about and use an oscilloscope and spectrum analyzer, as you build over 73 BONUS PROJECTS using your Windows-based PC (32 projects require the SC-500). Comes with all of the interface parts you need and the software. Great for introducing electronics through a computer. Acts as a scope and allows you to see the signals in the circuit.

(NOTE: This software is not compatible with a MAC. However a similar, non-ELENCO product software version exists for this product).

LIMITED STOCK ONLY



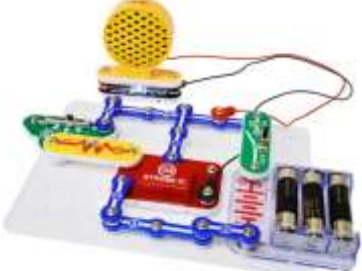
DELUXE SOUND & LIGHT COMBO IN CASE

SCC350

180.00















- Build over 350 exciting projects!
- Contains over 65 parts, and colour changing LED!
- Keyboard with optical theremin
- Features include: Sound energy demonstration; echo effects; infrared detector, strobe light, Strobe integrated circuits (IC) and much more!
- Suitable for ages 8+
- Requires 4 x AA batteries (not included).

LIGHT	SCL175	90.00
	<ul style="list-style-type: none"> • Watch and be amazed at what your music can do with the Snap Circuits Light kit • Connect your iPhone® or other device and enjoy your music as the lights change to the beat • Build over 175 exciting projects • All parts are mounted on plastic modules and snap together with ease • Contains over 55 parts to build the projects • No tools required • Suitable ages 8+ • Requires 4 x AA batteries (not included) 	
MOTION	SCM165	95.00
	<ul style="list-style-type: none"> • Snap Circuits Motion contains over 50 parts and over 165 projects to complete • All motion and physics focused • Experiment with gear ratios using various gears and pulleys • Experiments include: Colour changing lighted fan, Air “fountain”, Motion detector, and lots more • The project manual includes large colour illustrations and simple directions for each project • Suitable for ages 8+ • Requires 4 x AA batteries (not included). 	
STROBE LIGHT AND SOUND	SCP14	25.00
	<ul style="list-style-type: none"> • Adjustable-speed strobe light with sound effects • 14 additional projects • Suitable for ages 8+ • Requires 3 x AA batteries (not included) 	









ALL PRICES INCLUDE GST.







PHYSICS

ITEM NAME	CODE	PRICE	ITEM NAME	CODE	PRICE
ALPHA SCATTERING APPARATUS	AR1130260	51.15	CUBES FOR DENSITY INVESTIGATION WITH HOOK 20MM - SET OF 7	PH0108R	69.00
 <p>A low cost apparatus for the demonstration of the Rutherford scattering by means of a gravitational analog of inverse square law repulsion.</p> <p>Comprises a wooden launching lamp about 300x50x105mm (LxWxH) with a guiding groove running down its curved front face along its length and index marks at 40,60, 80 and 100mm height above the base that provides 4 pre-determined launching heights.</p> <p>Also included is a spun aluminium hill about 280mm diameter and 60mm height along with a 19mm steel ball.</p>		 <p>Density Cubes -Set of 7 Metals in Plastic Case with Hooks and Element Stamp.</p> <p>(20mm) sides - Iron, Copper, Aluminum, Brass, Tin, Zinc, Lead - For use with Density, Specific Gravity, Specific Heat Activities.</p> <p>Supplied with manual.</p>			
LEVER KIT	PH0340	67.00	CONE DISSECTIBLE	PH0103	59.00
 <p>Class pack of 5.</p> <p>Consists of 5 plywood beams with grooves. Supplied with 4 fulcrums & 40 metal blanks 25mm square.</p> <p>Supplied as kit for eight pupils and consists of five plywood beams 600 x 44 x 3 mm graduated every 38 mm and with groove across its centre to locate the fulcrum point. Also included are four fulcrums 32 x 32 x 64 mm and 40 metal blanks 25 mm square. The masses of the blanks are matched to + 1%.</p>		 <p>This cone is made of polished hardwood with four different sections. It can be dissected into 5 parts.</p> <p>Hardwood, polished, 24 cm height and 15 cm base dia. Four different sections: circle, ellipse, parabola and hyperbola held together by a pin and easily taken apart for demonstration.</p>			
SET OF SPHERES – 25MM	AR1030680-3	35.00	DRILLED BALL SET OF 12 IN BOX	PH0109PCB	67.00
 <p>Ideal for collision experiments and pendulum demonstrations and can also be used to meet a variety of laboratory needs. Solid spheres are also suitable for density/volume experiments.</p> <p>The set includes 6 balls of 25mm diameter each of different materials-one each of wood, aluminum, steel, copper, brass & lead.</p> <p>NOTE. Rust may build up on the steel ball, but does not affect experiments. Remove with fine sandpaper.</p>		 <ul style="list-style-type: none"> • Perfect for pendulum experiments. It's a multi-purpose set ideal for pendulum experiments but can be used to meet a variety of lab needs. • Set includes 6 balls each 25 mm in diameter. Contains two balls each of Wood, Aluminium, Steel, Cork, Brass and Lead. Each ball is drilled with 3 mm diameter hole. Supplied in plastic box. 			








ITEM NAME	CODE	PRICE	ITEM NAME	CODE	PRICE
CLINOMETER-MK 2	CLINOMK2	41.20	CLINOMETER	CLINO	37.95
 <ul style="list-style-type: none"> • A compact Clinometer with no external moving parts and a combined 'sighting' angle-reading eyepiece • A viewing window on the side of the Clinometer allows a second person to check a reading • All angles in degrees followed by a plus or minus to indicate an upward or downward slope • Complete with product guide • Size: 14cm dia. 			 <p>Sturdy plastic.</p>		
CUBE SET – SET OF 7	DENCUB7	41.15	DENSITY ROD SET – DIFFERENT MATERIAL	AR1010230	50.30
 <p>A set of 7 metal cubes with 20mm sides. Stamped with IDs: Cu, Br, AL, Pb, Fe, Zn, Sn.</p> <p>For students to familiarise themselves with the appearance, feel, texture, hardness and density of a range of common substances.</p> <p>Can be used for a variety of experiments relating to density, specific gravity & more.</p>			 <p>Density Rods Set, Comprising 12 cylinders of different material and of different lengths (38mm-60mm) but of same diameter 12.5mm.</p> <p>All density rods are placed in a square shaped wooden block. The are comprised of: Copper, Brass, Acetyl, Rubber, Acrylic, Aluminum, Polypropylene, PVC, Nylon, Oak, Maple, and Walnut.</p>		
TIMER-MULTI FUNCTION 220/240v AC	LB4064-101	398.00	CENTRE OF GRAVITY APPARATUS	1030500	29.20
 <ul style="list-style-type: none"> • Versatile timer with a bright red digital display for classroom work • LED 6 digits • Auto-ranging permits times up to 999.999S x 0.0001S and up to 999.999S by 0.001S • 240V • AC lamp or LED power is provided on rear panel for PhotoGates • A special constant current output is provided on the rear panel for the IEC 'Free Fall' experiment (MF1871-401) to energise the solenoid that holds the steel balls. The instant the timing begins, automatically the ball is made to drop. This makes the 'Free Fall' experiment very easy and accurate. • Timer is microprocessor controlled and is very fast • Selectable modes are: Start/Stop, PhotoGate, Period and Pendulum. Stores 20 memories that can be added, averaged, purged or cleared. 			 <ul style="list-style-type: none"> • Used to demonstrate the geometrical center of gravity of two-dimensional object • The center of gravity of a freely suspended two-dimensional object always lies along the line drawn vertically downward from its point of suspension • Comprises of a clear perspex rod mounted on a base with a suspension screw at the top and four laminas of clear acrylic - one each of circular, triangular, square and trapezoidal • Each lamina has suspension holes along their periphery • The point of intersection of lines drawn from point of suspension of 2 or more holes of a lamina gives center of gravity of that 2-dimensional lamina Suitable for ages 13+. 		






MECHANICS - FORCES, ENERGY & MOTION









ITEM NAME	CODE	PRICE	ITEM NAME	CODE	PRICE
INCLINED PLANE	PLANEINC	71.60	DYNAMIC TRACK, STAND & RAMP	PH0355DYTR	165.00
 <ul style="list-style-type: none"> • Ideal for demonstrating friction, acceleration, work, potential energy and vector components of force • Smooth wooden plane 600 x 80mm hinged to the base at one end • Provided with a pulley for force with scale pan & weight • Supplied with 3 friction boards, plastic cart and angled meter • Dimensions: 645 x 125 x 400mm • Weight: 2kg 		 <p>Made of Hardwood. Ramp size: 30cm (W) x 120cm (L). Complete with height adjustable support (max height is 65cm) and run off ramp to bridge the gap between track and floor when required.</p> <p>The track bases are in thick MDF with hardwood side supports which give good resistance to flexing. Rounded corners avoid injuries. Support feet link with the support frame which provides a robust system for height adjustment.</p>			
INCLINED PLANE – STEEL	PH0338	105.00	ROLLER FOR INCLINED PLANE – 400GM	PH0341B	23.00
 <p>Designed for student use. Board dimensions: 600 x 100 mm. Heavy gauge steel construction - base & plane connected by a hinge to allow the plane to be clamped at any angle from 0 to 45°. Built in scales allow for measuring vertical displacement, angular displacement and distance from hinge. Pulley can be adjusted to ensure cord runs parallel to the plane. Included: pan, roller & instructions.</p>		 <p>Solid metal 400 g roller, 7 cm wide, 5 cm dia. run on cone bearings and are mounted in a metal frame with provision for attaching cord.</p>			
			ROLLER FOR INCLINED PLANE – 1KG	PH0341A	23.00
			 <p>As per PH0341B, but 1 kg rollers, 8 cm wide, 4.3 cm dia.</p>		
WEIGHT PAN – 90MM DIA.	AR1031140-2	4.70	WEIGHT PAN – 150MM DIA	AR1031140-3	6.90
 <p>Stainless steel weight pans for use with apparatus where loading of weights is required such as inclined plane etc. Comprises a pan with a raised collar to prevent the falling of loaded weights. With three strings tied around the perimeter for suspension.</p>					
ROMAN ARCH	EMAR	52.00	TROLLEY RUNWAY	PH0352	115.00
 <ul style="list-style-type: none"> • Force & geometry combine to build an ingenious structure. • Excellent for use in the study of physics (static equilibrium), architecture and practical maths applications. 		 <p>Made of wood, Size 1.5 x 0.3 meters.</p> <p>Designed to provide a smooth flat easily inclinable surface for dynamic experiments using trolleys. With wooden sides rails and plastic feet.</p> <p>Supplied without <i>DYNAMIC TROLLEYS</i> pair PH0350 (sold separately). Special freight prices apply.</p>			







<p>DYNAMIC TROLLEY - WOODEN (PAIR) PH0350</p>	<p>101.00</p>	<p>TROLLEY RUNWAY & PAIR OF DYNAMIC TROLLEYS SET PH0352SET</p>	<p>205.00</p>
 <p>Pair of identical wooden trolleys 300 mm long, mounted on 3 wheels. A spring loaded rod is fitted to give impulse when released and have 5 slots for different level of spring compression. It has a provision for stacking the trolleys on top of each other with removable pins. Supplied complete with springs, 4 pins (for stacking) and 2 rubber corks.</p> <p>Can be used on TROLLEY RUNWAY (PH0352).</p>		 <p>This package includes the trolley runway and pair of wooden dynamic trolleys (Code: PH0350). The runway is designed to provide a smooth flat easily inclinable surface for dynamic experiments using the trolleys. Made of wood, Size 1.5 x 0.3 meters. With wooden sides rails and plastic feet.</p> <p>The pair of identical wooden trolleys are 300 mm long each and mounted on 3 wheels. A spring loaded rod is fitted to give impulse when released and have 5 slots for different level of spring compression. It has a provision for stacking the trolleys on top of each other with removable pins.</p> <p>Supplied complete with springs, 4 pins (for stacking) and 2 rubber corks.</p> <p>Special freight prices apply.</p>	
<p>DYNAMIC TROLLEY - METAL (PAIR) PH0351</p>  <p>Dynamic carts. Compact design. One end of the metal body carries an integral plunger / trigger system for explosion experiments. Other end of metal body has a clamping screw for attaching ticker tape. Includes built-in Velcro pads for non-elastic collisions & locating pins allowing secure stacking of two or more dynamic trolleys</p>	<p>102.00</p>	<p>HALL'S CAR - SINGLE PH0351HCS</p>  <p>For use with inclined plane, weights & pulleys. Used to study energy & work relationship.</p> <p>One piece moulded body with central well to hold additional masses. Moulded wheels with sleeve bearings. Hole in one end of body to attach cords</p>	<p>24.00</p>
<p>BALLISTICS CAR PH0355APL</p>  <ul style="list-style-type: none"> • The apparatus consists of a heavy metallic barrel mounted vertically on an aluminium car • The car has plastic wheels with ball bearings to minimize friction • Spring loaded piston arrangement • Complete with steel balls and a lock-pin with card • With instructions <p><i>(Model supplied may vary slightly from illustration)</i></p>	<p>97.85</p>	<p>NEWTON FAN NTN-FN</p>  <p>Can be used to convert most dynamic carts into a fan cart, quickly and easily.</p> <p>Can be used to demonstrate how forces can be resolved by adjusting the angle of the fan. Assists in the study of Newton's second law.</p>	<p>66.95</p>


ALL PRICES INCLUDE GST.



<p>HALL'S CARRIAGE PH0343A</p>  <p>For Dynamics experiments.</p> <p>The one-piece aluminum wheels and axles mounted in cone bearings for low friction operation. A one-piece plastic body with the facility to add weights on the top.</p> <p>Used with inclined planes.</p> <p>Size 13.5 x 7 x 3.5 cm</p>	<p>24.10</p>	<p>ROLLING FRICTION CARS PH1120147</p>  <p>The rolling friction car kit provides four cars for exploration into the force of friction. Each car provides a set of different material wheels (wood, fabric, soft rubber, soft silicone) with a different coefficient of friction. By setting the cars in motion with equivalent velocities, one can qualitatively demonstrate the frictional properties of rolling without slipping. Instruction manual included.</p>	<p>59.95</p>
<p>HALL'S CAR EXPERIMENTS (PAIR) PH0351A-PL</p>  <p>Used with inclined plane, weights & pulleys to study relationship between energy & work.</p> <p>Low friction wheels.</p> <p>Oil free sleeve adjustment - never needs adjustment.</p> <p>Instructions included</p>	<p>36.50</p>	<p>HALL'S CAR - SINGLE PH0351HCS</p>  <p>For use with inclined plane, weights & pulleys. Used to study energy & work relationship.</p> <p>One piece moulded body with central well to hold additional masses. Moulded wheels with sleeve bearings. Hole in one end of body to attach cords.</p>	<p>24.00</p>
<p>RATTLEBACK MRATTBK</p>  <p>A 107mm canoe-shaped object, also known as Celtic Stone (amongst other names), that when spun on a smooth surface will rotate on its axis in a preferred direction. If the rattleback is spun in the opposite direction, it becomes unstable and begins to rock or "rattle" (it oscillates upon its short axis), then it stops spinning in that direction, continuing to rock, before reversing its direction of spin.</p> <p>The shape of the bottom of the rattleback is not symmetric.</p> <p>Different concepts of Mechanics can be taught using this simple device.</p>		<p>3.75</p>	
<p>LOOP THE LOOP PH0323LL</p>  <ul style="list-style-type: none"> • Demonstrates transformation of potential energy into kinetic energy • Large imposing unit sure to impress • A steel ball, let loose at upper end of the loop, transverses the track at a fast speed without falling, while climbing the upper track of the loop • Stands 50cm tall <p><i>Outstanding DEMO in potential energy, kinetic energy, angular momentum and gravity!</i></p>	<p>71.50</p>	<p>LOOP THE LOOP WITH SCALE PH0323LS</p>  <p>To demonstrate transformation of potential into kinetic energy. For demonstration of conservation of energy, momentum and projectile motion.</p> <p>Loop the Loop looks like the track of a roller coaster. The curved metal track allows you to drop a steel ball from the top and watch the results.</p> <p>Depending on the height at which it is dropped the ball will roll completely around the interior of the track or will drop to the ground. A circular scale is attached to the device for measuring the angle at which the ball drops and the track is also graduated to determine the distance. Includes steel ball.</p> <p>Base Size 38 x 15cm Height 53 cm. Supplied with manual.</p>	<p>84.00</p>








MECHANICS KIT	AR1031354			370.00	
	<p>A comprehensive kit specially designed for exploring some more advanced concepts of mechanics.</p> <p>2 X Base support 2 X Rod 35cm 1 X Rod 40cm 1 X Rod 25cm 2 X Rod 50cm 1 X Connecting rod 1 X Trolley Plush 4 X Bosshead 1 X Thread 10m 2 X Pan with hook 1 X A pair of indicators 1 X Beaker 250mL 1 X Meter tape 1 X Archimedes Bucket 1 X Weight box</p>	<p>1 X A scale with clip 2 X S-shaped hook 1 X Dynamometer 1.5N 1 X Dynamometer 3N 1 X Friction wooden block 1 x Digital watch 1 x Spring 1N 1 x Spring 2.5N 1 x Solid Aluminium cylinder 1 x Graduated cylinder 100mL 1 x Aluminium parallelogram 1 x Beam balance with needle pointer 1 x Double scale with Bosshead</p>			
PROJECTILE LAUNCHER	PH0343	96.00	FRICITION CUBE WITH FOUR SIDES	PH1120151	22.00
	<p>Durable, unbreakable. Aluminium construction with hardened steel latches. String release trigger mechanism with 2 bore sights. Pivots from horizontal to 90 degrees. 19 mm diameter ball with hole is easy to use fixed launch position. Trajectories vary less than 1 cm because ball does not spin when launched.</p> <p>Includes assembled spring-loaded gun, two balls of aluminium, protractor, plumb bob and complete with operating instructions.</p>		<p>Four different surfaces - wood, paper, vinyl, sandpaper - with a different coefficient of friction.</p> <p>For exploration into the force of friction. Each face 5cm x 5cm.</p> <p>Pull the cube by the attached hook and both qualitatively and quantitatively demonstrate the properties of static and kinetic friction. Instruction manual included.</p>		
STUDY OF BALLISTICS KIT	AR1030838	99.95	INERTIA BALL	PH0311	22.50
	<p>Ballistics is the science of mechanics that deals with the launching, flight, behavior and effects of projectiles.</p> <p>Whole assembly is fitted on a metallic base. A knob is provided to adjust the launching angle from 0°-90°. Hardened spring and metallic trigger is provided to launch the rocket.</p>		<p>Great for numerous inertia labs. Heavy duty 455 g metal ball</p> <p>This is a demonstration of Newton's First Law of motion. Suspend the metal ball from the ceiling and attach a second string. What happens when you pull steadily on the lower string? What if you jerk it quickly? The ball can also be used as Pendulum bob. Fitted with 3 eye bolts.</p>		





<p>HAPPY & SAD BALLS AR1080391</p>  <p>Happy and Sad Ball, 2.5cm in diameter and can be used to demonstrate the difference between elastic and inelastic collisions. These have virtually the same density, mass and appearance. When these balls are thrown down, one bounces while the other hits the surface and lies there.</p>	15.00	<p>VARIABLE INERTIA SET AR1030548</p>  <p>Study rotational inertia with this well-conceived lab. Quickly change the distribution of mass by loading balls in compartments inside two plastic discs. Which is faster - the disc with the mass toward the center or toward the rim? Why? Includes two 11cm diameter plastic discs with eight compartments for holding balls and 8 x 19mm solid steel balls.</p>	25.00
<p>PUCK SET – SET OF 4 AR1031112</p>  <p>Pre-assembled ealing-style pucks, in 7 cm and 9 cm sizes, need only a smooth surface for levitation. Supplied as a set of two large and two small pucks and shipped with four sets each of balloons, stoppers, and connecting tubes.</p>	18.90	<p>MAGNETIC PUCK SET AR1031114</p>  <p>A new style puck set that is all magnet, so the field is strong. Reliable collisions occur before physical contact. Photo ready decals are installed. Supplied as a repelling pair.</p>	15.75
<p>ELECTRIC MOTOR & GENERATOR WITH 2-STEP PULLEY EM1760-001</p>  <p>A base mounted small DC motor with 2-step pulley used for experimentation, such as measuring electrical work done and comparing it with mechanical work done. A robust, small DC motor mounted on a compact base with 4mm socket head terminals. Motor is fitted with small metal 2 step pulley with large grooves for winding cotton or other fine threads, as weights are hoisted from the floor. The motor may be connected to a 3V DC (max) power source. Product dimensions (approx.): 110 x 65 x 39 mm; 0.1 kg. <i>Genuine IEC product.</i></p>	57.00	<p>STEAM ENGINE SECTIONAL AR1050120SE</p>  <p>This cast-metal model shows a longitudinal section of cylinder covered with a transparent plate, clearly showing the piston and position of valves. This model comes complete with working parts like piston, slide valve, crank, flywheel, connecting rods etc., and demonstrates the conversion of linear motion of piston rod to the rotatory motion of the crank shaft. Can be made to operate using a simple air pump or even by blowing with mouth.</p>	162.00
<p>LEVER KIT PH0340</p>  <p>Class pack of 5. Consists of 5 plywood beams with grooves. Supplied with 4 fulcrums & 40 metal blanks 25mm square. Supplied as kit for eight pupils and consists of five plywood beams 600 x 44 x 3 mm graduated every 38 mm and with groove across its centre to locate the fulcrum point. Also included are four fulcrums 32 x 32 x 64 mm and 40 metal blanks 25 mm square. The masses of the blanks are matched to + 1%.</p>	67.00	<p>LEVER & FULCRUM APPARATUS – 1M LONG MF1998-001</p>  <p>A simple demonstration where a metre rule balances at its mid point on a vertical pillar mounted on a base to rest on the table. It shows that when the weight x the distance (the moment) on one side of a pivot point equals the weight x distance on the other side, the system balances because the 2x moments are equal. This kit includes 2x 50g special slotted weight carriers that hook over the edge of a standard metre rule and can be slid to any point. The 1m wooden rule has a knife-edge fitted at the mid point and the support has a vee bearing to take the knife-edge. IEC product. <i>Slotted weights are not supplied.</i></p>	187.00






<p>NEWTON'S CRADLE PH0349ECB</p>  <ul style="list-style-type: none"> • Demonstrates Newton's Third Law • Some assembly required <p>(Item supplied may vary from illustration)</p>	33.95	<p>SET OF SPHERES – 25MM AR1030680-3</p>  <p>Ideal for collision experiments and pendulum demonstrations and can also be used to meet a variety of laboratory needs. Solid spheres are also suitable for density/volume experiments.</p> <p>The set includes 6 balls of 25mm diameter each of different materials-one each of wood, aluminum, steel, copper, brass & lead.</p> <p>NOTE. Rust may build up on the steel ball, but does not affect experiments. Remove with fine sandpaper.</p>	35.00
<p>FAN CAR FANCAR</p>  <ul style="list-style-type: none"> • Designed to examine Newton's Laws of motion, inertia, acceleration and action/reaction • Demonstrate what happens when sail is added or removed when fan is switched on • Features adjustable/removable sail • Dimensions: 180mm x 150mm x 200mm • 4 x AA batteries required (not included) <p>Teaching Unit included.</p>	58.70	<p>NEWTON'S FIXED ANGLE FAN CART 3568-00</p>  <ul style="list-style-type: none"> • Ideal for displaying Newton's laws of motion, force, acceleration, and mass in action • Easy to use, making it perfect for demonstration of these principles in any classroom • Comes with removable sail, to display action-reaction and to control motion, as well as battery clips • For use with one or two AA batteries • Shows the impact of different net forces on acceleration • Requires AA batteries (not included) <p>With teacher's guide</p>	56.00
<p>FALLING BODIES APPARATUS (PROJECTILE APP.) PH0318</p>  <ul style="list-style-type: none"> • Demonstrate the effect of gravity on falling bodies • 2 metal 19mm steel balls included in this kit. • L-section launcher with holes for locating two 19 mm diameter steel balls which act as projectiles. Launcher is released by push button and projects one ball forward while allowing the other to fall freely. • Launching mechanism mounted on wooden block 180 x 60 x 30 mm which may be clamped by bench and has a convenient storage pocket for the balls. 	32.20	<p>"G" BY FREE FALL APPARATUS ECONOMY WITH TIMER - 220V GFYE14-V2</p>  <p>The determination of the gravitational constant 'g' is one of the most fundamental and early physical constants students must derive and observe.</p> <p>This economical kit has a wooden base, 1.1m rod and a movable electromagnet. The electromagnet can be moved anywhere on the rod and is powered by the timer. When the ball is released the timer is triggered and stopped one the ball his landed on the base for a precise measurement and then calculation of 'g'.</p> <p>Supplied with manual.</p>	249.00





<p>AIR TRACK. 2.0M, COMPLETE KIT WITH ALL PARTS</p>	<p>MF0107Z-001</p>	<p>808.00</p>	<p>AIR TRACK 2.0M AIR TUBE WITH END SEALS ONLY</p> <p>MF0107-001</p>	<p>326.00</p>
<p>This IEC 'Linear Air Track' facilitates the study of mechanics, both quantitatively and qualitatively, by providing an almost friction free system on which a large range of experiments may be performed. It is a long straight 90 degree triangular shaped tube that is mounted on three adjustable feet so that the tube can be made level. The sloping sides of this tube have small holes drilled and air is pumped into the tube from an air blower. Air passes out the small holes in the sloping sides.</p>  <p>The AIR BLOWER & HOSE is not included (LB0115-002). Other optional parts include: the SUB-BASE & ASSEMBLY KIT (MF0107-005) to support the Air Tube and to pull it even straighter. PHOTO GATE KIT (MF0138-001); ELECTRONIC TIMER (LB4064-101); AIR TRACK 2.0M AIR TUBE WITH END SEALS ONLY (MF0107-001); SPARK RECORDING KIT (MF0107-401); SPARK GENERATOR & CABLES (LB0118-001).</p> <p>2.5m AIR TRACK COMPLETE KIT WITH ALL PARTS also available (Code: MF0105Z-001).</p>	<p>881.00</p>	<p>This IEC item is a 2m long AIR TUBE ONLY, drilled and anodised, complete with assembly kit.</p> <p>NOTE: Any basic IEC Air Track consists of an AIR TUBE with its assembly kit (end caps and feet etc) and an OPERATIONAL KIT of parts for doing experiments.</p> <p>Item MF0107Z-001 (2.0m Air Track with assembly & operating kits) is the 2m version of the complete basic Air Track (without the options below). OPTIONAL PARTS: (Many schools have some of these parts from older models) AIR BLOWER & HOSE (LB0115-002) to quietly feed air into any Air Track or Air Table. SUB BASE & ASSEMBLY KIT (MF0107-005) to support the Air Tube and to pull it even straighter. PHOTO GATE KIT (MF0138-001) measuring system to be used on any Air Track. ELECTRONIC TIMER (LB4064-101) that runs the Gates and measures times. LESS POPULAR PARTS ARE: SPARK RECORDING KIT (MF0107-401) measuring system of tapes and spark tracks to fit to the Air Track where sparks are fired to make black dots on paper tape as the gliders move along the track. SPARK GENERATOR & CABLES (LB0118-001) is the device that creates the sparks.</p> 	<p>220.00</p>	
<p>PHOTOGATE KIT</p> <p>MF0138-001</p> <p>This IEC PHOTOGATE KIT contains 2 x universal Photo Gates with all the cables and plugs required for connecting them to a digital timer (LB4064-101).</p>  <p>Photogates can be used on tracks either with or without a sub-base.</p> <p>A Photogate is a device that supports a small light source in line with a small light sensitive cell. A space between them permits a moving object to pass and break the light beam. On the Air Track, the Photogate sits directly on the track and permits a glider with a 'flag' taped to the side pass through the light beam.</p>	<p>317.00</p>	<p>AIR TRACK SUB-BASE & 10 STUD KIT</p> <p>MF0107-005</p> <p>The Sub-Base is a strong length of special tubing that is attached to the Air Track by sets of adjustable studs that can alter the straightness of the Air Track tube. For installations where the straightness is of special importance, it is recommended to use a sub-base under the track. Kit comprises of: 2m long Sub-Base tube with end caps. With 10x threaded studs with square heads and round knobs for level adjustment. Includes Instruction Sheet. <i>Genuine IEC product.</i></p>  <p>Sub-Track (MF0105-005) also available for IEC's 2.5m Air Track (MF0105Z-001)</p>	<p>251.00</p>	









<p>PHOTOGATE "U" SHAPED WITH SUPPORT ROD LB2336-001</p>  <p>The IEC Photo Gate is a universal type device for detecting of the breaking of a beam of red LED light as objects move to pass through the beam. Very useful for many types of measurement and adaptors are available to permit the standard gates to 'click' to the edges of the IEC Air Track so that gliders can pass through.</p> <p>12V, AC or DC is required to run the LED and any of IEC's many electronic timers will respond to the PhotoGate signal in your experiments.</p> <p>The gates developed for the new "Genius" timer (LB4055-001) permit powering the LED and retrieving the signal using the same cable and plug. The timer can run 2 gates simultaneously.</p> <p>Instruction Sheet included.</p>	<p>115.00</p>	<p>AIR TRACK 2.0M SPARK RECORDING KIT MF0107-401</p>  <p>This is the IEC SPARK RECORDING KIT for the 2m long Air Track.</p> <p>It consists of a pair of special insulated tracks that carry the spark electrodes and a pair of insulated tracks that carry the paper tapes. All parts are in the kit except the Spark Generator.</p> <p>The pens that fit to the gliders carry the spark from the electrodes to the paper tape without anything touching to spoil the friction free operation. The sparks going through the paper tape make black dots which are measured in pitch to calculate velocities and accelerations.</p> <p>The SPARK GENERATOR (LB0118-001) to create the sparks is not supplied with the kit.</p> <p>Instruction Sheet included.</p> <p>SPARK RECORDING KIT for AIR TRACK 2.5M also available (Code: MF0105-401).</p>	<p>350.90</p> <p>374.00</p>
<p>AIR TRACK KIT - ALL MODELS OPERATIONS KIT MF0133-001</p>  <p>This is the IEC AIR TRACK OPERATION KIT.</p> <p>It contains a large set of parts for performing all the experiments. The operation kit is the same for both 2m and 2.5m air tracks.</p> <p>It includes 2x long and 2x short gliders, spring buffers, non-spring buffers, various springs, track pulley, loop springs, magnets, weights, inclination blocks with instructions.</p> <p>It is included in the 2.5m MF0105Z-001 and 2m MF0107Z-001 Complete Air Tracks, but can also be obtained separately.</p> <p>Instruction Sheet included.</p>	<p>413.00</p>	<p>AIR TRACK KIT BOOSTER MF0136-101A</p>  <p>This is the AIR TRACK OPERATION BOOSTER KIT.</p> <p>It contains a set of parts for expanding the standard MF0133-001 operation kit. The booster kit is the same for both 2m Air Track and 2.5m Air Tracks.</p> <p>The booster kit is an additional kit of parts to extend the standard kit. It includes a heavy 'Stop Block' mounted on a felt lined piece of glider material that can be positioned part way along a track to divide the track into separate sections so that two students can perform experiments simultaneously. The heavy block is fixed to the felt lined glider with a special screw and nut.</p> <p><i>Genuine IEC product.</i></p>	<p>258.00</p>

<p>AIR TRACK TUBE ASSEMBLY KIT</p> 	<p>MF0132-001</p> <p>This is the AIR TRACK AIR TUBE ASSEMBLY KIT only. It is normally supplied with the Air Tube, but it is also available separately and is the same exactly for both 2m and 2.5m Air Tracks. It contains mainly the sets of feet, level adjusting screws, the end caps and 'O'ring seals and screws for the tube. Including the metric tape that fits the length of the track and the end plug that blocks the air. This kit of parts is used to assemble the Linear Air Track. The 'brace plate' is positioned between the tube and the mouldings to exert a pre-stress on the moulded feet towards the table to stop flexing of the feet upwards. The 16mm wide tape measure is slid up the slot provided in the Air Track tube. The excess length can be cut off if desired. Instruction Sheet included. <i>Genuine IEC product.</i></p>			<p>141.00</p>
<p>AIR TRACK GLIDER SPECIAL CONSTANT FORCE ATTACHEMENT</p> 	<p>PA0146-001</p> <p>Air Track special glider, 'constant force' attachment. For special experiments on Air Tracks. <i>IEC product.</i></p>	<p>205.00</p>	<p>AIR TRACK GLIDER SPECIAL PENDULUM ATTACHMENT</p>  <p>Air Track special glider, "pendulum" attachment. Used for special physics experiments.</p>	<p>206.00</p>
<p>AIR TRACK GLIDER – BLACK – 10CM LONG</p> 	<p>PA0130-025</p> <p>100mm long black glider for Air Track. With weight carrier blocks. 100g.</p>	<p>29.00</p>	<p>AIR TRACK GLIDER – GOLD – 10CM LONG</p>  <p>100mm long gold glider for Air Track. With weight carrier blocks. 100g.</p>	<p>29.00</p>
<p>AIR TRACK GLIDER – BLACK – 20CM LONG</p> 	<p>PA0130-024</p> <p>200mm long black glider for Air Track. With weight carrier blocks. 200g.</p>	<p>31.40</p>	<p>AIR TRACK GLIDER – GOLD – 20CM LONG</p>  <p>200mm long gold glider for Air Track. With weight carrier blocks. 200g.</p>	<p>31.40</p>






AIR TRACK TUBE ASSEMBLY KIT	MF0132-001	141.00		141.00
	<p>This is the AIR TRACK AIR TUBE ASSEMBLY KIT only. It is normally supplied with the Air Tube, but it is also available separately and is the same exactly for both 2m and 2.5m Air Tracks. It contains mainly the sets of feet, level adjusting screws, the end caps and 'O'ring seals and screws for the tube. Including the metric tape that fits the length of the track and the end plug that blocks the air.</p> <p>This kit of parts is used to assemble the Linear Air Track. The 'brace plate' is positioned between the tube and the mouldings to exert a pre-stress on the moulded feet towards the table to stop flexing of the feet upwards.</p> <p>The 16mm wide tape measure is slid up the slot provided in the Air Track tube. The excess length can be cut off if desired. Instruction Sheet included.</p> <p><i>Genuine IEC product.</i></p>			
AIR BLOWER WITH HOSE	LB0115-002	326.00	<p>See "Parts & Accessories" for more parts & accessories to suit the IEC Air Track,</p>	
	<p>This air blower is very compact, easy to use, it has a variable speed to suit requirements.</p> <p>It is very quiet in operation and comes complete with an outer shroud of styrene foam to reduce noise to a minimum, but it can be used with or without this shroud.</p> <p>Suitable for IEC Linear Air Track & Air Table.</p>			
WHEEL & AXLE – 2 SIZE PULLEYS – SIMPLE	MF4620-001	74.00	<p>PENDULUM CLAMP</p> <p>PENDUCLP</p> <ul style="list-style-type: none"> • Makes it easy to simultaneously demonstrate or test the properties of simple harmonic motion in physics labs or classrooms • Three screw clamps can securely and individually be used to attach weights with string • For use on support rods up to 16mm in diameter to hang weights or pendulums <p>Overall length (approx.): 28.5 x 3.75 x 3.1cm</p>	18.50
	<p>The 'Wheel & Axle' by IEC is a simple pair of pulleys made from very strong 5 ply timber and sealed against moisture. The pulleys are 150mm and 75mm diameters and are fixed together as one 'dual diameter' pulley, with a central bearing so it can rotate freely on a strong 10mm diameter rod. By winding cords around each size pulley and using weights, the mechanics of 'double pulleys' and ratios can be studied.</p> <p>Instruction sheet included.</p>			


CIRCULAR MOTION KIT WITH SPEED CONTROL	MF0848-001	187.00			
	<p>This kit permits the swinging of a mass in a circular orbit under controlled conditions. Measurements are made on orbit diameter, mass of the projectile and revolutions per minute. Mechanical experiments on circular motion can be performed with excellent accuracy. Runs from a transformer or low voltage power supply from 8 to 12V AC or DC (<i>NOT INCLUDED</i>).</p> <p>Motor and disc mounted on support tube with cable and banana plugs. This motor unit is complete with its electronic speed controller to adjust and maintain small but steady rotational power to maintain the circular motion of the masses.</p> <p>Apparatus also includes: • 3 x Special rubber masses, approx. 20mm diam x 4g, 25mm diam x 8g, 32mm diam x 16g, with measurement reference line, mass in grams marked on each and loop for attachment to light chain or cord; • 3 x Pieces of very light alloy chain cut to different lengths; • 4 x Metal clips to connect each chain to a mass and the motor disc; • 1 x Set of experiment notes (by Bruce Saunders).</p> <p>Retort stand not included. <i>IEC product.</i></p>				
INERTIA APPARATUS	PH03551A	21.75	RING AND DISC	RNGPL	13.90
	<p>Demonstrate inertia in a simple experiment.</p> <p>Perfect for middle, high school or even basic university physics</p> <p>Stand with a receptacle for a ball at the top. 18mm steel ball, a square piece of sheet metal and a trigger of sheet metal included. Pulling and releasing the trigger causes the square sheet to slide out from under the ball, dropping the ball in the receptacle by inertia.</p>			<p>A simple tool to demonstrate rotational inertia to students. The steel ring and wooden disc are of identical diameter and identical mass. Roll them down an inclined plane. Which will reach the bottom first? What happens if you let them keep moving?</p>	
WIRE TESTING CLAMPS, WITH WING NUT FIXINGS - TEST FOR BREAKING STRAIN AND STRENGTH	PH0327WT	17.00	STRIP TESTING CLAMPS, WITH WING NUT FIXINGS AND ATTACHMENT BARS - TO TEST FOR BREAKING STRAIN AND STRENGTH	PH0327ST	21.00
	<p>Pair of quality aluminium clamps with wing-nut and washer fixings.</p> <p>Clamps measure 6.25 x 5.0 x 1.87cm.</p> <p>Great for physics experimentation such as testing breaking strain and strength of wire. Clamps feature a 0.82cm hole for hanging slotted weights.</p> <p>Clamps are designed for testing fine ductile materials such as nylon, elastic bands, copper up to 30 SWG, human hair etc. Used in combination with a meter rule.</p> <p><i>(NOTE: Not suitable for testing low elasticity materials such as steel or brass. Supplied without weights).</i></p>			<p>Great for physics experimentation, testing breaking strain, strength, and stretch of fabrics, paper, polythene, etc.</p> <p>Pair of quality aluminium clamps with wing-nut fixings and attachment system.</p> <p>Clamps measure 6.25 x 5.0 x 1.87cm. Attachment bars measure 4.0cm.</p> <p>Clamps feature a 0.82cm hole for hanging slotted weights.</p> <p><i>(NOTE: Not suitable for testing low elasticity materials such as metal strips, etc. Supplied without weights).</i></p>	











ITEM NAME	CODE	PRICE	ITEM NAME	CODE	PRICE
PENDULUMS ON STAND	PH0309	68.00	PULLEY DEMONSTRATION SET – STUDENT'S	PH0305	365.00
 <p>Heavy metal stand with a meter scale mounted on a vertical rod can hold three pendulums of 5 cm apart with points for suspension of cords.</p> <p>Three 2.5 cm pendulum bobs of wood, iron and steel are suspended from a common hanger mounted on a vertical rod screwed to a heavy metal stand. A meter scale and a sliding index with projecting piece are provided. The sliding index can control the length of the first cord.</p> <p>Zero of meter stick is placed at the bottom and when the centre of the pendulum is placed opposite this point, the length of the pendulum is read directly from the position of the slider.</p>			 <p>Designed to demonstrate various concepts associated with pulleys and their configurations. Demonstrate multiple configurations simultaneously or concentrate on one topic. Instructions included.</p> <p>Built to last for years in the classroom with a sturdy metal base and quality-made steel rods. Easy to use, designed for students learning the basics of mechanical advantage with pulley applications. The variety of included pulleys and accessories make it the ideal pulley demonstration tool.</p> <p>Set includes:</p> <ul style="list-style-type: none"> - Pulleys - 8 x single, 2 x double sheave, ball bearing frictionless pulleys - Wooden base (20 x 15 cm) fitted with one vertical rod (61 cm x 12.5 mm) and one horizontal rod (20 cm x 9.5 mm) with clamp - 6 x Collars with hook - 1 x Right angled clamp - 1 x Wheel & axle - Cord - 2 rolls - 1 x Tommy bar to tighten vertical rods - Brass hooked mass set (1x10g, 2x20g, 1x50g, 1x100g, 2x200g, 1x500g, 1x1000g) 		
PULLEY – 50MM DIA. – ON STRAIGHT ALLOY ROD	MF2600-001	20.35	PULLEY – 50MM DIA. – ON OFFSET ALLOY ROD	MF2600-020	20.35
 <p>Held in place by the <i>BENCH CLAMP</i> (LB0858-001) or by a retort stand and boss head. This 50mm diameter nylon pulley is fixed to the end of an 20mm long x 8mm diameter anodised rod.</p> <p>The rod supporting the pulley is straight in one plane, but edgewise the rod is offset so that the pulley groove is in line with the rod.</p> <p><i>Genuine IEC product.</i> Instruction sheet included.</p>			 <p>Held in place by the <i>BENCH CLAMP</i> (LB0858-001) or by a retort stand and boss head. This 50mm diameter nylon pulley is fixed to the end of an 20mm long x 8mm diameter anodised rod.</p> <p>The pulley can be brought down to a very low position for use with cords passing over the edge of benches.</p> <p>The rod supporting the pulley is bent in one plane, but edgewise the rod is offset so that the pulley groove is in line with the rod.</p> <p><i>Genuine IEC product.</i> Instruction sheet included.</p>		










<p>SPARE ADJUSTABLE PULLEY ON ROD</p> <p>PH0297C</p>  <p>Spare pulley on rod suitable for ADJUSTABLE PULLEY CLAMP – METAL (PH0297A)</p> <p>Sturdy, metal constructed clamp pulley can be used to demonstrate a wide variety of mechanics' principles. The metal sheave is 5 cm in diameter</p>	12.50	<p>DIFFERENTIAL PULLEY – 4 STEP</p> <p>PH0282D</p>  <p>4 step differential pulley. 20, 30, 40, 60 mm diameter steps. 16.25cm total length. Ideal for classroom demonstrations pertaining to mechanical advantage. Each step has a gap of about 5mm. The 1.87cm diameter post attaches easily to any stand and rod assembly. NOTE: Clamps not included.</p>	21.00
<p>PULLEY SINGLE BENCH MOUNT</p> <p>PH0290A</p>  <p>Bench mounting, aluminium 50 mm diameter pulley, in metal frame for clamping to benches or boards upto 28 mm thick.</p>	15.00	<p>ADJUSTABLE PULLEY CLAMP – METAL</p> <p>PH0297A</p>  <p>Sturdy, metal clamp pulley that can be used to demonstrate a wide variety of mechanics principles. The metal sheave is 5 cm in diameter and can be adjusted from flush with the tabletop to 13 cm above it. Pulley can be rotated to 360° to suit any experimental setup. Adjustable to 22.5cm height with 4.75cm maximum clamp opening.</p>	32.00
<p>PENDULUM BOBS WITH HOOKS - SET OF 3</p> <p>PH0306F</p>  <p>Comprising a set of 3 solid spheres. One each of brass, copper & iron having diameter of 25 mm with a small ring for suspension.</p>	17.75	<p>STEEL BALLS - SET OF 60 EACH OF 3 DIFFERENT SIZES</p> <p>HSSTB20</p>  <p>Set of 60 steel ball bearings.</p> <p>20 each of 13mm, 16mm & 20mm.</p> <ul style="list-style-type: none"> • Come in storage jar. 	34.15
<p>PENDULUM BOBS - BRASS – 3 DIAMETERS</p> <p>MF2290-00</p>  <p>Set of 3 brass pendulum bobs. Genuine IEC products. Each bob has a 1.5mm diameter hole drilled right through the diameter with one side made larger so that a knot in a cord can be pulled into the larger hole to hold firmly and also be out of sight. Contains the following diameter sizes:</p> <ul style="list-style-type: none"> 1 x Brass bob: 25mm (MF2291-001) 1 x Brass bob: 20mm (MF2292-001) 1 x Brass bob: 12.5mm (MF2293-001). <p><i>Also sold separately – see below (individual codes listed above).</i></p>	16.00	<p>HOOKE'S LAW APPARATUS – SINGLE SPRING (COMPLETE)</p> <p>PH0322</p>  <p>Complete kit with 10 x 10g weights. Measure and prove that the stretch of a spring is proportional to its load. You can also determine harmonic motion by counting the oscillations. 12cm long metal scale with support spring. Illustrated instructions included.</p>	56.70




PENDULUM BOBS			
BRASS – 25MM DIAMETER	MF2291-001	Nominal diameters only. Actual diameters should be measured accurately if performing experiments that involve mass.	8.80
BRASS – 20MM DIAMETER	MF2292-001		6.05
BRASS – 12.5MM DIAMETER	MF2293-001	Each bob has a 1.5mm diameter hole drilled right through the diameter with one side made larger so that a knot in a cord can be pulled into the larger hole to hold firmly and also be out of sight. Genuine IEC products.	4.95
STEEL – 20MM DIAMETER	MF2294-001		4.95
PLASTIC – 20MM DIAMETER	MF2295-001		Instruction Sheet

ITEM NAME	CODE	PRICE	ITEM NAME	CODE	PRICE
HOOKE'S LAW APPARATUS - SINGLE – WITHOUT WEIGHTS	PH0322A	44.00	10G SLOTTED WEIGHTS FOR HOOKE'S LAW APPARATUS SINGLE	PH0322B	23.00
	Hooke's Law Apparatus – Single – Without weights.			Pack of 10 x 10g weights for use with HOOKE'S LAW APPARATUS (PH0322A)	
MULTI SPRING HOOKE'S LAW APPARATUS	PH0323SP3	79.50	SPRING SET - SPARES	PH0323SS	9.50
	<ul style="list-style-type: none"> • Heavy metal stand with a meter scale mounted on a vertical rod can hold three pendulums of 5 cm apart with points for suspension of cords. • Three 2.5 cm pendulum bobs of wood, iron and steel are suspended from a common hanger mounted on a vertical rod screwed to a heavy metal stand. A meter scale and a sliding index with projecting piece is provided. The sliding index can control the length of the first cord. • Zero of meter stick is placed at the bottom and when the centre of the pendulum is placed opposite this point, the length of the pendulum is read directly from the position of the slider. 			<p>Set of five different springs constants.</p> <p>The set has five different springs constants for in depth investigation with Hooke's law apparatus PH0323SP3.</p>	
SET OF SPRINGS – SET OF 6	AR1010140-2	14.20	SET OF SPRINGS – SET OF 12	AR1010140-3	25.20
	Set of 6 springs-1 each of diameter approx. 6, 9, 12, 15, 18 and 20mm.			Set of 12 springs-1 each of diameter approx. 4, 6, 8, 10, 12, 15, 18, 20, 22, 24, 26 and 28mm.	


<p>HOOKE'S LAW-SPRINGS – PROPORTIONAL - SET/6 MF1918-101</p>	<p>28.60</p>	<p>HOOKE'S LAW-SPRINGS - NON-PROPORTIONAL - SET OF 5 MF1918-001</p>	<p>25.30</p>
 <p>This set of 6 springs with their chosen diameters and lengths, together with the choice of wire thicknesses, make them very suitable for experiments relating to "Hooke's Law". The 'proportional set' have diameters and lengths in convenient ratios to one another. All 6 springs are tension springs with 'eye' each end. Contains one of the following springs:</p> <ul style="list-style-type: none"> • 10 x 150 mm diameter x length x 0.56 mm. diameter wire • 10 x 300 mm diameter x length x 0.56 mm. diam. wire • 10 x 150 mm diameter x length x 0.71 mm. dia. wire • 10 x 300 mm diameter x length x 0.71 mm. dia. wire • 15 x 150 mm diameter x length x 0.71 mm. dia. wire • 15 x 300 mm diameter x length x 0.71 mm. dia. wire. 		 <ul style="list-style-type: none"> • This set of 5 springs, with their chosen diameters and lengths, together with the choice of their wire thicknesses, make them very suitable for experiments relating to "Hooke's Law" • This set contains the following springs: <ul style="list-style-type: none"> • 1x Tension Spring, 6.2 x 320 mm diameter x length x 1.02 mm. diameter wire • 1x Tension Spring, 6.2 x 210 mm diameter x length x 1.02 mm. diameter wire • 1x Tension Spring, 7.8 x 70 mm diameter x length x 0.90 mm. diameter wire • 1x Tension Spring, 9.2 x 300 mm diameter x length x 0.71 mm. diameter wire • 1x Tension Spring, 14.5 x 300 mm diameter x length x 0.88 mm. diameter wire. 	
<p>HELICAL SPRING & MASS SET PH0325</p>  <ul style="list-style-type: none"> • Used to illustrate Hooke's Law • Consists of 20cm steel spring with hooks on both ends <p>Masses: 1 x 2kg, 1 x 0.5kg, 1 x 237g with hooks on both ends.</p>	<p>69.30</p>	<p>ELASTICS MATERIALS KIT PH0324</p>  <p>Contains various materials such as springs, rubber blocks, wire, rubber cord, tube etc., provided for class experiments to explore 'elasticity'. Kit comprises 2 latex foam blocks, 130 x 50 x 50 mm square, 4 elastic cords with eyelets, 4 soft rubber erasers, one 900 mm length of valve rubber tubing, 40 g reels of bare copper wire 0.28 mm and 0.45 mm diameter, 2 wide steel strings of 4½ turns 50 mm diameter and 25 pcs. of expandable steel springs for testing beyond the elastic limit, with ends bent to form hooks.</p>	<p>45.00</p>
<p>DRILLED BALL SET OF 12 IN BOX PH0109PCB</p>  <p>Perfect for pendulum experiments. It's a multi-purpose set ideal for pendulum experiments but can be used to meet a variety of lab needs. Set includes 6 balls each 25 mm in diameter. Contains two balls each of Wood, Aluminium, Steel, Cork, Brass and Lead. Each ball is drilled with 3 mm diameter hole. Supplied in plastic box.</p>	<p>69.00</p>	<p>DRILLED BALL SET - SET OF 6 PH0109</p>  <ul style="list-style-type: none"> • Perfect for pendulum experiments. It's a multi-purpose set ideal for pendulum experiments but can be used to meet a variety of lab needs. Set includes 6 balls each 25 mm in diameter. • Contains one ball each of wood, aluminium, steel, copper, brass and lead. Each ball is drilled with 3 mm diameter hole. 	<p>36.00</p>


<p>CORDS SUSPENSION - NYLON</p> <p>PH0302A</p>  <p>Nylon cord. Suitable for small pulley system & pendulum. Length 30 m approx.</p>	<p>9.45</p>	<p>CORDS SUSPENSION - COTTON</p> <p>PH0302B</p>  <p>Cotton twin cord. Suitable for small pulley system & pendulum. Length 30 m approx.</p>	<p>7.50</p>
<p>SLOTTED BRASS WEIGHTS - SET OF 3</p> <p>MF4304-101</p>  <p>Solid brass discs with shaped slots: 1 X 5 g, 1 x 10 g, 1 x 30 g.</p> <p>Solid brass discs with shaped slots for use with suitable carrier with 5mm rod.30 mm diameter. (Set excludes carrier). Accuracy greater than 1%. (Total weight 35 g).</p> <p><i>Genuine IEC product.</i></p>	<p>11.00</p>	<p>SLOTTED BRASS WEIGHTS - SET OF 5</p> <p>MF4304-001</p>  <p>Solid brass discs with shaped slots: 1 x 10 g, 2 x 20 g, 1 x 50 g, 1 x 100 gm.</p> <p>Solid brass discs with shaped slots for use with suitable carrier with 5mm rod. 30mm diameter. (Set excludes carrier). Accuracy greater than 1%. (Total weight 200g).</p> <p><i>Genuine IEC product.</i></p>	<p>20.90</p>
<p>BRASS SLOTTED WEIGHT 100GM</p> <p>MF4301-002</p>  <p>Individual 100g brass slotted weight suitable for standard slotted weight carrier from <i>IEC</i>. Accuracy better than 1%.</p>	<p>8.25</p>	<p>BRASS SLOTTED WEIGHT 50GM</p> <p>MF4300-002</p>  <p>Individual 50g brass slotted weight suitable for standard slotted weight carrier from <i>IEC</i>. Accuracy better than 1%.</p>	<p>5.95</p>
<p>BRASS SLOTTED WEIGHT 25GM</p> <p>MF4300-005</p>  <p>Individual 25g brass slotted weight suitable for standard slotted weight carrier from <i>IEC</i>. Accuracy better than 1%.</p>	<p>4.70</p>	<p>BRASS SLOTTED WEIGHT 20GM</p> <p>MF4300-006</p>  <p>Individual 20g brass slotted weight suitable for standard slotted weight carrier from <i>IEC</i>. Accuracy better than 1%.</p>	<p>4.30</p>
<p>BRASS SLOTTED WEIGHT 10GM</p> <p>MF4303-002</p>  <p>Individual 10g brass slotted weight suitable for standard slotted weight carrier from <i>IEC</i>. A pressed brass weight with a small section of circle cropped. Accuracy better than 1%.</p>	<p>4.05</p>	<p>BRASS SLOTTED WEIGHT 5GM</p> <p>MF4302-002</p>  <p>Individual 5g brass slotted weight from <i>IEC</i>. A pressed brass weight with a small section of circle cropped. Accuracy better than 2%</p>	<p>3.50</p>

<p>WEIGHTS 100G – BRASS – SET OF 9 ON CARRIER MF4301-001</p>  <ul style="list-style-type: none"> • Set of 9 X 100g weights brass slotted weights on carrier 100g • High quality, genuine IEC product 	84.00	<p>WEIGHTS 10G – BRASS – SET OF 9 ON CARRIER MF4303-001</p> <p>10g weights</p>	40.15
		<p>WEIGHTS 50G – BRASS – SET OF 9 ON CARRIER MF4300-001</p> <p>50g weights</p>  <ul style="list-style-type: none"> • Set of 9 X 10g weights brass slotted weights on carrier 10g (MF4303-001) OR • Set of 9 X 50g weights brass slotted weights on carrier 50g (MF4300-001) • High quality, genuine IEC product 	70.40
<p>HOOKED WEIGHTS - STAINLESS STEEL (METRIC GRAMS) PH0037DSS</p>  <p>Stainless Steel Hooked weights. Set of 9 weights, 10-1000 g in wooden block.</p> <p>Stainless Steel hooks at both ends. Recessed bottoms to enable the weights to be hooked together. The bottom is flat when placed on a flat surface.</p>	175.00	<p>HOOKED WEIGHTS - STAINLESS STEEL (METRIC GRAMS) - WITH WEIGHTS OF 1KG & 500G IN STEEL PH0037DSSECO</p>  <p>Same as PH0037DSS but with weights of 1 kg and 500 g in steel.</p>	131.00
<p>WEIGHT SET 1990GM WTSET1990</p>  <p>Set of weights mounted on sturdy plastic storage tray, useful for a variety of experiments. Contains the following weights: 1 x 1000gm, 1 x 500gm, 1 x 200gm, 2 x 100gm, 1 x 50gm, 1 x 20gm, 2 x 10gm.</p>	77.25	<p>SPHERES, STEEL – 3MM PH0203AA</p>  <p>High quality steel ball bearings. Can be used for a variety of mechanics experiments or a for a variety of uses at home.</p> <p>Pack of 3mm steel ball bearings.</p> <p>Quantity per pack: 50.</p>	7.05
<p>SPHERES, STEEL – 6MM PH0203AB</p>  <p>High quality steel ball bearings. Can be used for a variety of mechanics experiments including collision simulations, kinetic & potential energy experiments. Pack of 6mm. Quantity per pack: 50. CURRENTLY OUT OF STOCK</p>	10.75	<p>SPHERES, STEEL – 10MM PH0203AC</p>  <p>High quality steel ball bearings. Can be used for a variety of mechanics experiments.</p> <p>Pack of 10mm steel ball bearings.</p> <p>Quantity per pack: 10.</p>	11.30
<p>SPHERES, STEEL – 25MM PH0203AG</p>  <p>High quality steel ball bearings. Can be used for a variety of mechanics experiments.</p> <p>Pack of 25mm. Quantity per pack: 5.</p>	14.45		14.00 Ea (5+ packs)

ITEM NAME	CODE	DESCRIPTION	PRICE (ea)
NEWTON'S SPRING BALANCES - DYNAMOMETERS 	PH0033A	Newton Spring Balances - Tubular - Capacity: 100gm, Newton 1N, Sub-division 2gm.	11.00
	PH0033B	Newton Spring Balances - Tubular - Capacity: 250gm, Newton 2.5N, Sub-division 5gm.	11.00
	PH0033C	Newton Spring Balances - Tubular - Capacity: 500gm, Newton 5N, Sub-division 10gm.	11.00
	PH0033D	Newton Spring Balances - Tubular - Capacity: 1kg, Newton 10N, Sub-division 20gm.	11.00
	PH0033E	Newton Spring Balances - Tubular - Capacity: 2kg, Newton 20N, Sub-division 40gm.	11.00
	PH0033F	Newton Spring Balances - Tubular - Capacity: 3kg, Newton 30N, Sub-division 60gm.	11.00
	PH0033G	Newton Spring Balances - Tubular - Capacity: 5kg, Newton 50N Sub-division 100gm	11.00
	PH0033SET	Newton Spring Balances – Tubular – Set of 7 (one of each capacity)	70.00
SPRING BALANCES - FLAT 		Used in physics and education as basic accelerometers. Also known as a Newton Meter. Aluminium and plastic construction. Used in industry and education to measure a force exerted on a mass. One newton corresponds to the weight of about a tenth of a kilogram of mass.	
	GE1535-01	Spring Balance - Flat - Capacity: 1N	7.60
	GE1555-01	Spring Balance - Flat - Capacity: 2.5N	7.60
	GE1565-01	Spring Balance - Flat - Capacity: 5N	7.60
	GE1575-01	Spring Balance - Flat - Capacity: 10N	7.60
	GE1585-01	Spring Balance - Flat - Capacity: 20N	7.60
	GE1586-01	Spring Balance - Flat - Capacity: 50N	7.60
	GE15SET	Set of 1 each of the capacities of these types of flat spring balances.	43.00
PUSH-PULL DYNAMOMETERS 		Acrylic. Along with the suspension ring at the top and load hook at the bottom for pull type loading, it also has a plastic rod with rectangular cross-section at the top for push type loading of the balance. This bar extends to inside the clear acrylic tube and guides the tempered steel spring, which is always loaded compressively due to loading either at top or bottom i.e., push or pull, respectively. The reading scale is calibrated in both kg or Newton and a plastic cursor inside the tube registers the push/pull reading. Each capacity comes in a different colour.	
	AR2012440-1	250gm / 2.5N	11.00
	AR2012440-2	500g / 5N	11.00
	AR2012440-3	1kg / 10N	11.00
	AR2012440-4	2kg / 20N	11.00
	AR2012440-5	3kg / 30N	11.00
	AR2012440-6	5kg / 50N	11.00
	AR2012440SET	Set of 6 (one of each capacity)	61.00







ALL PRICES INCLUDE GST.

	SPRING BALANCES – POCKET SIZE	PH0028C	1 kg x 40 gm	Pocket size, moulded in tough ABS plastic, reading scale on both faces. Length 85 mm Width 25 mm.	9.10
		PH0028D	2 kg x 80 gm		9.10
		PH0028E	5 kg x 200 gm		9.10

	SPRING BALANCES – EXTRA STRENGTH	PH0031A	1 Kg / 10gm	Constructed of unbreakable nylon. Inbuilt tare screw for zero adjustment. Incorporates overload protection. Length: 200mm; Width: 25mm	11.50
		PH0031B	2 Kg / 20gm		12.10
		PH0031C	5 Kg / 50gm		12.10
		PH0031D	10 Kg / 100gm		12.50
		PH0031SET	Set of 4		Set of 4. Set includes one of each capacity: 1 x PH0031A, 1 x PH0031B, 1 x PH0031C, 1 x PH0031D.

ALL PRICES INCLUDE GST.








FLUID MECHANICS – DYNAMICS & STATICS







ITEM NAME	CODE	PRICE	ITEM NAME	CODE	PRICE
PASCAL'S BALL (PASCAL'S LAW SYRINGE, METAL)	AR1020360	48.95	PASCAL'S PRINCIPAL DEMONSTRATOR	AR1020340	12.00
	All metal construction provides rigidity, sturdiness and durability to the apparatus. Comprises a removable spherical metal bulb mounted at one end of the cylindrical barrel with piston plunger at the other end. The spherical bulb has a number of holes on its surface with small brass nozzles projecting out. All metal parts either well painted or plated. When filled with water, pushing in the plunger makes water to eject from all the nozzles with equal force.			This apparatus is used to demonstrate that the liquid transmits equal pressure in all directions. The apparatus comprising a glass cylinder provided with a piston plunger on one end and terminating in a spherical glass bulb on the other end. The bulb has small holes around its surface. On pushing the plunger inside with the apparatus filled with water, water is ejected with equal force from all the holes.	
PASCAL'S LAW APPARATUS	AR1020370	34.50	HARBOTTLE	AR1021245	12.85
	This apparatus is used to demonstrate the Pascal's Law that pressure exerted by a liquid in an enclosed space is equal in all directions. <ul style="list-style-type: none">Comprises a spherical glass bulb (with holes) with its neck supported horizontally and is connected to a vertically mounted 50ml plastic syringe through a flexible rubber tubing. Complete apparatus mounted on a plastic base.			The Harbottle helps students understand the concept of fluid pressure and pressure reduction. It is a spherical glass container with a balloon stretched over its opening and a hole in the flattened base that is fitted with a rubber stopper. See students be amazed when they observe that the balloon remains inflated inside the bottle even though it is not tied off or sealed. Insert water into the inflated balloon and entertain students when you remove the stopper.	
CATCH BUCKET	PH0119D	6.60	DISPLACEMENT VESSEL	MS0618-01	9.60
	<ul style="list-style-type: none">Aluminium vessel used for volumetric displacement of liquid experiments100 x 80mmWith handle Should be used in conjunction with a displacement vessel (overflow can) for collecting liquid from the spout of the overflow can.			<ul style="list-style-type: none">Metal displacement vessel with spout for specific gravity experimentsSize: 115mm x 50mm (approx.)- Spout 40mm long (approx.) Holds approx. 200ml of water	







For more displacement vessels and overflow cans, see "Density"

ALL PRICES INCLUDE GST.

<p>WIND TUNNEL</p> <p>AR1021470</p> <p>52.45</p> <p>Many students have flown in airplanes or know someone who has. Few understand the principles of lift. Even today, all of the principles of lift and aerodynamic flow are not completely understood. By and large, lift works because Bernoulli's Principle requires a partial vacuum to form over the wing of an airplane. This means greater pressure is under the wing, forcing it upwards.</p> <p>With this wind tunnel and an accurate balance, you can clearly see the effect of lift in action. Activate the unit, and the apparent weight of the airfoil will decrease. Useful for aerodynamics study. It is helpful for understanding what the behavior of air is when crossing through objects of different shapes and size. Comprises a clear tube with a fan located at one end and wing shaped object for demonstration. Provided with 4mm safety sockets for input. Instruction sheet included.</p> <p>NOTE: Requires small digital scale, low voltage power supply (e.g. POWER SUPPLY - Code: AR2040451 or POWER SUPPLY SW GENERAL PURPOSE 2-12VDC (Code: LB2633-001), and source of smoke, such as incense candle (<i>not included</i>).</p> 	<p>MANOMETER – LARGE DEMONSTRATION TYPE +/- 300MM</p> <p>MF2095-001</p> <p>138.00</p> <p>This demonstration Manometer is a high quality instrument designed to demonstrate the fundamentals of any manometer. This unit can be used for measuring very small pressures (perhaps the pressure of natural gas) and for the demonstration of how such low pressures are measured in mm of water height. It is constructed inside a strong alloy housing. It is complete with wall hanging ring and a mouth blow tube for pressurising one leg of the 'U' tube. The user may fill the 'U' tube with coloured water (water with a food dye) so that the water level is more easily seen.</p> <p><i>Genuine IEC product.</i></p> 
<p>HYDRAULIC PRESS - SYRINGE TYPE</p> <p>AR1020780</p> <p>135.00</p> <p>Simple construction permits the use of water or even air for demonstration of the concepts of Pascal's Law. Comprises a pair of graduated glass syringes of capacities 50cm³ and 20cm³, both having finely ground pistons and provide a cross-sectional area ratio of 3:1 respectively. Both the syringes mounted on a stable, non-skid sheet metal base with loading platform at their top and their nozzles linked to each other through a 3-position valve, by means of which they may be opened to the atmosphere, isolated or inter-connected as desired.</p> 	<p>PASCAL'S DEMONSTRATOR</p> <p>PH0214</p> <p>53.50</p> <p>The hydraulic press is a great way to show Pascal's Law in operation. Students will understand mechanical advantage when they use this system of connected pistons. Apply force to one 10 ml syringe-type piston to make the liquid rise in the other 50 ml syringe-type piston, recreating the concept behind such everyday items as power steering, shock absorbers, hydraulic jacks etc. Supplied with instructions.</p> 

<p>SPOUTING CYLINDER – PERSPEX PH0198</p>  <p>A Perspex spouting cylinder which gives a clear view of variation of level of liquid and pressure. 400mm tall with a 44mm diameter mouth mounted on a 100 x 100 mm base. There are no graduations on the spouting cylinder. For use with experiments in Snell's Law.</p>	53.00	<p>MANOSCOPE AR1020456</p>  <p>Useful to understand the concept of pressure variation in a liquid with respect to the depth. Consists of a pressure capsule of 38mm diameter approx. with silicon cover mounted on a metal scale. Pulley mechanism is used to turn the pressure capsule. Flexible transparent tubing mounted on graduated stand is slidable to facilitate setting of zero. Supplied with 1L capacity glass beaker</p>	140.00
<p>LIQUID LEVEL APPARATUS PH0200B</p>  <ul style="list-style-type: none"> • Stunning demonstration • Demonstrates Pascal's theorem of communicating vessels • Set of 4 tubes on plastic stand • Shows that the level of communicating vessels is constant irrespective of the size or shape of the vessels. 	23.00	<p>CAPILLARY TUBES APPARATUS PH0202A</p>  <ul style="list-style-type: none"> • Demonstrates relationship between capillary pressure & the bore diameter of the capillary tubes • Comprises of a metal frame arrangement whose base is like a trough • The upper part of frame supports six capillary tubes of different bore • Fill trough with water and the difference in heights of the resulting columns of water in the tubes is apparent • Overall frame height 90mm • Capillary tube length 150mm 	32.90
<p>EXPANSION OF LIQUIDS APPARATUS AR1060460-1</p>  <p>Demonstrates the different thermal expansion of various liquids and their comparison. Five glass tubes with turned shaped top, graduated in mm, are located inside a trough with a black colored vertical panel.</p> <p>This back panel provides the easy reading of liquid levels along the scale, while simultaneously facilitating easy removal and mounting of bulbs in the water trough for their convenient filling, care and cleaning.</p>	83.00	<p>EXPANSION OF LIQUIDS APPARATUS – SPARE GLASS TUBES – SET OF 5 AR1060460-2</p>  <p>Set of 5 spare glass tubes for use with the <i>EXPANSION OF LIQUIDS APPARATUS (AR1060460-1)</i></p>	25.95
<p>HYDRAULIC PRESS – BRAMAH - MOUNTED AR1020740-1</p>  <p>Working model made of borosilicate glass and mounted on a wooden frame with a trough for water, to provide a convenient demonstration to a group of students.</p>		33.00	









<p>CONSTANT VOLUME THERMOMETER (CHARLE'S LAW) – 1M</p>	<p>MF1005-001</p>	<p>240.00</p>	<p>TRANSPARENCY TUBE (TURBIDITY TUBE) AR1021045</p>	<p>32.90</p>
	<p>This Constant Volume Thermometer (CVT) is a high quality instrument for performing the standard experiments relating to gas temperature and gas pressure. The unit requires approx. 150gm of distilled mercury (not supplied in the kit). By removing several components and fitting others, the instrument can be converted to be the IEC Boyle's Law Apparatus.</p> <p>The CVT is a method of proving Charles' Law. In some ways it is similar to the classic Boyle's Law apparatus. A volume of air is heated to a known temperature and the mercury column is adjusted so that the volume of the air remains constant. In this way, the relationship between pressure and temperature of the air is established. In the theoretical Charles' Law, the volume is permitted to change at a constant pressure, but this method of developing the relationship by keeping the volume constant is easier to perform accurately.</p>		<p>Measure turbidity (the measure of relative clarity of any liquid), in streams where a Secchi disk cannot be used. Clear polycarbonate tube has a 4.5 cm diameter Secchi disk design on the bottom. Drain the tube with hose and finger clamp.</p>	
<p>DENSITY SPHERE</p>	<p>AR1020240</p>	<p>37.50 (1-10)</p>	<p>GUINEA & FEATHER APPARATUS PH0161</p>	<p>99.70</p>
	<p>Demonstrates the dependence of density of a liquid on the temperature. Comprises a hollow copper sphere, with a sealed mouth, carefully adjusted to float in cold water and sink in the hot water.</p>	<p>36.90 (11+)</p>		<p>Used to show how air resistance affects a falling object.</p> <p>Acrylic tube - 100cm (long) x 44mm (outer dia.) with two rubber bungs, one carrying stopcock and 60cm long tubing to connect to vacuum pump.</p>
<p>BELL IN VACUUM – ACRYLIC</p>	<p>PH0176CN8</p>	<p>72.00</p>	<p>BELL IN VACUUM – ECONOMY PH0177</p>	<p>46.85</p>
	<p>Demonstrate that sound requires air to travel through with the Bell in Vacuum Jar set. Slowly decrease the air inside and hear the sound disappear. Electric bell operates on 4-6V DC.</p> <p>Includes: (1) Bell Jar, (1) Electric Bell, (1) Rubber cork with terminals.</p> <p>Requires a vacuum pump (not included).</p>		<p>Economical version of PH0176CN8.</p> <p>Fitted in acrylic jar of size 20 x 10 cm and fitted with electric buzzer. Operates on 3-6 V DC.</p>	

<p>VACUUM PUMP WITH PUMP PLATE</p>	<p>PH0166B</p>	<p>164.50</p>	<p>VACUUM PUMP - HAND OPERATED</p>	<p>PH0167</p>	<p>99.00</p>
	<p>This is an integral system with the pump plate & hand vacuum pump. The plate comes with a rubber seal which facilitates sealing in bell jar experiments.</p> <p>The plate can be used with electric vacuum pumps also. A rubber seal is provided for copper pump plate.</p>			<p>Economical pump features a gauge in cm and inches, Hg displaces 725 ml of air. Pump rate of 15 ml Clear tubing is 60cm with 6mm inner diameter.</p> <p>Experiment with air pressure and atmosphere, vacuum filtering and check for leaks. This economical pump features a gauge in cm and inches, Hg displaces 725 ml of air. Pump rate of 15 ml Clear tubing is 60cm with 6mm inner diameter.</p>	
<p>VACUUM PUMP PLATE – 200MM MACHINED</p>	<p>PH0156B</p>	<p>130.00</p>	<p>SPARE BELL FOR PH0176CN8</p>	<p>PH1030B</p>	<p>34.50</p>
	<p>Made of aluminium metal, with tube for connection to pump and stopcock for air regulation on central pillar, supplied with a rubber seal which facilitates sealing in bell jar experiments.</p> <p>Mounted on painted heavy tripod base. Diameter 200 mm.</p>			<p>Spare Bell for <i>BELL IN VACUUM – ACRYLIC</i> apparatus (PH0176CN8).</p>	
			<p>SPARE JAR FOR PH0176CN8</p>	<p>PH0176E</p>	<p>40.00</p>
				<p>Spare jar for <i>BELL IN VACUUM – ACRYLIC</i> apparatus (PH0176CN8).</p>	
<p>BOYLE'S LAW – SIMPLE FORM</p>	<p>PH0145A</p>	<p>33.50</p>	<p>BOYLE'S MARIOTTE LAW</p>	<p>1020970</p>	<p>110.00</p>
	<ul style="list-style-type: none"> • Apparatus to demonstrate Boyle' Law • Graduated plastic syringe mounted on wooden block & lubricated piston of the syringe mounted on another platform • Different weights can be placed (stacked) on the top to measure the pressure volume 			<ul style="list-style-type: none"> • Pressure/Volume relationship of air at constant temperature • A graduated (0-300) cm³ cylinder with closely fitting piston is connected to a pressure gauge by a narrow tube to minimize the dead volume • Cylinder is made of transparent material to see the working process inside • Pressure inside the cylinder can be adjusted by rotating the knob connected to the piston via threaded shaft • A gas tap allows the cylinder to communicate with the outside air to adjust the mass of air enclosed • The pressure can directly read out from a big size pressure gauge circular dial, graduated in (0-3.4) x 10⁵Pa. 	

ALL PRICES INCLUDE GST.

MAGDEBURG HEMISPHERE-RUBBER	PH0171	18.00	MAGDEBURG HEMISPHERE	PH0171A	42.00
 <ul style="list-style-type: none"> • Demonstrates air pressure without a vacuum pump • Rubber • 7.5cm diameter • Each hemisphere has 2 release posts and 2 finger tug handles • Place the edges of the two hemispheres together and squeeze to force out the air between them. 		 <ul style="list-style-type: none"> • Extra large • Tough plastic • Secure O-ring seals • 11cm dia. • 2-way valve for easy release and operation <p>Magdeburg Hemispheres have been used for centuries and is used to illustrate the force of atmospheric pressure.</p>			





DENSITY & SPECIFIC GRAVITY





ITEM NAME	CODE	PRICE	ITEM NAME	CODE	PRICE
ARCHIMEDES PRINCIPLE KIT 	PH0121	46.35	CYLINDER WITH HOOK – SET OF 4 – EQUAL MASS 	DENCYLHK4	24.00
<p>Used to explain (Archimedes Principle) that the buoyant force on an object submerged in a fluid is equal to the weight of the fluid that is displaced by that object.</p> <p>Can be used to calculate the density of any liquid. Set contains a regular-shaped metal solid, an irregular-shaped metal solid, a 250ml capacity glass beaker with spout, a 50ml plastic beaker with spout and a Newton meter.</p>			<p>Set 4 of equal mass cylinders of different metals, with hooks, for density experiments.</p> <p>This equal mass set contains one each of AL, Zn, Cu and Stainless Steel cylinders of 56gm each. This set can be used to conduct experiments that demonstrate the inverse relationship between density and length. Excellent for use in the physics classroom or even for home schooling.</p> <p>Compact and easy to store.</p>		
CUBE SET – SET OF 7 	DENCUB7	41.15	DENSITY ROD SET – DIFFERENT MATERIALS 	AR1010230	50.30
<p>A set of 7 metal cubes with 20mm sides. Stamped with ID. Cu, Br, AL, Pb, Fe, Zn.</p> <p>For students to familiarise themselves with the appearance, feel, texture, hardness and density of a range of common metallic substances.</p>			<p>Density Rods Set, Comprising 12 cylinders of different material and of different lengths (38mm - 60mm) but of same diameter 12.5mm.</p> <p>All density rods are placed in a square shaped wooden block. Copper Rod, Brass Rod, Acetyl Rod, Rubber Rod, Acrylic Rod, Aluminum Rod, Polypropylene Rod, PVC Rod, Nylon Rod, Oak Rod, Maple Rod, Walnut Rod.</p>		
DENSITY INVESTIGATION CUBES WITH HOOKS – 20MM 	PH0108R	69.00	DENSITY SPHERE 	AR1020240	37.50 (1-10) 36.90 (11+)
<p>Set of 7 density cubes with 20mm sides and hook.</p> <p>Density Cubes, Set of 7 Metals in Plastic Case with Hooks and Element Stamp. With 20mm sides - Iron, Copper, Aluminum, Brass, Tin, Zinc, Lead. Supplied with manual. For use with Density, Specific Gravity, Specific Heat Activities.</p>			<p>Demonstrates the dependence of density of a liquid on the temperature.</p> <p>Comprises a hollow copper sphere, with a sealed mouth. Carefully adjusted to float in cold water and sink in the hot water.</p>		
SET OF SPHERES – 25MM 	AR1030680-3	35.00	DENSITY CYLINDERS – ALUMINIUM – 12 PIECES 	PH0113F	62.50
<p>The set includes 6 balls of 25mm diameter each of different materials-one each of wood, aluminum, steel, copper, brass & lead.</p> <p>Ideal for collision experiments and pendulum demonstrations and can also be used to meet a variety of laboratory needs. Solid spheres are also suitable for density/volume experiments.</p>			<p>Set of 12 aluminium cylinder bars with same diameter (12.5mm) but different lengths on a wooden storage block.</p> <p>Useful for density investigation, heat specific and specific gravity experimentation. Includes complete manual describing basics of density, mass & volume. You only need to supply a weight device (0.01g capacity), metric ruler or caliper.</p> <p>Some oxidation or corrosion may occur.</p>		

DISPLACEMENT VESSEL – TIN SHEET	100 X 50 mm 225 x 125 mm AR1020100-1 AR1020100-3	6.70 11.85	DISPLACEMENT VESSEL – OVERFLOW CAN	250mL 500mL AR1020150-1 AR1020150-2	4.40 11.90
	<p>For experiments density, specific gravity and Archimedes' principle etc., where volumetric displacement of liquids is involved.</p> <p>Seamless fabrication with flared top edge, complete made of tin sheet, well painted and angled spout for convenient overflow and collection of liquids.</p>			<p>Plastic vessel with spout.</p>	
DISPLACEMENT VESSEL	MS0618-01	6.60	CATCH BUCKET	PH0119D	7.25
	<p>Metal displacement vessel with spout for specific gravity experiments. Size: 115mm x 50mm (approx.)- Spout 40mm long (approx.). Holds approx. 200ml of water.</p>			<p>Aluminium vessel used for volumetric displacement of liquid experiments. 100 x 80mm; With handle. Should be used in conjunction with a displacement vessel (overflow can) for collecting liquid from the spout of the overflow can. Alternatively, handle useful for hanging bucket from a balance for weighing the water displaced from an overflow can.</p>	





ALL PRICES INCLUDE GST.







SOUND & WAVES

ITEM NAME	CODE	PRICE	ITEM NAME	CODE	PRICE
RESONANCE APPARATUS – 1 METER VERTICAL SCALE	SWRESAPP	126.00	COMPACT WAVE TANK	AR1120756	445.00
 <p>This basic unit comes with a 1 metre high scale that allows students to investigate the resonant behavior of an enclosed air column when it is stimulated by an external sound source.</p> <p>The air column lengths for multiple resonances at various frequencies can be found and the resulting data can be used to determine the speed of sound. An 100cm cylindrical acrylic tube is mounted vertically on a stand base and rod. The tube is open at the top and closed at the bottom by a rubber stopper with a hose barb. A scale is printed along the length of the tube. Flexible tubing connects the bottom of the tube to a large reservoir. The reservoir and tube are partially filled with water, creating an air space in the tube above the water level. The length of the space can be varied by adjusting the height of the reservoir on the support rod.</p> <p>A suitable sound source is held close to the mouth of the tube while the length of the air column is varied. The sound source can be a tuning fork or a tone generator (not included). Points of resonance where the sound in the tube becomes louder can be heard and measured. The sound level may also be recorded for later analysis using probeware or other suitable equipment.</p> <p><i>NOTE: Tuning Fork is sold separately.</i></p>			 <p>This apparatus provides a simple and effective method for students to investigate the properties of waves.</p> <p>The tank is completely self-contained, requiring no setting-up apart from the addition of water, and incorporates a built-in stroboscope to provide stationary or slowly moving images. Experiments can be performed, related to:</p> <ol style="list-style-type: none"> 1. Properties of water waves 2. Properties of waves in general 3. Diffraction, refraction, reflection and interference <p>Set consists of:</p> <ul style="list-style-type: none"> • Ripple Tank Controller • Power Supply for Ripple Tank Controller • Power Adaptor • Wave Tank • Single Point Dipper • Double Point Dipper • Bar Dipper • Curved Reflector • Straight Barrier Pair • Convex & Concave Acrylic Shape • Triangular, Rectangular & Trapezoidal Acrylic Shape 		
SLINKY HELIX – 75 X 50MM	HSSPRGH7.5	13.95	STEEL SPRING – NARROW – 20 X 1800MM	HSSPRGN1.8	27.00
 <p>Helical coil of 75 x 50mm flat sectioned steel wire. Ideal for demonstrating different types of waves.</p>		 <p>Very long, narrow steel spring. Can be used for transverse wave motion demonstration.</p>			

<p>KUNDT'S APPARATUS WITH MICROPHONE & SPEAKER 50 X 80CM</p> <p>SW1996-001</p>  <p>This 'Kundt's Apparatus' is a new high-quality item for the study of sound and waves, standing waves, resonance, musical instruments and tones.</p> <p>The apparatus includes: The transparent resonance tube, 850mm long with metric scale, 2x side holes and sliding shutters, an adjustable piston, a miniature microphone which can be passed up the tube, a mini-speaker that fits to one end of the tube and produces the sound waves, a driver to interface the speaker to an amplifier or oscilloscope and an instruction booklet.</p> <p>Only a <i>Signal Generator LB3754-001</i> or LB3756-101 or LB3758-001 is required to run the equipment. An oscilloscope is ideal to determine the maximum and minimum sound levels although a normal amplifier does the job too audibly.</p> <p><i>Genuine IEC apparatus.</i> Click here for Instruction Sheet supplied. Experiment manual also supplied with apparatus.</p>	<p>396.00</p>	<p>1.29M SONOMETER 3-WIRE PATTERN – MERSENNE'S LAW</p> <p>PH0730</p>  <p>A hollow wooden sounding box 1290 x 130 x 110 mm (length x width x height) provided with scales divided in mm between fixed bridges over which the wires are stretched.</p> <p>To one wire a spring balance reading to 100N x 5N is fitted and the tension exerted and measured can be finely adjusted by wing-nut.</p> <p>Another wire passes over a pulley and can be loaded as desired. A third wire is provided for comparison, its tension may be adjusted by means of a wristpin.</p> <p>The wires supplied are of steel which is rustles.</p> <p>The distance between the fixed bridges is 720 mm.</p> <p>Complete with three movable bridges, wrist-pin key and a set of four wires, length 1.5 m of 20, 22, 24, 26 SWG.</p> <p>NOTE: Supplied without weight.</p>	<p>178.00</p>
<p>SIMPLE RESONANCE TUBE SET WITH TUNING FORK</p> <p>PH0715</p>  <p>A simple apparatus that clearly demonstrates the principles of resonance without requiring a water column or other apparatus.</p> <p>Using the included 512 Hz tuning fork as a sound source, the inner tube slides inside the outer one and the student finds the point of loudest sound.</p> <p>The tubes adjust from 25 to 38 cm which will tune over a range of approx. 452 Hz to 585 Hz at room temperature.</p> <p>Includes 50 mm plug to close end.</p>	<p>24.00</p>	<p>MELDE'S EXPERIMENT KIT</p> <p>AR1120522</p>  <p>This experiment attempts to demonstrate that mechanical waves undergo interference phenomena.</p> <p>Kit consists of:</p> <ul style="list-style-type: none"> • Vibration Generator • Frequency Generator • Retort Stand with Rod • Clamp & Boss Head • Weight Pan with Weight Set • Pulley with Bench Clamp • Cotton Thread Reel, etc. 	<p>212.00</p>







ALL PRICES INCLUDE GST.

<p>MELDE'S APPARATUS AR1120520</p> <p>89.00</p> <p>Apparatus used to show the effects of vibrations in a stretched cord. Also used to investigate the relationship between frequency, tension and density.</p> <p>The provision of electrical contacts, opened and closed by the vibrating armature, allows the apparatus to be used as a highspeed changeover switch in. Comprises of a thin steel rod armature mounted in a clamp formed by a pair of 4mm socket terminals, so that its free length may be adjusted as desired.</p> <p>An AC energizing coil surrounds the armature and a permanent magnet provides the necessary magnetic polarization. The free end of the armature equipped with a small boss and clamping screw for attachment of the cord also serves as the moving contact when the apparatus is operating as a changeover switch.</p> <p>The complete apparatus is mounted upon a box type base.</p> 	<p>219.00</p>	<p>CHLADNI'S PLATES, SET OF 2, COMPLETE WITH VIOLIN BOW & SAND SW0855-001</p> <p>Invented by German scientist, Ernst Chladni, in the Chladni's Plate Experiments is used to show that when a plate is vibrating at a frequency, sand grains sprinkled on the plate will move towards the regions on the plate with less vibration (nodal lines).</p> <p>Chladni's Plates kit comprises a pair of square and round bronze plates, about 150mm diameter, mounted centrally to a clamp that can fix the discs to a bench so they are rigid but can freely vibrate when agitated with a violin bow.</p> <p>A small amount of special sand is placed on the plate, the plate is lightly touched with the finger and a certain point and the resin coated bow is passed across the edge of the plate so it vibrates at its natural frequency. The sand collects on the plate in the form of complex patterns.</p> <p>Genuine IEC product. Comes with instruction sheet.</p> 	<p>47.50</p>
<p>WAVE MOTION APPARATUS "POWELL'S PATTERN" WITH ROTATING SCALE SW4250-001</p> <p>193.60</p> <p>The 'Wave Motion Machine' from IEC is a high-quality, quietly running instrument designed to demonstrate the fundamentals of transverse and longitudinal wave motion. A scale placed behind the handle divides the rotary motion into degrees of rotational angle so that the relationship or 'phase' between the rotary and the vertical motions may be studied. Includes Instruction Sheet.</p> 	<p>219.00</p>	<p>STRINGLESS PENDULUM AR1030825</p> <p>The stringless pendulum demonstrates simple harmonic motion in a way that doesn't seem so tied down.</p> <p>Students will see the period of an oscillating body from a different perspective than the standard string and ball. The period of the steel ball can be measured, and the distance to a focal point can be calculated to compare the demonstration to a classic pendulum.</p> <p>Kit includes 2 x 19mm mild steel balls. Dimensions (approx.): 500 (l) x 20 (w) x 10(h) mm: 850g.</p> 	<p>47.50</p>







<p>SUPER SLINKY ON STAND AR1120035</p>  <p>Allows students more time to observe wave behavior, pulses behavior and standing wave.</p> <p>A wooden stand helps to prevent tangles during use as well as in storage. Spring size of 200 x 75mm.</p>	<p>29.50</p>	<p>ORGAN PIPE WITH PISTON AR1120600</p>  <p>Stoppered, varnished wood with movable piston marked with the chromatic scale from C (512) to (1024). Overall length when fully extended: 840mm.</p> <p>Can also be used for investigating the phenomenon of beats in conjunction with a second pipe of the same type.</p>	<p>64.00</p>
<p>STEEL TUNING FORK SET (SET OF 13) IN WOODEN CASE PH0744A</p>  <p>Set of 13 steel tuning forks, stored in wooden carry case. They have been designed for use in physics experiments.</p> <p>Best quality nickel-plated steel, plain shanks, with frequency marked from C (236) to C (512). +/- 5% of stated frequency. Varying lengths</p>	<p>65.00</p>	<p>STEEL TUNING FORK SET (SET OF 8) IN WOODEN BOX PH0738A</p>  <p>Designed for physics experiments. Nickel-plated, plain shanks. Scientific Pitch, C₄ = 256Hz. Frequency marked: C (256), D (288), E (320), F (341), G (384), A (426), B (480), C (512). Supplied in wooden case.</p>	<p>56.95</p>
<p>PAIR OF TUNING FORKS ON RESONANCE BOX AR1120460-1</p>  <p>Used to explore the concept of resonance through sympathetic and forced vibrations, and phenomenon of beats.</p> <p>Two matched nickel-plated tuning forks of frequency A (426.6Hz). Each is mounted on top of a hollow wooden box open at one end. One fork has a sliding mass on one prong to vary its frequency from the nominal 426.6Hz. When both forks are sounded a clearly audible "beat" is produced, its rate depending on the difference in frequency between the forks.</p>	<p>67.85</p>	<p>ALUMINIUM TUNING FORK ON RESONANCE BOX AR1120440-1</p>  <p>For demonstrating the formation of basic major cord.</p> <p>Comprises four tuning forks mounted on a single wooden box in a line at the top and having frequencies (Hz) of C₁(256), E(320), G(384), C₂(512). Supplied with hammer.</p>	<p>64.90</p>

ALL PRICES INCLUDE GST.




HEAT, HEAT TRANSFER & THERMODYNAMICS

<p>KINETIC GAS THEORY VIBRATION APPARATUS</p>	<p>PH0203</p>	<p>113.95</p>	<p>HEAT TRANSFER KIT - PACK OF 15</p>	<p>PH1120144PK15</p>	<p>289.00</p>
	<p>This apparatus is used to study the motion & behaviour of molecules in gases. A small electric motor running at 4 - 12V DC vibrates the small platform inside the transparent tube so that the set of many small steel balls inside vibrate violently inside the tube. An increase in violence of the vibration simulates an increase in the gas temperature and an increase in the weight of the "float" simulates an increase in the gas pressure. Supplied with instruction manual, balls and 2 polystyrene "floats".</p> <p>Can also be to observe Brownian Motion, Boyle's Law & Charles' Law.</p>			<p>The Heat Transfer Kit efficiently introduces concepts of thermal energy and heat transfer to students.</p> <p>The aluminum heat transfer bar effectively demonstrates the migration of thermal energy between the two Styrofoam calorimeters. Comes with two thermometers specifically designed for hot and cold temperatures.</p> <p>Kit Contains 15 sets each of: 2 x Styrofoam Calorimeters with lids 1 x Aluminum heat transfer bar 1 x Low range thermometer (-40 - 50 deg. C) 1 x High range thermometer (-30 - 110 °C).</p>	
<p>SPECIFIC HEAT CYLINDERS – EQUAL SIZE</p>	<p>PH0434</p>	<p>38.60</p>	<p>RODS FOR THERMAL CONDUCTIVITY EXPERIMENTS – SET OF 8</p>	<p>TCRODS3X130</p>	<p>19.80</p>
	<ul style="list-style-type: none"> • Set of 6 specific equal in size heat cylinders • 38mm x 9.5mm • Copper, lead, brass, zinc, iron and aluminium • With stand 			<ul style="list-style-type: none"> • Set of 8 rods for thermal conductivity experiments: Iron, Copper, Brass, Lead, Aluminium, Stainless Steel, Tin & Plastic Rods sizes: 100-130mm long x 3.0mm diameter 	
<p>RODS FOR THERMAL CONDUCTIVITY EXPERIMENTS – SET OF 6</p>	<p>PH0397</p>	<p>26.90</p>	<p>BALL & RING GRAVESANDE'S – CHAINLESS</p>	<p>TCBALLRNC</p>	<p>19.80</p>
	<p>Which is the better conductor?</p> <p>Set of 6 rods: Iron, Copper, Aluminium, Lead, Brass & Zinc. 300mm long x 3mm diameter.</p>			<ul style="list-style-type: none"> • Used to demonstrate thermal expansion • When the ball is at room temperature, it will pass through the ring, but when the ball is gently heated it will no longer pass through • Ball size including handle length: 250 x 20mm • Ring size including handle length: 260 x 38mm 	






ALL PRICES INCLUDE GST.









<p>THERMAL CONDUCTIVITY BAR</p> <p>TCBAR</p>  <ul style="list-style-type: none"> • Ideal apparatus for the comparison of the thermal conductivity of different metals quickly and conveniently • Features convenient liquid crystal indicators mounted in robust holders that show how a red zone of 40°C moves up the bars • Comprises of four metal bars of the same shape & size • The tip of the heated bars are immersed into cold water to show how conductivity applies to heat leaving the metal <p>The tops of the bars are designed to be touched with a fingertip to reinforce the colour observations of the bars</p>	<p>29.85</p>	<p>THERMAL CONDUCTIVITY OF METALS APPARATUS</p> <p>TCCONDMTR</p>  <ul style="list-style-type: none"> • Conductometer type • Demonstrates the diverse thermal conductivity of 5 distinct metals: aluminium, brass, iron, stainless steel & copper • Place a small amount of supplied wax over each metal spoke • Heat the central hub over a Bunsen burner flame & watch the differing rates at which the wax melts • Wood handle mounted • 2 concave test points in each metal rod <p>Size: approx. 395 x 185 x 20mm</p>	<p>24.15</p>
<p>CONDUCTIVITY RING</p> <p>HL0910-001</p>  <ul style="list-style-type: none"> • The IEC conductivity ring is the classic device to demonstrate the different heat conductivity of different metals • 4 strips of iron, copper, brass and aluminium fixed to an aluminium ring • Pea-sized amount of wax is placed into the depressions at the end of each ring and the centre of the device placed on a Bunsen burner to heat the 4 metal rings evenly <p>Compare the heat conductivity of each metal by observing the melting of each particle of wax.</p>	<p>45.00</p>	<p>HEAT CONDUCTIVITY RING - WOOD BASE</p> <p>TCRING</p>  <ul style="list-style-type: none"> • Demonstrate the heat conductivity of metals • Metal strips - one each of: copper, brass, iron and aluminium • Fixed to a 13cm diameter wooden ring • Depressions at the end of each strip to place wax piece • Compare the heat conductivity of each metal by observing the melting of each piece of wax <p>NOTE: Do not use on a Bunsen burner as it will damage the metal strips. Use an alcohol burner due to its lower heat level.</p>	<p>19.25</p>
<p>INVESTIGATING ENERGY TRANSFER</p> <p>AR1060825</p>  <p>Study heat and light with the simplest of materials - a black can, a silver or white can and a connecting copper bar.</p> <p>Measure the temperature inside dark and shiny bright cans to determine the different ways light and heat are absorbed and radiated.</p> <p>Fill both cans with water - one with hot, one with cold - and connect them with the included energy transfer bar. Observe how the temperature of the water changes.</p>	<p>26.55</p>	<p>FIRE SYRINGE (FIRE PISTON)</p> <p>FD FIREPIST</p>  <p>Demonstrate an example of an adiabatic process found in diesel engines, using the Fire Syringe to compress air into a smaller volume. This is a classic example of how rapidly doing work on a gas results in an increase in temperature.</p> <p>Insert a small piece of cotton into the syringe piston, push down the plunger into the tube to produce a flash in the chamber which burns as long as there is air present. The Fire Syringe comes with combustible material and 2 replacement O-rings for the piston.</p> <p>NOTE: It may be best to dim the lights during demonstration.</p>	<p>27.30</p>







BIMETALLIC TECHNOLOGY



BIMETALLIC THERMOPILE	PH0428	13.50	PRACTICAL BIMETALLIC THERMOSTAT MODEL	CBP0403	44.65
	<ul style="list-style-type: none"> • Four copper & four iron wires, approx. 130mm lengths, twisted together to form junctions, four on one side, three on the other • Includes brass connectors • In other words, we have a series of thermocouples in use for generating thermoelectric current • Use with a galvanometer <p>Produces more current than a single thermocouple and is also a good starter to explain temperature measurement</p>			<ul style="list-style-type: none"> • This device automatically responds to temperature changes which activates a switch • Consists of a vertically bimetallic strip with binding posts and adjustable contacts • Practical uses include controlling heating systems, air-conditioners, fridges, etc. • Get this one for reinforcing the message! 	
THERMOCOUPLE - 4MM TERMINALS	PH0426	16.50	BIMETALLIC STRIP	PH0383	16.50
	<ul style="list-style-type: none"> • Copper / constantan 305mm with 4mm terminals • Produce an electric current simply by heating. • Connect to a galvanometer. <p><i>More sophisticated units are used for measuring temperature. This one is a good starter to explain the concept.</i></p>			<p>Essential for demonstrating the principles of thermal expansion in metals. This allows students to understand how bimetallic strips are applied practically in things such as thermometers, thermostats and heating coils. Strip comprised of copper & steel, with wooden handle. Distinct and visible metals. Activity guide included.</p>	

SOLAR ENERGY, HEAT & ENERGY TRANSFER

<p>HEAT & THERMOMETER KIT</p>	<p>AR1060011</p>	<p>86.95</p>	<p>BAR BREAKING APPARATUS</p>	<p>AR1060120-1</p>	<p>66.95</p>
 <p>Specially designed kit to perform a variety of experiments for students to understand various concepts related to heat and thermometry. Kit consists of: 1 x Thermometer without graduation 1 x Thermometer with graduation 1 x Wall thermometer 1 x Insulating case for beaker 1 x Plastic bowl 1 x Erlenmeyer flask 1 x Food Coloriser 1 x Plastic dropper 1 x One glass tube 165 x 5 mm 2 x Beaker glass 100ml 1 x Beaker (Graduated plastic) 100ml 1 x Bridge shaped stand 2 x Candle in metal holder 3 x Pegs 1 x Rubber stopper with bore.</p>			 <p>An apparatus used to demonstrate thermal expansion and contraction, as well as the forces involved in these processes.</p> <p>It is comprised of a heavy cast metal frame with U-shaped slotted end pillar to carry a sturdy iron bar. This iron bar is threaded at one end and incorporates a knurled tensioning knob. The other end accommodates a cast iron breaking bar.</p> <p>Using a Bunsen burner to heat the iron bar, the iron bar will expand and its tension will decrease. The initial tension is restored using the knob. The tension increases as the rod cool, until the force on the smaller iron bar causes it to fracture. Supplied with 10 breaking bars.</p> <p>NOTE: Bunsen burner required (not supplied).</p>		
<p>BAR BREAKING APPARATUS – SPARE CI BARS</p>	<p>AR1060120-2</p>	<p>8.25</p>	<p>JOULE & WATT METER CALORIMETER SET</p>	<p>AR1060950SET</p>	<p>690.00</p>
<p>Pack of 10 spare bars for the BAR BREAKING APPARATUS (AR1060120-1)</p>			 <p>Set including Joule & Watt Meter, Regulated Power Supply, connecting cable with 4mm banana plugs, 1kg Mild Steel Calorimeter block, and Immersion Heater.</p>		
<p>METAL CALORIMETER BLOCKS 1 KG (each detailed below)</p>	<p><i>A simple calorimeter facilitating quick experimental determination of the specific heat capacity of different metals. Comprises cylindrical metal blocks, each of equal mass adjusted to 1kg ±2%. Each metal block is drilled with two holes, a large central hole, about 12.5mm diameter to accept special immersion heater and a smaller hole about 7.5mm diameter, to accept thermometer or temperature sensor.</i></p>				
<p>METAL CALORIMETER BLOCK – ALUMINIUM</p>	<p>AR1060660-1</p>	<p>60.00</p>	<p>METAL CALORIMETER BLOCK – MILD STEEL</p>	<p>AR1060660-2</p>	<p>54.00</p>
 <p>Material Type: Aluminium Diameter: 76 mm Height: 84 mm Specific Heat: 878 J/Kg/K</p>			 <p>Material Type: Mild Steel Diameter: 44 mm Height: 89 mm Specific Heat: 480 J/Kg/K</p>		



<p>METAL CALORIMETER BLOCK – COPPER – 1KG</p> <p>AR1060660-3</p>	<p>68.00</p>	<p>METAL CALORIMETER BLOCK – BRASS – 1KG</p> <p>AR1060660-4</p>	<p>65.00</p>
 <p>Material Type: Copper Diameter: 44 mm Height: 79 mm Specific Heat: 381 J/Kg/K</p>		 <p>Material Type: Brass Diameter: 44 mm Height: 85 mm Specific Heat: 368 J/Kg/K</p>	
<p>METAL CALORIMETER BLOCK SET</p> <p>AR1060660SET</p>	<p>Set of metal calorimeter blocks. One each of the 1kg blocks of Aluminium, Mild Steel, Copper and Brass</p>		<p>235.60</p>
<p>IMMERSION HEATER</p> <p>AR1060680</p>  <p>A special heater designed for use with metal block calorimeters. This fully sheathed miniature heater has a heating element enclosed in a stainless steel tube with two flying leads, having heat resistant insulation coming out of the sealed tube body for electrical connections.</p> <p>Operates on 12 volts and rated 50 watts.</p> <p>12.5mm +0.5mm dia. X 150mm length.</p>	<p>43.00</p>	<p>ICE MELTING PLATES</p> <p>PH1120149</p>  <p>Suitable for the demonstration for conductivity and heat transfer.</p> <p>1 Aluminium and 1 plastic foam plate, each with depression, measuring 9 x 9 x 1cm each.</p>	<p>42.00</p>
<p>LESLIE'S CUBE – TIN</p> <p>PH0411A</p>  <p>Tin plate box with 13 cm sides. The vertical faces of the box are blackened, roughened, varnished and polished respectively. The top opening is fitted with a stopper.</p> <p>The apparatus is filled with water maintained at boiling point by a low Bunsen flame. Infrared sensors may be used to compare the relative radiant heat output from each of the four faces.</p>	<p>25.75</p>	<p>LESLIE'S CUBE – COPPER</p> <p>PH0411B</p>  <p>Each side of the copper cube has a different surface: dull black, bright black, white and bright. The cube measures approximately 100 mm across.</p>	<p>43.25</p>
<p>SOLAR ENERGY KIT</p> <p>PH1321</p>  <ul style="list-style-type: none"> • Apply knowledge of solar energy in a practical experiment with this kit • Solar panel housed in a plastic box • Low consumption motor with fan, buzzer and LED all included for conducting a number of solar powered activities. • Set of banana plugs with leads included. 	<p>78.00</p>	<p>MOUNTED SOLAR CELL</p> <p>PH0467L</p>  <p>This apparatus comprises a selenium photo-voltaic cell.</p> <p>For use with <i>MINI MOTOR UNIT</i> (Code: PH1319) to demonstrate the production of electrical energy directly from light energy.</p>	<p>51.35</p>







<p>ENERGY CONVERSION KIT</p> <p>AR1100050</p>  <p>There are three instruments fitted on a plastic moulded base to run electrical equipment. Battery, solar cell and hand driven dynamo selectable via a knob fitted on the base. Different components are also supplied with this kit to observe the effect of these three electrical energy conversion systems on the components.</p>	89.50	<p>MOUNTED LAMP 12V 12W</p> <p>PH0467M</p>  <p>Mounted Lamp 12v 24w SBC bulb in a metal socket mounted on a base with pair of 4 mm sockets. Globe included.</p> <p>Use for Energy Transfer Experiments. For use in conjunction with the <i>MOUNTED SOLAR CELL</i> (Code: PH0467L). The power rating of the bulb has been chosen so that when it is placed in front of the solar cell, sufficient power is produced to run the motor effectively whilst avoiding the risk of damage to the cell by excess light and/or heat.</p>	8.75
<p>TRANSPARENT SOLAR CELL DOLLY</p> <p>100013C</p>  <ul style="list-style-type: none"> • Discover how sunlight can be converted to energy. • Experiment with changing the angle of the solar panel, adding weight, running it uphill, and running it on rough & smooth surfaces. • Good for standard motion labs as well as lessons on energy and alternative energy • Runs on solar power or batteries; switch to solar drive, battery drive, or battery charge! • Adjustable panel. • Includes Teacher's Guide & reproducible Student Handout. • 12cm long. Battery not included. 	55.00	<p>CALORIMETER CUP - PAIR - INNER/OUTER WITH LID AND STIRRER</p> <p>HL0820-001</p>  <p>IEC produced Calorimeter Cups - Pair.</p> <p>Outer cup 75x100mm (D x H), with styrene foam insulation pad in the bottom of the cup to support and centralise the Inner calorimeter cup 50x75mm (D x H). The mouths of the two cups are level so that a single plastic lid engages and holds both cups aligned and carries a stirrer that can operate inside the smaller cup. A hole is provided in the centre of the lid to permit a thermometer to be inserted. The stirrer operates in a vertical action without touching the thermometer.</p> <p>NOTE: This is designed to be used with water only.</p>	95.00
<p>SOLAR FURNACE</p> <p>PH0467SF</p>  <ul style="list-style-type: none"> • Demonstrate the extraordinary power of the Sun. Did you know temperatures can reach more than 150 degrees C in bright sunlight? <p>Demonstrate this with our 31cm diameter parabolic reflector. It concentrates sunlight in a black colored copper cup.</p>	91.65	<p>INVESTIGATING ENERGY TRANSFER</p> <p>AR1060825</p>  <p>Study heat and light with the simplest of materials - a black can, a silver or white can and a connecting copper bar. Measure the temperature inside dark and shiny bright cans to determine the different ways light and heat are absorbed and radiated.</p> <p>Fill both cans with water - one with hot, one with cold - and connect them with the included energy transfer bar. Observe how the temperature of the water changes.</p>	25.30





<p>SOLAR ENERGY – MOTOR, CELL, FAN & REVERSE SWITCH</p>	<p>EM3732-001</p>	<p>69.00</p>	<p>CROOKE'S RADIOMETER PH0418A</p>	<p>23.65</p>
 <p>The <i>IEC</i> Solar Energy Fan is an excellent unit for demonstrating solar.</p> <p>It consists of a small base with a solar generator, connected to a motor and fan. Switches permit on/off and reversal of the motor direction.</p> <p>A cowl is fitted around the fan to avoid damage during use or storage. Designed strong for student use. The fan runs well under direct sunlight, as well as by bright incandescent light.</p>			 <p>An instrument dating back to 1876, with a 70mm (approx.) glass bulb mounted on a sturdy plastic moulded base.</p> <p>The partly evacuated bulb contains black and white veins. Each vein is blackened on one side, while the reverse side is bright. Stands over 17cm tall.</p>	

ALL PRICES INCLUDE GST.







OPTICS (LIGHT, APPLIED LIGHT & COLOUR FUNDAMENTALS)







ITEM NAME	CODE	PRICE
 <p>LASER RAY KIT</p>	<p>AR1110752</p> <ul style="list-style-type: none"> • The kit consists of the following items: • 1 x Diode laser box: It consists of 5 independent laser modules with peak wavelength of 635nm • 1 x Power adaptor; • 1 x Beam selector; • 1 x Human eye sheet; • 1 x Photo camera sheet; • 1 x Galilean telescope sheet; • 1 x Kepler telescope sheet; • 1 x Spherical aberration sheet; • 1 x Periscope sheet; • 1 x Hartle's circle sheet; • 1 x Bi-convex lens no 1, 1 x bi-convex lens no. 2, • 1 x Bi-convex lens no 3, • 1 x Bi-convex lens no. 4, • 1 x Bi concave lens no. 5, • 1 x Plane convex lens r=45mm, • 1 x Plane convex lens r=75mm, • 1 x Plane concave lens; • 1 x Concave mirror; • 1 x Convex mirror; • 1 x Plane mirror; • 1 x Rectangular slab Prism; • 1 x Optical Fibre; • 1 x Magnetic board 	<p>448.00</p>
 <p>OPTICAL BENCH</p>	<p>PH0649</p> <p>This kit is an optical bench that offers more enhanced set of accessories allowing the user to perform more experiments in optics. The bench is 1m long and is graduated on one side.</p> <p>Set comprises of:</p> <ul style="list-style-type: none"> 1 Bench with ends 1 meter long 8 pcs. Riders with tightening screw 1 Lamp housed with halogen bulb 12 Volt, 24 Watt 6 pcs. Lens Holder for 50 mm dia lenses 1 each Lens Biconvex +10, +20, +50 1 pc. Lens Biconcave -20 Set of Diaphragms 1 Plain mirror 100 x 100 mm 1 Translucent screen 100 x 100 mm 1 Transparent screen 100 x 100 mm 1 Object screen white 100 x 100 mm 	<p>208.75</p>
 <p>RAY OPTICS KIT</p>	<p>AR1110741</p> <p>The kit consists of the following:</p> <ul style="list-style-type: none"> 1 x Light Box - Made of plastic for ray tracing and color mixing experiments. It has a fixed condenser lens for providing parallel rays. Fixed mirrors are used to reflect light. Operating voltage 10-12V AC/DC, Lamp-halogen 12V, 21W. Box dimensions: 17.5x7x7cm approx. 1 x Power supply (2-12 V AC): Output voltage 2,3,4,5,6,8,10 and 12 V AC full wave. rectified, unsmoothed and unregulated D.C in maximum 8 steps. Overload protection resettable thermal trip. Working voltage 230V AC, 50 Hz. 1 x 1 & 2 slots diaphragm. 1 x 3 & 5 slots diaphragm. 1 x Right angled prism. 1 x Plano concave lens. 1 x Trapezoid acrylic block. 1 x Semi-circular bock. 1 x Parabolic mirror. 1 x Plane mirror. 1 x Set of color filters. 1 x Flexible lead - set. 1 x Optical disc. 1 x Magnetic board. 	<p>195.00</p>

ITEM NAME	CODE	PRICE	ITEM NAME	CODE	PRICE
LIGHT BOX "HODSON" WITH SLITS	HL2060-020	67.00	INTERFERENCE PLATES – SET OF 6 FLAT GLASS	HL1888-001	52.00
 <p>The IEC 'Hodson' Light Box a permits many experiments in basic optics and colour blending. HL2060-020 is for the Light Box only with the set of 3x slit formers. The full kit (HL2060-001 or HL2062-001 with transformer) is not included.</p> <p>The box is designed to take the rough handling of students and the unique lamp socket holds a 12Vx30W QI lamp. The socket permits one Light Box to be plugged into another so two boxes can run together. The banana plugs on the cables are stackable and moulded to the cable. The lens adjuster cannot be removed by students. The new lamp is lower wattage and draws less current. Two Light Boxes can now be driven from one standard IEC power pack LB2633-00</p> <p>The mirrors are efficient and are virtually unbreakable. All parts are available individually (<i>contact us for part required</i>).</p> <p>Instruction Sheet</p>			 <p>These IEC Flat Glass Plates set consists of 6 strips of flat glass that can be used in pairs to observe 'Newton's Rings' or the interference pattern in very thin films of air. A packet of very thin paper material is supplied with the glass plates to place between them at one end to form a 'wedge' of air between them. The air is observed by inspecting under monochromatic light (say a Sodium light source). The interference pattern is easily seen and it changes as the thickness of the air film changes from one end to the other.</p> <p>Each piece of glass is ground slightly at the edges for safety and to prevent cutting.</p> <p>NOTE: It is important that the glass pieces are very clean before attempting to create the 'air wedge' between them. The 'wedge' is created by placing the very thin paper spacer between the glass strips at one end only and allowing the glass pieces to touch together at the other end. Size: 150x23x3mm (0.17kg set/6).</p>		
LIGHT BOX & OPTICAL SET "HODSON" 12V (STD)	HL2060-001	121.00	REFLECTION & REFRACTION TANK	AR1110815	75.00
 <ul style="list-style-type: none"> • The comprehensive kit of parts permits many experiments in basic optics and colour blending • The banana plugs on the cables are stackable and moulded to the cable. • The lens adjuster cannot be removed by students. • The mirrors are efficient and are virtually unbreakable. • Genuine IEC product. • For use with a 12V AC/DC power source at 2 to 3 amps (not supplied). 		 <ul style="list-style-type: none"> • Protector is printed on the front of acrylic tank, to read out the angle of reflection & refraction. A laser diode with inbuilt beam spreader is supplied with the apparatus to perform the experiments of reflection & refraction. • The major advantage of the reflection & refraction tank is, the total internal reflection experiment can also be done. <p>Overall dimensions: 200x150x100mm</p>			
REFLECTION & REFRACTION BLOCK	AR1110805	101.00	STROBOSCOPE-LED DIGITAL	LB3806-001	350.00
 <ul style="list-style-type: none"> • Consists of an acrylic block of 300x300x6mm and a supporting base of 300x300x25mm. <p>Supplied with laser diode to perform the experiments of reflection & refraction.</p>		 <ul style="list-style-type: none"> • For student use • Low voltage miniature unit, 12V AC/DC • The LEDs provide a bright white flash • The flash accuracy and stability is absolute • Frequency can be adjusted from 1Hz to 500Hz • Packed with features 			





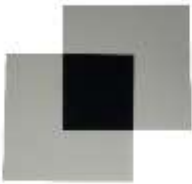

<p>RAY TRACK APPARATUS AR1110800-1</p>	<p>85.95</p>	<p>RAY TRACK APPARATUS - OPTICAL SET AR1110800-2</p>	<p>95.00</p>
 <ul style="list-style-type: none"> Comprises a wooden board with painted white, mounted on non-skid plastic feet, and a removable turntable about 170mm in diameter with two orthogonal lines along its diameter dividing it into four equal quadrants. Just beyond the rim of turntable, a circular scale graduated 90°-0°-90°-0°-90° \times 1° is printed. Also includes a Ray Box with a 12V, 24W bulb. Supplied complete with a cylindrical convex lens of focal length about 75mm and two double slits, giving one wide beam slit and one each of single, triple and five slits. <p><i>NOTE: Photo illustrates the Ray Track Apparatus with Optical Set (AR1110800-2)</i></p>		<ul style="list-style-type: none"> Optical Set for Ray Track Apparatus. Set contains one each of rectangular, semi-circular, right angled triangular-$90^{\circ}\times 45^{\circ}\times 45^{\circ}$, trapezoidal, biconvex and biconcave <p><i>NOTE: Optical Set is shown above with Ray Track Apparatus (AR1110800-1)</i></p>	
<p>LED RAY BOX WITH USB CABLE & CYLINDRICAL LENS PH0600USB</p>  <p>5V Raybox with bright cool white LED and On/Off switch on top of unit. Supplied with USB cable to connect up to your laptop making this unit very mobile. Comes with a slit plate and cylindrical lens.</p>	<p>67.50</p>	<p>MINI COLOUR MIXER HLCOLMIXMIN</p>  <p>Compact, lightweight unit to help teach how different colors can be made by the addition / mixing of the basic.</p> <p>Adjustable dial for each of the three primary colors - red, blue and green. The intensity of the red, green and blue LEDs of this Mini Color Mixer can be individually adjusted.</p> <p>Students can learn about areas such as colour mixing, complementary colours, etc.</p> <p>On/Off switch at rear of unit. Dimensions (approx.): 120 x 111 x 78mm. Requires 3 x AA batteries (not included).</p>	<p>46.35</p>
<p>BUDGET LED RAY BOX AR1110710-1</p>  <p>An economical metal ray box with a die cast enclosure, delivers white light but runs much cooler than conventional incandescent lamp models.</p> <p>It uses the latest cool ultra-bright LED technology giving superior white light. Supplied complete with slit plate, lens and its own battery power source.</p> <p><i>(Requires 2 x AA batteries - not supplied).</i></p> <p>Suitable for Ray Box (sold separately): CYLINDRICAL BICONCAVE LENS (AR1110780-2) CYLINDRICAL BICONVEX LENS (AR1110780-1) CYLINDRICAL PLANO CONVEX LENS - FOCAL LENGTH 20CM (AR1110080-13)</p>			<p>45.15</p>

ALL PRICES INCLUDE GST.



<p>LASER POINTER KEYRING HLLASRAYKR</p> <p>21.95</p>  <p>Chrome plated laser pointer with keyring. 75mm long x 14mm wide. 670nm red beam wavelength. Maximum laser power: 1.0mW.</p> <p>Requires 2 x LR44 batteries (included).</p> <p>Suitable as a pointer or for optics experiments.</p> <p>WARNING: This is not a toy. Do not shine into eyes.</p>	<p>21.95</p>	<p>LASER RAY BOX HLLASRAYBX5</p> <p>99.75</p>  <p>Light Box with Laser Beams. Five or three parallel bright and sharply defined diode beams 1.6cm apart can be selected for demonstrating the bending of light rays by reflection, Focusing effect, Reflection with mirrors, Fresnel reflection, Monochromatic character of laser light, Total Internal reflection. A great tool for demonstrating optical ray paths - it can turn optical ray diagrams found in science and physics books into visual reality. The Laser Ray Box consists of five 0.75 mW, 635 nm semiconductor diode lasers, each emitting a highly visible light beam. Beams are parallel and can be seen in most well-lit rooms. Energy is provided by a rechargeable NiCd battery.</p> <p>WARNING: Do not shine beams into eyes.</p>	<p>99.75</p>
<p>LASER LIGHT SOURCE AR1111030</p> <p>20.10</p>  <p>Compact in size, inexpensive, light weight with low power consumption diode laser is housed in a plastic moulded case.</p> <p>Qualitatively used for ray optics demonstration and simple diffraction work as well as to indicate the points on overhead images and charts.</p> <p>Requires three button cells (not supplied) to project visible red spot with a sharply focused beam of wavelength 630-680nm with only 1mw power consumption. Size: 90x90x42mm (approx.).</p>	<p>20.10</p>	<p>NEWTON'S COLOUR DISC MOUNTED ON A MOTOR AR1110610</p> <p>21.40</p>  <p>The simple hand-held unit is used for demonstrating that white light is comprised of all the spectral colours through the mixing of these colours.</p> <p>An 80mm multi-coloured circular disc mounted on low voltage DC motor. The disc has sectors of various spectral colours in quadrants. When the disc is rotated, all the colours appear to disappear by merging into a single white colour.</p> <p>The unit is supplied with colour-coded wires terminated in 4mm banana plugs, connected to the motor for power output.</p>	<p>21.40</p>
<p>NEWTON'S COLOUR DISC - HAND DRIVEN PH0582A</p> <p>58.00</p>  <ul style="list-style-type: none"> • Demonstrates that white light may be composed of all the spectral colours by the rotation of the multi-coloured disc • Mounted on metal stand • Hand operated, driven by belt • 175mm multi-coloured disc <p>(Item supplied may vary slightly from unit illustrated)</p>	<p>58.00</p>	<p>NEWTON'S COLOUR DISC - HAND SPUN PH0582HS</p> <p>21.00</p>  <ul style="list-style-type: none"> • 200mm diameter disc contains 4 distinct quadrants, each with violet, indigo, blue, green, yellow, orange & red wedges in that order • Plastic handle attaches to the centre of the wheel, which can be set to spin with an included cord • At rest, the wheel consists of the separate colours described. When the wheel is set in motion, does that still hold true? • Overall dimensions: 200 x 160mm 	<p>21.00</p>

<p>COLOUR FILTERS – SET OF 6</p> <p>AR1110880</p>  <p>Unmounted acetate sheets comprising of three primary colours & three secondary colours.</p> <p>Filter dimension: 75 x 50mm.</p>	<p>15.50</p>	<p>COLOUR BLENDING PADDLES</p> <p>LER0352</p>  <p>Set of 6.</p> <p>Transparent 6-inch paddles in six colours to demonstrate the principles of colour mixing.</p>	<p>21.00</p>
<p>STROBOSCOPE – HAND WHIRLING WITH ADJUSTABLE SLITS</p> <p>LB3851-001</p>  <p>The Hand Stroboscope is a very simple way that the principle of stroboscopy is taught. The eye looks through a narrow slit while a disc with 12 slots is spun by the user's finger as a set of slots go past the original stationary slot. This acts as a shutter and the eye sees rapid on/off images of a moving object. If the speed of the disc is correct the image will appear to be stationary or slowly moving forwards or backwards. Model LB3851-001 has 2 discs which can be easily adjusted to provide either 1, 2, 3, 4, 6, or 12 slots in the rotating disc.</p>	<p>91.00</p>	<p>DIFFRACTION KIT – COMPLETE WITH SLITS & FILTERS</p> <p>HL1670-001</p>  <p>A low cost and unique instrument to teach the principles of diffraction.</p> <p>Self-contained and housed in a small plastic box. A mono filament lamp provides a line source of light and it is viewed through various single and double slit sets produced photographically and supplied in the kit. An adjustable slit is provided and a set of colour filters to observe different patterns of different colours. A simple scale is mounted behind the light source to measure the distances between the dark and light bands of light.</p> <p>Genuine IEC product. Information sheet available.</p>	<p>67.00</p>
<p>DIFFRACTION GRATING 100 LINES/MM</p> <p>PH0624A</p>  <ul style="list-style-type: none"> • 100 lines / mm • Transmission type • 50mm x 50mm mounted in frame • (NOTE: 600 lines per mm illustrated) 	<p>39.15</p>	<p>EDUCATIONAL DIFFRACTION SLIDE</p> <p>PH0625</p>  <ul style="list-style-type: none"> • For demonstrating the principle of the diffraction grating and the way in which its properties are dependent upon the number of lines per unit length • Comprises of a card mount 90 x 40mm approximately with three 16 x 9mm apertures, each containing a diffraction grating replica • The grating are of 100 lines/mm, 300 lines/mm and 600 lines/mm respectively and protected cover glasses. 	<p>62.85</p>









ALL PRICES INCLUDE GST.








<p>POLAROID FILTERS – PAIR IN ADJUSTABLE GRADUATED DISC</p> <p>HL1883-060</p>  <p>This apparatus from IEC consists of a pair of Polaroid Filters mounted inside a rotating scale which due to its strong metal stem can be held in a clamp or can be supported on an optical bench. A pointer indicates around a circular scale and points to 'zero' where the filters are aligned so that transmission of light is at a maximum. The rotation in degrees on either side of zero is easily measured as the filters reduce the transmitted light to zero at 90 degrees. The transmission is 38% when polaroids are aligned. When misaligned at 90 degrees, the transmission reduces to less than 0.2% (almost complete blackout). By holding the front ring, the pointer can be moved to +/- 90 degrees from alignment which rotates one of the filters relative to the other filter to change the transmission from maximum to minimum. The diameter of the filter at the centre is 50mm. <i>Genuine IEC product.</i> Instruction sheet included.</p>	<p>91.00</p>	<p>POLAROID FILTERS SQUARE WITH CIRCULAR SCALE 100 X 100MM PAIR</p> <p>HL1883-050</p>  <p>These are a pair of special IEC Polaroid Filters that are 0.18mm thick, with a scale printed on each. One scale is circular and degrees marked. The other is a simple cross for the alignment of one filter over the top of the other. Rotary displacement can be measured on the scale as the behaviour of the light transmission is studied. Size is 100x100mm. Instruction sheet included.</p>	<p>60.00</p>
<p>POLAROID FILTER 300 X 300MM SHEET (OR EQUIVALENT AREA)</p> <p>HL1883-040</p>  <p>IEC Polaroid Filter - single piece, 0.18mm thickness, with a total area of the equivalent of 300x300mm from which the user can cut other pieces (this large size might not be in one piece). The transmission is 80% when polaroids are aligned. When misaligned at 90°, the transmission reduces to 0.2%. Information Sheet included.</p>	<p>262.00</p>	<p>POLAROID FILTERS – PAIR – 100 X 100MM SQUARE</p> <p>HL1883-030</p>  <p>Pair of 100 x 100mm 0.18mm thick polaroid filters by IEC. The transmission is 80% when polaroids are aligned. When misaligned at 90 degrees, the transmission reduces to 0.2%. Instruction sheet included. <i>Genuine IEC product.</i></p>	<p>48.00</p>
<p>POLAROID FILTERS – PAIR – 75 X 75MM SQUARE</p> <p>HL1883-020</p>  <p>Pair of 75 x 75mm 0.18mm thick polaroid filters by IEC. The transmission is 80% when polaroids are aligned. When misaligned at 90 degrees, the transmission reduces to 0.2%. Instruction sheet included. <i>Genuine IEC product.</i></p>	<p>37.40</p>	<p>POLAROID FILTERS – PAIR – 50 X 50MM SQUARE</p> <p>HL1883-010</p>  <p>Pair of 50 x 50mm 0.18mm thick polaroid filters by IEC. The transmission is 80% when polaroids are aligned. When misaligned at 90 degrees, the transmission reduces to 0.2%. Instruction sheet included. <i>Genuine IEC product.</i></p>	<p>19.80</p>









<p>SCREEN – FROSTED ACRYLIC 200 X 200MM</p>	<p>HL3740-001</p>	<p>27.50</p>	<p>LIGHT SOURCE - VERY HIGH POWER – Q/I TYPE LAMP 12V 100W</p> <p>HL2016-001</p>	<p>198.00</p>
 <p>The 'Frosted Screen' from IEC is used for the projection of images in optics. It is a sheet of acrylic, about 200 x 200 x 3mm (l x h x d) mounted on a simple foot to stand upright from a table. One side of the sheet has been finely shot blasted to create a 'frosted' surface.</p> <p>Click to see Instruction Sheet.</p>			 <p>This item is a very high power light source mounted inside a metal housing with viewing holes on two sides complete with shutters to select the desired viewing hole. The lamp is 12V x 100W quartz halogen and it generates considerable heat. The housing is ventilated to allow air to flow through without light escaping. A strong support rod is provided to permit the light source to be mounted on a retort stand with a boss head. A 1m long cable is terminated with moulded stackable banana plugs.</p> <p>For spare 12V x 100W QI lamp, see PA2043-001.</p>	
<p>LIGHT SOURCE – HIGH POWER 12V 15-21W ON BASE</p>	<p>HL2013-050</p>	<p>57.00</p>	<p>SPECTROSCOPE – STUDENT'S – WITH CALIBRATED SCALE & ADJUSTABLE SLIT</p> <p>HL3791-001</p>	<p>59.00</p>
 <p>The IEC High Power Light Source is a simple lamp holder on a base. The base will carry a 'BA15D' type lamp at powers up to 42 watt. Fitted with 4mm spin free IEC terminals.</p> <p>The term 'BA15D' means: Bayonet style, 15mm diameter, double contact. Special bronze internal contact springs are fitted to permit the normal socket to carry the large current of a high power lamp but, in this era of the LED, many lamps are no longer made.</p> <p>Dimensions (incl. lamp): 115 x 82 x 70mm.</p> <p>NOTE: Lamp supplied with this unit is unit PA2041-005, but other BA15D lamps are also available to fit this base.</p>			 <p>The IEC compact Direct Vision Spectroscope is a very useful hand held device for measuring the wavelength of light. An adjustable slit allows the light to enter the black chamber and the viewing eyepiece carries a 600 line/mm grating. The eye sees the incoming light split into its colours or wavelengths that appear to be deflected to the right hand side. The coloured bands appear over a scale calibrated in nanometres (nm) with each digit on the scale representing 100nm. The included instruction sheet introduces the principles and explains Angstrom units, nanometres, the spectrum and much more. Instruction Sheet included.</p>	
<p>LIGHT SOURCE – LOW POWER - 4MM TERMINALS</p>	<p>HL2012-101</p>	<p>28.60</p>	<p>LIGHT SOURCE – LOW POWER – 4MM SOCKETS</p> <p>HL2012-001</p>	<p>24.20</p>
 <p>A simple 2.5V light source in a protective housing, used in the teaching of basic electricity. There are two versions of this light source which is housed in a simple transparent plastic vial. HL2012-001 uses 4mm sockets for connection and HL2012-101 uses 4mm spin free IEC terminals for the connection of cables.</p> <p>These small light sources use an MES lamp screwed into a socket.</p> <p>Genuine IEC product.</p> <p>Instruction Sheet included.</p>			 <p>A simple 2.5V light source in a protective housing, used in the teaching of basic electricity. There are two versions of this light source which is housed in a simple transparent plastic vial. HL2012-001 uses 4mm sockets for connection and HL2012-101 uses 4mm spin free IEC terminals for the connection of cables.</p> <p>These small light sources use an MES lamp screwed into a socket.</p> <p>Genuine IEC product.</p> <p>Instruction Sheet included.</p>	









MECHANICAL EQUIVALENT OF HEAT – JOULE'S APPARATUS	HL3800-001			478.50
	<p>The Mechanical Equivalent of Heat ('J' apparatus) is an old unit patterned on the old Griffin model in the UK where mechanical work done is converted to heat and compared with the electrical equivalent. IEC has made a superb, unique and low cost digital model of extreme accuracy but only up to sample level. Design and production development cannot occur unless there is a proven market. The HL3800-001 performs quite well and permits both electrical and mechanical friction heating of a solid copper calorimeter. Temperature measurement is by thermometer. <i>Genuine IEC product.</i></p> <p>Instruction Sheet included.</p>			
IRON PINS FOR OPTICS EXPERIMENTS – 50MM	AR1110480-3	15.65	IRON PINS FOR OPTICS EXPERIMENTS – 75MM	AR1110480-4 20.05
	<p>Plated metal, heavy gauge. Useful as an object in optical bench for studying images and in ray tracing for marking the path of rays. Supplied in packs of 100g each.</p>			

ALL PRICES INCLUDE GST.

PRISMS, HOLLOWES, MIRRORS & LENSES					
7 PIECE GLASS PRISM SET IN WOODEN BOX	PH0572AG	82.00	7 PIECE ACRYLIC PRISM SET IN WOODEN BOX	PH0572A	54.60
	<p>High quality glass prism & lens set: perfect for optics experiments. Suitable for classroom or home schooling settings to demonstrate the reflecting, refracting and scattering properties of light.</p> <p>Pieces approx. 13mm thick. 7.5cm equilateral triangle; 5.75cm dia. semi-circle; trapezoid with 3.25 and 4 cm legs; 8.75cm double convex prism; 8.75cm double concave prism; 5 x 3.75 x 1.25cm triangular prism and 5 x 2.5 x 1.87cm triangular prism.</p>			<p>Kit contains seven acrylic prisms measuring 13mm thick (approx.) Shapes include a rectangle, a semicircle, three triangles, and double convex and double concave prisms. Prisms are polished. Acrylic material is less vulnerable than glass. This is a great set for classrooms and for home schooling learning about the properties of light.</p>	
RECTANGULAR ACRYLIC BLOCK - 100 X 75 X 18MM	PH0568B	12.50	PAIR OF NARROW PRISMS	PH0564	14.70
	<p>Used in the field of optics in the study of the properties of light.</p> <ul style="list-style-type: none"> • Solid acrylic block • Index of refraction plate 			<p>Designed to provide a progression of ideas from the principles of refraction in prism to the properties of lenses. Form of a narrow isosceles triangles 15 x 60 x 20 mm (base, height, thickness). When placed base to base a convex lens may be simulated and a concave lens when vertex to vertex.</p>	
PRISM – EQUILATERAL	PRHL1056-01	12.10	PRISM – RIGHT ANGLE	PRHL1706-01	13.60
	<p>50mm glass prism. 60 x 60 x 60 degree angles.</p>			<p>50mm glass prism.</p>	
PRISM - GLASS	PRGL503	9.60	ACRYLIC HOLLOW D CELL 200MM DIAMETER	PH0585B	9.70 (1-24)
	<ul style="list-style-type: none"> • 50mm long optical glass prism • Used to demonstrate that white light is made up of the colours of the rainbow (the spectrum) • Each face is 28mm • Corners are ground for safety <p>Suitable ages 10+</p>			<p>For refraction, reflection and wave demonstrations. Diameter 200 mm.</p>	9.20 (25+)





<p>ACRYLIC HOLLOW D CELL 70MM DIAMETER</p> <p>PH0585A</p>	<p>7.50 (1–24)</p>	<p>RECTANGULAR GLASS BLOCK - 115 X 65 X 18MM - DELUXE</p> <p>AR1110380-7</p>	<p>12.50</p>
 <p>Hollow Acrylic Semi Circle for study of index of refraction. For refraction, reflection and wave demonstrations. Diameter 70 mm.</p>	<p>7.00 (25+)</p>	 <p>High quality optical white glass blocks with polished surfaces free from any defects.</p> <p>All angles have been accurately worked with edges slightly beveled and glass totally free from bubbles.</p>	
<p>SEMI-CIRCULAR ACRYLIC BLOCK - 90 X 25MM</p> <p>PH0570B</p>	<p>12.10</p>	<p>SEMI-CIRCULAR GLASS BLOCK - 90 X 18MM</p> <p>PH0570D</p>	<p>11.00</p>
 <p>For use in light refraction and geometrical optics experiments. Polished sides. Works well with low power monochromatic light source.</p>		 <p>For use in light refraction and geometrical optics experiments. All faces fully polished. 90cm diameter - 18mm thickness.</p>	
<p>LASER VIEW KIT – FULL SET OF 8</p> <p>HL1985-001</p>			<p>168.30</p>
 <p>The Laserview Kit from IEC is a useful kit of specially moulded prisms and bars that permit a Laser beam to be visible as it passes through the plastic. The special prisms are the same shapes as the 'Hodson' Light Box kit and the long straight and curved bars are new mouldings. The bars are used to teach the principles of optical fibre and the action of internal reflection.</p> <p>The action of light inside optical fibre cables relates to the study of 'Photonics' which is now part of some curricula. The kit is available in 3 different forms.</p> <p><i>Genuine IEC product.</i></p> <p>Instruction Sheet</p>			
<p>GLASS RECTANGULAR MIRROR ON PLASTIC STAND</p> <p>PH0615A1</p>	<p>5.95</p>	<p>HOLLOW GLASS SHAPES WITH STOPPERS – SET OF 3</p> <p>PH0552SET</p>	<p>49.45</p>
 <p>Glass mirror on stand for experiments where an upright mirror is required. Dimensions (approx.): 70 x 23 mm. Suitable for Laser & Ray experiments.</p>		 <p>Excellent tools for a variety of optical experiments, including Snell's Law of Refraction.</p> <p>This set consists of the <i>HOLLOW – PRISM (PH0552B)</i>; <i>HOLLOW – SLAB (PH0552C)</i> and <i>HOLLOW – CUBE (PH0552D)</i> Glass plates cemented together. Hollow on the inside that allows liquid to be poured inside.</p> <p>Stopper included.</p>	

<p>HOLLOW GLASS SHAPE WITH STOPPER – PRISM</p> <p>PH0552B</p>	<p>14.20</p>	<p>HOLLOW GLASS SHAPE WITH STOPPER – SLAB (BLOCK)</p> <p>PH0552C</p>	<p>17.30</p>
 <p>Excellent tools for a variety of optical experiments, including Snell's Law of Refraction. Glass plates cemented together. Hollow on the inside that allows liquid to be poured inside. Stopper included. Dimensions (mm): 50 x 50</p>		 <p>Excellent tools for a variety of optical experiments, including Snell's Law of Refraction. Glass plates cemented together. Hollow on the inside that allows liquid to be poured inside. Stopper included. Dimensions (mm): 75 x 50 x 0.17</p>	
<p>HOLLOW GLASS SHAPE WITH STOPPER – CUBE</p> <p>PH0552D</p>	<p>21.00</p>	<p>MIRROR – 3 CORNERED</p> <p>LB2170-001</p>	<p>19.80</p>
 <p>Excellent tools for a variety of optical experiments, including Snell's Law of Refraction. Glass plates cemented together. Hollow on the inside that allows liquid to be poured inside. Stopper included. Dimensions (mm): 50 x 50 x 50</p>		 <p>Has 3 x front surfaced mirrors mounted inside a plastic moulded housing such that the 3 x faces are mutually at 90 degrees.</p> <p>A special mirror of this type always reflects the incident ray back to the source regardless of the angle of incidence. Miniature mirrors of this type are in reflectors used on the road and on posts beside the road. They always reflect back towards the vehicle's headlights even if illuminated from an angle.</p> <p><i>Genuine IEC product.</i></p>	
<p>CYLINDRICAL MIRROR - GLASS - CONCAVE</p> <p>MIRAR1110160-1</p>	<p>8.60</p>	<p>CYLINDRICAL MIRROR - GLASS - CONVEX</p> <p>MIRAR1110160-6</p>	<p>8.60</p>
 <p>Unmounted, optically worked, glass cylindrical mirrors, Semi-circular, 75 x 25mm (l x h). Silvered back with protective coating.</p>		 <p>Unmounted, optically worked, glass cylindrical mirrors, Semi-circular, 75 x 25mm (l x h). Silvered back with protective coating.</p>	
<p>UNMOUNTED PLANE MIRROR - 75X50MM</p> <p>MIRAR1110220-2</p>	<p>2.05</p>	<p>UNIVERSAL MIRROR - STAINLESS STEEL</p> <p>PH0528</p>	<p>10.45</p>
 <p>Unmounted rectangular plain glass mirrors with ground edges. Back silvered, with protective coating.</p> <p>NOTE: Mirror support block and second mirror for illustration purposes only. Sold separately.</p>		 <p>Provides a tool for the study of optics - perform experiments using light rays with plane, concave & convex mirrors. Flat on one side, curved on one side. 8.75 x 1.8 cm (approx.).</p>	

<p>PLANE HALF CYLINDER CONVEX STAINLESS STEEL MIRROR</p> <p>PH0529A</p>  <p>This plane half cylinder convex stainless steel mirror for use with ray box is designed for physics or other tabletop physics apparatus. It is approximately 150 x 70mm and 1mm thick. Note, thickness varies as they are not designed to be consistent in that respect and there may be minor imperfections that do not affect physical function.</p>	27.00	<p>PLANE HALF CYLINDER CONCAVE STAINLESS STEEL MIRROR</p> <p>PH0529B</p>  <p>This plane half cylinder concave stainless steel mirror for use with ray box is designed for physics or other tabletop physics apparatus. It is approximately 150 x 70mm and 1mm thick. Note, thickness varies as they are not designed to be consistent in that respect and there may be minor imperfections that do not affect physical function.</p>	27.00
<p>HINGED MIRRORS</p> <p>MIR11657</p>  <ul style="list-style-type: none"> • Single sided 3mm thick rigid plastic mirrors that are taped together to enable creative angled reflections • Three sets of 2 mirrors each 150mm x 100mm • Stable, fantastic for light studies 	19.80	<p>UNBREAKABLE DOUBLE SIDED MIRROR 100x150</p> <p>MIRHL0976-01</p>  <ul style="list-style-type: none"> • Double Sided, high quality mirror finish • Acrylic • Both sides are protected with a peel off film and can be bent or cut easily • Can be used in: Science experiments with light; Maths' shape & symmetry work; creative art and craft projects <p>Size of sheet: 100mm x 150mm</p>	9.65
<p>UNBREAKABLE DOUBLE SIDED MIRROR 100x100</p> <p>HL0966-01</p> <p>As MIRHL0976-01, but 100mm x 100mm.</p>	4.84	<p>UNBREAKABLE DOUBLE SIDED MIRROR 100x50</p> <p>HL0986-01</p> <p>As MIRHL0976-01, but 100mm x 50mm.</p>	4.18
<p>UNBREAKABLE DOUBLE SIDED MIRROR 50x50</p> <p>HL0946-01</p> <p>As MIRHL0976-01, but 50mm x 50mm.</p>	1.76	<p>UNBREAKABLE DOUBLE SIDED MIRROR 50x75</p> <p>HL0956-01</p> <p>As MIRHL0976-01, but 50mm x 75mm.</p>	2.42
<p>LIGHT BENDER</p> <p>PH0587</p>  <p><i>Light can go around corners!</i></p> <p>Light guide demonstrator displays total internal reflection. Can be used with a light box to demonstrate total internal reflection. Helps students to understand the principles of optical communications. The bottom of the bar is white to aid visibility. Acrylic bar 220 x 20 x 20mm.</p>	12.35	<p>UNBREAKABLE MIRROR DOUBLE SIDED – D-TYPE</p> <p>HL0776-01</p>  <p>100mm diameter plastic concave / convex mirror. D-type.</p>	3.85
<p>COMBI CONCAVE / CONVEX MIRROR 300MM DIAMETER</p> <p>HL0938-01</p>  <p>300mm diameter concave / convex mirror with focal length 25 – 30cm.</p>	69.30	<p>JUMBO CONCAVE / CONVEX MIRROR 600MM DIAMETER</p> <p>HL0939-01</p>  <p>Jumbo 600mm diameter concave / convex mirror with focal length 3.95 metres.</p>	181.00

MIRRORS

Unmounted spherical mirrors, optically worked, silvered back with protective coating.

MIRRORS – CONCAVE 50MM DIAMETER			MIRRORS – CONVEX 50MM DIAMETER				
	HL0616-01	Focal Length: 5cm	3.30		HL0786-01	Focal Length: 5cm	3.30
	HL0626-01	Focal Length: 7.5cm	3.30		HL0796-01	Focal Length: 7.5cm	2.75
	HL0636-01	Focal Length: 10cm	2.50		HL0806-01	Focal Length: 10cm	2.50
	HL0646-01	Focal Length: 15cm	2.50		HL0816-01	Focal Length: 15cm	2.50
	HL0656-01	Focal Length: 20cm	2.50		HL0826-01	Focal Length: 20cm	2.50
	HL0666-01	Focal Length: 25cm	2.50		HL0836-01	Focal Length: 25cm	2.50
	HL0676-01	Focal Length: 30cm	2.50		HL0846-01	Focal Length: 30cm	2.50
	HL0686-01	Focal Length: 50cm	2.50		HL0856-01	Focal Length: 50cm	2.50
	HL0696-01	Focal Length: 100cm	2.50		HL0866-01	Focal Length: 100cm	2.50
MIRRORS – CONCAVE 75MM DIAMETER			MIRRORS – CONVEX 75MM DIAMETER				
	HL0706-01	Focal Length: 7.5cm	5.75		HL0706-75	Focal Length: 7.5cm	5.75
	HL0726-01	Focal Length: 10cm	5.50		HL0726-75	Focal Length: 10cm	5.50
	HL0736-01	Focal Length: 15cm	5.50		HL0736-75	Focal Length: 15cm	5.50
	HL0746-01	Focal Length: 20cm	5.50		HL0746-75	Focal Length: 20cm	5.50
	HL0756-01	Focal Length: 25cm	5.50		HL0766-75	Focal Length: 30cm	5.50
	HL0766-01	Focal Length: 30cm	5.50				
	HL0767-01	Focal Length: 50cm	5.50				

MIRROR KIT #1

MIR50HLKIT

172.00



Set of 50mm (5cm) diameter concave & 50mm (5cm) diameter convex mirrors of various focal lengths (FL), with wooden holder. Unmounted spherical mirrors, optically worked, silvered back with protective coating.

Comprises of:

Concave mirrors:

- 6 x FL: 7.5cm (75mm),
- 6 x FL: 10cm (100mm),
- 6 x FL: 15cm (150mm),
- 6 x FL: 20cm (200mm),
- 6 x FL: 30cm (300mm);

Convex mirrors:

- 6 x FL: 7.5cm (75mm),
- 6 x FL: 10cm (100mm),
- 6 x FL: 15cm (150mm),
- 6 x FL: 20cm (200mm),
- 6 x FL: 30cm (300mm).

6 x Lens holder – wooden

NOTE: Wooden Lens Holder ([AR1110260](#)) in this kit fits both 50mm & 75mm lenses & mirrors.

ALL PRICES INCLUDE GST.



Set of 75mm (7.5cm) diameter concave & 75mm (7.5cm) diameter convex mirrors of various focal lengths (FL), with wooden holder.
Unmounted spherical mirrors, optically worked, silvered back with protective coating.

Comprises of:

Concave mirrors:

6 x FL: 7.5cm (75mm),
6 x FL: 10cm (100mm),
6 x FL: 15cm (150mm),
6 x FL: 20cm (200mm),
6 x FL: 30cm (300mm);

Convex mirrors:

6 x FL: 7.5cm (75mm),
6 x FL: 10cm (100mm),
6 x FL: 15cm (150mm),
6 x FL: 20cm (200mm),
6 x FL: 30cm (300mm).
6 x Lens holder – wooden

NOTE: Wooden Lens Holder ([AR1110260](#)) in this kit fits both 50mm & 75mm lenses & mirrors.

LENSES

LENSES 50MM – SET OF 6

[PH0538A](#)

28.35

ROUND BI-CONCAVE
50MM GLASS LENS - HIGH
OPTICAL PURITY - 14MM
THICK

[PH0531ACC](#)

22.50



50mm diameter glass optic lenses.
Ground and polished surfaces.

Double convex, plano-convex, converging
concave-convex, diverging concave-
convex, double concave & plano-concave.

In storage case.



For physics experiments.
Focal length: 50mm.
14mm thick (Note: thickness varies as they
are not designed to be consistent in that
respect).

Because of their educational use design,
there may be minor imperfections that do not
affect physical function.

ROUND BI-CONCAVE
50MM GLASS LENS - HIGH
OPTICAL PURITY – 4.7MM
THICK

[PH0531CCC](#)

22.50

ROUND BI-CONCAVE
50MM GLASS LENS - HIGH
OPTICAL PURITY

[PH0531FCC](#)

22.50



Focal length: 150mm.
4.7mm thick (Note: thickness varies as
they are not designed to be consistent in
that respect).
Because of their educational use design,
there may be minor imperfections that do
not affect physical function.







Good quality, exact focal length.
Focal length: 1000mm

<p>CYLINDRICAL BICONCAVE LENS FOR RAY BOX</p> <p>AR1110780-2</p>  <p>Cylindrical lens, approx. 45mm wide. Focal length 15cm (approx.) (+6.67D).</p>	15.50	<p>CYLINDRICAL BICONVEX LENS FOR RAY BOX</p> <p>AR1110780-1</p>  <p>Cylindrical lens, approx. 45mm wide. Focal length 15cm (approx.) (+6.67D).</p>	15.00
<p>CYLINDRICAL PLANO CONVEX LENS - FOCAL LENGTH 20CM</p> <p>AR1110080-13</p>  <p>Optically worked faces, ground edges, white glass, well polished, size 50x45mm. Suitable for <i>BUDGET RAY BOX</i>.</p>	18.50	<p>LENS - PLANO CONVEX 50MM DIA. FOCAL LENGTH 200MM (PACK OF 10)</p> <p>PH0532F-CV</p>  <p>Clear glass, spherical, optically worked glass. Highly polished 50mm (5cm) diameter and Focal Length 200mm (20cm). Pack of 10.</p>	65.00

GLASS LENSES - SPHERICAL






High quality, optically true lenses. Made of high quality polished glass. Spherical with round edges.

<p>BI-CONCAVE LENS - DIAMETER: 50MM (5CM)</p>  <table border="1"> <tr><td>PH0536G-CC</td><td>Focal Length: 5cm</td><td>4.50</td></tr> <tr><td>PH0536H-CC</td><td>Focal Length: 10cm</td><td>3.65</td></tr> <tr><td>PH0536I-CC</td><td>Focal Length: 15cm</td><td>3.35</td></tr> <tr><td>PH0536J-CC</td><td>Focal Length: 20cm</td><td>3.35</td></tr> <tr><td>PH0536K-CC</td><td>Focal Length: 25cm</td><td>3.25</td></tr> <tr><td>PH0536L-CC</td><td>Focal Length: 30cm</td><td>3.15</td></tr> <tr><td>PH0536L-CC1</td><td>Focal Length: 50cm</td><td>3.15</td></tr> </table>	PH0536G-CC	Focal Length: 5cm	4.50	PH0536H-CC	Focal Length: 10cm	3.65	PH0536I-CC	Focal Length: 15cm	3.35	PH0536J-CC	Focal Length: 20cm	3.35	PH0536K-CC	Focal Length: 25cm	3.25	PH0536L-CC	Focal Length: 30cm	3.15	PH0536L-CC1	Focal Length: 50cm	3.15	<p>BI-CONVEX LENS - DIAMETER: 50MM (5CM)</p>  <table border="1"> <tr><td>PH0534G-CV</td><td>Focal Length: 5cm</td><td>3.65</td></tr> <tr><td>PH0534H-CV</td><td>Focal Length: 10cm</td><td>3.65</td></tr> <tr><td>PH0534I-CV</td><td>Focal Length: 15cm</td><td>3.35</td></tr> <tr><td>PH0534J-CV</td><td>Focal Length: 20cm</td><td>3.35</td></tr> <tr><td>PH0534K-CV</td><td>Focal Length: 25cm</td><td>3.20</td></tr> <tr><td>PH0534L-CV</td><td>Focal Length: 30cm</td><td>3.15</td></tr> <tr><td>PH0534L-CV1</td><td>Focal Length: 50cm</td><td>3.15</td></tr> <tr><td>PH0534L-CV2</td><td>Focal Length: 100cm</td><td>3.15</td></tr> </table>	PH0534G-CV	Focal Length: 5cm	3.65	PH0534H-CV	Focal Length: 10cm	3.65	PH0534I-CV	Focal Length: 15cm	3.35	PH0534J-CV	Focal Length: 20cm	3.35	PH0534K-CV	Focal Length: 25cm	3.20	PH0534L-CV	Focal Length: 30cm	3.15	PH0534L-CV1	Focal Length: 50cm	3.15	PH0534L-CV2	Focal Length: 100cm	3.15
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PH0534L-CV2	Focal Length: 100cm	3.15																																												
<p>BI-CONVEX LENS - DIAMETER: 75MM (7.5CM)</p>  <table border="1"> <tr><td>PH0534N-CV</td><td>Focal Length: 10cm</td><td>9.30</td></tr> <tr><td>PH0534O-CV</td><td>Focal Length: 15cm</td><td>7.05</td></tr> <tr><td>PH0534P-CV</td><td>Focal Length: 20cm</td><td>6.85</td></tr> <tr><td>PH0534Q-CV</td><td>Focal Length: 25cm</td><td>6.85</td></tr> <tr><td>PH0534R-CV</td><td>Focal Length: 30cm</td><td>6.30</td></tr> <tr><td>PH0534R-CV1</td><td>Focal Length: 50cm</td><td>6.30</td></tr> <tr><td>PH0534R-CV2</td><td>Focal Length: 100cm</td><td>6.30</td></tr> </table>	PH0534N-CV	Focal Length: 10cm	9.30	PH0534O-CV	Focal Length: 15cm	7.05	PH0534P-CV	Focal Length: 20cm	6.85	PH0534Q-CV	Focal Length: 25cm	6.85	PH0534R-CV	Focal Length: 30cm	6.30	PH0534R-CV1	Focal Length: 50cm	6.30	PH0534R-CV2	Focal Length: 100cm	6.30	<p>LENS KIT #1</p> <p>LENS50HLKIT1</p>  <p>Set of 50mm (5cm) dia. biconcave and 50mm (5cm) dia. biconvex lenses of various focal lengths (FL), and lens holders. Comprises of: Biconcave lenses: 6 x FL: 15cm, 6 x FL: 20cm, 6 x FL: 25cm. Biconvex lenses: 6 x FL: 15cm, 6 x FL: 20cm, 6 x FL: 25cm. Lens holder - wooden x 6 (fits 50mm & 75mm lenses). <i>Lenses stored in handy plastic container.</i></p>																								
PH0534N-CV	Focal Length: 10cm	9.30																																												
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LENS KIT #2	LENS50HLKIT	177.50	BI-CONVEX 50MM LENS SET	PH0534-50SET	25.95
	<p>Set of 50mm (5cm) diameter biconcave and 50mm (5cm) diameter biconvex lenses of various focal lengths (FL), lens holders with slot in base for meter ruler.</p> <p>Comprises of: Biconcave lenses: 6 x FL: 15cm (150mm), 6 x FL: 20cm (200mm), 6 x FL: 25cm (250mm). Biconvex lenses: 6 x FL: 15cm (150mm), 6 x FL: 20cm (200mm), 6 x FL: 25cm (250mm). 6 x Lens holder 6 x Meter ruler</p> <p><i>Lenses stored in handy plastic container.</i></p>		 <p>Set of eight 50mm (5cm) diameter bi-convex lenses. Set comprises of one each of the following focal lengths: 5, 10, 15, 20, 25, 30, 50 and 100cm.</p> <p>These are high quality, optically true lenses. Made of high quality polished glass and are spherical with round edges.</p>		





ALL PRICES INCLUDE GST.

LENS & MIRROR HOLDERS





<p>LENS HOLDER - WOODEN AR1110260</p>	<p>6.80</p>	<p>LENS HOLDER PH0550E</p>	<p>7.05 (1-24)</p>
 <p>Useful tool in optical benches or other optical experiments for securely holding different sizes and types of lenses and mirrors up to 75mm diameter.</p> <p>Comprising a V-shaped groove to hold lenses or mirrors, mounted on a rectangular wooden base. With index mark engraved on either side of the base.</p>		 <p>Lens holder, comprising of a metal holder with sides grooved to hold the lens or mirror. The holder is finished in matt black and is free standing for bench use.</p> <p>Can slide narrow meter rulers through the slot in the base for measurement.</p>	<p>6.65 (25+)</p>
<p>LENS HOLDER LENSHOLD</p>	<p>7.05</p>	<p>MIRROR SUPPORT BLOCK – WOODEN – 75MM AR1110240-3</p>	<p>12.10</p>
 <p>Adjustable plastic lens holder. Able to hold a 4mm thick lens that are up to a diameter of 75mm. Height can be adjusted by up to 60mm. Overall dimensions (approx.): 110 x 70 x 160mm</p>		 <p>Plain wooden block with a slot at the centre along its length to vertically mount plain rectangular mirrors. Suitable for plane mirrors of range 75mm.</p>	
<p>MIRROR SUPPORT BLOCK – WOODEN – 50MM PH0516</p>	<p>7.00</p>		
 <p>Wooden block for supporting mirrors. 50 x 50 x 50mm.</p>			

ALL PRICES INCLUDE GST.

ATOMIC PHYSICS

<p>ALPHA SCATTERING APPARATUS</p> <p>AR1130260</p>	<p>48.95</p>	<p>FRANCK HERTZ EXPERIMENT SET - INBUILT AMPLIFIER</p> <p>AP1870-001</p>	<p>352.00</p>
<p>A low cost apparatus for the demonstration of the Rutherford scattering by means of a gravitational analog of inverse square law repulsion.</p> <p>Comprises a wooden launching lamp about 300x50x105mm (LxWxH) with a guiding groove running down its curved front face along its length and index marks at 40,60, 80 and 100mm height above the base that provides 4 pre-determined launching heights. Also included is a spun aluminium hill about 280mm diameter and 60mm height along with a 19mm steel ball.</p> 		<p>The Franck Hertz Experiment Board consists of an Electron Valve configured to behave as a miniature laboratory to detect the behaviour of Xenon gas atoms when bombarded with electrons.</p> <p>Power supplies are required for the tube heater and the Anode / Cathode voltage. The system is complete with an inbuilt 9V battery and amplifier so the very small currents can be seen on ordinary bench meters if a sensitive mirror galvanometer is not available.</p> <p>Instruction Sheet</p> <p><i>Genuine IEC product.</i></p> 	
<p>LED ARRAY</p> <p>AR1110767</p>	<p>115.45</p>	<p>PLANCK'S CONSTANT DETERMINATION BOX</p> <p>PH1365</p>	<p>130.80</p>
<p>LED Array can be used to study the relation between light color and wavelength. Planck's constant can also be determined by knowing voltage & the wavelength across different color LEDs.</p> <p>Features: Eleven different color LEDs with different wavelength are mounted in a vertical column. 140 x 80 x 268 mm. Rotary switch is provide to select any individual LED or all together. 4mm safety sockets are provided to check the voltage across individual LED. Input 5V DC, 1.5 Amp Power Adaptor.</p> <p><i>How colour affects wavelength. A major improvement over using colour filters. Students can easily observe colour diffraction from their seats and actually compare the diffraction patterns for each colour. Invaluable for determining frequencies.</i></p> 		<p>This apparatus is designed to determine the approximate value of Planck's constant using the elbow voltage in the characteristic curves of a number of LEDs.</p> <p>There are 7 LEDs covering from deep blue at 470 nm to near IR 940 nm mounted on the box with sockets 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.</p> <p>External power supply for 9 volts is required or a 9 Volts battery with suitable connecting cords can also be used.</p> 	

ALL PRICES INCLUDE GST.

<p>PHOTO-ELECTRIC CELL WITH 90CG CELL & TERMINALS ON BASE</p> <p>AP2330-001</p>  <p>A simple, gas filled photocell that is mounted on a base with terminals for connection to a power source. The photocell is sensitive in the red and blue of the visible region. It normally runs at 90V DC applied to the anode/cathode circuit.</p> <p>IEC instruction sheet available.</p>	<p>157.00</p>	<p>HALF LIFE ANALOGUE</p> <p>HLIFEAN</p>  <p>Perfectly safe way to study the topic of radioactivity. This set gives students the opportunity to obtain realistic results. The student set contains ten trays and 500 small plastic cubes. The cubes have one face identified and represent radioactive nuclei which have "decayed" when this face is uppermost.</p> <p>Ten groups shake their set of nuclei and roll them out onto the bench. For each throw the decayed nuclei are counted and removed from the set. Excellent results for an exponential decay curve are obtained with increased awareness of the link between activity and the number of nuclei present.</p> <p>Each set contains 10 trays and 500 small plastics cubes.</p>	<p>90.00</p>
<p>GEIGER COUNTER - DIG. LCD - TIME/RATE – INTERNAL GM TUBE – BATT/POWER PACK</p> <p>AP1884-001</p>  <p>This fully portable Geiger Counter with inbuilt GM tube and LCD display is powered by 3x 'AA' cells. 'Lo Batt' warning is provided. The large sensitive tube is of the 'thin mica window' type and detects Gamma, Beta and high energy Alpha particles.</p> <p>The instrument is light, very robust and is useful for both field work and the classroom. Other models are available with remote tube. Tube voltage can easily be adjusted up to 600V. Counts can be selected to be continuous, counts over preset times, or Rate displayed as counts/Second. Socket provided for standard 240/12V.AC. Plug Pak to run the unit if cells flatten.</p> <p><u>Instruction Sheet</u> included.</p> <p><i>Genuine IEC product.</i></p>	<p>948.00</p>	<p>GEIGER COUNTER - DIG. LCD - TIME/RATE – W/O INTERNAL GM TUBE – BATT/POWER PACK</p> <p>AP1884-002</p>  <p>This Geiger Counter is powered by 3x 'AA' cells and uses a remote GM tube in a holder connecting by standard BNC plug. 'Lo Batt' warning is provided. The large sensitive tube is of the 'thin mica window' type and detects Gamma, Beta and high energy Alpha particles.</p> <p>The instrument is light, very robust and is useful for both field work and the classroom. Other models are available with inbuilt tube. Tube voltage can easily be adjusted up to 600V. Counts can be selected to be continuous, counts over preset times, or Rate displayed as counts/Second. Socket provided for standard 240/12V.AC. Plug Pak to run the unit if cells flatten.</p> <p><u>Instruction Sheet</u> included.</p> <p><i>Genuine IEC product.</i></p>	<p>478.00</p>

<p>MASS OF ELECTRON APPARATUS WITH TUBE – WITHOUT SOLENOID</p> <p>AP2120-001</p>	<p>191.00</p>	<p>GEIGER COUNTER DIGITAL LED TIME / RATE 240V.AC WITHOUT TUBE</p> <p>AP1886-101</p> <p>580.00</p>
 <p>The <i>IEC MASS OF ELECTRON APPARATUS</i> is a 'Magic Eye' tube mounted on a base with terminals to accept both heater and plate voltages. A fan of electrons can be seen by viewing through the end of the tube.</p> <p>An <i>AIR CORED SOLENOID (EM0090-001)</i> is placed over the tube and a current passed through the solenoid. The field at the centre of the solenoid causes the fan to curve (distort) and this curvature is measured to permit the approximate mass of an electron to be calculated.</p> <p><u>Instruction Sheet</u> included.</p>		 <p>This 240V.AC. mains powered <i>GEIGER COUNTER / RATE METER</i> by IEC uses a remote GM tube in a holder connected by standard BNC plug.</p> <p>Ideal for classroom use with sloping front panel and large red LED display. Other models are available for portable use and with inbuilt tube. The large sensitive tube is of the 'thin mica window' type and detects Gamma, Beta and high energy Alpha particles.</p> <p>Tube voltage is adjustable to 600V and inbuilt loudspeaker with volume control permits counts to easily be heard. Counts can be selected to be continuous, counts over preset times, or Rate displayed as counts/second.</p> <p><u>Instruction Sheet</u> included.</p>
<p>GEIGER COUNTER TUBE HOLDER SUPPORT</p> <p>AP1885-100</p>  <p>Simple plastic base with clips designed to hold the <i>GEIGER TUBE HOLDER (PA1885-050)</i> horizontally and in line with the holder used for supporting the Radio Active sources and the Absorbers (PA0031-001). IEC product.</p> <p><u>Instruction Sheet</u> included.</p>	<p>58.30</p>	<p>GEIGER TUBE – HOLDER CABLE – WITH MX168 TUBE FITTED</p> <p>PA1885-050</p> <p>730.00</p>  <p><i>GEIGER TUBE HOLDER</i> with current model GM tube (PA1885-020) fitted, with cable & BNC plug, connected and tested.</p> <p>Ready to plug directly to any model of IEC Geiger Counter.</p> <p><i>Genuine IEC product.</i></p>
<p>GEIGER TUBE – HOLDER & CABLE ONLY</p> <p>PA1885-030</p>  <p><i>IEC GEIGER TUBE HOLDER & CABLE ONLY</i> (tube not fitted), anodised aluminium construction with plastic grille at the front and cable grip at the rear.</p> <p>With 750mm long cable and BNC plug moulded to the cable. The old model was orange colour and made from plastic. This model replaces the old model.</p>	<p>180.00</p>	<p>GEIGER TUBE ONLY – BARE MX168/ZP1481</p> <p>PA1885-020</p> <p>610.00</p>  <p><i>GEIGER TUBE</i>, bare tube only, replacement for the normal MX168 or ZP1481 tube. Detects higher energy alpha, all beta and all gamma. This is the tube used in all models of IEC Geiger Counters.</p> <p>NOTE: For warranty, IEC must fit & test all GM tubes. If tube only is despatched (unfitted), there is no warranty on the tube.</p>

ALL PRICES INCLUDE GST.

MILLIKAN'S APPARATUS WITH BUILT-IN POWER SUPPLY	AP2131-001	785.00	ABSORBERS-SET OF 24- WITH HOLDER FOR RADIATION STUDY	AP0030-001	940.00
	<p>Millikan's apparatus with inbuilt power supplies from IEC permits the atomising of a latex solution into small spheres and the rubber hose induces a static charge upon them. They are introduced between charged plates in the form of a cell. As the voltage between these cell plates is reversed, the particles are attracted to one plate or the other. Their movement is viewed through a small telescope with a graticule. The required power sources are inbuilt. Knowing the potential on the cell plates and plotting the velocities of the spheres permits the calculation of the charge on a single electron. Instruction Sheet supplied.</p>			<p>Set of 24 absorbers, 50mm square, from tissue paper to aluminium foils, to aluminium sheet and plate, to lead foils and finally up to 12mm thick lead. Packed in a stout card box with dividers.</p> <p>Each absorber is marked with its density in gms/sq.cm. Kit includes plastic plates for supporting absorbers when used in a castle. Kit also includes a holder for both absorber and radioactive source to position the items in the horizontal plane, ready for experiments.</p> <p>Radioactive sources for use with this equipment available separately: Alpha (PA2667-005), Beta (PA2667-010) and Gamma (PA2667-020).</p>	
RADIOACTIVE SOURCE SIMULATOR ELECTRONIC	AP2668-001				270.00
	<p>This genuine IEC instrument simulates a Geiger Counter but without using actual radioactive sources. It is therefore completely safe. Powered by 240/12V.AC. Plug Pak, this microprocessor based instrument can display the counts of particles leaving an imaginary r/a 'source' and also can display the number of r/a particles remaining inside the 'source'. The concept of half-life is easily demonstrated and the random nature of the particle counts can be shown. The unit is used also in Maths in the study of 'random numbers' and statistics.</p> <p>The instrument is programmed to behave like a Radioactive Source and two different types of source are simulated • Very long half life type: The source appears to be radiating particles and the display appears to be a Geiger Counter that indicates the same reading that would be found on a real Geiger Counter at a certain distance from a real source. These 'Geiger Counter' readings are actually random numbers within a window of maximum and minimum. This set of random numbers is useful to be used in mathematics and in theories of probabilities.</p> <ul style="list-style-type: none"> • Very short half-life type: The display in this case shows the number of particles remaining in the source. Initially the source contains 1.000 x 10²⁰ particles. Eventually, after about 45 minutes, the number of particles remaining reaches one last particle. The time when that last particle will go is indeterminate. The elapsed decay time is also displayed in minutes and seconds for graphs to be plotted which demonstrate and explain the concept of half-life. When the source is exhausted, or at any other time, it can be 'replenished', ready for the next experiment, by a simple press on a button. • Audible monitoring: The 'clicking' sound associated with the counting of a Geiger Counter can be turned ON or OFF as desired. • Fun to use: The "Magic" concept makes the equipment fun to use and the results taken by the student actually work properly. This aspect improves the confidence level of the student. <p>INPUT: 12V.AC/DC 50/60Hz. Two 4mm sockets are provided on the end of the instrument for connection by banana plugs to a standard school power pack. A socket is provided also for a 240/12V.AC. Plug Pak.</p>				

ALL PRICES INCLUDE GST.

PHOTO-ELECTRIC
EFFECT "PLANCK'S"
DIGITAL METER WITH 5
LEDS

AP2342-001

773.00



A modern version of the "Photo-Electric Effect" by IEC for teaching this very important phenomenon and for the determination of "Planck's Constant" to a reasonable accuracy.

A choice of 5 different LEDs of known wavelength provide photons to a cell that generates electrons to create a very small current. A 'backing voltage' is applied to the cell to stop the current flow and this becomes the measurement of the energy level of the photon. These energy levels are plotted against the frequencies of the LEDs.

Major improvements of this model include: The backing voltage and the photo-cell current can be viewed together without switching from one to the other. LEDs are used as the specific wavelength light sources instead of an incandescent lamp and colour filters.

DETAILS:

Requires 12V AC or DC from either a mains PlugPak or from a classroom power supply. Provides 2x digital meters to read Backing Volts and Cell Current at the same time. 4x controls for: selection of LED colour, adjustment of brightness or intensity, the option of coarse and fine adjustment of Backing Volts.

- Includes set of 5 x LEDs of specific wavelength mounted on a small panel with cable & plug. Mounts on the rear of the instrument. The LED wavelengths are indicated on a label on the rear face of the instrument.
- Includes instructions and experiment sheets

PHOTO-ELECTRIC
EFFECT "PLANCK'S"
DIGITAL METER 9V

AP2341-002

715.00



New version of the IEC Photo Electric Effect with 2 separate meters. One displays the current through the Photo Tube in 0.1 nanoamps and the other displays the backing volts that brings the current to exactly zero. With both readings on view without the need for switching, experiments are faster and less confusing.

The light source is by the traditional method of a white light source and colour filters.

Contents:

1 x Photo-Electric Effect instrument. Runs from 9V transistor battery.

1 x 9V battery, type #216

1 x Lamp as light source, 12Volt, 25 Watt. Mounts on rear of unit. Spare lamp is [PA2043-004](#) 2pin, QI, 12V, 25W.






1 set of 5 x colour filters. Calibrated in nanometres wavelength.

1 set. 4 x Apertures to set the quantity of light from the light source. Aperture orifices: 7mm, 10mm, 14mm, and 20mm diameters.

One test sheet and Experiment Sheets for using the instrument are included.



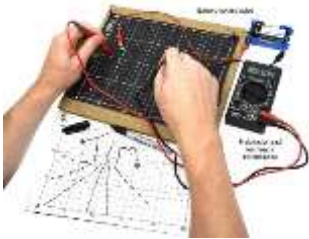

Requires a 12V.AC or DC plug pak (not supplied) or by banana plugs from any normal school power supply.










ALL PRICES INCLUDE GST.

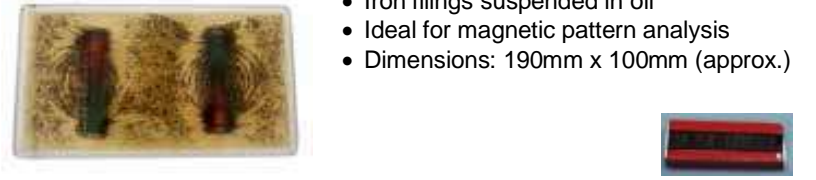
<p>RADIOACTIVE SOURCE ALPHA POLONIUM 210</p>  <p>Radioactive source, ALPHA, Polonium 210, low energy, suitable for classroom use, for study in radioactivity and absorbers.</p> <p>This source has a very short half-life of 135 days. NOTE: <i>About 18 months after purchase, the item is useless for experiments. Therefore, we normally do not carry stocks of this item. This must be ordered in from our supplier. Allow 3-4 weeks for availability.</i></p>	<p>320.00</p>	<p>RADIOACTIVE SOURCE BETA STRONTIUM 90</p>  <p>Radioactive source, BETA, Strontium 90, low energy, suitable for classroom use, for study in radioactivity and absorbers. Half-life is hundreds of years.</p> <p>Instruction Sheet available.</p>	<p>320.00</p>
<p>RADIOACTIVE SOURCE GAMMA COBALT 60</p>  <p>Radioactive source, GAMMA, Cobalt 60, low energy, suitable for classroom use, for study in radioactivity and absorbers. Half-life is hundreds of years.</p> <p>Instruction Sheet available.</p>	<p>320.00</p>	<p>RADIOACTIVE SOURCE LEAD STORAGE 3MM THICK (HOLDS 4)</p>  <p>For storing our radioactive sources.</p> <p>These products are for use in Laboratory or Educational setting only Use under appropriate supervision.</p> <p>Instruction Sheet</p>	<p>66.00</p>
<p>RADIOACTIVE SOURCE NEEDLE ALPHA & BETA (CLOUD CHAMBER)</p>  <p>These products are for use in Laboratory or Educational setting only. Use under appropriate supervision.</p>	<p>320.00</p>		







ALL PRICES INCLUDE GST.






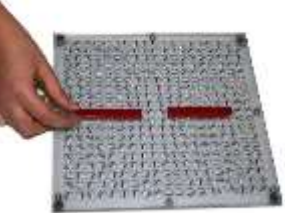

ELECTRICITY & ELECTROMAGNETISM





ITEM NAME	PRICE
<p>ELECTRICITY GENERATION DEMONSTRATION KIT</p> <p>DEMOELGEN</p>  <p>The <i>ELECTRICITY GENERATION DEMONSTRATION</i> unit is a FULLY ASSEMBLED UNIT designed to show Physics students that:</p> <p>(1) a generator being turned at speed will generate electricity and</p> <p>(2) increasing the generator's revs (rpm or revolutions per minute) increases the electrical output.</p> <p>This is easily demonstrated, as the motor's rpm increases, it lights up more LEDs: a good visual demonstration of increasing power output.</p> <p>This supplied information covers the theory of how the unit works, Ohm's Law, power and efficiency. It includes a Lesson plan on: Generating Electricity using a Motor Generator Set and spells out a series of tests that can be carried out with the unit.</p>	79.20
<p>FIELD LINES AND EQUIPOTENTIAL LINES</p> <p>AR1090142</p> <p>544.00</p>  <p>The kit consists of the following:</p> <ul style="list-style-type: none"> 1 x Trough 1 x Needle 1 x Rod with socket 1 x Multi-meter 1 x Cylindrical base 2 x Bar electrode 2 x Disc electrode 1 x Ring electrode 1 x Stand rod 1 x Boss head 1 x Power supply (2-12 V AC). Output voltage 2,3,4,5,6,8,10 and 12 V AC full wave, rectified, un-smoothed and unregulated D.D in maximum 8 steps. Overload protection resettable thermal trip. Working voltage 230 V AC, 50 Hz 2 x Flexible plug lead (set) 	<p>DRY FIELD MAPPING KIT – FOR EXPERIMENTS IN VISUALISING ELECTRIC FIELDS</p> <p>PH0918DFM</p> <p>169.00</p>  <p>Easily visualize electric fields generated by electrodes of your own design. Simply draw your electrodes, hook up a battery to generate the electric fields, and use a multimeter or voltmeter to map out the equipotential surfaces.</p> <p>Then connect equipotential field lines to generate electric fields.</p> <p>Kit contains conductive paint, conductive graph paper (25 sheets) and non-conductive graph paper (100 sheets), D-cell battery holder, corkboard, push pins, circle template, and 4 colored leads with alligator clips.</p> <p>Electric fields can be a difficult concept to grasp - but not with this kit! Use at home or with a large classroom. You can even visualize dipoles and quadrupoles by using only the push pins.</p> <p>Ages 8+.</p> <p>NOTE: <i>Multimeter or Voltmeter required. D-cell battery not included</i></p>
<p>MAGNETIC FIELD PROBE</p> <p>PH0798MP</p> <p>24.50</p>  <p>For detecting and mapping magnetic fields. An ingenious device. Put it anywhere where there is a magnetic field including hard to get at spots. 19mm alnico magnet is mounted in a freely rotating gimbal for 3D location and mapping. Quality plastic superstructure. Quick, easy and effective detector and inexpensive enough to consider class sets.</p> <p>Rotating Magnet Head</p>	<p>SCORPIO TECHNOLOGY STOCKS A WIDE RANGE OF COMPONENTS & TOOLS SUCH AS BATTERY HOLDERS, BATTERIES, SOLAR PANELS, ELECTRIC MOTORS, CLIPS, WIRING, BENCH METERS, ETC., FOR USE WITH ELECTRIC CIRCUITS.</p>




ELECTRIC FIELD APPARATUS	AR1090120	31.95		31.95
	<p>For investigation of electric field patterns due to various electrode configurations. Permits easy demonstration of the related concepts to a group of students through overhead projector.</p> <p>The apparatus comprises a clear plastic dish and a transparent rectangular base carrying a pair of 4mm socket terminals that can also hold adjustable electrodes.</p> <p>Includes a set of 6 electrodes: two point source, two line (parallel) source and two circular rings of 35 and 70mm diameter respectively.</p>			
MAGNETIC FIELD DEMONSTRATION KIT	EM0602-02	42.35	MAGNETIC FIELD DEMO - SET OF 3 PH0803SET	95.95
	<ul style="list-style-type: none"> Kit contains: <ul style="list-style-type: none"> 2 x magnetic field panels - 200mm x 100mm that can be locked together to form one larger panel. 2 x Straight bar magnets 75 x 12 x 8mm (length x width x thickness) 1 x "U" shaped magnet 50 x 25 x 12mm (length x width x thickness) This kit uses clear moulded plate containing many metal pins that clearly show the path of magnetic fields when a magnet is placed upon it Panels can be locked together so the working area can be further expanded with more panels (EM0602-01) Can be placed on an overhead projector for student viewing 		  <ul style="list-style-type: none"> Superb relationship studies of the interplay of electric and magnetic fields Use a compass or magnetic field demonstrator to detect and study nature magnetic fields Set of 3 Set includes: Magnetic Field Demonstrators - Vertical Wire; Coils; & Solenoid (Max Current 8A) <p style="text-align: center;"><i>WHILE STOCKS LAST</i></p> 	
MAGNETIC FIELD PANELS	EM0602-01	15.90	MAGNET THEORY BOARD EM1070415	60.00
	<ul style="list-style-type: none"> Additional panels available for purchase to add to Magnetic Field Demonstration Kit (EM0602-02) Panel size: 200mm x 100mm No glycerine to leak Very sturdy – can be dropped without serious damage Black pins that don't jam or rust 		 <ul style="list-style-type: none"> Magnetic Field Demonstrator Used to demonstrate the magnetic lines of forces 46 magnetic compasses fixed around the square plastic base Approx. 302 x 302mm Easy to handle and store 	
MAGNETIC LINE COLOURED CHIPS	EM0605-01	71.50	MAGNETIC LINE COLOURED CHIPS WITH MAGNET EM0604-01	77.00
	<p>Explore 3-dimensional magnetic fields with this great visual display from Narika. Pack of magnetic chips.</p> <p>Clean, easy alternative to ironing filings. Shows a 3D magnetic field. 100gm. 5 mixed colours per pack.</p>		 <p>Explore 3-dimensional magnetic fields with this great visual display from Narika. Pack of magnetic chips with round ferrite magnet. Clean, easy alternative to ironing filings. Shows a 3D magnetic field. 100gm. 5 mixed colours per pack.</p>	

<p>MAGNETIC FIELD DEMONSTRATOR – SET OF 3 WITH SHAKER</p>	<p>EM2067-001</p>	<p>200.00</p>	<p>MAGNETIC FIELD DEMONSTRATOR - STRAIGHT</p>	<p>EM2067-010</p>	<p>55.00</p>
	<p>Set of 3 Magnetic Field Demonstrators: <i>STRAIGHT CONDUCTOR (EM2067-010)</i> <i>ROUND COIL (EM2067-020)</i> <i>SOLENOID (EM2067-030)</i> Shaker with iron filings (however, a small plotting compass can also be used to view the magnetic fields). Small carry case. Genuine IEC products.</p>			<ul style="list-style-type: none"> • Consists of a rectangular coil passing through a transparent base plate to provide two vertical conductors to carry current so the field shape around a straight conductor can be demonstrated • Can be used on an overhead projector • Use a plotting compass or sprinkle iron filings on the base plate so that the magnetic field formed around the straight conductor can be easily observed and studied Size (approx.): 140 x 96 x 83mm 	
<p>MAGNETIC FIELD DEMONSTRATOR - ROUND COIL</p>	<p>EM2067-020</p>	<p>55.00</p>	<p>MAGNETIC FIELD DEMONSTRATOR - SOLENOID</p>	<p>EM2067-030</p>	<p>65.00</p>
	<ul style="list-style-type: none"> • Consists of a round coil passing through a transparent base plate to carry current so the field shape around a round coil can be demonstrated • Can be used on an overhead projector • Use a plotting compass or sprinkle iron filings on the base plate so that the magnetic field formed by a round coil can be easily observed and studied • Size (approx.): 140 x 96 x 57mm 			<ul style="list-style-type: none"> • Consists of a round spiral coil passing through a transparent base plate to carry current • Magnetic field shape around a solenoid coil can be demonstrated • Suitable for use on an overhead projector • Use a plotting compass or sprinkle iron filings on the base plate so that the magnetic field formed around the solenoid coil can be easily observed and studied. Size (approx.): 140 x 96 x 54mm 	
<p>MAGNETISM PLATE 2D</p>	<p>EM0603-01</p>	<p>29.70</p>	<p>MAGNETIC FIELD OBSERVATION TANK</p>	<p>EM0602-05</p>	<p>165.00</p>
	<ul style="list-style-type: none"> • Iron filings suspended in oil • Ideal for magnetic pattern analysis • Dimensions: 190mm x 100mm (approx.) 			<ul style="list-style-type: none"> • Used to observe magnetic force fields • Can be demonstrated with or without overhead transparency • The tank is supplied with a magnet 	
<p>MAGNETIC FIELD CHAMBER</p>	<p>AR1070380-1</p>	<p>33.00</p>	<p>SIMPLE TANGENT GALVANOMETER</p>	<p>PH0810</p>	<p>83.00</p>
	<p>Demonstrates three-dimensional nature of magnetic field associated with cylindrical magnets. Comprises a hollow chamber of clear acrylic with a tunnel at its center to hold cylindrical magnets.</p> <p>The chamber has high quality iron filings, which aligns itself as per the magnetic field geometry of the magnet.</p> <p>Also allows magnets of other shapes to be investigated by simple positioning their poles adjacent to any side of the chamber.</p>			<p>An instrument used to measure an electric current by determining the direction and magnitude of the horizontal components of the Earth's magnetic field.</p> <p>The compass is placed with the needle parallel to the coil, a current is passed through, and the angle of deflection can be measured.</p> <p>Features: sturdy heavy duty non-magnetic base measuring 20 x 11.8 cm; non-magnetic stand, non-magnetic plane, 10cm compass and copper magnet wire. Stands 24cm tall.</p>	





<p>AMPERE RULE APPARATUS</p> <p>PH0839</p>  <p>Heavy brass wire with terminals at both ends, arranged on transparent plastic base. Use this apparatus to Investigate the magnetic field around a wire. Includes: • 1 x 45mm compass • 6 x 16mm compass Dimensions: 175 x 75 x 10 cm approx.</p> <p>Requires a 6V battery or low voltage power supply and 2 pairs of alligator clips with leads (wires).</p>	48.55	<p>DEFLECTION MAGNETOMETER</p> <p>AR1070640-1</p>  <p>For studying the Earth's magnetic field. Comprises of a compass box (with 100mm diameter aluminium dial) mounted at the centre of a long wooden base board, with a 0 - 50cm scale on either side of the compass box.</p>	61.00
<p>OERSTED'S APPARATUS</p> <p>PH0838</p>  <ul style="list-style-type: none"> • This demonstrates the action of electric current on a magnet. • A cobalt steel needle (75mm long) with agate bearing supported by pivot is mounted on a plastic base and surrounded by rectangular frame fitted with terminals. <p>NOTE: Item supplied may vary slightly from illustration</p>	26.75	<p>DIP NEEDLE</p> <p>EMDIPN</p>  <p>This apparatus is used to measure the dip angle of Earth's magnetic field. When used horizontally, this apparatus can be used as a standard compass. Vertically, it can be used to find the dip angle of the Earth's magnetic field (inclination / declination).</p> <p>It consists of a freely moving magnetic needle that is vertically suspended in a non-magnetic frame. A transparent full circle graduated plastic protractor is mounted in the frame on the back of the needle. The frame can be rotated on its axis to vary the angle of the needle, which can be read by a second mounted protractor. The frame is also equipped with two terminals to pass current for advanced experiments in inclination.</p> <p>Overall dimensions (approx.): 200 x 145 x 200mm. Weight (approx.): 0.4kg.</p>	89.00
<p>BARLOW'S WHEEL</p> <p>PH0843</p>  <ul style="list-style-type: none"> • This item is equipped with neodymium-ironboron magnets that generate a strong magnetic field over the wheel that is therefore set on motion when crossed by currents. • Discover Lorentz force without using mercury. Barlow's wheel is an historical demonstration experiment of Lorentz force generated by currents flowing between the polar expansions of a magnet. <ul style="list-style-type: none"> • Requires AA Batteries (not supplied). 	94.92	<p>ELECTROMAGNET U-FORM - ECONOMICAL</p> <p>PH0800A</p>  <ul style="list-style-type: none"> • Comprising iron U-shaped core of circular section, with armature and carrying hook. • Comprising iron U-shaped core of circular section, with armature and carrying hook. Wound with 0.46mm insulated copper wire (250 turns). Provided with two, 4mm sockets, for use on 4-6 volts D.C. Overall length: 4.3" 	30.00






<p>ELECTROMAGNET ON BASE</p>	<p>1070715</p>	<p>28.35</p>	<p>LENZ LAW</p>	<p>AR1070850</p>	<p>52.85</p>
	<ul style="list-style-type: none"> An electromagnet fitted on a plastic moulded base (140 x 80 x 40mm approx.) with a maximum operating voltage 12V DC. Open for easy study! 			<ul style="list-style-type: none"> A copper and transparent acrylic tube with a wire wound coil is used to demonstrate the Lenz Law. <p>One neodymium magnet and a steel rod is also provided with the instrument. On passing out magnet and steel rod from the copper tube steel rod fall freely but magnet take same time to pass out from tube.</p>	
<p>VARIABLE ELECTROMAGNET</p>	<p>PH0800C</p>	<p>46.00</p>	<p>EDDY CURRENT UNIT</p>	<p>PH0845EDU</p>	<p>33.50</p>
	<p>Variable coil electromagnet has 6 different coil options:100, 200, 300, 400, 500 and 600 coils. A hook underneath used to measure the strength of the magnetic field To study the effect of current and number of coils on the strength of an electromagnet. Tapping at 100, 200, 300, 400, 500, 600 turns.</p> <p>The weights used are large paper clips. A variable D.C. low voltage supply is required.</p>			<ul style="list-style-type: none"> Two masses drop down a 33cm copper tube. One is steel, one is a neodymium magnet. When students see the magnetic mass fall more slowly than the steel mass, you can introduce them to electrical eddy currents. These currents oppose downward motion through a moving magnetic field created by the falling neodymium magnet. <p>Demonstrate Lenz's Law.</p>	
<p>DEMONSTRATION INDUCTION COIL WITH PRIMARY & SECONDARY COILS & CYLINDRICAL MAGNET</p>	<p>PH0840</p>	<p>83.45</p>	<p>GIANT MAGNETIC FIELD DEMONSTRATOR PANEL</p>	<p>PH0802</p>	<p>46.35</p>
	<p>Also known as the mutual induction apparatus.</p> <p>With primary comprised of heavy gauge enameled copper wire, approximate resistance 0.5 ohms wound on former 110 x 30 mm length x diameter.</p> <p>Secondary coil of fine enameled copper wire, approximately resistance 100 ohms on former 120 x 82 mm length x diameter. Both coils fitted with 4 mm sockets.</p> <p>Iron core 160 x 15 mm length x diameter.</p>			<p>Board of 98 chambers each containing a small iron rod. Conveniently displays configuration of a magnetic field. Can be used on overhead projector.</p>	
			<p>OHM'S LAW DEMONSTRATOR – LAMPBOARD RHEOSTAT</p>	<p>AR1100378</p>	<p>24.50</p>
				<p>For the study of series and parallel circuits in a way that is easy to understand. Consists of five low voltage lamps (2.5V) that can be connected in various combinations of series and parallel by means of the permanently mounted switchable shunts on the base.</p>	





<p>FARADAY'S ELECTROMAGNETIC INDUCTION DEMONSTRATOR</p>	<p>AR1070830</p>	<p>88.55</p>	<p>AIR CORED SOLENOID – 700 TURNS – 5A</p> <p>EM0090-001</p>	<p>136.00</p>
 <p>For demonstrating the important experiments performed by Faraday and how they lead to some of the significant conclusions in electromagnetism. Designed to perform studies even beyond the basic experiments,</p> <p>It comprises three solenoids of 20, 40 and 80 turns each of identical cross section, mounted on a transparent base along with a milliammeter. Repeatedly inserting a magnet into the coil and removing it causes electric current to flow through the coil, which can be read directly from the milliammeter.</p> <p>Using this apparatus, students can study correlations between induced current to that of magnetic field strength, number of turns of coil, magnetic field polarity and speed. Requires 1.5V dry cell battery (not included).</p>			 <p>Instruction Sheet</p> <p><i>AIR CORED SOLENOID</i> is formed on a strong moulded plastic bobbin and is used in several experiments. It can be mounted over the 'Magic Eye' tube for the Mass of Electron experiment, or used for making the IEC Current Balance apparatus, or used for calibrating the IEC Hall Effect apparatus or used for any time a magnetic field is required of known field strength.</p> <p>It contains 700 turns of copper wire and can carry about 5 amps maximum current. Size is 150mm long and 37mm bore. The wire terminates to 4mm socket head terminals which point inwards so that the ends of the solenoid can sit flat on the table.</p>	
<p>CURRENT BALANCE KIT – SMALL – WITHOUT SOLENOID PSCC</p> <p>EM1230-01</p>  <p>The <i>IEC</i> Current Balance Kit is designed to fit directly to the <i>IEC AIR CORED SOLENOID (EM0090-001)</i>, which is sold separately.</p> <p>It consists of a platform that is simply attached to the end cheek of the solenoid and a slim blade carrying one single turn of conductor which balances in sensitive pivots on the two small round support rods fitted to the platform.</p> <p>When current is passed through both the solenoid coil and the single turn, the blade deflects due to the interaction of the magnetic fields. Small weights are added to the beam to restore the balance and the weight required is a measurement of the force on a conductor carrying current whilst inside a magnetic field.</p> <p>This is the theory that causes electric motors to turn.</p> <p>Instruction Sheet</p>	<p>73.70</p>		<p>CURRENT BALANCE KIT – SET OF WEIGHTS</p> <p>PA1230-050</p>  <p>The current Balance is a device that attaches to an Air Cored Solenoid and is used to measure the reaction of a conductor carrying current inside a magnetic field.</p> <p>As the balance deflects due to the force of the conductor moving inside the field, very small weights are placed on the front end of the beam to restore the balance to being horizontal again. The amount of weight to achieve this is equal to the force displacing the beam.</p> <p>The weights are small coils of thin stainless wire. 4 different weights are provided: 10mg, 20mg, 40mg and 60mg. Use combinations of these weights to determine the restoring force required. This small set of mini weights is supplied with a pair of tweezers with which to handle the weights.</p> <p>Instruction Sheet</p>	<p>37.25</p>







WESTMINSTER ELECTROMAGNETIC KIT	PH0846	290.00	FARADAY'S LAW	AR1070710	72.40
	<p>Comprises of 8 ticonal magnets, 8 magnadur magnets, 4 steel yokes, 4 plotting compasses, 4 formers of compasses, 1 bottle fine iron filling (approx. 500g), 4 each double C-cores, 4 clips for C-cores, 2 aluminium rings, 2 split aluminium rings, 4 support bases, 4 armature with axle rods, 8 split pins, 24 rivets, 1 length rubber tubing, 4 formers for coils, 2 rolls of cello tapes, 4 reel of copper wire, 4 sheets plain postcards, 1 reel white cotton, 4 each carbon resistors of 10 ohm & 10 ohms, 8 flash lamp bulbs, 5 neon bulbs, 8 M.E.S. bulb holders, 1 wooden clamp and 4 wooden rods.</p>			<p>For quick visualization of Faraday's Law, includes a 150-0-300 turns coil with 4mm sockets with a provision to freely slide on a transparent acrylic tube.</p> <p>On drooping down a cylindrical magnet through the tube a pulse of electricity is generated across the coil and can be visualized on an oscilloscope.</p>	
WESTMINSTER ELECTROMAGNETIC KIT - ECONOMY	AR1070940	242.55			
	<p>A comprehensive kit designed to contain all the necessary components for exploring concepts of electromagnetism, such as various types of magnets and their different arrangements and properties, working of motors, dynamos, vibrators and meters, principle of transformers, eddy current and damping etc. Standard pack sufficient for 8 students.</p> <p><i>(NOTE: Quantity in photo differs from items supplied. Due to the nature of the material, rust will build up on the iron cores. This does not affect experimentation).</i></p>				

ALL PRICES INCLUDE GST.







<p>ELECTRICITY KIT IN ALUMINIUM CASE - STANDARD KIT – DEMO MAGNETIC FIELD</p>	<p>1250.00</p>	<p>ELECTRICITY KIT – SIGNAL GENERATOR & MOTOR /GENERATOR</p>	<p>1700.00</p>
<p>EM1763-001</p> <p>The <i>IEC</i> "Electricity Kit" is an excellent teaching kit for electrical theory.</p> <p>It is contained in a strong aluminium carry case and the whole system is of high quality and designed to last for many years. Each component is encased in an individual housing large enough not to be easily lost.</p> <p>All connections are by 4mm banana plugs. It covers DC theory and a large proportion of AC theory, including transformers and chokes. It is complete with 5amp power supply, 3x digital meters and all the components required. It is fully self-contained with cables and an excellent experiment book.</p> <p>No more chasing around the store looking for components. See also EM1764-001. Manuals included.</p> 		<p>EM1763-010</p> <p>The <i>IEC</i> "Electricity Kit" is an excellent teaching kit for electrical theory.</p> <p>It is contained in a strong aluminium carry case and the whole system is of high quality and designed to last for many years. Each component is encased in an individual housing large enough not to be easily lost.</p> <p>All connections are by 4mm banana plugs. It covers DC theory and a large proportion of AC theory, including transformers and chokes. It is complete with 5amp power supply, 3x digital meters and all the components required. It is fully self-contained with cables and an excellent experiment book.</p> <p>No more chasing around the store looking for components. See also EM1764-001. Manuals included.</p> 	
<p>EM1763-020</p> <p>The famous <i>IEC</i> "Electricity Kit" is excellent at teaching electrical theory. All housed in a strong aluminium carry case with dividers and foam fitments to protect the contents from damage.</p> <p>The kit contains: 1 x Power Supply, 1 x Digital Signal Generator and 1 x Demonstration transformer (at 12V) with extra coils, 3 x Multimeters with cables, 14 different components of resistors, capacitors, potentiometers, lamp holders, switches all housed in strong containers with 4mm sockets. Hand driven Motor/Generator, 4 x sets of "Hodson" Motor Kits (instead of the magnetic demonstrators), compasses, magnets and other parts to make a good kit. Complete with all cables with stackable <i>IEC</i> banana plugs permanently fitted. There is no need to look for any other components or equipment to perform all 66 AC and DC experiments.</p> 	<p>1550.00</p>	<p>EM1764-001</p> <p>ELECTRONICS KIT BASIC ELECTRONICS LINKS METERS</p> <p>This unique <i>IEC</i> "Electronics Kit" is designed on the same standards as the "Electricity Kit" EM1763-001.</p> <p>All components are individually housed and, because of the smaller sized housings, the system uses the excellent 2mm banana plug system with adaptors to 4mm where required. To avoid masses of wires, small links are provided for joining components and each component engages to a back panel to allow a circuit to be plotted logically. It is run by 12V.PlugPak and is complete with a mini regulated power supply and a mini signal generator.</p> <p>It is fully self-contained in a strong carry case and is complete with excellent experiment book. See also EM1763-001.</p> <p>Instruction Sheet and Experiment Manual included.</p> 	<p>1013.00</p>

<p>COMPREHENSIVE BASIC ELECTRICITY KIT – 3 PART</p> <p>BKEPH2010</p>   <p>NEW</p> <p>This kit enables the teaching of various topics related to electricity and is an extremely flexible alternative to a circuit board. Suitable for years 6-12, it includes the Primary Basic Electricity Kit A and Primary Basic Electricity Kit B.</p> <p>Each component such as a switch, rheostat, bulb holder, etc., is mounted on its own individual plastic panel with 4mm sockets. The panels are then formed into circuits by using 4mm stackable leads. Each kit is supplied in two polystyrene trays that keep the units organized. Kit A is for a group of up to six students, while Kit B contains additional items and consumables that could be issued by teachers as required. Only one Kit B is necessary per classroom or lab.</p> <p>A Teacher's Manual is included in Kit A that introduces each item of equipment and a range of tasks and investigations. Topics covered include: bulbs and cells, switches, electromagnets, motors and buzzers.</p>	<p>570.00</p>	<p>PRIMARY BASIC ELECTRICITY KIT (PART A)</p> <p>BKEPH2011</p>  <p>NEW</p> <p>This hands-on learning kit is perfect for introducing students to electricity basics. Includes a well-structured instructional manual & robust components mounted on hardy plastic bases, each with two 4mm sockets. Panels are formed into circuits by connecting them together using 4mm stackable leads. Perfect for home education or for 6 students in a classroom. Provides a range of tasks and investigations to explore.</p> <p>Build simple circuits and explore bulbs & cells, switches, electromagnets, motors and buzzers. Additionally, students will be introduced to electrical symbols, simple electricians' shorthand, the basics of electrical currents, short circuiting and switches.</p> <p>Set includes 6 cell holders, 6 bulb holders, 3 press switches, 3 two-way switches, 18 connecting leads and 6 miniature light bulbs.</p>	<p>105.00</p>
<p>ELECTRONICS & PHOTONICS KITS</p> <p>EM1765-001</p>  <p>This <i>IEC</i> Electronics Kit is designed for HSC curriculum where electronics option includes the study of basic electronics and "Photonics". The components cannot be removed from the work panel and all connections are by the neat 2mm banana plug cables and link system with adaptors to 4mm as required. There is no need for the instructor to be expert in electronics because the student works through the experiments with minimal assistance. The course is covered by 9 experiments provided by copyable files on a CD, so only one CD of student and teacher files (with answers) is required for the school. CD is not included in this kit but can be purchased separately (Code: EM1765-002) Please read the PDF file for more information. <u>Instruction Sheet</u> included.</p>	<p>387.00</p>	<p>ELECTRICITY & MAGNETISM SET</p> <p>ELEM2</p>  <p>NEW</p> <p>This kit is not only a perfect starter set, but also for teachers who want additional materials for their existing labs. Batteries and experiment guide not included. 37 pieces for conducting a wide variety of physics experiments in electricity and magnetism:</p> <ul style="list-style-type: none"> • Stackable Single Cell Holders • Red & Black Crocodile Leads-30cm • Red & Black Banana Plug Leads-30cm • Resistance Coils • Rheostat on Base • Bulb Holders • Push Switches • Voltmeter and AmmeterEM • Electroscopes • Assorted Materials - Silk cloth, 2 PVC rods, acrylic strip, electrolysis apparatus, cupric sulfate, support rod & L-base and wire coil Assorted Magnets - Bar magnet, U-form electromagnet with keeper, U magnet, electro 	<p>165.00</p>




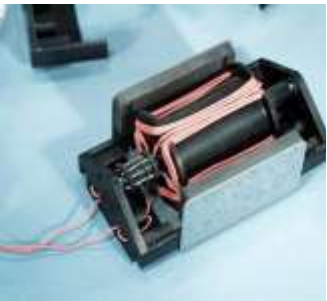
<p>bar magnet, iron filings, magnetic needle, magnetic needle stand and micro fine wire</p>		
<p>CIRCUIT BOARD KIT - WORCESTER STYLE</p>	<p>EM0113-01</p>	<p>149.00 (1-5)</p> <p>"HODSON" INDUCTION KIT - TRANSFORMER & MOTORS</p> <p>EM1973-001</p> <p>355.00</p>
<p>Kit that allows students to investigate the nature and properties of electricity. This 300x300mm circuit board with 16x strong upstanding pins for the connection of components for the teaching of basic electricity. Each component has a metal tab that makes a reliable connection to the pins. IEC has more advanced electricity kits in its range. Complete with joiners, various types of wire for heating and melting experiments, globes, cables with alligator clips, battery holders for 'D' cells, lamp holders, press switch, thin copper foil, carbon electrodes and an excellent experiment book. Experiments are limited to very basic electricity, series & parallel connection of lamps, basic electroplating, electromagnetism, conductivity and more. For more flexible teaching and for entry into more advanced experiments, including AC induction and transformers.</p> 	<p>144.00 (6-9)</p> <p>141.00 (10+)</p>	 <p>The new 'Hodson' Induction Kit is specially designed for student use to study electromagnetic induction, both DC and AC. Runs on 12V for safety and contains an extensive list of parts including a 'squirrel cage' induction motor. A manual of experiments includes transformer theory, magnetising currents, electromagnets, electric motor and generator theory, losses in iron circuits, eddy currents, synchronous motors, mutual induction, effect of laminations and much more. Students can wind their own transformer coils to produce outcomes and so on. Read the PDF file to learn more about this very useful kit and see how it simplifies studies of the difficult to teach aspects of electromagnetic induction. Teachers can learn too.</p> <p>Instruction Sheet</p> <p>Experiment Manual</p>
<p>DISSECTIBLE TRANSFORMER WITH SPOT WELD & FULL KIT</p>	<p>EM1660-001</p>	<p>930.00</p> <p>DISSECTIBLE TRANSFORMER SMALL 12V AC 300+300+600T</p> <p>EM4089-001</p> <p>217.00</p>
<p>The IEC Dissectible Transformer is the classic instrument for teaching the principles of the transformer. The large iron core has a section of 35x35mm and the 'I' is clamped to the 'U' to close the magnetic circuit. Various special coils are available but the standard set contains a mains operated primary with on/off switch and a removable mains cable together with a low voltage, heavy current tapped secondary coil. A plastic foot protects the work bench. The kit contains also a rugged 'spot welder' and a heavy copper ring that heats to melt wax or melt solder through induction. The coil formers are made from heat resistant glass filled nylon and are unbreakable. A 'Thompson's ring' is included.</p> <p>Instruction Sheet</p> <p>Experiment Manual</p> 		 <p>Consists of a "U" and "I" core and a set of coils for study of induction and transformers. Designed to operate at a safe 12V.AC Iron bars are included to study losses in iron, eddy currents, DC and AC magnets and more. A pair of strong Alnico bar magnets are included in the kit.</p> <p>The experiment notes as supplied with the 'Hodson' Induction Kit can be used for this item although many of the experiments will not be possible with this simpler kit.</p> <p><i>Genuine IEC product.</i></p>







<p>THERMIONIC TUBE TRIODE ON BASE WITH 6X4 TUBE.</p> <p>EM4040-001</p>  <p>The Thermionic Tube - Diode is a diode tube (or sometimes called an electron valve or electron tube) that rectifies. A heater inside the tube warms the cathode so electrons can emanate. The AC voltage is applied between the Anode (Plate) and the Cathode, but electrons can flow only one direction, therefore the AC is rectified into 'half wave' DC. This diode has 2x Anodes, so the circuit can be configured so that both halves of the AC sine wave can be rectified to produce 'full wave' rectification. 4mm spin free IEC terminals are provided for all connections.</p>	81.00	<p>THERMIONIC TUBE TRIODE ON BASE WITH 6C4 TUBE.</p> <p>EM4050-001</p>  <p>The Thermionic Tube - Triode is a triode amplifier tube (or sometimes called an electron valve or electron tube) that rectifies. A heater inside the tube warms the cathode so electrons can emanate. A DC voltage is applied between the Anode (Plate) and the Cathode and electrons can flow from cathode to anode. A third electrode called the Grid can carry a charge that can control the current flow from cathode to anode. A very small amount of power at the grid can control a much greater amount of power through the tube. This is the function of an amplifier. 4mm spin free IEC terminals are provided for all connections. Unit comes with the "6C4" tube.</p>	79.00
<p>JUNIOR MAGNET SET</p> <p>PH0800</p>  <p>A kit of magnets and accessories for science experiments in a compartmental storage tray.</p> <p>Contents: 1 Horseshoe magnet with keeper, 100mm 2 Ceramic bar magnets 75 mm Long. 3 Ceramic ring magnets, 38 mm dia., face polarised. 2 x Plotting compasses - clear both sides, 19 mm dia. 1 Pack Iron Filing. 1 piece. each of square iron, aluminium, zinc and copper metal.</p>	44.00	<p>AC/DC MOTOR GENERATOR DEMO ACTIVITY MODEL - HAND POWERED</p> <p>PH1245N8</p>  <p>Learn about current and see a visual demonstration. The elegant design produces AC & DC current at the same time. Allows students to easily compare and contrast an AC generator and a DC generator. Activity guide included.</p>	129.00
<p>ENERGY CONVERSION KIT</p> <p>AR1100050</p>  <p>There are three instruments fitted on a plastic moulded base to run electrical equipment. Battery, solar cell and hand driven dynamo selectable via a knob fitted on the base. Different components are also provided with this kit to observe the effect of these three electrical energy conversion systems on the components.</p>	89.50	<p>SET OF METAL STRIPS</p> <p>PH0798A</p>  <p>Set of twelve metal strips of size 50 x 25 mm for magnetism work. Each strip is stamped with a key letter for identification.</p>	25.00

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<p>HAND GENERATOR</p>  <p>PH1229HG</p> <p>Hand operated, housed in clear tough plastic case. Mounted lamp on the end can be used as a flashlight. Can be utilized with almost any experiment requiring up to 12V DC current. Use binding post to connect outside electrical circuit.</p> <p>Banana plug terminals.</p>	40.50	<p>BICYCLE DYNAMO ASSEMBLY</p>  <p>PH1252</p> <p>For showing slow AC on an oscilloscope or meter or for demonstrating the use of a dynamo in lighting a lamp.</p> <p>This apparatus has a cycle dynamo mounted on a base. Two 4 mm. socket terminals are provided for the dynamo output, connected in parallel with an M.E.S. lamp holder and 2.5 V bulb.</p>	61.95
<p>RHEOSTAT</p>  <p>PH1151F</p> <ul style="list-style-type: none"> • Portable, heavy duty educational model • Provides a variable resistance in electrical circuits. • Maximum current: 5 Amps • Resistance: 11 Ohms • Tube size: 300 x 43mm <p>Sliding carriage, air cooled.</p>	130.00	<p>DEMONSTRATION METER KIT</p>  <p>AR1091861</p> <p>30X30X15cm demonstration meter in tough plastic frame with transparent front & back windows.</p> <p>Used to demonstrate the functioning of simple, permanent magnet type moving coil meters to your students.</p> <p>Sensitivity: 5mA, 100mV.</p> <p>Complete with 4 interchangeable dials, power supply & flexible lead pair.</p>	386.00
<p>DEMONSTRATON METER KIT – INTERCHANGEABLE SCALES</p>  <p>Interchangeable Scales for the <i>DEMONSTRATION METER KIT</i> (AR1091861).</p>		<p>DEMONSTRATON METER KIT – INTERCHANGEABLE SCALES</p>  <p>Interchangeable Scales for the <i>DEMONSTRATION METER KIT</i> (AR1091861).</p>	
2.5/0/2.5mA	16.50	AR1091880-1	16.50
10-0-10mA	16.50	AR1091880-2	16.50
0-10mA	16.50	AR1091880-3	16.50
0-50mA	16.50	AR1091880-4	16.50
0-100mA	16.50	AR1091880-5	16.50
0-500mA	16.50	AR1091880-6	16.50
0-1A	16.50	AR1091880-7	16.50
0-5A	16.50	AR1091880-8	16.50
2.5/0/2.5mA	16.50	AR1091880-9	16.50
10-0-10mA	16.50	AR1091880-10	16.50
0-10mA	16.50	AR1091880-11	16.50
0-50mA	16.50	AR1091880-12	16.50
0-100mA	16.50	AR1091880-13	16.50
0-500mA	16.50	AR1091880-14	16.50
0-1A	16.50	AR1091880-15	16.50
0-5A	16.50	AR1091880-16	16.50







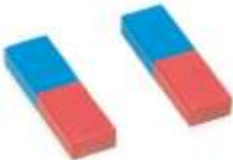
ALL PRICES INCLUDE GST.

<p>HELMHOLTZ COILS</p> <p>PH0845HEL</p>  <p>A pair of precision coils and 400 turns of wire are wound on former of about 150 mm diameter. The coil is comprised of a support rod, which fits on the holders of the track system supplied, which enables them to be aligned on a common axis for measurements and study of the magnetic fields.</p> <p>Normally used in pairs, each coil has 4mm terminals and their distance apart is adjusted over the track supplied.</p> <p>The maximum current in the coil is 1A to avoid overheating. Direction of current is marked on each coil.</p>	<p>177.00</p>	<p>KIT FOR MAGNETISM EXPERIMENTS</p> <p>AR1070251</p>  <p>Magnetic kit provided with the components in a box to perform basic experiments in magnetism.</p> <p>Comprises of the following items: 1 x Test Tube; 1 x Bar Magnet; 3 x Iron Screws; 1 x Cylindrical Magnet; 1 x Knitting needle; 1 x Spool of Thread; 1 x Plastic box small; 1 x Wooden Disc; 1 x Rubber eraser; 1 x Sheet of Copper; 1 x Sheet of iron; 1 x Sheet of cardboard; 1 x Piece of cloth; 10 x Nails; 1 x Compass needle; 1 x Compass card; 1 x Hiking Compass; 1 x Paper Clips; 1 x Mini Waggons for Magnets; 1 x Filter Bowl; 1 x Aluminium Screws; 1 x Floating platform for bar magnet; 1 x Floating platform for Compass needle ; 1 x Bar Magnet with red marked north pole.</p>	<p>142.80</p>
<p>INDUCTION COIL (RUHM KORFF)</p> <p>AR1090700</p>  <p>Useful for the demonstration of characteristics associated with high voltage phenomena such as with Geissler tubes, spectrum analysis tubes etc. This traditional induction coil is capable of producing a spark length of up to 30mm with an input of 6-8V DC and is therefore ideal for use with vacuum tubes, eudiometers, etc.</p> <p>A fully adjustable trembler system is incorporated and spark suppression capacitors are housed in the base. The Ruhmkorff commutator allows primary current to be both reversed and switched ON/OFF with make-and-break point. A pair of pointed electrodes is supplied with the instrument, the pointed electrodes having an insulating handle for adjustment of the spark gap.</p> <p>Low voltage input is provided via a pair of baseboard mounted colour coded 4mm sockets.</p>	<p>178.00</p>	<p>“HODSON” MOTOR KIT</p> <p>EM2193-201</p>  <ul style="list-style-type: none"> • Set of 2, packed into a strong jar • Students can wind up their own electric motor and make the brushes required to run it • The motor can run as either a DC motor from a battery or as a synchronous AC motor required from an AC power source (not supplied) • Students obtain knowledge from winding the motor and predicting the results • Everything is provided in the kit to assemble the motors (photo depicts motor assembled for use) • Instructions included • Requires 1 x D battery (not supplied) (<i>Bulk pricing applies</i>) 	<p>60.00 Ea (1-4)</p> <p>58.00 (5-9 units)</p> <p>56.00 (10+ units)</p>








<p>MOTOR CONSTRUCTION KIT EM1413-01</p>  <p>High quality build / take apart unit for the demonstration of the transformation of energy and the operation of a motor. Open structure, ideal for analysis.</p> <p>Small tool included.</p>	31.90	<p>MINI MOTOR UNIT PH1319</p>  <p>This small motor with a blue fan is a good fit for a variety of electronics experiments. Operates from 1.5 to 4.5 volts DC. Base is 3 7/8" x 2 3/4"</p> <p>Can be used with a solar cell. Made from durable plastic.</p>	24.20 23.60 (11+ units)
<p>STUDENT CELL & POROUS CUP PH0927-N8</p>  <p>This basic voltaic student cell set is ideal for demonstrating the characteristics of primary cells. The set includes one plastic student cell complete with a screw-on plastic ring, two adjustable electrode holders, porous ceramic cup and eight electrodes: 1 x aluminium, 1 x nickel, 1 x tin, 1 x graphite, 1 x iron, 1 x copper, 2 x zinc.</p> <p>Complete instructions are included.</p>	43.25	<p>ST. LOUIS DEMONSTRATION MOTOR - OPEN DESIGN PH1236</p>  <p>St Louis Motor Generator. A compact, open design that allows students to observe how each part of the motor operates and functions. Motor is mounted on a sturdy base. Apparatus dimensions (overall - approx): 13.75cm tall, 13.75cm long, 9.4cm wide. Requires 4-6V DC to operate.</p>	21.50
<p>MOTOR/GENERATOR-KIT-SMALL-WITH DOUBLE PULLEY ASEP EM1760-001</p>  <p>This Electric Motor / Generator is a single small DC electric motor with a two-step pulley attached.</p> <p>It is clamped to the bench with the pulley overhanging the edge so it can wind a thin cord around the pulley to lift a weight from the floor to measure the electrical work done and to compare it with the mechanical work done. The weight can then be allowed to fall to drive the motor as a generator to recover power from kinetic energy.</p>	59.00	<p>MOTOR/GENERATOR SET - BELT DRIVEN EM1759-001</p>  <p>Electric Motor Generator Set consisting of 2x medium sized DC electric motors with permanent magnet fields.</p> <p>The motors are coupled together by pulleys and a small belt. One is run as a DC motor while the other behaves as a DC generator.</p> <p>The efficiency of the arrangement can be measured by comparing the electrical energy fed to the motor with the electrical energy drawn from the generator. Suitable for voltages around 6V.DC. With the belt removed, either motor can be used for any other mechanical purpose. See also EM1760-001</p> <p><i>Genuine IEC product.</i></p>	80.00






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<p>DEMOUNTABLE MOTOR KIT (MINI ELECTRIC MOTOR)</p>	<p>MOTDMT</p>	<p>21.95</p>	<p>LIQUID CONDUCTIVITY METER</p> <p>LIQCONMTR</p>	<p>43.25</p>
 <ul style="list-style-type: none"> • A mini model of a simple form of DC electric motor has a 2 pole armature wound with enameled copper wire and a permanent magnet • The construction of the model is open for observation and investigation • The two magnets are able to be removed for experimentation • Wiring for hooking up to a battery source, mini spanner and screw driver are supplied with the kit • Motor kit is stored in its own plastic box <p>(Power source such as 3 x AA Batteries recommended. Not included)</p>			 <p>A very simple and easy unit to compare conductivity of different solutions, acids or salts. Dip the probes, press the button and note. The conductivity can be compared in 10 levels. Green LED gives a quick visual comparison.</p> <p>Approximate size: 150 x 40 x 15mm.</p>	
<p>LIGHT SOURCE – LOW POWER WITH WIRES</p>	<p>HL2010-001</p>	<p>9.90</p>	<p>LIGHT SOURCE – LOW POWER – SIMPLE – 4MM SOCKETS</p> <p>HL2011-001</p>	<p>31.00</p>
 <p>A simple light source used in the teaching of basic electricity. This small light source uses a 2.5V MES lamp screwed into a plastic base with wires connected.</p> <p>Instruction Sheet</p>			 <p>A simple but high quality light source used in the teaching of basic electricity. This small light source uses an MES lamp screwed into a plastic base with 2 x 4mm sockets for connection.</p> <p>This lamp is also a spare part for the IEC 'Electricity Kit' (EM1763-001).</p> <p>Instruction Sheet</p>	

LIQUID CONDUCTIVITY APPARATUS	LIQCONDAPP	11.50	LIGHT SOURCE – LOW POWER - 4MM TERMINALS HL2012-101	28.60
 <p>Test the conductivity of liquids in a test tube or narrow beaker.</p> <ul style="list-style-type: none"> · Can test conductivity of solids as well. · Two stainless steel wires, connected to the globe, will fit into the test tube. · Overall length: 140mm (approx.); Plate size: 80mm x 60mm x 2mm (approx.) <p>NOTE: Power source such as 2 x AA batteries and suitable battery holder is required (3 x AA can also be used with a suitable battery holder - depending on conductivity/resistance of item being tested).</p> <p>A single 1.5V battery does not supply adequate current for the globe to register the conductivity of liquids.</p> <p>{This apparatus can be used in conjunction with the 2 way component holders (PA0875-001) which has 2 x banana sockets & 2 x connectors to allow connections to be made to small or fragile components by standard 4mm banana plugs}.</p> <p>Lesson plan included.</p>			 <p>A simple 2.5V light source in a protective housing, used in the teaching of basic electricity. There are two versions of this light source which is housed in a simple transparent plastic vial. HL2012-001 uses 4mm sockets for connection and HL2012-101 uses 4mm spin free IEC terminals for the connection of cables. These small light sources use an MES lamp screwed into a socket.</p> <p><i>Genuine IEC product.</i></p> <p>Instruction Sheet included.</p>	
			LIGHT SOURCE – LOW POWER – 4MM SOCKETS HL2012-001	24.20
			 <p>A simple 2.5V light source in a protective housing, used in the teaching of basic electricity. There are two versions of this light source which is housed in a simple transparent plastic vial. HL2012-001 uses 4mm sockets for connection and HL2012-101 uses 4mm spin free IEC terminals for the connection of cables. These small light sources use an MES lamp screwed into a socket.</p> <p><i>Genuine IEC product.</i></p> <p>Instruction Sheet included.</p>	
HORSESHOE MAGNET – 80MM	PA-57	16.35	MAGNETS – 75MM – PAIR PA2097-001	32.00ea (1-24)
 <ul style="list-style-type: none"> • U-Magnetic • Overall length 80mm, cross section of poles 20 x 10mm • Space between poles 42mm • 350 Gauss, made of Al/Fe/C • North pole painted red, south pole blue • In plastic storage case 			 <ul style="list-style-type: none"> • Pair of bar type magnets • High strength “Alnico” • Size: 75mm (l) x 12mm x 8mm • One end painted red (points to the north and is marked “N”), the other end painted blue <p>Magnets are supplied in a vial with a screw top</p>	29.00 ea (25+)
MAGNETS – 100MM – PAIR PA-56D	PA-56D	9.10	PLASTIC CASED BAR MAGNET PAIR PH0785	8.80
 <p>Pair of Alnico. Size: 100 x 20 x 6 mm (700 Gauss). In plastic case.</p> <p>NOTE: Magnets should be handled with care. Dropping magnets may result in the paint chipping.</p>			 <p>2 durable red / blue plastic bar magnets. Measure 75 x 20 x 12.5mm each.</p>	

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<p>MAGNET - FERRITE RING 32X18X7MM</p>	<p>MAGFERR32</p>	<p>16.00</p>	<p>BAR MAGNETS – ALNICO – 75X12X8MM</p>	<p>AR1070040-12</p>	<p>15.50</p>
	<p>Pack of 10.</p>			<p>Strong lasting power. N-pole marked. Supplied in pairs, with keepers. Supplied in cardboard box. Size: 75 x 12 x 8mm (LxWxH).</p>	
<p>BAR MAGNET 70x12x5MM</p>	<p>MAGTH1874</p>	<p>2.75</p>	<p>MAGNETS – FERRITE 20X15X5 - PACK OF 6</p>	<p>MAGLM1614</p>	<p>5.95</p>
	<p>Bar magnet with “N” or “S” marked on it. Ideal for educational purposes to teach students about magnetism or for hobbyists.</p>			<p>Pack of 6 ferrite magnets – 20 x 15 x 5mm each. Ideal for school projects, hobby or craftwork. Can be glued to wood, plastic rubber, etc.</p>	
<p>MAGNETS – FERRITE 10X10X4MM – PACK OF 12</p>	<p>MAGLM1616</p>	<p>5.95</p>	<p>MAGNETS – LARGE RARE EARTH – PAIR</p>	<p>MAGLM1652</p>	<p>49.00</p>
	<p>Pack of 12 ferrite magnets – 10 x 10 x 4mm each. Ideal for school projects, hobby or craftwork. Can be glued to wood, plastic rubber, etc.</p>			<p>A pair of exceptionally strong rare earth metal magnets – 28.2 x 19mm each. They are made from NdFeB (Neodymium Iron Boron), providing the highest available magnetic energy of any material. Suitable for a wide variety of applications where a very strong magnet is required. The nickel casing protects the magnets because the material is very brittle.</p>	
<p>BAR MAGNETS – ALNICO – 100X20X10MM</p>	<p>AR1070040-18</p>	<p>21.50</p>	<p>MAGNET – U-SHAPED – 30X30MM</p>	<p>MAGTH1873</p>	<p>2.75</p>
	<p>Strong lasting power. N-pole marked. Supplied in pairs, with keepers. Supplied in cardboard box. Size: 100 x 20 x 10mm (LxWxH).</p>			<p>30 x 30mm u-shaped magnet with north (“N”) or south (“S”) marked on either end. Educational magnets. Ideal for hobbyists & children to learn more about magnetism.</p>	
<p>MAGNETS – RARE EARTH 10X2MM – PACK OF 10</p>	<p>MAGREM1002</p>	<p>14.95</p>	<p>MAGNET – RARE EARTH – SMALL (PK/ 4)</p>	<p>MAGLM1622</p>	<p>12.95</p>
	<p>Pack of 10 rare earth metals magnets - 10 x 2mm. Approx. pulling strength: 1.2kg (not laboratory tested).</p> <p>Rare earth magnets are the strongest type of permanent magnets made, producing significantly stronger magnetic fields than other types. All rare earth magnets have a silver finish on them. Commonly used in woodworking by gluing them in place so they can be used as a clasp or latching mechanism on doors.</p>			<p>These magnets feature rare earth compounds combined with ferrite (anisotropic) to produce incredibly strong attraction/repulsion. They are encased in nickel jackets because the material itself is very brittle. They are provided with a nickel plated iron keeper. 10mm x 3mm. (Specs as per MAGLM1618) WARNING: Getting a finger between these could result in a nasty pinch!</p>	

<p>MAGNET – RARE EARTH – 25 X 5MM WITH HOLE</p> <p>MAGLM1626</p>  <p>Cylindrical shaped magnet that features rare earth compounds combined with ferrite (anisotropic) to produce incredibly strong attraction/repulsion. Encased in nickel jackets. With 4.5mm countersunk mounting hole.</p> <p>Maximum Operating Temp: <80 deg C Remanence: 1180 - 1220 Br (mT) / 11800-12200 Br (Ga) Coercitivity: 860 - 915 kA/m / 10800 - 11500 Oe Intrinsic Coercitivity: >955 kA/m / >12000 Oe Maximum Energy Product: 263 - 279 kJ/m3 / 33 - 35 MGOe (BH)max Currie Temperature: 310 - 370 deg C Density: 7.4 g/cm3 Hardness (Hv): 560 - 580 Weight: 20g</p>	22.95	<p>MAGNET – RARE EARTH – 25 X 5MM</p> <p>MAGLM1618</p>  <p>Cylindrical shaped magnet that features rare earth compounds combined with ferrite (anisotropic) to produce incredibly strong attraction/repulsion. Encased in nickel jackets. Provided with a nickel plated iron keeper.</p> <p>Maximum Operating Temp: <80 deg C Remanence: 1180 - 1220 Br (mT) / 11800-12200 Br (Ga) Coercitivity: 860 - 915 kA/m / 10800 - 11500 Oe Intrinsic Coercitivity: >955 kA/m / >12000 Oe Maximum Energy Product: 263 - 279 kJ/m3 / 33 - 35 MGOe (BH)max Currie Temperature: 310 - 370 deg C Density: 7.4 g/cm3 Hardness (Hv): 560 - 580</p>	12.95
<p>MAGNETS - NEODYMIUM DISC 6MM X 1.5MM</p> <p>MAGDISC6X1.5</p>	1.30	<p>IRON FILINGS – FINE - 500G</p> <p>PH0799B01</p>	20.00
<p>MAGNETS - NEODYMIUM DISC 6MM X 2.0MM</p> <p>MAGDISC6X2</p>  <ul style="list-style-type: none"> • Rare Earth Disc Magnet • Axially magnetized • Weight: 1gm • Width (diameter): 6.0mm • Height: 1.5mm (MAGDISC6x1.5) and 2.0mm (MAGDISC6X2) • Pull Force: 0.400kg (MAGDISC6x1.5) & 0.540kg (MAGDISC6x2) • Grade: N38 • Coating: Nickel (NiCuNi) • Gauss: 2818 (MAGDISC6x1.5) and 3495 (MAGDISC6x2) 	1.70	<p>IRON FILINGS – COURSE - 500G</p> <p>AR1070340-1</p>  <ul style="list-style-type: none"> • 500g jar of fine iron filings for magnetic field mapping (PH0799B01) • 500g jar of course iron filings for magnetic field work (AR1070340-1) – LOW IN STOCK <p>(WARNING: Not for use by young children. It is advisable to wear gloves when handling this product.</p> <p>NOTE: Product supplied may vary slightly from illustration)</p>	17.50
<p>MAGNETIC WAND</p> <p>EM0555-01</p>  <p>Permanent wand moulded in plastic.</p>	6.50	<p>IRON FILINGS - FINE - 100G IN SPRINKLER JAR</p> <p>PH0799B100</p>  <p>.100g sprinkler jar of iron filings (PH0799B)</p> <p>(WARNING: Not for use by young children. It is advisable to wear gloves when handling this product).</p>	6.50

<p>IRON FILINGS – COURSE – 250G</p> <p>PH0799A</p>  <p>250g of course 20 mesh iron filings. Comes in translucent plastic bottle with screw-on cap for easy dispensing. Great for magnetism demos and a variety of experiments.</p> <p><i>(WARNING: Not for use by young children. It is advisable to wear gloves when handling this product).</i></p>	14.00	<p>MAGNETIZER BOX – ELECTRICAL 220/240V AC</p> <p>MAGBAR-V2</p>  <p>220/240V AC, 50/60Hz Revitalizes iron, nickel, cobalt, and alnico horseshoe and bar magnets in seconds.</p> <p>Simply place magnets in the 25 x 25 mm holes and press the button to make old magnets new again.</p>	253.00				
<p>MAGNETISING CHARGER</p> <p>PH0800E</p>  <ul style="list-style-type: none"> • Power up your old magnets! • Charger for Bar and Horseshoe magnets <p>No electricity required</p>	104.95						
<p>COMPASS - ORIENTEERING</p> <p>EMCOMP10X6</p>  <p>Basic oil-filled orienteering compass measuring 108 x 60 x 45mm. Base is graduated with simple 10cm ruler (1mm graduations), 1:25,000 and 1:50,000 scales on other 2 sides. 40mm compass face with cardinal points and graduated in degrees. Clear plastic base has 25mm integrated magnifying glass.</p>	6.85	<p>MAGNETIC COMPASS – 38MM</p> <p>AR1070480-5</p>  <p>Top glass face. Dial marked with principal points of the compass. In plastic/aluminium casing.</p>	3.50 3.20 ea (30+)				
<p>COMPASS – 35MM</p> <p>EM0193-01</p>  <p>Ideal for use by students Smooth action pocket compass - 35mm diameter</p>	3.60	<p>PLOTTING COMPASS - 20MM</p> <p>PH0822</p> <p>PLOTTING COMPASS - 20MM (PACK OF 10)</p> <p>PH0822</p>  <p>Both sides glass tops. Sold as individual items or packs of 10.</p>	1.75 16.00				
<p>PLOTTING COMPASS – 100MM</p> <p>PH0820F</p>  <p>In aluminium case, with one glass face only. Dial marked with principal points.</p>	6.25	<p>PLOTTING COMPASS - 35MM - PLASTIC</p> <p>PH0821C</p>  <p>Housed in plastic case with clear directional marking that makes it easy to read. Basic component for the study of the characteristics of a magnetic field.</p>	<table border="1"> <tr> <td>1 – 29 (each)</td> <td>3.40</td> </tr> <tr> <td>30+ (each)</td> <td>3.05</td> </tr> </table>	1 – 29 (each)	3.40	30+ (each)	3.05
1 – 29 (each)	3.40						
30+ (each)	3.05						

RESISTANCE SETS

<p>RESISTANCE SET - HIGH POWER - SET OF 7 IN ONE HOUSING</p>	<p>133.10</p>	<p>RESISTANCE SET - HIGH POWER - SET OF 8 IN ONE HOUSING</p>	<p>149.60</p>
<div data-bbox="153 326 380 542" data-label="Image"> </div> <p>This genuine <i>IEC</i> High Power Resistor Set is a unique and useful set of 7 resistors that is designed to work hard. The resistor values are higher than EM2710-002. The housing is ventilated at both ends to dissipate heat. The accuracy of these resistors is within 5% of the marked value. The resistors may be connected by 4mm banana plugs in series or parallel to make networks for experiments. The set is designed so that 12V applied to any one resistor will not overload or damage the resistor. Values are: 10, 20, 50, 100, 200, 500 and 1,000 ohms.</p> <p>Instruction Sheet included.</p>	<div data-bbox="1094 326 1314 542" data-label="Image"> </div> <p>This High Power Resistor Set is a unique and useful set of 8 resistors that is designed to work hard. The resistance values are lower than EM2710-001. The housing is ventilated at both ends to dissipate heat. The accuracy of these resistors is within 5% of the marked value. The resistors may be connected by 4mm banana plugs in series or parallel to make networks for experiments. The maximum permissible current is marked on each pair of 4mm sockets. Values are: 1, 2, 3, 5, 10, 15, 20 and 25 ohms.</p> <p><i>Genuine IEC product.</i></p> <p>Instruction Sheet included.</p>		

ELECTROSTATICS

VAN DE GRAAFF LARGE
250mmD 400kV 240V.AC

EM4134-101

726.00



The 250mm diameter ball is a good size and is in proportion with all the rest of the instrument's construction. This model now uses an insulation tube to protect the belt, but the pulleys, the belt and the combs are accessible for inspection, cleaning or adjustment at both the top and bottom ends of the tube. The belt is a long-lasting Silicone rubber and both performance and reliability are excellent.

The whole instrument can easily be dismantled down to the components to reduce size for transport. The drive unit can be removed easily for return to IEC should repair be required but the whole instrument is not required to be sent. This is a big saving on freight.

This model is available also with a remote speed control (**EM4134-101R**).

792.00

VAN DE GRAAFF HAND
OPERATED GENERATOR
180MM DIA.

EM4152-001

423.00



A modern, compact and robust instrument that is specially designed with all parts fully exposed for use in the classroom. This hand driven model does not require electrical power. With 180mm dome.

NOTE: Instruction Sheets for both Van de Graaff generators available on our website.

Genuine IEC product.

VAN DE GRAAFF
ACCESSORIES - SET OF 7

EM4144-001

194.00



A set of 7x Van De Graaff Accessories, designed to fit any IEC model Van De Graaff generator. The set consists of:

- Insulated cylinder with conductive pith balls plugs into socket on terminal and balls vibrate.
- Faraday pail for electrostatic experiments.
- Neon lamp in a holder that glows when pointed close to the charged Van De Graaff generator.
- Insulating rod with pith ball for electrostatic experiments.
- Head of hair mounted to a 4mm banana plug.
- Rotary whirl discharger rests on needle and rotates.
- Needle point discharger for study of corona and as a pivot.

These items can all be purchased separately. Please contact us for prices.

Instruction Sheet available on our website.
Genuine IEC product.

GOLD LEAF
ELECTROSCOPE

PH0916B





59.00













- This gold leaf electroscope is great for hands on experience with electrostatic principles in physics classrooms and labs. The solidly constructed sheet anodized aluminum walls of the electroscope are mounted on a plastic base. Front glass window slides up to allow insertion of ionizing material in chamber. Transparent scale is attached inside chamber to measure the deflection of the gold leaf.





- Comes with two gold leaf sheets. Fitted with 4mm socket. Assembled, the electroscope measures 6.5 x 3.75 x 2.75 inches.

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 with the product manual.

<p>SIMPLE ELECTROSTATICS KIT, PSSC EM1770-001</p> <p>52.00</p> <p>A simple kit with a variety of mate suitable for basic electrostatic experiments.</p> <ul style="list-style-type: none"> • Use plastic strips and rubbing cloths to produce positive and negative charges • This kit contains the following items: <ul style="list-style-type: none"> • 9 pieces Polystyrene Balls • 2 pieces Cloth, Cotton • 2 pieces Cloth, Woollen • 6 pieces Wooden Clothes Pegs • 1 piece Nylon Filament x 3.5 metres long • 1 piece Small Paint Brush • 1 piece Bottle graphite in Alcohol - 25ml • 6 pieces Insulators, polythene, 130 x10 x 3mm • 5 pieces Pins • 5 pieces Acrylic Strip, transparent, 3mm thick, (replaces older style acetate strip but produces same polarity charge) • 5 pieces Vinyl Strip, approx.1mm thick. <p>Visit www. http://iecpl.com.au/z_pdfs/em1770-001.pdf for more details.</p> 	<p>WIMSHURST ELECTROSTATIC GENERATOR AR1080620</p> <p>214.00</p> 	<p>AR1080620</p> <ul style="list-style-type: none"> • A traditional device capable of generating high electrostatic potential that can produce spark of length up to 7.5cm under favourable weather condition. • Equipped with two clear acrylic plates, each of diameter about 25cm and having aluminium sectors permanently pasted radially along the rim. Both the plates mounted parallel to each other and rotate in opposite direction through a belt-pulley arrangement. Pulley on one wheel has handle for manual rotation. A set of charge collecting combs in mounted toward either end of a horizontal insulating beam, together with the adjustable spark gap arms, the latter equipped with small metallic sphere discharger at one end and long insulating handle adjustment at the other end. • The charge can be stored in a pair of high capacity Leyden jar capacitors that can be connected or disconnected as desired. When connected to the Leyden jars through a pair of levers, the spherical dischargers start accumulating the charge and transfer of charge from one discharger to other takes place in the form electric spark jumping from one sphere to other as a consequence of build-up of sufficiently high potential difference across the two spheres. The spark produced intermittently by the continuously rotating plates. <p>Complete apparatus is mounted on a well insulated base that also carries a pair of earth terminals for the Leyden jars.</p>
<p>ELECTROSTATICS KIT PH0900</p> <p>82.00</p> <ul style="list-style-type: none"> • Complete electrostatics kit • Comprises of 1 x electroscope, 4 metallised polystyrene spheres, 1 x reel nylon, 1 x cellulose acetate strip, 1 x polythene strip, wire stirrup, wool cloth, wire hook, electrophorus on handle & proof plane • 2 x polythene tiles & 2 x aluminium cans <p>Comes with manual</p> 	<p>FUN FLY STICK EM0254-01</p> <p>19.80</p> 	<p>EM0254-01</p> <p>The Fun Fly Stick is a must have electrostatics experiment that is as easy to demonstrate as it is fun.</p> <p>Turn on the levitation wand and toss one of the five flying toys included into the air. Touch the wand to the toy once and shake it off. You now have complete control over the flying toy. Fun Fly Stick comes with one Fun Fly Stick levitation wand, five pre-cut Mylar tinsel flying shapes and manual.</p> <p>Requires 2 x AA batteries (not included).</p>







<p>GOLD LEAVES – PACK OF 6</p> <p>PH0914</p>	<p>15.85</p>	<p>PROOF PLANE – SPHERICAL TYPE – 20MM DIA.</p> <p>EM2521-001</p>	<p>19.80</p>
 <p>Set of 6 spare gold leaves for Gold Leaf Electroscope (PH0916B) supplied in case.</p>		 <p>A classic tool for use in teaching electrostatics. It is used for accepting and transporting an electrostatic charge from one place to another. Consists of a sphere, approx. 20mm diameter, mounted on a 150mm long very insulating handle. Genuine IEC product. Instruction sheet included.</p>	
<p>CAPACITANCE DEMONSTRATION KIT</p> <p>AR1080318</p> <p>For investigation of various concepts related to capacitance. The kit comprises:</p> <ul style="list-style-type: none"> 2 (Pair) x Parallel Plates 20x20cm 2 (Pair) x Parallel Plates 28x28cm 1 x Glass Sheet 21x21cm 1 x Polystyrene Sheet 21x21cm 1 x LCR Meter 2 x Patch Cord 1ea Spacing Blocks 1,2,3,4,6mm 2 x Capacitor Rail 	<p>265.00</p>	<p>LEYDEN JAR</p> <p>LEYJAR</p> <p><i>Shock your students again and again with this Leyden Jar.</i></p> <p>Use this equipment to duplicate many classic static electricity experiments.</p> <ul style="list-style-type: none"> • It comes with a durable inner and outer plate, a plastic dielectric, and directions. • The inner plate has a hook and ball attached which makes it easy to charge. 	<p>25.00</p>
<p>ELECTROPHORUS – METAL – 50MM DIA. WITH HANDLE & PLATE</p> <p>EM1780-001</p> <p>The IEC "Electrophorus" is the classic device for collecting and removing the electrostatic charge from the combination of a metal plate against an insulating sheet with the electrophorus on the opposite side of the insulating sheet. The three devices form a capacitor that can store a charge. The electrophorus is a flat disc of metal fixed to a very insulating handle. See also EM1781-001 and EM1782-001 for the other sizes in the IEC Electrophorus range. For a Capacitance Demonstration Kit, see AR1080318.</p> <p>Instruction Sheet available.</p>	<p>46.20</p>	<p>ELECTROPHORUS – METAL – 100MM DIA. WITH HANDLE & PLATE</p> <p>EM1781-001</p> <p>The IEC "Electrophorus" is the classic device for collecting and removing the electrostatic charge from the combination of a metal plate against an insulating sheet with the electrophorus on the opposite side of the insulating sheet. The three devices form a capacitor that can store a charge. The electrophorus is a flat disc of metal fixed to a very insulating handle. See also EM1780-001 and EM1782-001 for the other sizes. For a <i>Capacitance Demonstration Kit</i>, see AR1080318.</p> <p>Instruction Sheet included.</p>	<p>50.60</p>







<p>ELECTROPHORUS – METAL – 150MM DIA. WITH HANDLE & PLATE</p> <p>EM1782-001</p>  <p>The IEC "Electrophorus" is the classic device for collecting and removing the electrostatic charge from the combination of a metal plate against an insulating sheet with the electrophorus on the opposite side of the insulating sheet. The three devices form a capacitor that can store a charge. The electrophorus is a flat disc of metal fixed to a very insulating handle. See also EM1780-001 and EM1781-001 for the other sizes in the IEC Electrophorus range. For a <i>Capacitance Demonstration Kit</i>, see AR1080318.</p> <p>Instruction Sheet available.</p>	58.00	<p>COULOMB METER – DIGITAL – PLASTIC 1-1999nc</p> <p>EM1100-001P</p>  <p>The IEC Coulomb Meter is a useful tool and behaves similar to a "digital electroscope". The display will show the number of coulombs deposited into the instrument either by current through a resistance or from a capacitor or from a source of static electricity, e.g. a charged plastic rod. An Electroscope will deflect its vane, but this instrument displays the charge digitally in coulombs up to 1.999 nano coulombs.</p>	154.00
<p>FARADAY'S PAILS</p> <p>PH0902</p>  <p>Set consists of 4 nesting aluminium cylindrical containers each fitted with insulating feet. Individual sizes (diameter. x height): 50 x 120 mm 120 x 110 mm 90 x 90 mm 75 x 75 mm</p>	41.50	<p>ELECTROSCOPE, PITH RAIL</p> <p>AR1080380-2</p>  <p>Electroscope, Pith Ball, on plastic base</p>	12.80
<p>ELECTROSTATIC PITH BALLS - PLAIN</p> <p>EM1774-001</p>  <ul style="list-style-type: none"> • Set of 12 plain pith balls for use in electrostatics experiments • The balls are not fully round by are generally shaped as a ball <p>Diameter: 8mm (approx.)</p>	7.70	<p>ELECTROSTATIC PITH BALLS – CONDUCTIVE COATING</p> <p>EM1775-001</p>  <ul style="list-style-type: none"> • Set of 10 pith balls with conductive coating for use in electrostatics experiments • The balls are not fully round by are generally shaped as a ball • The conductive pith balls carry the electrostatic charge all over their surface and the whole surface charges or discharges <p>Diameter: 10mm (approx.)</p>	8.80
<p>PITH BALLS - ASSORTED SIZES</p> <p>AR1080400</p>  <ul style="list-style-type: none"> • Available as spare for Pith Ball Electroscope (AR1080380) • In assorted sizes 	2.20	<p>ELECTROSTATIC RUBBING CLOTHS</p> <p>EM1772-001</p>  <ul style="list-style-type: none"> • Set of 2 cloths: cotton flannelette & wool • Size of each cloth: 200mm x 200mm (approx.) • Used for rubbing on electrostatic rods for the creation of electrostatic charges <p>The edges of each piece of cloth have been overlapped to prevent fraying</p>	9.90

<p>ELECTROSTATIC RUBBING CLOTH – SILK</p>	<p>ESCLTHS</p>	<p>3.95</p>	<p>ELECTROSTATIC POMPON SET – PAIR</p>	<p>PH0871C</p>	<p>32.50</p>
	<p>300 x 300mm silk rubbing cloth. Edges have been overlocked to prevent fraying.</p> <p><i>NOTE: Colour may vary from illustration.</i></p>			<p>Pair of pompoms 18 x 10cm long. When the plate is touched with an electrostatically charged rod, the cords become charged and spread out into a wide cone by mutual repulsion.</p>	
<p>AEPINUS CONDENSER</p>	<p>AR1080280</p>	<p>86.00</p>			
	<p>A useful apparatus for exploring the principle of working of capacitance, and the relationship between charge, voltage and capacitance.</p> <p>This apparatus comprises of a pair of adjustable circular metal discs of diameter 100mm attached to the insulated handles and is supported on insulated pillars mounted vertically on a base. Another pillar has a clamp for holding glass dielectric plate between the metal discs. The glass plate may be replaced by plates of other material to study the effect of dielectric. The end of insulating handles of metal discs carry a 4mm socket for electrical connection.</p>				
<p>ELECTROSTATIC FRICTION RODS</p>					
<p>ELECTROSTATIC ROD – EBONITE</p>	<p>PH0856A</p>				<p>6.25</p>
<p>ELECTROSTATIC ROD – GLASS</p>	<p>PH0856B</p>				<p>6.50</p>
<p>ELECTROSTATIC ROD – NYLON</p>	<p>PH0852</p>				<p>8.25</p>
<p>ELECTROSTATIC ROD - POLYTHENE</p>	<p>PH0851</p>				<p>8.00</p>
<p>ELECTROSTATIC ROD – PERSPEX</p>	<p>PH0857</p>				<p>5.00</p>
	<ul style="list-style-type: none"> • Electrostatic rods are made up of various insulation materials • Use the rods to rub against different fabrics such as faux fur, cotton, etc., to create static electricity • Polythene is a type of plastic also known as Polyethylene • Ebonite is a vulcanized rubber • The type of rod and the type of cloth used will determine the amount of charge produced • Rod sizes (approx.): 300mm long x 10-13mm diameter 				
<p><i>NOTE: Length & diameter may vary with different rods and different manufacturers.</i></p>					

ELECTROCHEMISTRY

HOFMANN VOLTAMETER – ALL PLASTIC	269.00	COPPER VOLTAMETER	29.35
<div data-bbox="191 256 344 784" data-label="Image"> </div> <p data-bbox="443 168 905 548"> This acrylic <i>HOFMANN VOLTAMETER</i> includes 1 x pair platinum electrodes. Plastic type - Australian design & manufacture. A compact new model of Voltmeter that is plastic and stainless steel but it retains all the classic features of the original design. The materials are suitable for weak electrolyte that is required to make water conductive. The boldly graduated tubes for Hydrogen and Oxygen have a generous volume exceeding 40ml. Physical dimensions: 140 x 520 mm (WxH) Weight: 0.58 kg. Robust and unbreakable </p> <p data-bbox="443 578 873 768"> Maintenance: This product must be washed after each use. Appropriate PPE to be worn when filling with Acid solution READ AND FOLLOW INSTRUCTIONS CAREFULLY. </p> <p data-bbox="443 797 842 878"> For use in a laboratory or educational setting only. <u>Instruction Sheet</u> included. </p>		<div data-bbox="1073 358 1283 691" data-label="Image"> </div> <p data-bbox="1381 386 1871 496"> Used for experimenting with electrolysis. This voltameter consists of 3 copper plates with terminals suspended from an insulated cover in a glass jar. </p> <p data-bbox="1381 526 1871 659"> Outer two electrodes acting as double anode are connected to one binding post on the top. The third inner copper plate fixed to another binding post acts as a cathode and can easily be removed for weighing. </p>	
VOLTA PILE APPARATUS	48.50	VOLTAMETER - MINI	54.00
<div data-bbox="134 922 348 1284" data-label="Image"> </div> <p data-bbox="443 915 905 1321"> PH0925 A fully functioning replica of Alessandro Volta's apparatus. Consist of a series of connected galvanic cells to make up a source of electricity. 3.75cm zinc and copper plates are stacked in alternation and are separated by a sheet of felt soaked in an electrolyte. The electrolyte allows electricity to pass between layers, allowing the voltage to be measured between the plates and at ends. Approximately 17.5 cm tall including the base. The cable on the base is 14.3 cm long and reaches the top of the item. </p>		<div data-bbox="1066 938 1304 1295" data-label="Image"> </div> <p data-bbox="1381 1052 1839 1187"> Neat compact design, easy to use student voltameter. <ul style="list-style-type: none"> · Platinum electrodes · With two graduated tubes, 10ml capacity · Fitted with tow 4mm banana plug sockets </p>	

<p>STUDENT CELL & POROUS CUP</p> <p>PH0927-N8</p>  <p>This basic voltaic student cell set is ideal for demonstrating the characteristics of primary cells.</p> <p>The set includes one plastic student cell complete with a screw-on plastic ring, two adjustable electrode holders, porous ceramic cup and eight electrodes: 1 x aluminium, 1 x nickel, 1 x tin, 1 x graphite, 1 x iron, 1 x copper, 2 x zinc.</p> <p>Complete instructions are included.</p>	<p>43.25</p>	<p>ELECTRODE IN GLASS - SET OF 4 - "NORWOOD" TYPE KIT</p> <p>EM1800-001</p>  <p>This electrode set consists of 4 x glass tubes. Each glass tube has an electrode mounted inside and protruding from the sealed end for making connection to a power source.</p> <p>The set includes 2 x carbon rods in glass, 1 x stainless steel rod in glass and 1 x platinum wire in glass. A bracket is supplied for carrying any 2 x electrodes so that they can hang into a small beaker of liquid.</p> <p>Can be used for electrolysis and for generation of gases that are collected inside the glass tubes.</p> <p>Read the PDF file below to understand the function, other items not supplied that are required, safety information and to see the experiments that can be undertaken with this apparatus.</p> <p>Instruction Sheet</p>	<p>111.00</p>																														
<p>ELECTRODES FOR STUDENT CELLS</p>  <p>For student's demonstration cell and electrochemical experiments. Very high quality electrodes. Size 100 x 19 mm. Carbon rod 100 x 6mm. Stamped with identifier.</p> <table border="1" data-bbox="441 917 1018 1193"> <tr> <td>PH0927A</td> <td>Aluminium</td> <td>5.80</td> </tr> <tr> <td>PH0927</td> <td>Brass</td> <td>6.00</td> </tr> <tr> <td>PH0927</td> <td>Carbon</td> <td>5.80</td> </tr> <tr> <td>PH0927</td> <td>Carbon Rod</td> <td>5.80</td> </tr> <tr> <td>PH0927</td> <td>Copper</td> <td>5.80</td> </tr> <tr> <td>PH0927</td> <td>Lead</td> <td>5.80</td> </tr> <tr> <td>PH0927</td> <td>Nickel</td> <td>11.50</td> </tr> <tr> <td>PH0927</td> <td>Tin</td> <td>11.00</td> </tr> <tr> <td>PH0927</td> <td>Zinc</td> <td>5.80</td> </tr> <tr> <td>PH0927</td> <td>Iron</td> <td>5.80</td> </tr> </table>	PH0927A	Aluminium	5.80	PH0927	Brass	6.00	PH0927	Carbon	5.80	PH0927	Carbon Rod	5.80	PH0927	Copper	5.80	PH0927	Lead	5.80	PH0927	Nickel	11.50	PH0927	Tin	11.00	PH0927	Zinc	5.80	PH0927	Iron	5.80		<p>SIMPLE CELL</p> <p>PH0924</p>  <p>A <i>SIMPLE VOLTAIC CELL</i> comprising of a glass jar 15 x 10 cm (length x dia.). Complete with zinc and copper plates.</p>	<p>27.50</p>
PH0927A	Aluminium	5.80																															
PH0927	Brass	6.00																															
PH0927	Carbon	5.80																															
PH0927	Carbon Rod	5.80																															
PH0927	Copper	5.80																															
PH0927	Lead	5.80																															
PH0927	Nickel	11.50																															
PH0927	Tin	11.00																															
PH0927	Zinc	5.80																															
PH0927	Iron	5.80																															
<p>PLATES FOR SIMPLE CELLS</p>  <p>Plate size 125 x 50 mm fitted with 4 mm socket terminals.</p> <table border="1" data-bbox="441 1315 1018 1364"> <tr> <td>PH0926A:</td> <td>Zinc</td> <td>7.95</td> </tr> <tr> <td>PH0926B:</td> <td>Carbon</td> <td>12.30</td> </tr> </table>	PH0926A:	Zinc	7.95	PH0926B:	Carbon	12.30		<p>PLATES FOR SIMPLE CELLS</p>  <p>Plate size 125 x 50 mm fitted with 4 mm socket terminals.</p> <table border="1" data-bbox="1375 1315 1984 1364"> <tr> <td>PH0926C:</td> <td>Copper</td> <td>11.10</td> </tr> <tr> <td>PH0926D:</td> <td>Lead</td> <td>8.10</td> </tr> </table>	PH0926C:	Copper	11.10	PH0926D:	Lead	8.10																			
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PH0926D:	Lead	8.10																															





<p>ELECTRODE HOLDER PH0939A</p>	<p>6.80</p>	<p>HOFMANN VOLTAMETER SPARE PLATINUM ELECTRODES PA1412-01</p>	<p>101.00</p>
 <p>Plastic strip of 78 x 27 x 5mm fitted with two alligator clips to take rod electrode. The alligator clip has a 4mm socket for lead connection.</p> <p>NOTE: Without electrodes.</p>		 <p>This pair of spare IEC platinum electrodes is designed to fit <i>HOFMANN VOLTAMETER (GE5600-01)</i>.</p>	
<p>ELECTRODE IN GLASS "NORWOOD" TYPE – SPARE CARBON PA1800-002</p>	<p>27.20</p>	<p>ELECTRODE IN GLASS "NORWOOD" TYPE – SPARE STAINLESS STEEL PA1800-003</p>	<p>30.20</p>
 <p>Spare carbon electrode in glass for Electrode in Glass - "Norwood" Kit (Code: EM1800-001)</p>		 <p>Spare stainless steel rod electrode in glass for Electrode in Glass - "Norwood" Kit (Code: EM1800-001)</p>	
<p>ELECTRODE IN GLASS "NORWOOD" TYPE – SPARE PLATINUM PA1800-004</p>	<p>53.20</p>	<p>ELECTRODE IN GLASS "NORWOOD" TYPE – SUPPORT STAND PA1800-005</p>	<p>12.10</p>
 <p>Spare platinum electrode in glass for Electrode in Glass - "Norwood" Kit (Code: EM1800-001)</p>		 <p>Spare support stand / bracket for Electrode in Glass - "Norwood" Kit (Code: EM1800-001)</p>	
<p>COPPER SHEET 150 X 150MM PA0912-01</p>	<p>63.00</p>	<p>COPPER GAUZE MESH 300 X 300M SQUARE PA1629-01</p>	<p>52.00</p>
 <p>Pack of 8, 28swg plain, raw copper sheets 150 x 150mm squares. 0.36mm thick.</p>		 <p>Wire copper gauze 40 mesh. Used in Electrolysis experiments. 300 x 300mm square.</p>	











PARTS & ACCESSORIES – FOR PHYSICS EQUIPMENT










<p>SPARE GLOBES FOR LAMPBOARD RHEOSTAT</p>	<p>GLOMES3.2</p>	<p>9.39</p>	<p>ABSORBER SET – SUPPORT RACK</p>	<p>PA0031-001</p>	<p>41.10</p>
	<p>Spare pack of 2.5V globes for <i>OHM'S LAW DEMONSTRATOR – LAMPBOARD RHEOSTAT</i> (AR1100378). Pack of 10.</p>			<p>A small plastic rack that carries the radioactive source and the selected absorber in alignment.</p> <p>This is normally part of the <i>ABSORBER SET KIT</i> (AP0030-001).</p>	
<p>AIR TRACK SPARK GENERATOR – SPARK PAPER ROLL – WHITE 180M X 20MM</p>	<p>PA0116-001</p>	<p>16.25</p>	<p>AIR TRACK TAPE MEASURE 3MX16MM</p>	<p>PA0130-022A</p>	<p>5.50</p>
	<p>Spare large roll of white paper used on Air Tracks for spark recording. 20mm wide x180m long. For use with <i>IEC SPARK GENERATOR 240V AC</i> (LB0118-001).</p> <p>This white paper is wider than the 'Recording Timer' paper and it lies over the spark paper. As a spark is shot through both papers to earth, a black dot is erupted to the underside of this white paper, thus forming a set of black dots that relate to velocity.</p>			<p>3m long fibreglass tape measure for Air Track, fits slot in edge of air tube. Cut to length required.</p>	
<p>AIR TRACK MAGNET FOR GLIDER – 50G</p>	<p>PA0130-031</p>	<p>12.30</p>	<p>AIR TRACK SPARK GENERATOR CABLE REMOTE CONTROL</p>	<p>PA0130-058</p>	<p>31.45</p>
	<p>Air Track 50g mass Alnico Magnet for glider. Fits glider spine.</p>			<p>Air Track remote control cable and press button for start/stop of <i>SPARK GENERATOR</i> (LB0118-001).</p>	
<p>AIR TRACK SPARK GENERATOR EARTH CABLE & PLUGS</p>	<p>PA0130-060</p>	<p>10.85</p>	<p>AIR TRACK INCLINATION BLOCKS – PLASTIC – SET OF 4</p>	<p>PA0130-047</p>	<p>6.15</p>
	<p>Air Track earth cable with 4mm banana plugs to connect between air track and <i>SPARK GENERATOR</i> (LB0118-001).</p>			<p>Set of 4 moulded <i>AIR TRACK INCLINATION BLOCKS</i>. 3mm, 6mm, 12mm and 20mm high.</p>	











NOTE: Replacement parts and accessories are available for many of the IEC physics apparatuses. Please email us with a list of parts and accessories required, as many are not listed in the catalogue..




<p>AIR TRACK BUFFER NON-ELASTIC VELCRO PAIR</p> <p>PA0130-073A</p>	<p>11.00</p>	<p>AIR TRACK BUFFER SPRING STAINLESS STEEL ELASTIC WITH SCREW</p> <p>PA0130-032A</p>	<p>9.50</p>
 <p>A genuine IEC product Air Track 'non-elastic' buffer to fit to the end of glider. 'Velcro' type for non-elastic collisions.</p> <p>Fits both old and new style Air Track gliders.</p>		 <p>This genuine IEC <i>AIR TRACK BUFFER SPRING</i> and Mount for glider, stainless steel, fits to end of tracks and ends of gliders.</p> <p>Fits both old and newer models of Air Track gliders.</p>	
<p>AIR TRACK GLIDER – BLACK – 10CM LONG</p> <p>PA0130-025</p>	<p>29.00</p>	<p>AIR TRACK GLIDER – GOLD – 10CM LONG</p> <p>PA0130-025A</p>	<p>29.00</p>
 <p>100mm long black glider for Air Track. With weight carrier blocks. 100g. <i>IEC product.</i></p>		 <p>100mm long gold glider for Air Track. With weight carrier blocks. 100g. <i>IEC product.</i></p>	
<p>AIR TRACK GLIDER – BLACK – 20CM LONG</p> <p>PA0130-024</p>	<p>31.40</p>	<p>AIR TRACK GLIDER – GOLD – 20CM LONG</p> <p>PA0130-024A</p>	<p>31.50</p>
 <p>200mm long black glider for Air Track. With weight carrier blocks. 200g. <i>IEC product.</i></p>		 <p>200mm long gold glider for Air Track. With weight carrier blocks. 200g. <i>IEC product.</i></p>	
<p>AIR TRACK GLIDER SPECIAL PENDULUM ATTACHMENT</p> <p>PA0142-001</p>	<p>205.00</p>	<p>AIR TRACK GLIDER SPECIAL CONSTANT FORCE ATTACHMENT</p> <p>PA0146-001</p>	<p>205.00</p>
 <p>Air Track special glider, "pendulum" attachment. Used for special physics experiments. <i>IEC product.</i></p>		 <p>Air Track special glider, 'constant force' attachment. For special experiments on Air Tracks. <i>IEC product.</i></p>	









<p>AIR TRACK GLIDER SPECIAL VERTICAL PROJECTION ATTACHMENT</p> <p>PA0143-001</p>	<p>229.00</p>	<p>AIR TRACK LAUNCHER MANUAL TRIP SIMPLE TYPE</p> <p>PA0130-065</p>	<p>68.70</p>
 <p>Air Track special glider, 'vertical projectile' attachment. For special experiments.</p>			
<p>AIR TRACK GLIDER SPECIAL JET ATTACHMENT</p> <p>PA0145-001</p>	<p>68.95</p>	<p>ELECTRICITY KIT – SWITCH – 1 WAY</p> <p>PA1763-250</p>	<p>32.60</p>
 <p>Air Track special glider 'jet propulsion' attachment. By balloon air jet. For special experiments.</p>		 <p>Spare 1 way switch for <i>IEC</i> Electricity Kit. Electricity Kit, rocker switch, single pole, one way (one input and one output), 76x76mm base, 4mm sockets for connection.</p>	
<p>ELECTRICITY KIT - AXLE & DISC FOR EDDY CURRENT EXPERIMENT</p> <p>PA1763-022</p>	<p>12.30</p>	<p>ELECTRICITY KIT - IRON CORE & AXLE SUPPORTS - PLASTIC</p> <p>PA1763-030</p>	<p>4.70</p>
 <p>Spare part for <i>IEC</i> Electricity Kits.</p>		 <p>Spare part of <i>IEC</i> Electricity Kits. Plastic iron core & axle supports.</p>	
<p>ELECTRICITY KIT CAPACITOR 5µF DUAL</p> <p>PA1763-045</p>	<p>49.80</p>	<p>ELECTRICITY KIT CAPACITOR 10µF DUAL</p> <p>PA1763-050</p>	<p>49.80</p>
 <p>Spare capacitor for <i>IEC</i> Electricity Kit. 76x76mm base. 5µF + 5µF dual - in housing.</p>		 <p>Spare capacitor for <i>IEC</i> Electricity Kit. 76x76mm base. 10µF + 10µF dual - in housing.</p>	
<p>ELECTRICITY KIT – COILS - 300T FOR U/I CORE</p> <p>PA1763-070</p>	<p>68.90</p>	<p>ELECTRICITY KIT – COILS - 600T FOR U/I CORE</p> <p>PA1763-080</p>	<p>66.50</p>
 <p>Spare 300T coil for <i>IEC</i> Electricity Kit "U" & "I" core.</p>		 <p>Spare 600T coil for <i>IEC</i> Electricity Kit "U" & "I" core.</p>	
<p>ELECTRICITY KIT – COILS - 1200T FOR U/I CORE</p> <p>PA1763-085</p>	<p>79.80</p>	<p>ELECTRICITY KIT - CONNECTOR BLOCK</p> <p>PA1763-090</p>	<p>27.80</p>
 <p>Spare 1200T coil for <i>IEC</i> Electricity Kit "U" & "I" core.</p>		 <p>Spare connector block for <i>IEC</i> Electricity Kit. 76x76mm base with 4 x 4mm sockets that permit circuit and device connections.</p>	









<p>ELECTRICITY KIT - IRON CORE - U/I SET - IN PLASTIC MOUNT</p> <p>PA1763-100</p>	<p>72.60</p>	<p>ELECTRICITY KIT – CORES - PLAIN IRON - SET/3</p> <p>PA1763-110</p>	<p>25.40</p>
		 <p>Set of 3 plain iron cores for IEC Electricity Kit. One core (dimensions): 16 x 16 x 95 (l) mm. Two cores (dimensions): 16 x 16 x 48 (l) mm.</p>	
<p>ELECTRICITY KIT - EXPERIMENT MANUAL</p> <p>PA1763-120</p>	<p>28.60</p>	<p>ELECTRICITY KIT – CASE - ALUMINIUM WITH FOAM/DIVIDERS ONLY</p> <p>PA1763-055</p>	<p>174.00</p>
<p>ELECTRICITY KIT - IRON FILINGS - IN SPRINKLER</p> <p>PA1763-130</p>	<p>13.30</p>	<p>ELECTRICITY KIT LAMP HOLDER FOR 2 x MES LAMPS</p> <p>PA1763-140</p>	<p>39.90</p>
 <p>Replacement for IEC Electricity Kit. Iron filings in 'flip-top' well sealed sprinkler bottle. 250g.</p>		 <p>Spare part for IEC Electricity Kit - Lamp holder for two MES lamps. 76 x 76mm base with 4mm sockets.</p>	
<p>ELECTRICITY KIT – MES LAMPS – 10 x 2.5V & 10 x 12V - IN VIAL</p> <p>PA1763-150</p>	<p>21.70</p>	<p>ELECTRICITY KIT - MAGNETISM DEMO - RECTANGULAR COIL</p> <p>PA1763-160</p>	<p>58.30</p>
 <p>Spare MES globes in vial for IEC Electricity Kits. 10 x 2.5V and 10 x 12V MES globes.</p>		 <p>Spare part for IEC Electricity Kits. Magnetism demonstrator, 10turn copper rectangular coil, passes through the base to detect magnetic field around the conductor.</p>	
<p>ELECTRICITY KIT - MAGNETISM DEMO - ROUND COIL</p> <p>PA1763-170</p>	<p>58.30</p>	<p>ELECTRICITY KIT - MAGNETISM DEMO - SPIRAL COIL</p> <p>PA1763-180</p>	<p>66.00</p>
 <p>Spare part for IEC Electricity Kits. Magnetism demonstrator, brass solenoid coil, passes through the base to detect magnetic field around the conductor.</p>		 <p>Spare part for IEC Electricity Kits. Magnetism demonstrator, 10turn copper circular coil, passes through the base to detect magnetic field around the conductor.</p>	
<p>ELECTRICITY KIT - MULTIMETER - AC & DC – COMES WITH CABLES</p> <p>PA1763-190</p>	<p>43.50</p>	<p>ELECTRICITY KIT - PLOTTING COMPASSES - 10 IN VIAL</p> <p>PA1763-200</p>	<p>37.50</p>
 <p>Spare digital multimeter for IEC Electricity Kit or for all electrical measurements. Good ranges including AC & DC amps, AC & DC volts, ohms and capacitance.</p>		 <p>Spare parts for IEC Electricity Kit. Set of 10 plotting compasses for detecting magnetic fields.</p>	


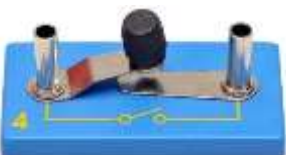






ELECTRICITY KIT - POTENTIOMETER - W/W - 50 OHMS	PA1763-210	65.30	ELECTRICITY KIT - RESISTOR - W/W - 50 OHMS	PA1763-220	37.50
	Spare Potentiometer for <i>IEC</i> Electricity Kit. Wire wound, adjustable resistance 0 - 50ohm, 76 x 76mm base, 4mm sockets for connection.			Spare part for <i>IEC</i> Electricity Kit. Resistor, wire wound, 50 ohm + 50 ohm dual, 76 x 76mm base, 4mm sockets for connection.	
ELECTRICITY KIT - RESISTOR - W/W - 100 OHMS	PA1763-230	37.50	ELECTRICITY KIT - RESISTOR - W/W - 500 OHMS	PA1763-240	39.60
	Spare part for <i>IEC</i> Electricity Kit. Resistor, wire wound, 100 ohm + 100 ohm dual, 76 x 76mm base, 4mm sockets for connection.			Spare part for <i>IEC</i> Electricity Kit. Resistor, wire wound, 500 ohm + 500 ohm dual, 76 x 76mm base, 4mm sockets for connection.	
ELECTRICITY KIT - SWITCH - 2 WAY	PA1763-260	39.90	ELECTRICITY KIT - THOMPSON'S RING TO FIT IRON CORE	PA1763-270	3.63
	Spare part for <i>IEC</i> Electricity Kits. Rocker switch, single pole, two way (one input and choice of two outputs), 76 x 76mm base, 4mm sockets for connection. Genuine IEC product.			<i>IEC</i> Electricity Kit spare part - Thompson's ring (floats in AC magnetic field).	
ELECTRICITY KIT COPPER WIRE - ROLL 100m x0.2mm(D)	PA1763-280	10.85	ELECTRICITY KIT FUSE WIRE - ROLL 50m x0.05mm(D)	PA1763-290	13.30
	Spare part for <i>IEC</i> Electricity Kit. Reel of bare copper wire, 100m x 0.2mm dia.			Spare part for <i>IEC</i> Electricity Kits. Reel of very fine 1A fuse wire, 50m x 0.05mm dia. This very fine wire fuses (melts) at a current of about 1 amp.	
ELECTRICITY KIT RESISTANCE WIRE - ROLL 100m x0.2mm(D)	PA1763-300	14.50	ELECTRONICS KIT ALLIGATOR CLIP/BANANA PLUG COMBO	PA1764-010	4.80
	Spare part for <i>IEC</i> Electricity Kits. Reel of bare resistance wire, 'advance', 100m x 0.2mm dia,				
ELECTRONICS KIT - PERFORATED BASE PLATE	PA1764-030	9.65	ELECTRONICS KITS LINKS 2MM & 2MM - SET OF 10	PA1764-200	54.00
	Spare perforated base plate for <i>IEC</i> Electronics Kit. For locating kit components. Base plates link together to make larger bases for larger circuits. The rubber feet of the components press firmly into the perforations to hold in place firmly.			Spare parts for <i>IEC</i> Electronics Kit. Links for joining, set of 10 in holder, 2mm plugs, 2mm sockets. These links replace wires and reduce the messy connections of wires between components.	

<p>ELECTRONICS KITS LINKS 2MM & 4MM - SET OF 10</p>	<p>PA1764-210</p>	<p>54.00</p>	<p>ELECTRONICS KIT SIGNAL GENERATOR 1-10KHZ</p>	<p>PA1764-360</p>	<p>214.00</p>																			
	<p>Spare parts for IEC Electronics Kit. Links for joining, set of 10 in holder, 2mm plugs, 2+4mm sockets. These links replace wires and reduce the messy connections of wires between components.</p>			<p>Spare part for IEC Electronics Kit. Mini signal generator, 1Hz-10kHz, 76 x 76mm base, 2mm sockets for connection. This provides both sine and square waves for all electronic experiments and for the demonstration bridge rectifier with LEDs. <i>Genuine IEC product.</i></p>																				
<p>ELECTRONICS KIT MULTIMETER WITH CABLES</p>	<p>PA1764-220</p>	<p>43.50</p>	<p>ELECTRONICS KIT REGULATED POWER SUPPLY 0-12V DC</p>	<p>PA1764-250</p>	<p>127.00</p>																			
	<p>Spare part for IEC Electronics Kit. Multimeter with cables. Good ranges, AC & DC volts, AC & DC amps, ohms, capacitance, auto power off.</p>			<p>Spare part for IEC Electronics Kit. Power supply, mini size, plug pak operated, 1.2-12V.DC. regulated, 76 x 76mm base, 2mm sockets for connection. This IEC product is a very convenient regulated power supply for many purposes.</p>																				
<p>ELECTRONICS KITS - RESISTORS</p>	<table border="1"> <tr> <td data-bbox="443 732 751 755">100 OHM – 1W</td> <td data-bbox="764 732 905 755">PA1764-270</td> <td data-bbox="942 732 1010 755">14.50</td> </tr> <tr> <td data-bbox="443 771 751 794">100K OHM – 0.3W</td> <td data-bbox="764 771 905 794">PA1764-320</td> <td data-bbox="942 771 1010 794">14.50</td> </tr> <tr> <td data-bbox="443 810 751 833">10K OHM – 0.3W</td> <td data-bbox="764 810 905 833">PA1764-300</td> <td data-bbox="942 810 1010 833">14.50</td> </tr> <tr> <td data-bbox="443 849 751 872">1K OHM – 1W</td> <td data-bbox="764 849 905 872">PA1764-280</td> <td data-bbox="942 849 1010 872">14.50</td> </tr> </table>		100 OHM – 1W	PA1764-270	14.50	100K OHM – 0.3W	PA1764-320	14.50	10K OHM – 0.3W	PA1764-300	14.50	1K OHM – 1W	PA1764-280	14.50	<table border="1"> <tr> <td data-bbox="1383 732 1587 755">470 OHM – 1W</td> <td data-bbox="1738 732 1879 755">PA1764-290</td> <td data-bbox="1917 732 1984 755">14.50</td> </tr> <tr> <td data-bbox="1383 771 1587 794">470K OHM – 0.3W</td> <td data-bbox="1738 771 1879 794">PA1764-330</td> <td data-bbox="1917 771 1984 794">14.50</td> </tr> <tr> <td data-bbox="1383 810 1587 833">47K OHM – 0.3W</td> <td data-bbox="1738 810 1879 833">PA1764-310</td> <td data-bbox="1917 810 1984 833">14.50</td> </tr> </table>	470 OHM – 1W	PA1764-290	14.50	470K OHM – 0.3W	PA1764-330	14.50	47K OHM – 0.3W	PA1764-310	14.50
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47K OHM – 0.3W	PA1764-310	14.50																						
	<p>Spare resistors for IEC Electronics Kit. Various resistance values. 17 x 38mm base. 2mm sockets for connection.</p>																							
<p>NOTE: More replacement parts for IEC Electronics Kits, IEC Electricity Kits and other IEC kits are also available. Please email us with your requirements.</p>																								
<p>BANANA PLUG-BANANA PLUG - 4MM STACKABLE - BLACK 300MM CABLE</p>	<p>PA0695-001</p>	<p>7.35</p>	<p>BANANA PLUG-BANANA PLUG - 4MM STACKABLE - BLUE 300MM CABLE</p>	<p>PA0695-002</p>	<p>7.35</p>																			
	<p>300mm long black cable with 4mm end stackable IEC banana plugs at each end. Is available as spare part for IEC's Electricity Kits.</p>			<p>300mm long blue cable with 4mm end stackable IEC banana plugs at each end. Is available as spare part for IEC's Electricity Kits.</p>																				
<p>BANANA PLUG-BANANA PLUG - 4MM STACKABLE - GREEN 300MM CABLE</p>	<p>PA0695-003</p>	<p>7.35</p>	<p>BANANA PLUG-BANANA PLUG - 4MM STACKABLE - RED 300MM CABLE</p>	<p>PA0695-004</p>	<p>7.35</p>																			
	<p>300mm long green cable with 4mm end stackable IEC banana plugs at each end. Is available as spare part for IEC's Electricity Kits.</p>			<p>300mm long red cable with 4mm end stackable IEC banana plugs at each end. Is available as spare part for IEC's Electricity Kits.</p>																				








<p>BANANA PLUG-BANANA PLUG - 4MM STACKABLE - YELLOW 300MM CABLE</p> <p>PA0695-005</p>	<p>7.35</p>	<p>TRANSFORMER FOR LOW VOLTAGE POWER SUPPLY LB2633-001</p> <p>PA4093-001</p>	<p>69.00</p>
 <p>300mm yellow 26cable with 4mm end stackable IEC banana plugs at each end. Is available as spare part for IEC's Electricity Kits.</p>		 <p>Transformer only, spare for <i>GENERAL PURPOSE POWER SUPPLY (LB2633-001)</i> and others. 240V / 2, 4, 6, 8, 10, 12V.AC. 6 Amp.</p> <p>NOTE: There are several Power Supplies in the IEC range that use this transformer.</p>	
<p>GEIGER TUBE – HOLDER CABLE – WITH MX168 TUBE FITTED</p> <p>PA1885-050</p>	<p>671.00</p>	<p>RECORDING TIMER PAPER ROLL – LARGE – 180M X 16MM</p> <p>PA2670-006</p>	<p>15.40</p>
 <p>Geiger Tube Holder with current model GM tube (PA1885-020) fitted, with cable & BNC plug, connected and tested. Ready to plug directly to any model of IEC Geiger Counter.</p> <p><i>Genuine IEC product.</i></p>		 <p>Recording Timer Paper Roll, large, 180m long x 16mm wide. White paper roll for marking with dots. A piece, long enough for the experiment, is normally torn off the roll and threaded through the paper guides on the platform with a carbon paper disc on top.</p>	
<p>RECORDING TIMER PAPER ROLL – WHITE – SMALL 30M X 16MM</p> <p>PA2670-005</p>	<p>3.30</p>	<p>RECORDING TIMER CARBON DISC (PACK/25)</p> <p>PA2670-007</p>	<p>4.40</p>
 <p>Recording Timer Paper Roll, small (as supplied as part of the Recording Timer Kit), 30m long x 16mm wide. White paper roll for marking with dots. A piece, long enough for the experiment, is normally torn off the roll and threaded through the paper guides on the platform with a carbon paper disc on top.</p>		 <p>Pack of 25 carbon paper discs for Recording Timer (either AC or DC). These discs are located on the platform, so a dot appears on the paper tape at the same rate as the hammer vibrates. They can be used numerous times before they are exhausted.</p> <p>The IEC Recording Timer permits the platform to be moved so a new part of the carbon disc can be used as required.</p>	
<p>RECORDING TIMER CARBON DISC (PACK/100)</p> <p>PA2670-008</p>	<p>13.50</p>	<p>PHOTO-ELECTRIC EFFECT SPARE GLOBE – QI – 12V 25-30W</p> <p>PA2043-004</p>	<p>4.50</p>
 <p>Pack of 100 carbon paper discs for Recording Timer (either AC or DC). These discs are located on the platform, so a dot appears on the paper tape at the same rate as the hammer vibrates. They can be used numerous times before they are exhausted.</p> <p>The IEC Recording Timer permits the platform to be moved so a new part of the carbon disc can be used as required.</p>		 <p>Lamp (globe), QI (Quartz Iodine or 'halogen') type, 12V x 25W, lateral filament lamp. Used in the current model IEC <i>PHOTOELECTRIC EFFECT / PLANCK'S CONSTANT APPARATUS.</i> (PA2341-002)</p>	

<p>PHOTO-ELECTRIC EFFECT – SPARE GRADUATED FILTERS SET</p> 	<p>PA2341-010</p>	<p>58.00</p>	<p>CHLADNI'S PLATES KIT – SPECIAL SAND – 1 KG BAG</p> 	<p>PA0855-002</p>	<p>22.90</p>
<p>Photoelectric Effect & Planck's Constant - set of 5 standard graduated filters to perform the required experiments. Each filter marked with the highest wavelength passed. The filters slide into the retainer at the rear of the instrument and these filters suit any model of Photoelectric Effect apparatus.</p>	<p>1kg bag of special sand for Chladni's Plate Kit (SW0855-001).</p> <p>IEC product.</p>				
<p>REPLACEMENT WHITE NON-CONDUCTIVE PAPER PACK OF 100 FOR DRY FIELD MAPPING</p> 	<p>PH0918DFMWHT</p>	<p>64.00</p>	<p>25 SHEET PRE-PRINTED CONDUCTIVE PAPER PAD - BLACK</p> 	<p>PH0918DFMBLK</p>	<p>39.50</p>
<ul style="list-style-type: none"> • Contains 20cm x 25cm grid for plotting electric fields (20 grids per page) • For use with other field mapping equipment • Each sheet of non-conductive paper measures 27.5 x 21.3 cm and is bound into a pad 	<p>Pad of replacement black pre-printed conductive pre-printed paper for Dry Field Mapping Kit (PH0918DFM).</p>				
<p>RADIOACTIVE SOURCE ALPHA POLONIUM 210</p> 	<p>PA2667-005</p>	<p>320.00</p>	<p>RADIOACTIVE SOURCE BETA STRONTIUM 90</p> 	<p>PA2667-010</p>	<p>320.00</p>
<p>Radioactive source, ALPHA, Polonium 210, low energy, suitable for classroom use, for study in radioactivity and absorbers.</p> <p>This source has a very short half-life of 135 days.</p> <p>NOTE: About 18 months after purchase, the item is useless for experiments. Therefore, we normally do not carry stocks of this item. This must be ordered in from our supplier. Allow 3-4 weeks for availability.</p>	<p>Radioactive source, BETA, Strontium 90, low energy, suitable for classroom use, for study in radioactivity and absorbers. Half-life is hundreds of years.</p> <p>Allow 3-4 weeks for availability.</p> <p>Instruction Sheet available.</p>				
<p>RADIOACTIVE SOURCE GAMMA COBALT 60</p> 	<p>PA2667-020</p>	<p>320.00</p>	<p>RADIOACTIVE SOURCE LEAD STORAGE 3MM THICK (HOLDS 4)</p> 	<p>PA2667-060</p>	<p>60.30</p>
<p>Radioactive source, GAMMA, Cobalt 60, low energy, suitable for classroom use, for study in radioactivity and absorbers. Half-life is hundreds of years.</p> <p>.Allow 3-4 weeks for availability.</p> <p>Instruction Sheet available.</p>	<p>For storing our radioactive sources</p> <p>Our products are for use in Laboratory or Educational setting only. Use under appropriate supervision.</p> <p>Instruction Sheet</p>				

FIRE PISTON – SPARE, COTTON WOOL & O-RING	FD FIREPIST-A	3.95	KINETIC GAS THEORY VIBRATION APPARATUS – SPARE POLYSTYRENE	PH0203A	5.00
Contains a pack of cotton wool & O-ring for use with the <i>FIRE SYRINGE</i> (Fire Piston).				Spare polystyrene for <i>KINETIC GAS THEORY VIBRATION APPARATUS</i> (PH0203)	
SPARE Q/I LAMP 12V 100W	PA2043-001	18.35	REPLACEMENT WIRES FOR 1.29M SONOMETER – PACK OF 6	PH0730A	26.00
	Lamp (globe), QI (Quartz Iodine or 'halogen') type, 12V x 100W, projector type lamp. Used in the IEC <i>VERY HIGH POWER LIGHT SOURCE</i> in housing HL2016-001 . Instruction Sheet included.				Spare / replacement wires for use with <i>SONOMETER</i> (PH0730). Pack of 6. Length each wire: 150cm. Steel wires: 22, 24 & 26 gauge Brass wires: 22, 24 & 26 gauge Looped ends, ready for use.
WIMSHURST MACHINE – SPARE BRUSH	AR1080620BRSH	8.00	WIMSHURST MACHINE – SPARE BELT	AR1080620BELT	6.00
Spare belt for <i>WIMSHURST ELECTROSTATIC GENERATOR</i> (AR1080620)				Spare belt for <i>WIMSHURST ELECTROSTATIC GENERATOR</i> (AR1080620)	
SPARE Q/I MICROSCOPE LAMP 12V 20W REFLECTOR TYPE	PA2043-010	15.40	CHLADNI'S PLATE VIOLIN BOW – SPARE	PA0855-003	79.80
	Lamp (globe), QI (Quartz Iodine or 'halogen') type, 12V x 20W, reflector type lamp. Used in the current model IEC Low Voltage Microscope Lamp. Instruction Sheet				Spare violin bow for Chladni's Plates Kit (SW0855-001)
TRANSFORMER FOR EHV POWER SUPPLY LB2615- 001 – LOW PROFILE	PA4093-402	122.00	TRANSFORMER FOR "TRIMODE" SIGNAL GENERATOR LB3758-001	PA4093-101	159.00
	Spare Transformer (only) spare for the IEC <i>EXTRA HIGH VOLTAGE (0-6,000V.DC) POWER SUPPLY LB2615-001</i> . This transformer is for the later model instrument with the sloping front panel. It is a low-profile transformer and is mounted from the rear panel by a flat strip. The old model is a normal design transformer and is foot mounted.				Transformer only, spare for the IEC <i>'TRI-MODE' SIGNAL GENERATOR</i> . Powers the power supply, the signal generator and the audio amplifier.
BULB (LAMP) HOLDER – SPARE FOR BKE (BEK) KITS	BKE1	6.75	RHEOSTAT – SPARE FOR BKE (BEK) KIT	BKE3	10.75
	A basic electricity kit (BEK) lamp holder. Fits screw in torch bulbs. Robust and low cost and is for use with a battery (low-wattage). Not suitable for use with a power supply. Base size dimensions: 30 x 60 mm. Fits 4 mm banana plugs or alligator clips.				Robust rheostat with a 11-Ohms coil mounted on a rectangular plastic base 30 x 60 mm with 4 mm sockets fitted and is for use with a battery (low-wattage). Not suitable for use with a power supply. Alligator clips can also be connected to the metal 4 mm socket barrels if required.

<p>BATTERY (CELL) HOLDER – SPARE FOR BKE (BEK) KIT</p>	<p>BKE2</p>	<p>7.85</p>	<p>PUSH SWITCH – SPARE FOR BKE (BEK) KIT</p> <p>BKE4</p>	<p>7.95</p>
 <p>Two component battery cell holder for use with Eisco Elementary and Basic Electricity Kit. Battery not included. Mounted on high quality plastic blue base with two 4mm sockets. When combined with elementary basic electricity kit, provides an introduction to basic circuitry for young students. Can be used (in conjunction with other items) to show the principles of lighting a lamp, using a switch, lamps in series and parallel, using motors, heat from electricity and more.</p>			 <p>A robust 'Push-on/release off' switch with 4 mm sockets and is for use with a battery (low-wattage). Not suitable for use with a power supply.</p> <p>Spare components for BEK kits. Components are mounted on bright blue base.</p>	
<p>UNIVERSAL CLIP – SPARE FOR BKE (BEK) KIT</p>	<p>BKE5</p>	<p>7.95</p>	<p>ELECTRODE HOLDER – SPARE FOR BKE (BEK) KIT</p> <p>BKE6</p>	<p>5.35</p>
 <p>This Universal Clip comprises a blue plastic base 30 x 60 mm with two 4 mm sockets. Two alligator clips are supplied which attach to the 4mm sockets and stand vertically.</p> <p>Can be used for a variety of uses such as clipping electronic components or attaching different materials to check if they conduct electricity.</p>			 <p>Spare electrode holder for BKE kits. 4mm sockets mounted on a sturdy blue base 30 x 60mm.</p>	
<p>CHANGEOVER SWITCH – SPARE FOR BKE (BEK) KIT</p>	<p>BKE7</p>	<p>7.00</p>	<p>MOUNTED MOTOR – SPARE FOR BKE (BEK) KIT</p> <p>BKE8</p>	<p>9.75</p>
 <p>'Push-on/release off' switch with 4 mm sockets. Robust and is for use with a battery (low-wattage). Not suitable for use with a power supply.</p>			 <p>A simple electric motor mounted on a solid plastic base 30 x 60 mm. Suitable for BEK kits. 4 mm sockets fitted for ease of connecting to power source. For use with a battery (low-wattage). Not suitable for use with a power supply.</p>	
<p>MOUNTED BUZZER – SPARE FOR BKE (BEK) KIT</p>	<p>BKE9</p>	<p>9.75</p>	<p>CARBON ROD – SPARE FOR BKE (BEK) KIT</p> <p>BKE10</p>	<p>5.80</p>
 <p>A simple 6-volt buzzer mounted on a 60 x 30 mm plastic base fitted with 4 mm banana sockets.</p> <p>Alligator clips can be attached to the metal 4 mm banana socket barrel if preferred. Ideal for basic electrical experiments</p>			 <p>Spare carbon rod for BKE kits.</p>	

“HODSON MOTOR KIT” SPARE PARTS

<p>ROLL OF WIRE – BLACK PA2193-211</p>  <p>Small reel of black “bell wire” -0.5mm dia. For winding rotor coils.</p>	<p>6.90</p>	<p>ROLL OF WIRE – RED PA2193-212</p>  <p>Small reel of red “bell wire” -0.5mm dia. For winding rotor coils.</p>	<p>6.90</p>
<p>ROTOR (ARMATURE) 2 HALVES PA2193-270</p>  <p>Motor Kit, 'Hodson' type - 2 plastic parts used to form the motor armature.</p>	<p>2.75</p>	<p>“U” SHAPED BRACKET PA2193-260</p> 	<p>4.29</p>
<p>RUBBER RING PA2193-230</p>  <p>'Hodson' type Motor Kit, rubber ring, for forming the commutator. The rings hold the bare ends of the rotor winding tightly to the central boss to form the commutator.</p>	<p>0.77</p>	<p>MAGNET ONLY PA2193-210</p>  <p>Motor Kit, 'Hodson' type, ceramic magnet only, 50x22x6mm LxWxTh. Each motor kit is supplied with 2x magnets to create the field for the motor to run.</p>	<p>2.42</p>
<p>RUBBER BAND SIZE 32 PA2193-240</p>  <p>'Hodson' type Motor Kit, rubber band to hold end plates to 'U' bracket.</p>	<p>0.66</p>	<p>ROTOR SHAFT PA2193-220</p> <p>'Hodson' type Motor Kit, rotor shaft, accepts the rotor and locates into the 2x end mouldings.</p>	<p>1.98</p>

MOTORS

ELECTRIC MOTORS

CODE

MOT12

MOT12W

MOTJ2

MOTJ2W

MOT17AM*

MOT22*

MOT22W*

MOT30*

GENDC



SPECIFICATIONS

Operating range (Volts)		1.5-4.5		1.5-6.0		3.0-12.0		1.5-4.5		4.5-6.0		1.5-9.0
No load current	RPM	15,500		6,700		11,800		9,000		13,600		2,600
	Amps	0.32		0.12		0.30		0.16		0.28		0.025
Under load at Max efficiency	RPM	11,900		4,450		9,350		7,350		11,350		2,100
	Amps	1.01		0.27		1.04		0.83		1.38		0.089
	Torque-g.cm	10.0		8.1		17.5		13.6		29.7		11.0
Testing voltage		3.0V		3.0V		3.0V		3.0V		4.5V		6.0V

DIMENSIONS

Body size (O.D.) / across flat (mm)		20.0 / 15.0		20.0 / 15.0		23.8		24.0/18.3		30.0		32.0
Body length (mm)		25.0		25.0		26.9		26.9		24.0		20.0
Shaft dia. & length (mm)		2.0 / 7.7		2.0 / 7.7		2.0 / 6.9		2.0 / 6.3		2.0 / 9.5		2.0 / 11.0
Weight (grams)		17	20	17	20	28	28	31	41	43		
Wire lengths (mm)		N/A	120mm	N/A	120mm	N/A	N/A	120mm	N/A	N/A		
Price per pack of 5 (no. of packs)	1-4	12.24	13.08	12.24	13.08	13.25	13.08	13.88	20.24	19.24		
	5-10	12.10	12.94	12.10	12.94	13.08	12.94	13.80	18.89	17.67		
	11-20	11.95	12.78	11.95	12.80	12.94	12.80	13.63	17.67	16.74		
	21+	11.88	12.62	11.80	12.62	12.78	12.62	13.47	16.38	16.07		

*Two screws supplied with these motors.

MORE POWERFUL MOTORS - SUITABLE FOR BOTH CAR & BOAT (Refer to the SOLAR CHALLENGE Catalogue for more details)



MODEL	CODE	MODEL	CODE		
ST-403 T1	SM403	FAULHABER 2232	SMFAU		
SPECIFICATIONS		SPECIFICATIONS			
Efficiency	67%	Efficiency	87%		
Operating range (Volts)	6.0 V	Operating range (Volts)	Nom. 6.0 V		
No load current	RPM	9,000	No load current	RPM	7,100
	Amps	0.17		Amps	1.83
Under load at Max efficiency	RPM	7,790	Under load at Max efficiency	RPM	6,600
	Amps	1.1		Amps	1.83
	Torque	51g.cm		Torque	62
Testing voltage	6.0 V	Testing voltage	6.0 V		
DIMENSIONS		DIMENSIONS			
Body size (O.D.) /length (mm)	32.0/29.0	Body size (O.D.) /length (mm)	22.0/32.2		
Shaft dia. & length (mm)	2.0/8.5	Shaft dia. & length (mm)	2.0/6.0		
Weight (grams)	76.5	Weight (grams)	62		
PRICE		PRICE			
	9.50		127.28		





SERVO MOTORS

ITEM NAME	CODE	PRICE (each)	ITEM NAME	CODE	PRICE (each)
SERVO MOTOR MG995-180 DEGREES	SERVO995-180	19.78	SERVO MOTOR SG90	SERVOSG90	5.28
	Operating Speed: 0.17sec/60 degrees (4.8V no load) Operating Speed: 0.13sec/60 degrees (6.0V no load) Stall Torque: 9kg-cm (180.5 oz.-in) at 4.8V Stall Torque: 12kg-cm (208.3 oz.-in) at 6V Operation Voltage: 4.8 – 7.2Volts 180 degrees operation Dimension: 40mm x 19mm x 43mm Weight: 55g			This 9g micro servo can rotate 180 degree (90 degrees in either direction). Includes servo horns and mounting screws.	

MOTOR MOUNT PLATES

ITEM NAME	CODE	Qty.	PRICE	ITEM NAME	CODE	Qty.	PRICE
PLATE – MOTOR MOUNT	MMPLHP	5	3.75	MOTOR MOUNT - ADJUSTABLE - SM403	MMPL403	1	1.70
	Motor mount plate ideal for motors: <i>MOT17, MOT22 and MOT30.</i>				Adjustable motor mount plate for solar motor <i>SM403</i> . (This motor mount plate will also be available as a motor mounting kit with and without the <i>SM403</i> motor – See “Solar Challenge Kits” for more details)		


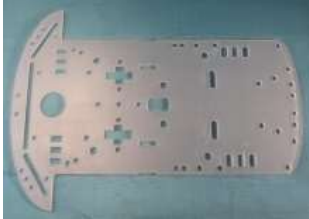

MOTOR MOUNT KIT











ITEM NAME	CODE	PRICE (each)
BUGGY MOTOR MOUNT KIT (FOR TT MOTOR)	BUGMOTMNT	2.28
	This mounting bracket is specifically designed to hold the yellow buggy motors (TT Geared Motor) (code: BUGMOT). Each bracket comes with four bolts and two nuts for installation. Material: Rigid aluminum alloy Length: 22.5mm Width: 15.5mm Thickness: 5mm Mount hole dimensions: 3mm Bolts: 3 x 30mm and 3 x 8mm	

NOTE: Scorpio Technology has motor mounting kits and motor & mounting kits for the Faulhaber 2232 (**SMFAU**) and ST-403 T1 (**SM403**) motors. These are located in the **SOLAR CHALLENGE KITS** section.




MECHANICAL COMPONENTS

MOTOR, WHEEL & CHASSIS (suit *Robot Buggy & Buggy 2WD Robot*)








		PRICE (each)				
ITEM NAME	CODE	1-99	100+	ITEM NAME	CODE	PRICE (each)
BUGGY MOTOR	BUGMOT	5.34	4.34	BUGGY CHASSIS	BUGCHAS	4.20
	Yellow motor with 2 flats shafts; Operating voltage 3-12VDC; Gear Ratio 1:48; Load current 70mA; L=65mm, W=37mm, H=22mm				Replacement chassis suitable for the <i>ROBOT BUGGY & BUGGY 2WD ROBOT</i> . Construction Material: Plastic	
BUGGY WHEEL & MOTOR	BUGWANDM	7.70	6.85			
	Yellow motor (specs. as above) Yellow plastic wheel: D=68mm, W=30mm					


BATTERY HOLDERS		Qty./ Pack	Price per Pack				ITEM NAME	CODE	Qty./ Pack	Price per Pack			
			1-4 Pkts.	5-9 Pkts.	10-19 Pkts.	20+ Pkts.				1-4 Pkts.	5-9 Pkts.	10-19 Pkts.	20+ Pkts.
ITEM NAME	CODE												
CLIP-ON BATTERY CONNECTOR	BCLIP	5	4.02	3.78	3.54	3.37	BATTERY HOLDER – 4 X AA	BH4AA	5	8.30	8.08	7.38	7.08
	Fits 9V Battery With Wires							Fits 4 x AA Batteries With Wires					
BATTERY HOLDER – 9V - FLAT	BH9VF	5	16.76	15.78	14.82	13.87	BATTERY HOLDER – 4 X AA - FLAT	BH4AAF	5	17.84	16.37	14.99	13.74
	With Cover On-Off Switch Fits one 9V Battery With Wires							With Cover On-Off Switch Fits 4 x AA Batteries With Wires					
BATTERY HOLDER – 1 X AA	BH1AA	5	6.46	6.31	6.10	5.74	BATTERY HOLDER – 6 X AA	BH6AA	5	9.37	8.68	8.12	7.91
	Fits 1 x AA Battery With Wires							Fits 6 x AA Batteries With Wires					
BATTERY HOLDER – 2 X AA	BH2AA	5	6.58	6.47	6.10	5.99	BATTERY HOLDER – 8 X AA	BH8AA	5	15.00			
	Fits 2 x AA Batteries With wires							Fits 8 x AA Batteries With wires					
BATTERY HOLDER – 2 X AA – FLAT	BH2AAF	5	15.93	14.61	13.37	12.27	BATTERY HOLDER – 3 X AA	BH3AA	5	7.47	7.24	6.74	6.50
	With Cover On-Off Switch Fits 2 x AA Batteries With Wires							Fits 3 x AA Batteries With Wires					

BATTERY HOLDER – 4 XAAA	BH4AAA	5	7.85	7.62	7.03	6.75	BATTERY HOLDER – 3 X AA – FLAT	BH3AAF	5	17.84	16.37	14.99	13.74
	Fits 4 x AAA Batteries With Wires							On-Off Switch Fits 3 x AA Batteries With Wires					
BATTERY HOLDER – 2 X AAA - FLAT	BH2AAAF	5	21.00	20.50	18.50	---	BATTERY HOLDER – 2 X AAA	BH2AAA	5	6.45	6.35	6.00	5.90
	On-Off Switch Fits 2 x AAA Batteries. With Wires							Fits 2 x AAA Batteries With Wires					
BATTERY HOLDER – 1 X D	BH1D	5	8.76	8.41	8.08	7.75	BATTERY HOLDER – D – STACKABLE	BHSTKD	1	4.07			
	Fits 1 x D Battery with Wires							Fits 1 X D Battery Stackable In Series & Parallel Circuits No Wires					
BATTERY HOLDER – LITHIUM ION	BHLIT	5	12.77	11.91	11.28	11.13	BATTERY HOLDER – 4 X AA WITH SWITCH & 2.1MM DC PLUG	BH4AAUNO	1	6.65			
	Fits 1 x Lithium Ion Battery No Wires							Fits 4xAA Batteries With cover and On- Off switch. Arduino compatible DC Cable 2.1mm plug (centre positive). 150mm cable					
BATTERY HOLDER – 2 X C	BH2C	5	11.12	10.47	9.96	9.47	BATTERY HOLDER – 6 X AA WITH SWITCH & 2.1MM DC PLUG	BH6AAUNO	1	7.74			
	Fits 2 x C Batteries With Wires							Fits 6xAA Batteries With cover and On- Off switch Arduino compatible DC Cable 2.1mm plug. 150mm cable					

<p>CLIP-ON BATTERY CONNECTOR – 9V - 2.1MM DC CABLE PLUG 0.3M</p> <p>BCLIPUNO</p>	<p>1</p>	<p>5.95</p>	<p>BATTERY HOLDER - 2 X 18650 RECHARGEABLE BATTERIES</p> <p>BH2R18650</p>	<p>1</p>	<p>5.95</p>
 <p>9V battery snap to centre positive 2.1mm DC connector lead. Arduino compatible. Plug type: 5.5 x 2.1mm DC Cable length: 300mm</p>			 <p>Fits 2 x 18950 batteries. 150mm leads. Ideal for Arduino® projects or any on-board power storage applications. Suitable for case mounting too. Constructed of ABS Plastic</p>		
<p>LILYPAD COINCELL CR2032 BATTERY HOLDER MOUNT MODULE</p> <p>BHCR2032LP</p>  <p>Has a small slide switch installed on the board, in-line with the power so you can shut off your project and save battery power. This slide switch is the same as on the LilyPad Slide Switch Board.</p> <p>Holds a CR2032 coin cell battery & gives you four connection points (two positive and two negative) for sewing into your project. Dimensions: 2.9x2.8x0.58mm.</p>	<p>1</p>	<p>3.48</p>			


BATTERIES

ITEM NAME	CODE	Qty. Per Pack	PRICE	ITEM NAME	CODE	Qty. Per Pack	PRICE
AA BATTERY 	BATTAA	4	3.90	"N" TYPE BATTERY 	BATTN	2	2.27
Heavy Duty Toshiba				Alkaline. NOTE: Clearance item. Best before date on pack 10/2020.			
AA ALKALINE BATTERY	BATTALK	4	4.90	3.6V LITHIUM ION BATTERY 	BATTL3.6	1	5.90
AA ALKALINE BATTERY (40)	BATTALK40	40	29.64	Rechargeable Buttoncell 3.6V			
AAA ALKALINE BATTERY	BATTA3A	4	4.90				
AAA ALKALINE BATTERY (40)	BATTA3A40	40	29.64	D BATTERY 	BATTD	2	3.60
	Alkaline			Heavy Duty Toshiba			
	(BRANDS MAY VARY FROM THOSE ILLUSTRATED)			9V BATTERY 	BATT9	1	3.90
				9V Heavy Duty			
BATTERY 18650 RECHARGEABLE LI-ION 2600MAH 3.7V	BATTR18650					1	25.95
	18650 Li-Ion battery, commonly used in LED torches. Specifications DC Voltage : 3.7V Dimensions: 65 x 18 mm UN Number : 3480 Battery Chemical Composition : Lithium Ion						
	NOTE: For shipment by road transport only.						
	NOTE: This is an unprotected rechargeable lithium battery (Li-Ion or LiFePO4) which is only suitable for use in a compatible device/charger. Use of a unprotected cell where a protected cell is expected is very dangerous, please review your product's user manual before proceeding.						



CR2032 LITHIUM BUTTON CELL BATTERY – MAXELL	BATT CR2032-5	5	10.85
	<p>Blister pack of 5 CR2032 lithium button cell batteries. These are commonly used in: watches, clocks, calculators, toys, cameras, and many other electronic devices. For use with the LilyPad Coin Cell Battery Holder CR2032 Battery Mount Module. Suitable for use with Paper Circuits.</p> <p>Voltage: 3V Nominal Capacity: 225 mAh Diameter: 20mm Height: 3.2mm Lithium MnO2.</p>		

Batteries & packaging supplied may vary from those illustrated.



BATTERY CHARGERS

BATTERY CHARGER FOR RECHARGEABLE LI-ION / NI-CH / NI-CD BATTERIES	BATT CHGLI-NI	1	32.95
 <p>Downloadable Manual available</p>	<p>This PowerTech product is available as a single cell or twin cell charger. Just about any cylindrical lithium ion battery can be recharged by this unit thanks to the spring loaded terminals. Powered by USB, so no mains power is required. Automatic battery detection to determine if 500mA or 1000mA charge current is required. USB power cable included.</p> <ul style="list-style-type: none"> • 5VDC 1A Input Power • 4.2VDC Charge Output • Short Circuit and Reverse Polarity Protection <p>Length: 100 x 60 x 28mm - 0.06kg. USB Input Current: 2.0V Charger Output Current : 500mA, 1000mA Connection Type : Contact Plate Reverse Polarity Protection</p> <p>The following batteries supported by this unit include: 10440 / 14500 / 16340 / 17335 / 17670 / 18490 / 18650 / 22650 / 26500 / 26650 / RCR123A</p> <p>Type of Batteries: Lithium Ion, Nickel Metal Hydride (Ni-MH), Nickel Cadmium (Ni-Cad) Cell Type(s) Charged : 10440, 14500, 16340, 18650, 20700, 22650, 26650, AA, AAA, C, Sub-C, 17335, 17670, 18490, 26500, A, AAAA</p>		





BATTERY TESTERS



ITEM NAME	CODE	PRICE	ITEM NAME	CODE	PRICE
 <p>This all-in-one handy unit will test all types of batteries currently out there on the market including standard AA/AAA/C/D/9V batteries, button cells and lithium batteries such as those used in digital cameras. The LCD display indicates the level of capacity.</p>	BAT TEST	32.95	 <p>BATTERY, BULB AND FUSE TESTER</p>	BAT TESTBF	15.95
			<p>Battery tester with fuse and bulb checker. Tests AAA, AA, C, D (1.5V) & 9V batteries and indicates their power level on the easy-to-read, colour-coded analogue display. It checks bulbs and fuses, giving a 'good' or 'replace' indication, and will also test larger 1.5V button batteries like the LR-44.</p> <p>There is also a handy compartment to store spare fuses, bulbs and button cells. 150mm long.</p>		









O-RINGS

ITEM NAME	CODE	Diameter	Cross Section	Qty. Per Pack	PRICE
O-RINGS USED AS BELTS					
BELT O-RING 45.5 X 1.5MM	ORING	45 mm	1.5 mm	10	5.39
O-RING 78.99 X 1.78MM	ORING79	79 mm	1.8 mm	10	6.04
	NOTES: <i>ORING</i> – As used in the <i>BELT DRIVEN CAR (BELTCAR & BELTCAR-NS)</i> .				
O-RINGS USED AS TYRES					
O-RING 5.28 X 1.78MM	ORING5.3	5.3 mm	1.8 mm	10	3.23
O-RING 50 X 4.0MM	ORING50X4	50 mm	4.0 mm	10	7.14
BELT O-RING 55 X 1.5MM	ORING55	55 mm	1.5 mm	10	5.39
	NOTES: <i>ORING50</i> fits the 50mm pulley (<i>PU50</i>). <i>ORING55</i> – is also used as a tyre for Solar Wheels with grooves (<i>SW70A-GR</i> and <i>SW70E-GR</i>).				

PULLEYS

ITEM NAME	CODE	Colour	Hole diameter	Groove diameter	Qty. per pack	PRICE
PULLEY 5.5MM	PU5.5	Black	1.9 mm	5.5 mm	10	14.65
PULLEY 5.5MM WHITE	PU5.5W	White	1.9 mm	5.5 mm	10	14.65
	Press fits onto 2mm motor shaft. Hole can be drilled to 2.4mm diameter to suit the 2.5mm rod Colours available: Black or White					
PULLEY 10MM	PU10	White	1.9 mm	10 mm	10	15.80
	Press fits onto 2mm motor shaft. Hole can be drilled to 2.4mm diameter to suit the 2.5mm rod					
PULLEY 30MM	PU30	Black	2.4 mm	30 mm	10	17.95
PULLEY 30MM WHITE	PU30W	White	2.4 mm	30 mm	10	17.95
	Press fits onto 2.5mm steel rod. Hole can be drilled to 2.9mm diameter to suit the 3.0mm rod Colours available: Black or White					
PULLEY 50MM	PU50	White	2.4 mm	50 mm	10	21.80
	Press fits onto 2.5mm steel rod. Hole can be drilled to 2.9mm diameter to suit the 3.0mm rod					

ITEM NAME	CODE			
	PULLEY – SINGLE PLASTIC, BALL BEARING TANDEM	PUPH281A	Open sided frame, with hooks at each end carrying three ball bearing pulleys with 25mm, 38mm & 50mm diameter. The open side frame greatly facilitates stringing up as no 'threading' is involved.	5.45
	PULLEY – DOUBLE PLASTIC, BALL BEARING TANDEM	PUPH281B		8.75
	PULLEY – TRIPLE PLASTIC, BALL BEARING TANDEM	PUPH281C	Sold separately.	12.00
	PULLEY – SINGLE-IN-LINE, PLASTIC	PUPA80	Economical pulleys perfect for students use. They come with steel frames, brass axles, wide hubs and rigid plastic free-running sheaves. Sheaves on single axle pulleys are 50 mm in diameter. All pulleys feature steel hooks at each end.	4.30
	PULLEY – DOUBLE-IN-LINE, PLASTIC	PUPA81		5.40
	PULLEY – TRIPLE-IN-LINE, PLASTIC	PUPA80A	Sold separately.	6.60

ITEM NAME	CODE	PRICE	ITEM NAME	CODE	PRICE
PULLEY – 50MM DIA. – ON STRAIGHT ALLOY ROD	MF2600-001	20.35	PULLEY – 50MM DIA. – ON OFFSET ALLOY ROD	MF2600-020	20.35
	Held in place by the <i>BENCH CLAMP (LB0858-001)</i> or by a retort stand and boss head. This 50mm diameter nylon pulley is fixed to the end of an 20mm long x 8mm diameter anodised rod. The rod supporting the pulley is straight in one plane, but edgewise the rod is offset so that the pulley groove is in line with the rod. Genuine IEC product. Instruction sheet included.			Held in place by the <i>BENCH CLAMP (LB0858-001)</i> or by a retort stand and boss head. This 50mm diameter nylon pulley is fixed to the end of an 20mm long x 8mm diameter anodised rod. The pulley can be brought down to a very low position for use with cords passing over the edge of benches. The rod supporting the pulley is bent in one plane, but edgewise the rod is offset so that the pulley groove is in line with the rod. <i>Genuine IEC product.</i> Instruction sheet included.	
PULLEY WITH UNIVERSAL CLAMP – LARGE	PUCLAMP70	32.00	LARGE VERTICAL PULLEY ON BENCH CLAMP	PUCLAMP	19.10
	Large 70mm light alloy pulley with universal bench clamp. Can be clamped onto edge of bench up to 3.75cm thick, or screwed to flat surface or on 13mm diameter support rod. (Item supplied may differ slightly from illustration)			70mm metal pulley on bench clamp. (RUN OUT STOCK - LIMITED QUANTITIES)	
PULLEY SINGLE BENCH MOUNT	PH0290A	15.00	ADJUSTABLE PULLEY CLAMP – METAL	PH0297A	32.00
	Bench mounting, aluminium 50 mm diameter pulley, in metal frame for clamping to benches or boards up to 28 mm thick.			Sturdy, metal clamp pulley that can be used to demonstrate a wide variety of mechanics principles. The metal sheave is 5 cm in diameter and can be adjusted from flush with the tabletop to 13 cm above it. Pulley can be rotated to 360° to suit any experimental setup. Adjustable to 22.5cm height with 4.75cm maximum clamp opening.	
SPARE ADJUSTABLE PULLEY ON ROD	PH0297C	12.50	DIFFERENTIAL PULLEY – 4 STEP	PH0282D	21.00
	Spare pulley on rod suitable for ADJUSTABLE PULLEY CLAMP – METAL (PH0297A) . Sturdy, metal constructed clamp pulley can be used to demonstrate a wide variety of mechanics principles. The metal sheave is 5 cm in diameter			4 step differential pulley. 20, 30, 40, 60 mm diameter steps. 16.25cm total length. Ideal for classroom demonstrations pertaining to mechanical advantage. Each step has a gap of about 5mm. The 1.87cm diameter post attaches easily to any stand and rod assembly. NOTE: Clamps not included.	

ELECTRIC MOTOR &
GENERATOR WITH 2-STEP
PULLEY








EM1760-001

59.00




A base mounted small DC motor with 2-step pulley used for experimentation, such as measuring electrical work done and comparing it with mechanical work done. A robust, small DC motor mounted on a compact base with 4mm socket head terminals. Motor is fitted with small metal 2 step pulley with large grooves for winding cotton or other fine threads, as weights are hoisted from the floor. The motor may be connected to a 3V DC (max) power source. Product dimensions (approx.): 110 x 65 x 39 mm; 0.1 kg. *Genuine IEC product.*

PROPELLERS


ITEM NAME	CODE	Usage	Type	Diameter	Hole Size	Qty per Pack	PRICE	
74MM PROPELLER	PROP74	Aero	2 Blade	74 mm	1.9 mm	10	12.17	
								
P128 PROPELLER	PROP128	Aero	2 Blade	128 mm	1.9 mm	10	14.15	
								
147MM PROPELLER	PROP147	Aero	2 Blade	147 mm	1.9 mm	10	15.85	
								
2 BLADE PROPELLER	PROP2	Boat	2 Blade	28 mm	2.4 mm	10	16.45	
								
3 BLADE PROPELLER	PROP3	Boat	3 Blade	25 mm	2.4 mm	10	16.45	
								
4 BLADE PROPELLER YELLOW	PROP460	Aero	4 Blade	60 mm	1.9 mm	5	8.65	
								
ITEM NAME		CODE	Usage	Type	Diameter	Hole Size	Qty per Pack	PRICE
3 BLADE PROPELLERS								
	3 BLADE PROPELLER BLUE	PROP380BL	Aero	3 Blade	80 mm	1.9 mm	5	8.65
	3 BLADE PROPELLER GREEN	PROP380G	Aero	3 Blade	80 mm	1.9 mm	5	8.65
	3 BLADE PROPELLER RED	PROP380R	Aero	3 Blade	80 mm	1.9 mm	5	8.65

PROPELLER SHAFTS, AXLES, GUIDE TUBES & COUPLING

AXLE / PROPELLER SHAFTS

	ITEM NAME	CODE	Rod O.D.	Rod Length	Qty. per Pack:	PRICE	Qty. per Pack:	PRICE
	STEEL ROD 2.5MM X 500MM	STR2.5	2.5 mm	500 mm	5	4.05	20	14.50
	CARBON FIBRE ROD 2.5MM X 650MM	CFR	2.5 mm	650 mm	5	21.70	-----	N/A
	FIBREGLASS ROD 3.0MM X 500MM	FIBGRD500	3.0 mm	500 mm	5	7.30	20	24.45
	CARBON FIBRE ROD 3.0MM X 650MM	CFR3	3.0 mm	650 mm	5	25.50	-----	N/A
	CARBON FIBRE TUBE (3.0 -3.5MM ID)	CFT	6.0 mm	650 mm	5	40.95	-----	N/A


GUIDE TUBES FOR AXLE / PROPELLER SHAFTS

	ITEM NAME	CODE	Notes	Tube I.D.	Tube Length	Qty. per Pack:	PRICE
	GUIDE TUBE 500MM WHITE	GUIDW	Suit 2.5mm steel rods.	2.7 mm	500 mm	5	7.30
	GUIDE TUBE 500MM WHITE	GUIDW20		2.7 mm	500 mm	20	26.80
	GUIDE TUBE 500MM GREY	GUIDG	Suit 3.0mm steel rods.	3.2 mm	500 mm	5	8.80
	GUIDE TUBE 500MM GREY	GUIDG20		3.2 mm	500 mm	20	31.95
	GUIDE TUBE 500MM YELLOW	GUIDY	Larger inner diameter so that drive line bearings can be used for the 2.5mm steel rods.	4.5 mm	500 mm	5	10.20
	GUIDE TUBE 500MM YELLOW	GUIDY20		4.5 mm	500 mm	20	39.00






AXLE / PROPELLER SHAFTS & TUBE

ITEM NAME	CODE	Notes	Rod O.D.	Rod Length	Tube I.D.	Tube Length	PRICE
STEEL ROD & GUIDE TUBE WHITE	SRGTW	Pack consists of 5 Steel Rods & 5 White Guide Tubes.	2.5 mm	500 mm	2.7 mm	500 mm	10.35
STEEL ROD & GUIDE TUBE YELLOW	SRGTY	Pack consists of 5 Steel Rods & 5 Yellow Guide Tubes. Larger inner diameter so that drive line bearings can be used for the steel rod.	2.5 mm	500 mm	4.5 mm	500 mm	13.10
CARBON FIBRE ROD & GUIDE TUBE YELLOW	CFGTY	Pack consists of 5 Carbon Fibre Rods & 5 Yellow Guide Tubes. Larger inner diameter so that drive line bearings can be used for the steel rod.	2.5 mm	650 mm	4.5 mm	500 mm	29.90
FIBREGLASS ROD & GUIDE TUBE GREY	FGRGTG	Pack consists of 5 3.0mm Fibreglass Rods & 5 Grey Guide Tubes.	3.0 mm	500 mm	3.0 mm	500 mm	15.00
CARBON FIBRE ROD & GUIDE TUBE GREY	CF3GTG	Pack consists of 5 3.0mm Carbon Fibre Rods & 5 Grey Guide Tubes.	3.0 mm	650 mm	3.2 mm	500 mm	32.40


COUPLING

ITEM NAME	CODE	Colour	Material	I.D.	O.D.		PRICE PER METRE	
COUPLING 1.3/3.3	COUP1.3	Transparent	Silicon Rubber Tube	1.3 mm	3.3 mm	Will fit on a 2.0mm motor shaft (as used in <i>ROBOBUG</i>).	7.00	
COUPLING 1.8/3.8	COUP1.8	Grey	Silicon Rubber Tube	1.8 mm	3.8 mm	1mm wall thickness. For use with 2.0mm motor shafts – to join the 2.0mm motor shaft to the 2.5mm propeller shaft.	7.00	
COUPLING 1.8/2.8	COUP1.8/0.5	Grey	Silicon Rubber Tube	1.8 mm	2.8 mm	0.5mm wall thickness. For use as per COUP1.8 (this has a thinner wall thickness).	5.70	
COUPLING 2.0/4.0	COUP2Y	Yellow	Silicon Rubber Tube	2.0 mm	4.0 mm	For use with shafts 2.2mm and larger – to join two shafts together (e.g. 2.5mm & 3.0mm shafts).	7.85	
								

BEARINGS

ITEM	CODE	Description	Outer Diameter	Flange Diameter	Bore Diameter	Width	Qty. per pack	PRICE
	BEAR7	Single row, unsealed ball races.	7.0 mm	---	3.0 mm	2.0 mm	10	39.30
	BEAR10	Single row, unsealed ball races.	10.0 mm	---	3.0 mm	4.0 mm	10	39.45
	BEAR10F	Single row, unsealed ball races.	10.0 mm	11.2 mm	6.0 mm	3.0 mm	10	41.30
	BEARBT	Driveline bearing. Used with yellow guide tube (GUIDY) to reduce friction & reduce power consumption. <i>(See Appendix C: Solar Challenge for details).</i>	4.3 mm	6.0 mm	2.6 mm	7.0 mm	10	7.80
	BEAR10/3F	Suitable for use with the 3mm fibreglass (FIBGRD500) or 3mm Carbon fibre (CFR3) rods OR with BOLT3X40 and the Guide Roller (GUIDEROLLER).	10.0 mm	11mm	3.0mm	3.0 mm	10	38.60

GUIDE ROLLERS

ITEM	CODE	Description	Qty. per pack	PRICE
	GUIDEROLLER	25mm diameter x 9mm high. Hole that will take 2 x 10mm flanged bearings with a 0.5mm thick washer between the bearings. NOTE: If the bearings in the guide rollers will be bolted, a half millimetre spacer may be required to avoid the bearings being crushed.	4	9.63



GEARS

The GEARS have a number of different hole sizes to suit different usages:

- Spur gears have a second (smaller) gear. For clarity all spur gears have the number of teeth listed for both larger and smaller gears
- Only the brass pinion gears listed should be used with the Faulhaber motors (Code: **SMFAU**). Plastic pinion gears are press-fit and are **not** recommended to use Faulhaber motors due to the risk of damage to the motor.



GEARS – 1.9 MM HOLE

The white gears with the 1.9 mm dia. hole are a press fit on to the 2.0mm diameter electric motor shaft.

	ITEM NAME	CODE	Gear Type	Qty per pack	PRICE	Qty. per pack	PRICE
	WORM GEAR	GEARWORM		10	10.09	50	24.76
	GEAR 8T X 1.9	GEAR8/1.9	Pinion	10		50	
	GEAR 9T X 1.9	GEAR9/1.9	Pinion	10		50	
	GEAR 10T X 1.9	GEAR10/1.9	Pinion	10		50	
	GEAR 12T X 1.9	GEAR12/1.9	Pinion	10		50	

GEARS – 2.4 MM HOLE

- The white gears with the 2.4 mm dia. hole are a press fit on to the 2.5mm diameter steel rod.
- 12T / 2.4 mm hole Pinion gears are very useful to use as retainers on a 2.5mm rod.


	ITEM NAME	CODE	Gear Type	Qty per pack	PRICE	Qty. per pack	PRICE
	GEAR 12T X 2.4	GEAR12/2.4	Pinion	10	10.09	50	24.76
	GEAR 18T X 2.4	GEAR18/2.4	Pinion	10		50	
	GEAR 22T X 10T X 2.4	GEAR22/10/2.4	Spur	10	10.18	50	25.00
	GEAR 30T X 10T X 2.4	GEAR30/10/2.4	Spur	10		50	
	GEAR 30T X 12T X 2.4	GEAR30/12/2.4	Spur	10		50	
	GEAR 40T X 10T X 2.4	GEAR40/10/2.4	Spur	10		50	
	GEAR 40T X 12T X 2.4	GEAR40/12/2.4	Spur	10		50	
	GEAR 50T X 10T X 2.4	GEAR50/10/2.4	Spur	10		50	
	GEAR 50T X 14T X 2.4	GEAR50/14/2.4	Spur	10		50	
	GEAR 60T X 10T X 2.4	GEAR60/10/2.4	Spur	10		50	
GEAR 60T X 12T X 2.4	GEAR60/12/2.4	Spur	10	50			

Pinion Gears

Spur Gears

GEARS – 2.6 MM HOLE

The yellow gears with the 2.6 mm dia. hole are free spinning, on the 2.5mm diameter steel rod.

ITEM NAME	CODE	Gear Type	Qty per pack	PRICE	Qty. per pack	PRICE	
	GEAR SPUR 50T X 10T X 2.6MM	GEAR50/10/2.6	Spur	10	10.18	50	25.00
	GEAR SPUR 50T X 14T X 2.6MM	GEAR50/14/2.6	Spur	10			


GEARS – 2.9 MM HOLE

The white gears with the 2.9 mm dia. hole are a press fit on to the 3.0mm diameter steel rod.

ITEM NAME	CODE	Gear Type	Qty per pack	PRICE	Qty. per pack	PRICE		
 SPUR GEAR	GEAR SPUR 24T X 12T X 2.9MM	GEAR24/12/2.9	Spur	10	10.18	50	25.00	
	GEAR SPUR 30T X 12T X 2.9MM	GEAR30/12/2.9	Spur	10				
	GEAR SPUR 36T X 12T X 2.9MM	GEAR36/12/2.9	Spur	10				
	GEAR SPUR 42T X 12T X 2.9MM	GEAR42/12/2.9	Spur	10				
	GEAR SPUR 48T X 12T X 2.9MM	GEAR48/12/2.9	Spur	10				
	GEAR SPUR 54T X 12T X 2.9MM	GEAR54/12/2.9	Spur	10				
	GEAR SPUR 60T X 12T X 2.9MM	GEAR60/12/2.9	Spur	10				
	 SPUR GEAR 0.5 MODULE	GEAR SPUR 64T X 12T X 2.9MM	GEAR64/12/2.9	Spur	10	10.63	50	25.50
		GEAR SPUR 72T X 0.5MM X 2.9MM	GEAR72/0.5/2.9	Spur	10			
		GEAR SPUR 76T X 0.5MM X 2.9MM	GEAR76/0.5/2.9	Spur	10			
	GEAR SPUR 80T X 0.5MM X 2.9MM	GEAR80/0.5/2.9	Spur	10		50		

GEARS – 0.6 MODULE

These 0.6 Module gears are used in the *WIND-UP TORCH* ([WINDT](#)), *ROBOT ARM CONTROLLER* ([ROBARMCONTR](#)) & *ROBOT ARM WITH CONTROLLER* ([ROBARMWTC](#)). They are **not** compatible with the 0.5 Module gears.

ITEM NAME	CODE	Gear Type	Qty per pack	PRICE	
 SPUR GEAR 0.6 MODULE BOSSED HOLE	GEAR PINION – 0.6 MODULE - 10T X 5L X 1.9MM DIA HOLE	GEAR0.6M10T	Pinion	5	7.25
	GEAR SPUR – 0.6 MODULE – 30T X 10T X 4L X 2.9MM DIA. HOLE	GEAR0.6M30T	Spur	5	8.35
	GEAR SPUR – 0.6 MODULE – 40T X 10T X 4L X 2.9MM DIA. HOLE	GEAR0.6M40T	Spur	5	8.35
	GEAR SPUR – 0.6 MODULE – 50T X 4L X 3.9MM DIA. HOLE BOSSED	GEAR0.6M50T	Spur	5	9.45

ITEM NAME	CODE	Description	PRICE PER PACK
GEAR MIX	GEAR130	A pack of 130 gears containing a range of the general purpose gears listed in the table below.	44.20
Gear Type	Worm	Pinion	Spur
Teeth	---	12	30/10
Diameter	6	7	16
Hole Size	1.9	2.4	2.4
Quantity	10	60	10

PINION GEARS – to suit Faulhaber & ST-403 T1 Motors



Brass *PINION GEARS* suitable for use with *FAULHABER* and *ST-403 T1 (SM403) MOTORS*. 0.5 Module, 2.0mm bore with grub screws. The grub screw mounting allows gears to be changed quickly during competitions.

NO. OF TEETH	11	13	16	18	20
CODE	BRGP11	BRGP13	BRGP16	BRGP18	BRGP20
PRICE (each) \$	23.20	24.15	25.20	25.80	26.70

GEAR RACK








ITEM	CODE	Description	Qty. per pack	PRICE
GEAR RACK	GEARRACK	This <i>GEAR RACK</i> meshes with the 0.5 Module gears listed. It is 100.6 mm long and two or more racks can be interlocked to make a longer rack	5	16.20

GEAR ADAPTER



ITEM	CODE	Description	Qty. per pack	PRICE
SPUR GEAR TO WHEEL ADAPTER	GEARADAPT	The <i>GEAR ADAPTOR</i> is designed to mount a (modified) 80T gear onto a solar wheel, where the wheel is installed on a 6mm carbon fibre axle using 10mm flanged bearings. To see how this is used in conjunction with our wheels, refer to Appendix D. NOTE: The spur gear (GEAR80/0.5/2.9) needs to be modified with the centre machined out with a 12mm end mill, so that it fits over the <i>GEAR ADAPTOR</i> .	1	9.80










FRAMING COMPONENTS




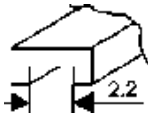

ITEM	CODE	Description	Qty. per pack	PRICE
	COLLAR	I.D. 6.2mm. Used to retain wheels on the 6.0mm diameter axle shaft (<i>CFT</i>). It uses a small grub screw.	10	6.15
	SCRGRUB	Pack of spare grub screws for use with collars & brass pinion gears (<i>BRGRP11-20</i>).	10	2.45
	ELBOW	Used to join Carbon Fibre Tubes (<i>CFT</i>).	10	2.57
	TYRE	Rubber TYRE material is designed to suit the normal 70mm wheels, and has to be glued to form the tyre.	Per Metre	3.34
	ORING55	This O-Ring is approximately 1.0mm diameter, to suit the groove in the wheels <i>SW70AGR</i> & <i>SW70EGR</i> , to increase traction.	10	5.39

See *BEARINGS* & *CARBON FIBRE TUBE* for more framing components.


WHEELS & TYRES

WHEELS

CODE	Wheel dimensions (mm)			Tyre Material	Hub Colour	Qty. Per Pkt	PRICE \$	
	Diameter	Width	Hole Diameter					
WHEELS – WITH BLACK RUBBER TYRE								
 	W35W	35	12	2.4	Soft Rubber	White	40	16.54
	W35W2.9	35	12	2.9	Soft Rubber	White	40	16.54
	W35C	35	12	3.1	Soft Rubber	Chrome	40	18.29
WHEELS – WITH CHROME HUB								
  	W30C	30	9	2.4	Plastic	Chrome	40	11.08
	W38BH	38	13	2.9	Plastic	Chrome	40	13.42
	W38C	38	13	2.4	Plastic	Chrome	40	13.42
	W52C2	52	18	2.4	Plastic	Chrome	40	17.04
RUBBER TYRES								
	TY54	54	18	49	Rubber	N/A	40	14.73
Will fit over the W52C2 wheel (will fit over the hard plastic tyre on the W52C2 wheel for improved traction).								
RUBBER TYRE & WHEEL WITH CHROME HUB								
	WT52/54	54	18	2.4	Plastic & Rubber	Chrome	40	33.50
*This consists of a 52mm wheel and a rubber tyre (will fit over the hard plastic tyre on the W52C wheel for improved traction).								
WHEELS – 50MM NARROW BLACK							10	4.78
	W50NB	Narrow plastic 50mm diameter wheels with 2.9mm diameter holes. Suitable for use with 3mm rods.						
CASTOR WHEELS								
SWIVEL CASTOR WHEEL – 25MM DIA.	WSWIVEL	High loading capacity and durability swivel castor wheels with plain bearings, suitable for projects similar to BUGGY kit, etc. Full inject PP 25mm wheel with 25mm plate. Load capacity: 10kg. Load height: 35mm Plate size: 38 x 33mm Bolt holes: 4mm Resistance to water, acids, bases, oils & salt.					3.06	
								

SOLAR WHEELS & RUBBER TYRES		Wheel dimensions (mm)			Colour		Qty. Per Pkt	PRICE
WHEELS – Nylon Low Rolling Resistance	CODE	Diameter	Hole Diameter	Thickness				
	SW70D	70 mm	2.5 mm	2.0 mm	Blue		10	18.95
	SW70B	70 mm	3.0 mm	2.0 mm	Yellow		10	44.22
	SW70A	70 mm	7.0 mm	2.0 mm	Yellow		10	44.22
	SW70E	70 mm	10.0 mm	2.0 mm	Yellow		10	44.22
	SW70AGR	70 mm	7.0 mm	4.0 mm	Yellow	To be used with ORING55	10	47.17
	SW70EGR	70 mm	10.0 mm	4.0 mm	Yellow		10	47.17
ITEM NAME	CODE						Qty.	PRICE
TYRE MATERIAL	TYRE						Per metre	3.34
		Rubber TYRE material is designed to suit the normal 70mm wheels and has to be glued to form the tyre.						
TYRE 71MM RUBBER EXTRUSION	TY71						5	6.86
	To suit 70mm solar wheels. WARNING: Be careful when installing the tyres onto the solar wheels, as they are NOT rubber bands and have very little stretch in them – they can easily be broken at the join.							

FASTENERS

BOLTS	ITEM NAME	CODE	Qty. per Pack:	PRICE
	M3 X 8MM BOLT	BOLT8	100	6.55
	M3 X 12MM BOLT	BOLT12	100	8.60
	M3 X 16MM BOLT	BOLT16	100	9.10
	M3 X 20MM BOLT	BOLT20	100	9.60
	M3 X 35MM BOLT	BOLT35A	10	4.10
	M3 X 40MM BOLT	BOLT40	10	4.50

ITEM NAME	CODE	Qty. per Pack	PRICE	ITEM NAME	CODE	Qty. per Pack	PRICE
BOLTS – M4 X 64MM	BOLTM4X65	10	4.65	BOLTS – M4 X 30MM	BOLTM4X30	10	3.90
	Pack of 10 clear zinc plated 65mm long bolts with M4 thread. Pan head and Phillips drive.				Pack of 10 clear zinc plated 30mm bolts with M4 thread. Pan head and Phillips drive.		

NUTS

ITEM NAME	CODE	Qty. per Pack	PRICE	ITEM NAME	CODE	Qty. per Pack	PRICE
M3 HEXAGONAL NUT	NUTM3	100	3.10	M3 NYLOC NUT	NUTNYL	100	6.70
	M3 nut is 5.0mm across flats				Nyloc nut is 5.5mm across flats		


SCREWS

ITEM NAME	CODE	Qty. per Pack	PRICE	ITEM NAME	CODE	Qty. per Pack	PRICE
SELF-TAPPING SCREWS – MOTOR MOUNT 2.6MMX4MM	STSC2.6X4MMP	100	3.10	SELF-TAPPING SCREWS – 3MM X 5MM	STSC3X5P	100	3.10
							
SPARE MOUNTING SCREWS FOR FAULHABER MOTORS	SCRFAU	10	1.60				
	2 X 5mm countersunk phillips head						

WASHERS & WING NUTS

ITEM NAME	CODE	Qty. per Pack	PRICE	ITEM NAME	CODE	Qty. per Pack:	PRICE	ITEM NAME	CODE	Qty. per Pack	PRICE
M3 WASHER	WASHER	100	1.90	WASHER 3.9 X 15MM	WASH3.9/15	10	3.70	WASHER BRASS M2	WASHBRM2	100	5.30
	3.0mm hole x 8.0mm (outer diameter) 0.5mm (thick)				Large washer 3.9mm hole x 15mm (outer diameter)				2.0mm hole 5.0mm (outer diameter), 0.5mm (thick)		
M3 WASHER – BRASS	WASHBRM3A	20	1.95	M4 WASHER	WASHM4.5	10	1.40	WING NUT M4	NUTWINGM4	10	4.65
	ID.: 3.0mm OD.: 6.8mm Thickness: 0.5mm. <i>NOTE: Photo illustrates a generic brass washer.</i>				Pack of 10 clear zinc plated M4 washers. 4.5mm / 0.5mm.				Pack of 10 clear zinc plated M4 Wing Nuts.		

OTHER FASTENERS

ITEM NAME	CODE	Qty. per Pack:	PRICE	ITEM NAME	CODE	Qty. per Pack:	PRICE
VELCRO HOOK 16MM WIDE	VELHO	Per mtr.	4.02	VELCRO LOOP 16MM WIDE	VELLO	Per mtr.	4.02
	White self-adhesive 16mm Hook tape.				White self-adhesive 16mm Loop tape.		
CABLE TIE 200 X 3.65MM	CABTIE200	10	1.87	RUBBER BANDS			
	Cable ties 200mm long x 3.65 mm wide. Suitable for attaching the motor to the chassis.				Spares for the <i>SHERIDAN KIT CAR</i> . Packs of 10.		
CABLE TIE 100 X 3.65MM BLACK	CABTIE100A	10	0.51	RUBBER BAND NO. 16	RUBBAND16	10	0.41
CABLE TIE 100 X 3.65MM WHITE	CABTIE100AW	10	0.51	RUBBER BAND NO. 18	RUBBAND18	10	0.41

PLATFORM (for both cars & boats)

ITEM NAME	CODE	DESCRIPTION	Qty.	PRICE
CORFLUTE SHEET - DIMENSIONS: 100MM X 200MM X 5MM	CORF100/200/5	Suitable as platforms or other uses, such as art (model making), building model houses (<i>see our SOLAR HOUSE KIT</i>), backboards for small signs, etc.	1	1.10
CORFLUTE SHEET - DIMENSIONS: 300MM X 120MM X 5MM	CORF300/120/5		1	1.80
CORFLUTE SHEET - DIMENSIONS: 200MM X 300MM X 5MM	CORF200/300/5		1	2.25
FOAM TRAY - 11 X 9 - SHALLOW	FOAMTR11X9	Light weight foam tray suitable for boats 11" X 9" 15mm deep (approx.).	1	0.66
FOAM TRAY - 11 X 5 - SHALLOW	FOAMTR11X5	Light weight foam tray suitable for boats 11" x 5" 13mm deep (approx.).	1	0.43
FOAM TRAY - 14 X 11 - DEEP	FOAMTR14X11	Light weight foam tray suitable for boats 14" x 11" 35mm deep.	1	1.50
STYROFOAM - DIMENSIONS: 600MM X 400MM X 25MM	STYRO600/400/25	Large piece to cut out multiple platforms. Also suitable for other uses such as in art class, model making, building houses, etc.	1	15.00
STYROFOAM - DIMENSIONS: 300MM X 200MM X 25MM	STYRO300/200/25A	For monohull. Also suitable for other uses such as in art class, model making, building houses, etc.	1	7.80
STYROFOAM - DIMENSIONS: 300MM X 50MM X 25MM	STYRO300/50/25	2 pieces required to make a catamaran. Also suitable for other uses such as in art class, model making, etc.	1	2.10



Above: Corflute



Above: Styrofoam



Above: Foam Tray (FOAM14X11)

CLEAR PVC

ITEM NAME	CODE	DESCRIPTION	PRICE
PVC SHEET - 610 X 420 X 0.25MM	PVC610X420	Clear PVC sheet 610mm wide x 420mm long x 0.25mm thick size, as used in the <i>SHERIDAN KIT CAR</i> .	2.14
PVC SHEET - 610 X 0.25MM - PER METRE	PVC610M	Clear PVC sheets 610mm wide x 0.25mm thick. Sold in desired length in 1 metre increments.	5.00

SOLAR PANELS



SOLAR PANELS – Small Hobby Panels


	CODE	Size	No. of pieces	Watts	Volts/Amps (nom)	Wires (length)	PRICE (each)
	SOLAR1	86 x 57 mm	1	0.485	0.5V / 0.97A	---	6.62
	SOLAR2	86 x 133 mm	1	1.2	1.5V/0.8A	---	14.49
	SOLAR2L	71 x 161 mm	1	1.2	1.5V/0.8A	---	14.49
	SOLAR 3	105 x 72 mm	1	0.68	2.0V / 0.34A	---	10.58
	SOLAR4	86 X 170 mm	1	1.6	2.0V / 0.92A	---	18.14
	SOLAR5	22 x 84 mm	1	0.18	0.5V / 0.37A	100 mm	4.17
	SOLAR7	78 x 179mm	1	2.4	3.0V/0.8A	120 mm	18.14
	SOLAR8	86 x 147 mm	1	1.44	2.0V/0.72A	---	13.05
	SOLAR9.5	51 x 58mm	1	0.10	1.5V/0.07A	100 mm	4.43
	SOLAR11	91 x 104 mm	2	2 x 0.525	2x 1.5V/0.35A	---	10.58
	SOLAR13	91 x 216 mm	4	4 x 0.57	4 x1.5V/0.38A	---	19.15
	SOLAR14	60 x 78 mm	1	0.45	1.5V/0.3A	100 mm	6.62
	SOLAR17	85 x 65 mm	1	0.48	4.0V / 0.12A	---	6.62
SOLAR23	86 x 188 mm	2	2 x 0.85	2 x 1.0V/0.85A	---	17.27	

NOTE: When selecting a solar panel to drive an electric motor, please ensure that you select a panel with the appropriate voltage & current for the selected motor – or vice versa.


SOLAR PANELS – Solar Challenge

Below is the part of our range of SOLAR PANELS that are most suitable for use in the Model Solar Challenges (Car, Boat & Sheridan).

CODE	Area	Dimensions	Watts	Volts/Amps (nom)	Weight	PRICE (each)
SOLAR4		86 x 170 mm	1.6	2.0V / 0.92A	70 grams	18.14
	4 of these panels can be connected in series or parallel to power the Sheridan car or other Solar challenge projects.					
SOLAR10		52 x 56 mm	100% sun=100mA	1.5V / 0.1A		13.85
	The No. 10 calibrated panel is used to determine how intense / powerful the sun is at the time of testing. When connected to a digital multi-meter, this panel measures the sunlight intensity as a percentage. This panel has 100mm long wires. NOTE: 100% sun = 100mA					

SOLAR26	350 cm ²	160 x 252 mm	5.0 to 6.0	7.0V / 1.0A	50 grams	111.50
	High performance competition grade solar panel.					










AUTOMAX SOLAR

ITEM NAME	CODE	PRICE (each)
AUTOMAX	AUTOMAX	127.36
	<p>AutoMax is a computerised Maximum Power Point Tracker.</p> <p>This unit holds the solar panel's output voltage at its Maximum Power Point voltage regardless of the load conditions. Assembled and tested.</p> <p>Includes Deans Micro plugs.</p>	








FOR MORE INFORMATION ON SOLAR CHALLENGES, SEE “**APPENDIX C & C2: SOLAR CHALLENGE – TECHNICAL GUIDE**”.

ELECTRONIC COMPONENTS

SWITCHES







ITEM NAME	CODE	Description	Wires	Qty./ Pack	PRICE PER PACK			
					1-4 Pkts.	5-9 Pkts.	10-19 Pkts.	20+ Pkts.
 SLIDE SWITCH – SMALL	SSWS	DPDT. ON-OFF.	NO	5	6.25	6.10	5.90	5.55
 SLIDE SWITCH – LARGE	SSWL	DPDT. ON-OFF-ON. With centre “OFF” position. Can be used as a forward/off/reverse switch for solar panels.	NO	5	7.85	7.65	7.25	6.95
 SLIDE SWITCH – LARGE - BLACK	SSWLBK	DPDT. ON-OFF-ON. With centre “OFF” position. Can be used as a forward/off/reverse switch for solar panels. Darker metal body than SSWL.	NO	5	7.85	7.65	7.25	6.95
 SLIDE SWITCH – SMALL WITH WIRES	SSWS-W	DPDT. ON-OFF. With 100mm Wires.	YES	5	6.55	6.30	6.05	5.95
All the above switches are supplied with two screws per switch.								
 PUSH SLIDE SWITCH – NON-LOCK	PUSLSWN	DPDT push slide switch without locking position	NO	5	6.25	6.05	5.80	5.50
 PUSH BUTTON SWITCH	PUBUTM	Momentary “ON” switch with washer and nut.	NO	5	6.60	6.15	5.80	5.35
 PUSH BUTTON SWITCH WITH WIRES	PUBUTMW	Momentary “ON” switch with washer and nut. Approx. 125mm long wires.	YES	5	6.95	6.50	6.10	5.70
 ONE WAY SWITCH	SW1W	SPDT (Single Pole Double Throw). “ON-OFF” switch. 4 terminals” 2 “in” and 2 “out”.	NO	5	8.10	7.85	7.70	7.55
 TWO WAY SWITCH	SW2W	DPDT (Double Pole Double Throw). “ON-OFF-ON” switch. 6 terminals: 2 “in” and 4 “out”. Can be used as a forward/off/reverse or series/off/parallel switch for solar panels.	NO	5	12.95	12.65	12.40	12.15





....switches continued next page.

ITEM NAME	CODE	PRICE (each)	ITEM NAME	CODE	PRICE (each)
SWITCH – KNIFE TYPE	SWKNF	7.85	SWITCH – ROCKER	SWRCKD	6.65
	Knife type switch. Single pole, single throw (SPST). 100mm x 35mm x 30mm With 2 terminals suitable for both banana plugs and alligator clips. Suitable for low voltage electric circuit experiments in Physics & Primary School science classes to control the flow of electricity in a circuit. <i>(Item supplied may vary slightly from photo).</i>			Rocker-type switch SPST (“ON-OFF”) 100mm x 60mm x 60mm With 2.5mm plastic housing on terminals suitable for both banana plugs and alligator clips. Suitable for low voltage electric circuit experiments in Physics classes.	
CONTACT KEY SWITCH - SINGLE	SWCONKEY	11.95	LILYPAD CR2032 COIN CELL BATTERY HOLDER MOUNT MODULE	BHCR2032LP	3.48
	Provides momentary contact when pressed down in electrical circuits which are normally open. Comprising a plated spring strip arm with thumb-press knob, a contact stud, plated connecting strip and a pair of 4mm terminals, all mounted on a moulded blue plastic base Suitable for Physics experiments <i>(Item supplied may vary slightly from photo).</i>			The LilyPad Coin Cell Battery Holder has a small slide switch installed on the board, in-line with the power so you can shut off your project and save batteries. This slide switch is the same as on the LilyPad Slide Switch Board, so it's not easy to accidentally turn off or on. Holds a CR2032 coin cell battery and gives you four connection points (two positive and two negative) for sewing into your project. Dimensions: 2.9x2.8x0.58mm.	
LILYPAD PUSH BUTTON MODULE	PUBUTLPM	3.10	LILYPAD SLIDE SWITCH MODULE	SSWLPM	3.10
	LilyPad Button Board Module for Arduino DIY kits. Can be sewn onto clothing – washable (e-textile technology). Momentary push button (i.e. button closes when you push it and opens when you release it). 8x16mm 0.8mm PCB.			Simple On/Off switch or to control LEDs, buzzers, sensors, etc. Can also be sewn onto clothing – washable (e-textile technology).	
MICRO SWITCH – LONG LEVER	MICSSL	2.85	MICRO SWITCH – SMALL LEVER 40G	MICSSL	1.55
	51mm Lever SPDT Momentary Micro switch Rating: 3A 250V AC Body dimensions: 28 x 16 x 10mm Operating force: 40gf			11.5mm Lever SPDT Momentary Micro switch Rating: 0.5A 125V AC Body dimensions: 12.9 x 6.5 x 5.8mm Operating force: 40gf	

ITEM NAME	CODE	PRICE (each)	ITEM NAME	CODE	PRICE (each)
SLIDE SWITCH – PCB MOUNT	SSWPCB	1.60	TACTLE PUSH BUTTON SWITCH	SWPUBUTTAC	1.05
 <p>Rating: 0.3A, 50V DC Contact Resistance: 30mΩ (initial) 8.8mm (w) x 3.9mm (d) Actuator: 4mm Vertical Slide Switch, PCB Mount</p>			 <p>Small Tactile Push Button Switch. Suitable for use on PCBs and Breadboards. 12mm (l) x 12mm (w) x 10mm (h). 4 pins.</p> <p>Sold in packs of 5 (Price per pack shown).</p>		
INLINE LOW VOLTAGE SWITCH – 2.1MM DC PLUG & SOCKET	SWINLINEPS	9.95	ROCKER SWITCH – MINI	SWRCKDMIN	2.25
 <p>Used to connect to a plug pack adaptor to provide quick & easy on/off control. With rocker switch, 2.1mm DC plug and socket. DC Current Rating: 2.0ADC Voltage: 24.0V Pole Throw Type: SPST</p>		 <p>SPST Mini Rocker Switch. Length 20mm, width 14mm.</p>			
LEAF SWITCH – LARGE	LEAFSL	0.25	LEAF SWITCH - SMALL	LEAFSS	0.18
 <p>12V 1 Amp Operating Force: 100g (max)</p>		 <p>50V 0.5Amp Operating Force: 100g (max)</p>			


LIGHT BULBS & LIGHT BULB HOLDERS

LIGHT BULBS (MES MOUNT)						
	ITEM NAME	CODE	Description	Qty. Per Pack	PRICE (1 Pack)	PRICE (2 Packs)
	LIGHT BULB 2.5V	LIGBULB25	2.5V, 0.5A torch bulb	25	18.20	30.46
	GLOBE MES – 6.3V	GLOMES6.3P	MES light bulb 6.3V, 0.25A	10	9.77	--
	GLOBE MES – 6.2V	GLOMES6.2	MES light bulb 6.2V, 0.5A	10	9.77	--
	GLOBE MES – 3.5V	GLOMES3.5	MES light bulb 3.5V, 0.2A	10	9.77	--
	GLOBE MES – 1.5V	GLOMES1.5	MES light bulb 1.5V, 0.3A	10	9.77	--
	FLASH LAMP BULB – ROUND– 12V	2020040-8	MES E10 round bulb suitable for flash lamps, spotlights, panel lamps, etc. 12V, 0.5W	10	7.70	--
	FLASH LAMP BULB – ROUND – 6V	2020040-6	MES E10 round bulb suitable for flash lamps, spotlights, panel lamps, etc. 6V, 0.3W	10	7.70	--
FLASHING BULBS WITH WIRES						
	FLASHING BULB 2.2V – WHITE WITH 120MM WIRES	GLOFLWW	Flashing Bulb white 2.2V 0.25A 5mm w. 120mm wires. Glowes at 3.0 volts, starts flashing when 4.5volts is applied.	10	2.45	---
	FLASHING BULB 2.2V – BLUE WITH 120MM WIRES	GLOFLBW	Flashing Bulb blue 2.2V 0.25A 5mm w. 120mm wires. Glowes at 3.0 volts, starts flashing when 4.5volts is applied.	10	2.45	---
	FLASHING BULB 2.2V – GREEN WITH 120MM WIRES	GLOFLGW	Flashing Bulb green 2.2V 0.25A 5mm w. 120mm wires. Glowes at 3.0 volts, starts flashing when 4.5volts is applied.	10	2.45	---


BULB HOLDERS	ITEM NAME	CODE	Description	Qty. Per Pack	PRICE (1 Pack)	PRICE (2 Packs)
	BULB HOLDER	BULBH25	Light bulb holder for screw mounting bulb	25	13.40	24.00
	BULB HOLDER ROUND BASE	BULBHBASE	Miniature bulb holder with round base for 2.5V or 6V MES bulbs.	10	16.25	---
					(Each)	(Each)
	MES GLOBE HOLDER WITH TERMINALS AND GLOBE	MESHOLD	Mounted MES bulb holder on plastic base. With terminals. Approx. 11 x 7cm. Supplied with 1.5V 0.3A globe.	1	9.95	---
				10+	9.30	
	GLOBE HOLDER & SWITCH – ECONOMY	BULBHECO2052	Plastic bulb holder and switch with two Fahnstock clips for connecting wire. Made of durable plastic. (Sold as a pair)	1	4.50	--

LEDs (LIGHT EMITTING DIODES)


COLOURED BODY – 17MM LEGS - 5mm

	ITEM NAME	CODE	MCD Rating	Qty. per pack	PRICE
	LED DIFFUSED LENS BLUE 5MM SHORT	LEDDL5B5	1000 – 1200	10	2.34
	LED DIFFUSED LENS GREEN 5MM SHORT	LEDDL5G5		10	2.34
	LED DIFFUSED LENS ORANGE 5MM SHORT	LEDDL5O5		10	2.34
	LED DIFFUSED LENS RED 5MM SHORT	LEDDL5R5	600 – 800	10	2.34
	LED DIFFUSED LENS MILKY WHITE 5MM SHORT	LEDDL5W5	4000 - 8000	10	2.34
	LED DIFFUSED LENS YELLOW 5MM SHORT	LEDDL5Y5	600 - 800	10	2.34


COLOURED BODY – 27MM LEGS - 5MM

	LED DIFFUSED LENS BLUE 5MM	LEDDL7B5		10	2.34
	LED DIFFUSED LENS GREEN 5MM	LEDDL7G5	40	10	2.34
	LED DIFFUSED LENS ORANGE 5MM	LEDDL7O5	800 – 1500	10	2.34
	LED DIFFUSED LENS RED 5MM	LEDDL7R5	1000 - 3000	10	2.34
	LED DIFFUSED LENS YELLOW 5MM	LEDDL7Y5	70	10	2.34


CLEAR BODY – 17MM LEGS - 5MM

	LED GREEN 5MM SHORT	LED5G5	15000 - 18000	10	7.09
	LED PINK 5MM SHORT	LED5PI5	1500 – 2000	10	2.60
	LED PURPLE 5MM SHORT	LED5PU5		10	2.60
	LED RED 5MM SHORT	LED5R5	3000 – 6000	10	5.78
	LED YELLOW 5MM SHORT	LED5Y5	6000 – 9000	10	2.93
	LED YELLOW 5MM SHORT - LOW	LED5Y5L	1000 - 1500	10	2.59
	LED BLUE 5MM SHORT	LED5B5	6000 - 8000	10	5.27
	LED CLEAR WHITE 5MM SHORT	LED5CW5		10	2.23

CLEAR BODY – 27MM LEGS - 5MM

	LED BLUE 5MM <i>(CURRENTLY NOT IN STOCK)</i>	LED7B5		10	---
	LED CLEAR 5MM	LED7C5	10000 – 14000	10	13.30
	LED GREEN 5MM	LED7G5	15000 – 25000	10	11.95
	LED RED 5MM	LED7R5	3000 – 5000	10	8.60
	LED YELLOW 5MM	LED7Y5	3000 – 5000	10	8.60

COLOURED BODY – 17MM LEGS - 3mm

	LED DIFFUSED LENS BLUE 3MM SHORT	LEDDL3B3		10	2.23
	LED DIFFUSED LENS GREEN 3MM SHORT	LEDDL3G3		10	2.23
	LED DIFFUSED LENS RED 3MM SHORT	LEDDL3R3		10	2.23
	LED DIFFUSED LENS YELLOW 3MM SHORT	LEDDL3Y3		10	2.23
	LED DIFFUSED LENS ORANGE 3MM SHORT	LEDDL3O3	300 – 400 (WL: 595-605nm)	10	2.26

COLOURED BODY – 27MM LEGS - 3mm

LED DIFFUSED LENS RED 3MM	LEDDL3	2	10	2.14
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COLOURED BODY – 27MM LEGS - 4mm



ITEM NAME	CODE	WAVELENGTH (nm)	IV (med)	Qty.	PRICE
LED DIFFUSED LENS BLUE 4MM	LEDDL4	460 – 470	400 - 600	10	2.52
LED DIFFUSED LENS GREEN 4MM	LEDDL4	520 – 530	2500 - 2800	10	2.52
LED DIFFUSED LENS RED 4MM	LEDDL4	620 – 630	400 - 600	10	2.63
LED DIFFUSED LENS WHITE 4MM	LEDDL4	495 – 605 / CCT(K): 8000 – 10000	12000 – 15000	10	3.21
LED DIFFUSED LENS YELLOW 4MM	LEDDL4	585 – 595	300 - 400	10	2.69

CLEAR BODY – 17MM LEGS - 3mm

LED CLEAR WHITE 3MM SHORT	LEDSCW3	2	10	2.23
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CLEAR BODY 45 DEGREE – 5MM



LED WHITE 45 DEGREE VIEWING ANGLE	LEDCW5D45	15000 MCD	10	2.57
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27mm legs.

LILYPAD LEDS – WHITE

LEDWLP

4.50



Strip of 5 white LilyPad LEDs, allowing you to snap the LEDs apart and sew onto clothing, etc. - washable (e-textile technology).

5.5mm x 12.5mm x 0.8mm (approx.).

FLASHING LEDS



FLASHING 3MM LEDS WITH ATTACHED BATTERY HOLDER

LEDBH



1

3.90


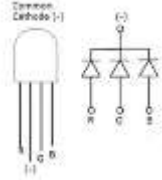
Two 3mm LEDs with preset changing flashing light sequence, attached to a battery holder with ON/OFF switch by 150mm (approx.) leads.
2 x AA batteries required (sold separately).





INFRARED

	LED INFRARED 5MM	LEDIRR5	5	4.85
	38KHz Carrier Frequency			
	INFRARED TRANSMITTING 5MM	LEDIRRT5	1	2.25
	5mm emitting diode that looks like a 5mm LED & has a blue transparent lens. Mechanically and spectrally matched to the infrared phototransistor (PHOTOIRR5).	Features: - Viewing Angle: 30° - Peak Spectral Wavelength (IR): 940nm @ 20mA - Spectral Bandwidth (DI): 50nm@20mA - Material: GaAs - Optocoupler Operating Current: 50mA - Reverse Voltage: 5V - Forward Voltage: 1.2		






RGB COMMON CATHODE

	LED RGB COMMON CATHODE	LEDRGB	10	5.90
		Red-Green-Blue 5mm 4 Pin 27mm long leg The cathode (the negative lead) is the longest pin. Hook up the longest pin to ground and apply power to one or more of the remaining leads.		

LED HOLDERS

ITEM NAME	CODE	Qty. per Pack	PRICE
SOCKET TO SOCKET JUMPER LEADS 40 PCE	SOCJUMPLD40	1	7.95
	A pack of 40 jumper leads of various colours for prototyping. Ideal for Arduino®, Raspberry Pi & DIY projects. Each flexible lead has pins to suit breadboards or PCB headers. These sockets also fit LED legs, thus eliminating the need to solder. Overall length 20cm.		
LED HOLDER -5MM	LEDHOLD	10	2.50
	Mounting 5mm LEDs.		

LED DISPLAY & LED STRIP LIGHTING

ITEM NAME	CODE	PRICE (each) 1-19	PRICE (each) 20+
7 SEGMENT LED DISPLAY	DISPLAY7	9.60	8.80
	2.3" single red digit (7 segment) display on black face. Common Cathode display.		
LED FLEXIBLE STRIP LIGHTING	LEDSTR	Qty. 1 metre	PRICE 7.20
	LEDs per metre: 120pcs Dimension: 8mm wide Can be cut every 3 LEDs (25mm) Installation: Using 3M double-sided adhesive fixed on the back Working input voltage : 12V DC LED Model: SMD 2835 Life span: MTBF 50-80K hours Power dissipation: 48W per 5 metre Working temperature : LED-20°C to +45°C LED viewing angle: 120 degrees	5 metres (reel)	29.50
5V LED FLEXIBLE STRIP LIGHTING	LEDSTR5V	1 metre	9.50
	LEDs per metre: 120pcs Dimension: 8mm wide Can be cut every LED Installation: Using 3M double-sided adhesive fixed on the back Working input voltage : 5V DC LED Model: SMD 2835 Life span: MTBF 50-80K hours Working temperature : LED-20°C to +45°C LED viewing angle: 120 degrees	5 metres (reel)	44.00
CONNECTOR - LED STRIP LIGHTING TO BARE WIRE	CONN-LEDSTR	1	3.50
	A simple clip-on connector suitable with any single colour 5050/5060 SMD LED strip lights. A 12V or 24V battery can be connected depending on the LED strip light without the need for soldering the connections. Will work with both 10mm & 8mm LED strips. 170mm (l) x 10mm (w). Features: Voltage: 12/24VDC Current: 4A (12V) 2A (24V) LED Type: 5050/5060 LED Colour: Single 2 Pin		

RESISTORS

4 BAND	ITEM NAME	CODE		Qty. per pack	PRICE
	RESISTOR 10 OHMS	RES10		10	0.67
	RESISTOR 18 OHMS	RES18		10	0.67
	RESISTOR 47 OHMS	RES47		10	0.67
	RESISTOR 100 OHMS	RES100		10	0.67
	RESISTOR 180 OHMS	RES180		10	0.67
	RESISTOR 220 OHMS	RES220		10	0.67
	RESISTOR 270 OHMS	RES270		10	0.67
	RESISTOR 330 OHMS	RES330		10	0.67
	RESISTOR 390 OHMS	RES390		10	0.67
	RESISTOR 470 OHMS	RES470		10	0.67
	RESISTOR 680 OHMS	RES680		10	0.67
	RESISTOR 1K OHMS	RES1K		10	0.67
	RESISTOR 1.5K OHMS	RES1.5K		10	0.67
	RESISTOR 2.2K OHMS	RES2.2K		10	0.67
	RESISTOR 3.3K OHMS	RES3.3K		10	0.67
	RESISTOR 3.9K OHMS	RES3.9K		10	0.67
	RESISTOR 4.7K OHM	RES4.7K		10	0.67
	RESISTOR 6.8K OHMS	RES6.8K		10	0.67
	RESISTOR 10K OHM	RES10K		10	0.67
	RESISTOR 15K OHMS	RES15K		10	0.67
	RESISTOR 18K OHMS	RES18K		10	0.67
	RESISTOR 22K OHMS	RES22K		10	0.67
	RESISTOR 47K OHM	RES47K		10	0.67
	RESISTOR 100K OHMS	RES100K		10	0.67
	RESISTOR 180K OHMS	RES180K		10	0.67
	RESISTOR 220K OHMS	RES220K		10	0.67
	RESISTOR 470K OHMS	RES470K		10	0.67
	RESISTOR 33SL	RES33SL	Large resistor suitable for teaching about colour bands	1	0.32
	RESISTOR 10KSL	RES10KSL	Large resistor suitable for teaching about colour bands	1	0.32



4 BAND RESISTOR



LARGE RESISTORS



Comparison of sizes of 4 band (standard) and large resistors .

NOTE: Photo is not to scale.

5 BAND



5 BAND RESISTORS







RESISTOR 82 – 5 BAND	RES82B5	¼ Watt, Carbon Film, 1%	10	0.67
RESISTOR 91 – 5 BAND	RES91B5	¼ Watt, Carbon Film, 1%	10	0.67
RESISTOR 15K – 5 BAND	RES15KB5	¼ Watt, Carbon Film, 1%	10	0.67
RESISTOR 22K – 5 BAND	RES22KB5	¼ Watt, Carbon Film, 1%	10	0.67
RESISTOR 2.2K – 5 BAND	RES2.2KB5	¼ Watt, Carbon Film, 1%	10	0.67
RESISTOR 3.3K – 5 BAND	RES3.3KB5	¼ Watt, Carbon Film, 1%	10	0.67
RESISTOR 680 – 5 BAND	RES680B5	¼ Watt, Carbon Film, 1%	10	0.67

RESISTANCE UNITS




RESISTANCE UNIT 4MM - 1 OHM	PH1143A	Max. 1.0V	A range of resistance units encased in plastic enclosure with 4mm terminals. Based on a high stability metal film element. They offer improved accuracy & robustness. Less expensive than traditional resistance coils. Suitable for PHYSICS experiments Accuracy 1%	1	8.00
RESISTANCE UNIT 4MM – 2 OHM	PH1143B	Max 1.4V		1	8.00
RESISTANCE UNIT 4MM – 5 OHM	PH1143C	Max 2.2V		1	8.00
RESISTANCE UNIT 4MM – 10 OHM	PH1143D	Max 3.0V		1	8.00
RESISTANCE UNIT 4MM – 20 OHM	PH1143E	Max 4.0V		1	8.00
RESISTANCE UNIT 4MM – 50 OHM	PH1143F	Max 7.0V		1	8.00
RESISTANCE UNIT 4MM – 100 OHM	PH1143G	Max 10V		1	8.00


PIEZO TRANSDUCERS & BUZZERS

ITEM NAME	CODE	Qty.	PRICE	ITEM NAME	CODE	Qty.	PRICE
MINI BUZZER 3V	BUZZERMIN3	1	4.95	MINI BUZZER 5V	BUZZERMIN5	1	5.35
	Piezo Buzzer 91DB 3-16VDC Dimensions (approx.): 33mm (l) x 22mm (w) x 10mm (h) Mounting hold centres: 30mm (screws not supplied).				Mini Buzzer 5-12V Dimensions (approx.): 33mm (l) x 16mm (w) x 15mm (h) Screw holes allow for mounting (screws not supplied).		
MINI BUZZER 3-9V	BUZZERMIN3-9	1	4.75	PIEZO SOUNDER	SOUNDER	1	4.50
	Op. Voltage: 3-9V. Current at Rated Voltage: Max 30mA; Sound Pressure at Rated Voltage: 80dB; With 100mm Red/Black Wires. Dimensions: 33mm (l) x 17mm (w) x 15mm (h). Screw holes allow for mounting (screws not supplied).				AC Audio Transducer Op. Voltage: 3~25; Current at Rated Voltage: Max 5.0mA; Sound Pressure at Rated Voltage: Min. 85; Dimensions: 22mm(D)x7.0mm(H) PCB mount (2 pins spaced at 10.0mm).		
PIEZO TRANSDUCER	PIEZOTRANS	1	4.90	BUZZER – LILYPAD MODULE	BUZZERLPM	1	4.90
	AC Audio Transducer with wires Op. Voltage: 1~30; Current at Rated Voltage: Max 3.0mA; Sound Pressure at Rated Voltage: Min. 80; Dimensions: 30/34mm(D)x4.5mm(H) With 75mm Red/Black Wires Screw holes allow for mounting (screws not supplied).				This is a small buzzer for the LilyPad system. Use 2 I/O pins on the LilyPad main board and create different noises based on the different frequency of I/O toggling. Loud enough to hear inside a pocket but not obtrusively loud. This is an inductive buzzer meaning that it will act as a short to ground if you are not actively driving it. Recommend that both I/O pins are put to low (0V) when the buzzer is not used. 20mm outer diameter. Thin 0.8mm PCB. <i>These buzzers are NOT WASHABLE. Washing these buzzers will damage them.</i>		

Colours & styles of item supplied may vary from photos above.

MICROPHONE UNIT



ITEM NAME	CODE	Qty.	PRICE
	MICROPHONE – OMNIDIRECTIONAL ELECTRET CONDENSER MPHONE	10	5.80
	Dimensions: 9.7 x 6.5mm diameter Model No.: IMP-97 1.5V voltage rating Sensitivity: -62+/-2 Impedance: 1.5K Ohm		

MICROPHONE FOR WAVE-LAB WITH LEAD & PLUG	PA3756-015	1	39.90	
				



TERMINALS

ITEM NAME	CODE	Qty.	PRICE	ITEM NAME	CODE	Qty.	PRICE
TERMINAL – LARGE	TERML	10	4.40	TERMINAL – SMALL	TERMS	10	2.45
 <p>Fits the terminals many of Scorpio Technology's range of solar panels, including the SOLAR26 panel. 6.3mm non-insulated spade connector.</p>				 <p>Push onto the terminals of the toggle or large sliding switch.</p>			
TERMINAL SCREW 2.1mm DC PLUG	TERMSCPLG	1	7.00	TERMINAL SCREW 2.1MM SOCKET	TERMSCSOC	1	7.00
 <p>2.1mm DC plug with screw terminals. Barrel plug / DC power plug.</p>				 <p>2.1mm DC socket with screw terminals.</p>			



DIODES

	ITEM NAME	CODE	Qty.	PRICE
	DIODE 1N4004	DIO1N4004	10	3.30
	DIODE 1N4148	DIO1N4148	10	3.30
	DIODE 1N914	DIOIN914	10	3.30
	DIODE SR340	DIOSR340	10	3.30
	DIODE ZENER 1N751 (5.1V-0.5W)	DIOZEN1N751	10	3.30
	DIODE ZENER 3.3 V	DIOZEN3.3V	10	3.30
	DIODE ZENER 4.3 V (0.5W)	DIOZEN4.3V	10	3.30
	DIODE 1N60 - CLEAR	DIO1N60	10	3.30
	DIODE 1N5817 SCHOTTKY	DIO1N5817	10	3.30
		DIODE INFRA-RED RECEIVER	DIOIRR 38KHz Carrier Frequency	5




INDUCTORS

ITEM NAME	CODE	Qty.	PRICE	ITEM NAME	CODE	Qty.	PRICE
INDUCTOR 100UH 5 amp	IND100UH5A	1	4.60	INDUCTOR 15UH	IND15UH	1	0.80
	Ferrite Choke 100uH – 5 Amps.				15uH RF Inductor/Choke		

INTEGRATED CIRCUITS

ITEM NAME	CODE	Specifications	PRICE (each)
	IC-L293MC	Motor Drive IC – 16 Pin	5.80
	IC-4017	CMOS Logic IC	1.50
	IC-4027FF	Dual JK Flip-Flop CMOS	1.05
	IC-555	Timer IC	1.45
	IC-74HC14	Schmitt Trigger Inverter IC	1.20
	IC-7555	Low Noise Op. Amp	2.25
	IC-CD4093BC	Quad 2-Input NAND Schmitt Trigger	1.25
	IC-LM741	Op. Amp. - 8 Pin	2.55
	IC-TL0718P	Low Noise JFET Op. Amp.	2.60

DIL IC SOCKETS

	IC-SOC8P	8 Pin - DIL IC Socket	0.35
	IC-SOC14P	14 Pin - DIL IC Socket	0.40
	IC-SOC16P	16 Pin - DIL IC Socket	0.45
	IC-SOC40P	40 Pin - DIL IC Socket	0.75
	IC-18ZIF	This IC (Integrated Socket) mount can be soldered to a prototyping board and being ZIF (Zero Insertion Force) using the lever to release the IC, allows for easy insertion and removal of the ICs. <i>NOTE: We have released a project sheet showing how to use this ZIF socket and our Protoboard, to make a PICAXE programming station. Available from our website.</i>	5.20

We also stock IC Straighteners, IC Extractors, Component Lead Bending Tools and IC Inserters. See our "Tools" section for more details.

CAPACITORS

ELECTROLYTIC

ITEM NAME	CODE	Capacitor Code	C in uF	C in nF	C in pF	Qty.	PRICE
CAPACITOR 0.47UF- 50V	CAP0.47UF	474	0.47	470	470,000	10	4.60
CAPACITOR 1UF - 25V	CAP1UF		1	1,000	1,000,000	10	4.60
CAPACITOR 1UF – 50V	CAP1UF50	105	1	1,000	1,000,000	10	4.60
CAPACITOR 3.3UF	CAP3.3UF		3.3	3,300	3,300,000	10	4.60
CAPACITOR 4.7UF	CAP4.7UF		4.7	4,700	4,700,000	10	4.60
CAPACITOR 10UF – 25V	CAP10UF	106	10	10,000	10,000,000	10	4.60
CAPACITOR 47UF – 16V	CAP47UF	476	47	47,000	47,000,000	10	4.60
CAPACITOR 100UF – 25V	CAP100UF	107	100	100,000	100,000,000	10	4.60
CAPACITOR 470UF – 25V	CAP470UF	477	470	470,000	470,000,000	10	4.60
CAPACITOR LOW ESR 1000UF -10V	CAPLE1000UF		1,000	1,000,000		10	7.80



DISC CERAMIC

DISC CERAMIC CAPACITOR 1C – 50V	DISCER1C	1	0.000001	0.001	1	10	2.00
DISC CERAMIC CAPACITOR 5PF – 50V	DISCER5PF	5	0.000005	0.005	5	10	2.00
DISC CERAMIC CAPACITOR 20PF – 50V	DISCER20PF	20	0.00002	0.02	20	10	2.00
DISC CERAMIC CAPACITOR 22PF – 50V	DISCER22PF	22	0.0000022	0.022	22	10	2.00
DISC CERAMIC CAPACITOR 30J – 50V	DISCER30J	30	0.00003	0.03	30	10	2.00
DISC CERAMIC CAPACITOR 40PF – 50V	DISCER40PF	47	0.00004	0.04	40	10	2.00
DISC CERAMIC CAPACITOR 47PF – 100V	DISCER47PF	47	0.000047	0.047	47	10	2.00
DISC CERAMIC CAPACITOR 151K – 50V	DISCER151K	151	0.00015	0.15	150	10	2.00
DISC CERAMIC CAPACITOR 102K – 50V	DISCER102K	102	0.001	1	1,000	10	2.00
DISC CERAMIC CAPACITOR 473Z – 25V	DISCER47NF	473	0.047	47	47,000	10	2.00
DISC CERAMIC CAPACITOR 0.1UF – 50V	DISCER0.1UF					10	2.00
DISC CERAMIC CAPACITOR 0.01UF – 50V	DISCER0.01UF	103	0.01	10	10,000	10	2.00
DISC CERAMIC CAPACITOR 0.02UF – 50V	DISCER0.02UF	203	0.02	20	20,000	10	2.00
DISC CERAMIC CAPACITOR 2.2NF	DISCER0.0022UF		0.0022	2.2	2,200	10	2.00
MONOLYTHIC CAPACITOR 0.1UF – 50V	CAPM0.1UF	104	0.1	100	100,000	10	2.00




Disc Ceramic Capacitor



Monolythic Capacitor

TRIMMING CAPACITOR

	CAPACITOR – TRIMMER (GREEN/BLACK)	CAPTRIM3-22PF		3pF – 22pF		1	1.60
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METAL POLYESTER CAPACITOR

	CAPACITOR 1UF METAL POLYESTER	CAPMP1UF		1uF		10	2.30
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RESONATORS

4 MHZ CERAMIC RESONATOR **RESO4MHZ30P**



4MHz 3-pin ceramic resonator with built-in load capacitors.

Mounting type: DIP.

Built-in Load Capacitance (C11/CL2): 15pF

Frequency Tolerance: +/-0.5% max.

Operating Temperature Range: -20°C~80C.

Frequency Shift by Temperature: +/-0.2% max.

Frequency Aging: +/-0.2% max.

Resonant Impedance (R1): 30ohm max.



Lead spacing: 2.5mm (± 0.2).

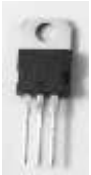
L x W (size): 9.0 x 6.0mm.


10


3.10

TRANSISTORS

TRANSISTORS		ITEM NAME	CODE	Transistor Type	Collector Emitter Voltage (Vce)	Collector Current (Ic)	Gain (Hfe)	Max Power	Lead Order	Qty.	PRICE
	NPN POWER TRANSISTOR	TIP122	NPN Darlington	100V	5A	1,000	65W	BCE	5	12.38	
	PNP POWER TRANSISTOR	TIP127	PNP Darlington	100V	5A	1,000	65W	BCE	5	12.38	
	TRANSISTOR A1300	TRAN1300P	PNP	20V	2A	120	750mW	ECB	5	1.96	
	TRANSISTOR C3279	TRAN327P9	NPN	30V	0.2A	200	750mW	ECB	5	1.96	
	TRANSISTOR 2N3904	TRAN3904	NPN	40V	0.2A	90	1W	EBC	5	1.96	
	TRANSISTOR D471AY	TRAN471	NPN	30V	1A	240	800mW	ECB	5	1.96	
	TRANSISTOR HIT5609	TRAN5609	NPN	20V	1A	150	900mW	ECB	5	1.96	
	TRANSISTOR HIT5610	TRAN5610	PNP	20V	1A	150	900mW	ECB	5	1.96	
	TRANSISTOR B564AY	TRAN564	PNP	25V	1A	240	800mW	ECB	5	1.96	
	TRANSISTOR S9011	TRAN9011	NPN	30V	30mA	90	400mW	EBC	5	1.96	
	TRANSISTOR H9013	TRAN9013	NPN	30V	500mA	150	625mW	EBC	5	1.96	
	TRANSISTOR 2SC945	TRAN945	NPN	50V	100mA	200	250mW	ECB	5	1.96	
	TRANSISTOR HE8050	TRANHE8050	NPN	25V	1.5A	110	1W	ECB	5	1.96	
	TRANSISTOR HE8550	TRANHE8550	PNP	25V	1.5A	110	1W	ECB	5	1.96	
	TRANSISTOR SS8050	TRANSS8050P	NPN	25V	1.5A	110	1W	EBC	5	1.96	
	TRANSISTOR SS8550	TRANSS8550	PNP	25V	1.5A	110	1W	EBC	5	1.96	
	TRANSISTOR BC327	TRANBC327	PNP	45V	0.8A	63	0.5W	CBE	5	1.96	
	TRANSISTOR BC337	TRANBC337	NPN	45V	800mA	100	---	CBE	5	3.25	
	NPN KSP14 TRANSISTOR	TRANSKP14H	NPN Darlington	30V	500mA	10,000	625mW	EBC	5	3.27	
	NPN MPSA13 TRANSISTOR	TRANSKP14L	NPN Darlington	30V	1.2A	10,000	625mW	EBC	5	3.27	

MOSFET / FET		ITEM NAME	CODE	VDSS	ID	RDS (ON)	VGS	Max Power	Lead Order	Qty.	PRICE
	MTP3055	SEMI3055	60V	12A	0.15 Ohms	10V	48W	GDS	1	3.52	
	FET IRL3103	FETIRL3103	30V	64A	0.012 Ohms	16V	94W	GDS	1	3.45	
This FET has internal power losses 12 times lower than the MTP3055 it can be used as a direct replacement in many applications.											

VOLTAGE REGULATOR	ITEM NAME	CODE	DESCRIPTION	Qty.	PRICE
	VOLTAGE REGULATOR LP2950ACZ-5	VRLP2950ACZ-5	Three terminal Positive Voltage Regulator – TO92 package (three pin); Output voltage: 5.0V fixed; Input voltage: 30V maximum; Output current: 100 milliamps maximum.	1	2.98

PHOTOTRANSISTOR	ITEM NAME	CODE	DESCRIPTION	Qty.	PRICE
	PHOTOTRANSISTOR – INFRA RED	PHOTOIR5	<p>NPN phototransistor in clear 5mm transparent LED housing.</p> <p>Features:</p> <ul style="list-style-type: none"> - NPN Collector-to-Emitter Breakdown voltage: 30V - Emitter-to-Collector Breakdown voltage: 5V - Collector-to-Emitter Saturation voltage: 0.8V Max - Rise and Fall time: 3uS @ 5V(Vce) - Breakdown voltage: 5V - Collector: Short Leg - Emitter: Long Leg 	1	1.75

TRIMPOTS

Pins 10mm Rotary Adjustable (Thumb Adjustable)



ITEM NAME	CODE	Qty.	PRICE
TRIMPOT 1K OHM (102)	TRIM1	5	5.47
	Resistance: 1K Ohm Rotary VR Single		

Pins 5mm Side Adjustable



TRIMPOT 10K OHM (103)	TRIM10	5	5.47
	Resistance: 10K; 4.7mm Knob Length		
TRIMPOT 50K OHM (503)	TRIM50	5	5.47
	Resistance: 50K Ohm		

Pins 5mm Top (Vertical) Adjustable









TRIMPOT 5K OHM (502)	TRIM5	5	5.47
	Resistance: 5K Ohm		
TRIMPOT 50K OHM (503)	TRIM50V	5	5.47
	Resistance: 50K Ohm		
TRIMPOT B1K OHM (102)	TRIMB1	5	5.47
	Resistance: 1K Ohm		
TRIMPOT 10K OHM (103)	TRIM10V	5	5.47
	Resistance 10K Ohm		
TRIM100K OHM (5MM VERTICAL) P5	TRIM100	5	5.47
	Resistance: 100K		

Side Adjustable 10 Turn, 3 Pins, Outside Pin Spacing 12.7mm



TRIMPOT 5K OHM (502)	TRIM5SA10	1	2.34
	Resistance: 5K Ohm Multi-turn 5mm inside pin		
TRIMPOT 100K SIDE ADJUSTABLE 10 TURN	TRIM100KSA10	1	2.34
	Resistance: 100K Ohm Multi-turn 5mm inside pin		

SOCKETS & CONNECTORS








ITEM NAME	CODE	Qty.	PRICE	ITEM NAME	CODE	Qty.	PRICE
COMPONENT HOLDER – 2 WAY	PA0875-001	1	12.00	COMPONENT HOLDER – 3 WAY	PA0875-010	1	12.85
	<p>Strong and convenient method of attaching small and difficult to handle components to a set of 2 4mm banana sockets to allow connections to be made to small or fragile components by standard 4mm banana plugs Constructed from strong fiberglass circuit board material – making it very sturdy for student use.</p> <p>Has 2 x banana sockets & 2 x connectors. Parts are fitted to the holders – there is no need to solder Components that can be supported include: transistors, diodes, resistors, MES lamp sockets, LEDs with their resistors or diodes Fitted with plastic feet to protect benches from being scratched from sharp wires & parts Size: 73 x 38mm.</p> <p><i>Genuine IEC product.</i></p>				<p>Strong and convenient method of attaching small and difficult to handle components to a set of 3 4mm banana sockets to allow connections to be made to small or fragile components by standard 4mm banana plugs Constructed from strong fiberglass circuit board material – making it very sturdy for student use.</p> <p>Has 3 x banana sockets & 3 x connectors. Parts are fitted to the holders – there is no need to solder Components that can be supported include: transistors, diodes, resistors, MES lamp sockets, LEDs with their resistors or diodes Fitted with plastic feet to protect benches from being scratched from sharp wires & parts Size: 73 x 38mm.</p> <p><i>Genuine IEC product.</i></p>		
CONNECTOR SCREW-ON	CONN-SC	100	6.95	DEANS MINI T-PLUG CONNECTORS	DEANSMP	2	3.30
	<p>3.8mm Twist on connector for joining 2-3 wires together without soldering (Grey).</p> <p>Pack of 100.</p>				<p>Great for quick connection and disconnection of wiring connections. As used on AUTOMAX and PICSPPC08M2 PCBs.</p>		
IC SOCKET 20 PIN STRIP	PIN20	1	0.90	HEADER STRIP 3 PINS	HEADST3P	1	0.20
	<p>2.54 strip tin PCB panel IC breakable 20 pin header IC socket round female pin header.</p> <p>Compatible for Arduino® projects.</p>				<p>3 Way 2.54mm Header Strip.</p> <p>Compatible for Arduino® projects.</p>		

<p>JUMPER-HEADER SOCKET 2 PIN</p> <p>JUMP2P</p>  <p>2.54mm – Closed 6mm</p>	1	0.20	<p>STEREO SOCKET 3.5MM PCB MOUNT</p> <p>SOCST3.5</p>  <p>Stereo Socket 3.5mm PCB Mount. Suits most download cables. 3 Pins for mounting to PCB. 12.0mm (w) x 14.3mm (l) x 6.0mm (h).</p>	1	1.50
<p>CH-2 PUSH WIRE CONNECTOR (SPRING LOADED)</p> <p>CONN-PUSH</p>  <p>Electrical spring loaded quick wiring terminal connector (push-in connector).</p>	1	0.55	<p>CONNECTORS – JST TYPE – MALE & FEMALE (2 SETS)</p> <p>CONN-JSTMF</p>  <p>JST type crimp connectors for a variety of uses such as on batteries and other connectors in radio controlled hobbies and models. Easily crimped using our Crimping Tool (CRIMPT) in the 22-26 gauge slot. Sold as 2 sets - i.e. 2 each of mating male & female red plug housing crimp terminal connectors 2.54mm (approx.) JST-SYP-2A with matching pins. Suitable for cable up to 1.3mm OD.</p>	2 SETS	3.05

Also see "Other Connectors".

MISCELLANEOUS ELECTRONIC COMPONENTS

ITEM NAME	CODE	Qty.	PRICE	ITEM NAME	CODE	Qty.	PRICE
HC-SR04 MODULE	HCSR04	1	5.35	SPEAKER TERMINAL	TERMCONSPKR	1	2.05
	<p>Ultrasonic Ranging Module uses sonar to determine the distance to an object. Provides 2cm-400cm non-contact measurement function, the ranging function can reach to 3mm. Arduino compatible. Includes ultrasonic transmitters, receiver & control circuit.</p> <p>Working Voltage: DC 5V Working Current: 15mA Working Frequency: 40Hz Dimensions: 45x20x15mm</p>				<p>2 Way Rectangular panel mounted spring terminal designed for use on speaker boxes and amplifiers. A fast and easy connection for your wires.</p> <p>2.8mm spade terminals, 12.5mm pitch Length: 37.0mm, Width: 19.0mm</p>		
BRACKET – HC-SR04	BRKTHCSR04	1	0.70	RELAY 5V	RELAY5	1	5.90
	<p>Mounting bracket for Ultrasonic Ranging Module <i>HC-SR04</i> (HCSR04). Includes 2 x screws & 2 x nuts for mounting. Acrylic. Dimensions: 51 x 15 x 34mm</p>				<p>PCB Mount Relay, DPDT. Relay is 5 volt, has a resistance of 45 ohm & requires 0.11 Amp to operate. 20.8mm(W)x15.5mm(H) x 9.9mm(D) approx.</p>		
LIGHT DEPENDENT RESISTOR	LDR	5	8.50	12-WAY RIBBON CABLE	RIBCAB	Per Metre	2.35
	<p>Light resistance: 8kΩ-24kΩ Dark resistance: > 2MΩ Max power: 100mW Size (mm): 5.1(l) x 4.3(w) x 2(h)</p>				<p>12 way Flat ribbon cable 15.5mm wide. Colour: grey (edge coloured red).</p>		
PICAXE USB DOWNLOAD CABLE	PICUCAB	1	35.00	25K LINEAR POTENTIOMETER	POT25	1	2.20
	<p>USB to 3.5mm Stereo socket. AXE027 - Picaxe USB Download Cable. This is required to download programs from your computer for Pat's PICAXE Microcontroller kits.</p>				<p>16mm Rotary Single PCB Horizontal Potentiometer. with nut and washer. Knob Type: Splined (18T) shaft. Terminal Type: 3 solder legs.</p>		

10K OHM LINEAR (B) SINGLE GANG 16MM POTENTIOMETER	POT10	1	3.95	POTENTIOMETER KNOB	POTKNOB	1	1.30
	<p>Power Rating Linear: 0.2W Log: 0.1W AC Voltage Rating: 150V Continuous Power: 0.125W Knob Type: Imperial D Terminal Type: 3 solder legs Shaft Length: 23.5mm Nut Size: 16mm Shaft is ¼ D type (30% of shaft has been removed for flat).</p>				<p>Push-On Style Knob. These knobs just push on to a standard splined (18T) shaft. Complete with coloured cap and stripe. 16mm diameter (at base) and 16mm high. (Colour of knob may vary from illustration).</p>		
TERMINAL BLOCK – 2 WAY 3.5MM PCB MOUNT	TERMBLKPCBMT	1	2.19	TERMINAL BLOCK – 2 WAY 5.0MM PCB MOUNT	TERMBLKPCBMT5.0	1	1.95
	<p>Handy for connecting wires to a printed circuit board. 3.5mm pitch. Dove-tail grooves enable these terminal blocks to be ganged together in any combination. With spring steel wire protect terminals. 300V AC rated. Cable size: 0.22-1.4mm</p>				<p>Ideal for those situations where wires leave a PCB. Just solder the terminal strip to the PCB and connect wires. Terminal spacing: 5mm</p>		
THERMAL HEATSINK WASHER & THERMAL BUSH (PACK OF 10 PAIRS)	HEATWB	10	1.80	USB CABLE A-B FOR ARDUINO	UNOCAB	1	2.50
	<p>The silicone rubber heat transfer washer is used to mount the TO-220 Transistor to the heatsink and draw heat away from it.</p> <p>The plastic bush is used to isolate the screw from the body of the transistor, preventing electrical shorts from the aluminium heatsink.</p> <p>Pack contains 10 each of the thermal heatsink washer and thermal bush.</p>				<p>USB 2.0 A to B Male/Male type cable. Suitable to run a Arduino compatible controller from your computer or other 5V source. 30cm long cables.</p>		
CONDUCTIVE FOAM SHEET 12 X 12 X 5CM	FOAMCONSH	1	4.20				
	<p>Non-static reusable black sheeting for storing ICs, CMOS, etc. Approximate size: 11.9 x 11.9 x 5cm.</p>						

Product items and shapes may vary slightly from illustrations.

ITEM NAME	CODE	Qty.	PRICE
TEMPERATURE PROBE DS18B20	<p data-bbox="573 102 716 134">PROBE1820</p> <p data-bbox="573 139 1031 167">Water Proof DS18B20 temperature sensor.</p> <p data-bbox="573 191 806 219">Arduino compatible.</p> <p data-bbox="573 248 1150 276">Stainless steel tube: 35mm (length) x 6mm (diameter).</p> <p data-bbox="573 277 997 305">Cable: 90cm (length) x 4mm (diameter).</p> <p data-bbox="573 334 1761 440">Provides 9 to 12-bit (configurable) temperature readings which indicate the temperature of the device. Unique 1-Wire interface requires only one port pin for communication. Each DS18B20 contains a unique silicon serial number enabling multiple DS18B20s to exist on the same 1-Wire bus and therefore placing sensors in many different places.</p> <p data-bbox="573 469 1436 578">Can be powered from data line. Power supply range is 3.0V to 5.5V. Measures temperatures -55°C to +125°C (±0.5°C accuracy from -10°C to +85°C). Converts 12-bit temperature to digital word in 750 ms (max.).</p>	1	6.45









ADHESIVES & TAPES








ITEM NAME	CODE	Qty.	PRICE	ITEM NAME	CODE	Qty.	PRICE
HOT GLUE STICK	GLUESTK	5	6.40	HOT GLUE STICK 7MM	GLUESTK7 GLUESTK7-5	50 5	11.95 3.90
	For hot glue gun. 11mm (dia) x 300mm (l) NOTE: <i>HOT GLUE GUNS</i> are available from Scorpio Technology. Please see <i>Tools</i> section.				For Hot Glue Gun Mini (<i>GLUEGUNMIN</i>). 7.4mm (dia) x 100mm (l) NOTE: <i>MINI HOT GLUE GUNS</i> are available from Scorpio Technology. Please see <i>Tools</i> section.		
DOUBLE SIDED ADHESIVE TAPE	TAPEDS	25m roll	13.23	SINGLE SIDED ADHESIVE TAPE	TAPESS	66m roll	7.79
	Cloth double sided tape. Approx. 12 or 18mm wide (<i>depending on availability</i>) Suitable for use to retain motors & guide tubes.				PVC single sided tape. Approx. 12mm wide. Suitable for use to retain motors & guide tubes.		
GAFFER TAPE – BLACK	TAPEGBK	25m roll	16.95	GAFFER TAPE – BLUE	TAPEGBL	25m roll	16.95
	25 metre roll of black cloth-backed tape. Matte surface, no residue, strong adhesive. 50mm wide x 0.27mm thick. Ideal for a variety of uses.				25 metre roll of blue cloth-backed tape. Matte surface, no residue, strong adhesive. 50mm wide x 0.27mm thick. Ideal for a variety of uses.		
GAFFER TAPE – WHITE	TAPEGFW	4.5m	2.50	DOUBLE SIDED TAPE PIECES 20X15X1MM	TAPEDS20X5X1	16	0.60
	4.5 metre roll of white cloth-backed tape. Matte surface, no residue, strong adhesive. 50mm wide x 0.27mm thick. Ideal for a variety of uses.				Small double-sided tape rectangles. Block of 16 (connected).		
ADHESIVE COPPER TAPE – 6MM X 50M	TAPECOPAD	20m	11.45	HEATSINK COMPOUND 10GM TUBE	HEATSINK10	10gm tube	4.95
	20 metre roll of 0.06mm thick adhesive copper tape. Suitable for Paper Circuits projects. 6mm wide. Price per roll: \$11.45 (1 - 9 rolls): \$10.95 (10+ rolls)				Heat conducting paste facilitates heat transfer from semiconductors to heatsinks.		





WELD ON ADHESIVE	WELDON16	44ml 146ml	22.90 33.27	NEON GAFFER TAPE GREEN	NM2813	10m roll	15.95
	<p>For Acrylics. Clear, medium bodied solvent cement. For high joint strength.</p>				<p>Stylus, Fluorescent Gaffer 511 – 10m long x 24mm wide – Matte finish - Water proof. (END OF LINE - LIMITED STOCK)</p>		
NEON GAFFER TAPE PINK	NM2815	10m roll	15.95				
	<p>Stylus, Fluorescent Gaffer 511 – 10m long x 24mm wide – Matte finish - Water proof. (END OF LINE - LIMITED STOCK)</p>						

SOLDERING



SOLDERING TOOLS



ITEM NAME	CODE	PRICE (1-24 packs)	PRICE (25+ packs)
SOLDERING IRON	SOLDIRN	26.95	25.95
	40 Watt; 240Volt.		
SOLDERING IRON 6W – BATTERY OPERATED	SOLDIRNBT	25.95	23.95
	6W, 4.5V battery operated soldering iron useful for on-site repairs and PCB work and heats to soldering temperature in about 10 seconds. It also has a safety cover that prevents damage to the tip and prevents the power being turned when it's in the drawer of a toolbox. 175mm long. Requires 3 x AA batteries (<i>not included</i>).		
SOLDERING IRON STAND	SOLDIRNSTD	19.82	19.02
	Heavy duty soldering iron stand with hefty cast iron base with removable sponge tray and twin spiral iron holder. Ideal for heavier soldering irons. Its weight makes it more stable in a classroom situation. Packaged weight: 0.442kg.		
SOLDERING IRON STAND - ECONOMY	SOLDIRNSTD-EC	8.75	8.75
	Economical version suitable for Home Education settings or occasional use. Pressed metal base & spring. Standard Iron Size. NOTE: We recommend schools ordering the Soldering Iron Stand (SOLDIRNSTD) as its weight makes it more stable in a classroom situation.		
SOLDERING SPONGE (REPLACEMENT)	SOLDSPGE	3.95	3.95
			
SOLDERING STATION	SOLDSTN	85.00	78.00
	48 Watt Temperature controlled soldering station . Temperature range: 150-450C.		

<p>SOLDERING STATION TIP REPLACEMENT</p> 	<p>SOLDSTNTIP</p> <p>Soldering Station Soldering Iron Tip Replacement for the <i>SOLDERING STATION</i> (SOLDSTN).</p>	<p>10.16</p>	<p>10.16</p>
<p>SOLDER SUCKER</p> 	<p>SOLSUC</p> <p>High suction power de-soldering pump.</p>	<p>11.00</p>	<p>11.00</p>
<p>DESOLDER BRAID</p> 	<p>SOLBRAID</p> <p>De-solder wick. High quality Goot brand Gootwick, made in Japan. Contains wash- free RMA flux and conforms to MIL- F- 14256F. Supplied in plastic reels - 1.5 metres long. Bulk Pricing (per reel): \$8.95 (1-4) \$8.00 (5+)</p>	<p>8.95</p>	<p>8.00</p>
<p>SOLDERING IRON TIP REPLACEMENT</p> 	<p>SOLDTIP</p>	<p>7.75</p>	<p>7.75</p>
<p>SOLDERING IRON TIP CLEANING PASTE</p> 	<p>SOLDIRNTIPCLN</p> <p>The lead free tip cleaner/tinner compound revitalises and restores tips so they're almost as good as new. It contains solder powder, and non-corrosive flux, so it cleans and tins your tip at the same time. Supplied in a handy tin, it also has double sided tape so you can stick the tin to your work bench or soldering station.</p> <p>Click here for Datasheet Click here for MSDS</p>	<p>16.95</p>	<p>16.95</p>
<p>PCB HOLDER WITH MAGNIFYING GLASS</p> 	<p>THIRDHAND</p> <p>Printed Circuit Board holder with magnifier.</p>	<p>20.50</p>	<p>20.50</p>
<p>SOLDER FUME EXTRACTOR</p> 	<p>SOLDFAN</p> <p>Designed to remove dangerous solder fumes from the work area. Suitable for use in schools, production lines, service centres, R&D workbenches or the hobbyist. It incorporates a ball bearing high volume fan to maximise airflow which is directed upwards at the rear of the unit to aid in safe dispersion of fumes. ESD safe. Operating voltage: 240V AC. Max Power (current consumption): 23W Fan air volume: 1m³/min (ie. Air flow: 60 m³/hr) One installed carbon filter and two spares are included. Dimensions: 200 (w) x 250 (h) x 170 (d) mm</p>	<p>82.00</p>	<p>82.00</p>

EXTRACTOR FAN FILTERS	SOLDFUMEXFIL	11.90	11.90
	<p>Universal filters to suit the <i>SOLDER FUME EXTRACTOR</i> (SOLDFAN) and the <i>EXHAUST FAN/FUME EXTRACTOR</i> (SOLDFANADJ). Pack of 5.</p>		
EXHAUST FAN / FUME EXTRACTOR – ADJUSTABLE	SOLDFANADJ	60.00	60.00
	<p>The practical solder fume extractor with different speed settings can not only be used as a table fan but also can be mounted on a beam or on the wall. You have the choice, which positioning option you prefer. One installed carbon filter and one spare are included. Dual function: can work as either a Solder smoke absorber or Bench fan Adjustable speed: 10 speed settings Operating voltage: 240V AC. Max Power (current consumption): 23W Blowing capacity: 0.2 to 1m3 / minute Air flow rate: -1.2 m³/min Max. noise generation 45 dBa Dimensions (L x W x H): 185 x 135 x 217 mm</p>		
SOLDER REEL HOLDER	SOLDHOLD	32.95	32.95
	<p>It will hold our solder reels and the solder is fed through the guide. It has a handle, so it can easily be carried, and in can be wall mounted to be right there where you always need it. The base is super heavy, giving it stability, so even when the solder reel is nearly empty it will feed through well. Recommended for classroom situation or on any technician's workbench. Solder reel holder weight: 620g. Assembly required.</p>		
PCB HOLDER FOR SOLDERING	PCBHOLD	20.20	20.20
	<p>Adjustable PCB holder for soldering, desoldering or rework. 2 adjustable grips – suits various board sizes. PCB can be rotated 360 degrees & stay set in any position. Rigid metal stand with rubber feet for stability. Size: 300mm x 165mm x 125mm Holds PCB size (max): 200mm x 140mm</p>		
*Colours and models of tools may vary from illustrations above.			






SOLDER


	ITEM NAME	CODE		PRICE (ea)
	SOLDER – ROLL – 500GM X 0.71MM	SOLD500	60/40 Resin Cored 0.71mm x 500gm	58.00
	SOLDER – ROLL – 200GM X 0.71MM – LEAD FREE	SOLD200-LF	200gm roll of 0.71mm lead free resin core solder. 99.3% tin / 0.7% copper.	48.00 (1-5) 45.00 (6+)
	SOLDER TUBE - 0.71MM	SOLDTUBE	60/40 resin cored 0.71mm x 15g tube.	4.50
	SOLDER TUBE - 0.71MM – LEAD FREE	SOLDTUBE-LF	Lead free resin core solder - 0.71mm x 15g tube. 99.3% tin / 0.7% copper.	5.95

ITEM NAME	CODE	PRICE
TINNED COPPER WIRE	TCW-1	0.67
	0.71MM, 22 SWG. Ideal for solder practice and wire links. Lead free. <i>Sold in 1 metre increments.</i>	
TINNED COPPER WIRE – 25 GRAM ROLL	TCW25	11.95
	25 gram roll of 0.71mm (22 AWG) of tin plated copper wire.	

*Colours and models of tools may vary from illustrations above.

WIRES, TERMINATED WIRES & HEAT SHRINK

ITEM NAME	CODE	Qty.	PRICE
HOOK UP WIRE 	WIREHU10 Choice of black / red / blue / green / yellow / white / brown / orange Size (approx.) 21 / 0.08. <i>Please specify colour & length when ordering. If no colour is specified, black (WIREHUBK10) will be delivered.</i>	Per 10 metres	3.50
	WIREHUT5 Suitable for making up Banana Plug leads and Alligator Clip leads. Choice of black / blue / green / red Size (approx.) 24 / 0.2. <i>Please specify colour & length when ordering. If no colour is specified, black (WIREHUTBK5) will be delivered</i>	Per 5 metres	5.84
MILD STEEL MIG WIRE 	WIREMIG 0.9mm. Ideal for the "JUMPING BUG" project (See WIND-UP CLOCK MECHANISM)	Per metre	0.45
WIRE – COPPER BASE 	WIRECOP2/14 2mm; 14swg. Great for steady hand game.	Per metre	4.67
FIGURE 8 SPEAKER WIRE – 30M 	WIREFIG8 Colour: Light Grey, size 14 / 0.14. WIREFIG8 is ideal for such projects as the LUMA DESK LAMP (LUMA), or MORSE CODE KIT (MORSE) if mounting the buzzer remotely, or if making a pair of Morse Code kits.	30 metre roll	20.45
WIRE CABLE (PLASTIC COATED) 	CA2-10 7 X 7 strand, stainless steel rope, 2mm diameter	10 metres	3.75
	CA2-15 7 x 7 strand stainless steel rope, 2mm diameter	15 metres	5.25

TERMINATED WIRES	ITEM NAME	CODE	Qty. per Pack:	PRICE
	TERMINATED WIRE 75MM BLACK WITH FEMALE SPADE AT ONE END	WIRETB75	10	3.60
	TERMINATED WIRE 75MM RED WITH FEMALE SPADE AT ONE END	WIRETR75	10	3.60
	TERMINATED WIRE 150MM BLACK WITH FEMALE SPADE AT ONE END	WIRETB150	10	3.60
	TERMINATED WIRE 150MM RED WITH FEMALE SPADE AT ONE END	WIRETR150	10	3.60



TERMINATED WIRES 180MM WITH FEMALE SPADE AT ONE END - PAIR

WIRE180PR

2

0.95

Pair of 180mm terminated wires (1 x black + 1 x red) with 6.3mm terminal at one end.
24 strands / 0.2mm dia.
Fit solar panel terminals.

ENAMELED COPPER WIRE

Enameled (or enamelled) copper wire, useful as winding wire, but also has many other electrical applications. Wound in reel.

Enameled copper wire is used in applications such as winding electric motor coils, speakers and transformers. It is also used in the construction of electromagnets, transformers, generators and inductors. has a very thin insulating coating, allowing it to be wrapped tightly around an object to create an electromagnet, a motor, a solenoid or any other magnet operated piece of machinery.

250g REELS



SWG	CODE	LENGTH (m)	REEL WEIGHT	WIRE DIA. (mm)	PRICE PER REEL
18	WIREEC1120-3	24.06	250gm	1.22	35.00
20	WIREEC1120-5	43.23	250gm	0.91	37.00
22	WIREEC1120-7	71.03	250gm	0.71	37.00
24	WIREEC1120-9	114.18	250gm	0.56	37.00
26	WIREEC1120-11	176.82	250gm	0.45	37.00
28	WIREEC1120-13	247.96	250gm	0.38	37.00
30	WIREEC1120-14	372.59	250gm	0.31	37.00
32	WIREEC1120-15	491.15	250gm	0.27	35.00
34	WIREEC1120-16	676.85	250gm	0.23	35.00

500g REELS



14	WIREEC1120-1	17.37	500gm	2.03	65.00
16	WIREEC1120-2	26.95	500gm	1.63	70.00
18	WIREEC1120-4	48.11	500gm	1.22	70.00
20	WIREEC1120-6	86.48	500gm	0.91	70.00
22	WIREEC1120-8	142.05	500gm	0.71	70.00
24	WIREEC1120-10	228.35	500gm	0.56	70.00
26	WIREEC1120-12	353.64	500gm	0.45	70.00

BARE COPPER WIRE



SWG	CODE	REEL WEIGHT	WIRE DIA. (mm)	PRICE PER REEL
16	WIRECOPB16	500gm	1.5	50.00
18	WIRECOPB18	500gm	1.2	50.00
22	WIRECOPB22	200gm	0.7	28.00
24	WIRECOPB24	500gm	0.6	54.00
26	WIRECOPB26	500gm	0.5	54.00
28	WIRECOPB28	500gm	0.4	55.00

CONSTANTAN WIRE – BARE - EUREKA

A copper nickel wire that allows for low temperature coefficient suitable for resistance coils, etc.



SWG	CODE	LENGTH (m)	REEL WEIGHT	WIRE DIA. (mm)	PRICE PER REEL
16	WIRECBE1200-1	6.78	125gm	1.62	26.27
18	WIRECBE1200-2	12.00	125gm	1.22	26.27
20	WIRECBE1200-3	21.56	125gm	0.91	26.27
22	WIRECBE1200-4	35.43	125gm	0.71	26.27
24	WIRECBE1200-5	57.00	125gm	0.56	26.27
26	WIRECBE1200-6	84.43	125gm	0.46	26.27
28	WIRECBE1200-7	123.75	125gm	0.38	28.53
30	WIRECBE1200-8	185.92	125gm	0.31	28.53
32	WIRECBE1200-9	245.00	125gm	0.27	28.53
34	WIRECBE1200-10	337.72	125gm	0.23	28.53

NICHROME (RESISTANCE) WIRE- BARE

A low nickel (0.5%0 iron allow for laboratory uses. Made up of 0.5% Ni, 15% Cr, 4% Al, 89.5% Fe. Designed for science experiments but can also be used in heaters and electrical appliances. Maximum operating temperature 1150°C, Electrical resistivity at 20°C | mm²/m - 1.26



Lengths are derived from diameter, density, and mass - they are not exact (but should be quite close). Many industrial and hobby hot wire foam cutters also use Nichrome wire.

Nichrome wire is also commonly used in ceramics, as an internal support structure to help some elements of clay sculptures hold their shape while they are still soft. Nichrome wire is used because of its ability to withstand the high temperatures.

NOTE: The wire is sold by weight. The lengths are approximations based on the density, weight, and thickness of the wire.










SWG	CODE	LENGTH (m)	REEL WEIGHT	WIRE DIA. (mm)	PRICE PER REEL
18	WIREPH1064A	15.2	125gm	1.22	31.00
20	WIREPH1064B	27.4	125gm	0.91	31.00
22	WIREPH1064C	45.7	125gm	0.71	31.00
24	WIREPH1064D	76.2	125gm	0.56	31.00
26	WIREPH1064E	109.7	125gm	0.45	31.00
28	WIREPH1064F	160.0	125gm	0.38	31.00
30	WIREPH1064G	228.6	125gm	0.31	31.00
32	WIREPH1064H	304.8	125gm	0.27	31.00






HEATSHRINK	ITEM NAME	CODE	PRICE PER MTR
	HEATSHRINK – 3MM TUBING- BLACK - FOR INSULATING WIRES & TERMINALS	SHRINK3BLK	2.35
	HEATSHRINK – 3MM TUBING- RED - FOR INSULATING WIRES & TERMINALS	SHRINK3RED	2.35
	HEATSHRINK – 6MM TUBING – BLACK – FOR INSULATING WIRES & TERMINALS	SHRINK6BLK	3.45
	HEATSHRINK – 6MM TUBING – RED – FOR INSULATING WIRES & TERMINALS	SHRINK6RED	3.45
	Shrinks to 50% of its size. Shrink with a heatgun or hairdryer. Sold in 1.2metre packs.		











ALLIGATOR CLIPS, BANANA PLUGS & OTHER CONNECTORS











ALLIGATOR CLIPS



ITEM NAME	CODE	Qty. Per Pack	PRICE (1-4 PK)	PRICE (5-19 PK)	PRICE (20+ PK)
 ALLIGATOR CLIP WITH WIRE	ALLIWIRES12 Alligator clips with 250mm wire – Set of 6 different colours (black, red, blue, yellow, green & white)	12	13.85	13.30	12.75
 ALLIGATOR CLIPS	ALLICLIP Alligator Clips without wires. Pack contains 5 red and 5 black alligator clips.	10	6.40	5.50	5.05
				Qty. per Pack	PRICE
ALLIGATOR CLIP – INSULATED SHANK - BLACK	ALLICLIPISB			10	10.50
ALLIGATOR CLIP – INSULATED SHANK - RED	ALLICLIPISR			10	10.50
 ALLIGATOR CLIP – INSULATED SHANK - BLACK	ALLICLIPISB Alligator clips with screw. Overall length approx. 75mm. Black or red (please specify colour).				
 ALLIGATOR CLIP – INSULATED SHANK - RED	ALLICLIPISR Alligator clips with screw. Overall length approx. 75mm. Black or red (please specify colour).				
 ALLIGATOR CLIP – PLAIN SHANK	ALLICLIPPS			10	8.00
 HOOK UP WIRE - THICK	WIRESHUT5 Suitable for making up Banana Plug leads & Alligator Plug leads. Size (approx.) 24 / 0.2. Choice of black / blue / green / red Please specify colour & length when ordering. If no colour is specified, black (<i>WIRESHUTBK5</i>) will be delivered.			5 metres	5.84
 ALLIGATOR CLIP TO PIN – JUMPER LEAD SET	ALLIWIRESCLIP10 Jumper Cable Set – Arduino & RaspberryPi compatible <ul style="list-style-type: none"> • Each cable consists of a Pin to insulated Alligator Clip • Ideal use with Prototyping Breadboards • Multi-coloured for easy identification • 20cm Length 			10	11.95


BANANA PLUGS & SOCKETS

ITEM NAME	CODE		
BANANA PLUGS – 4MM BLACK	BAPLBK4A	10	10.05
BANANA PLUGS – 4MM GREEN	BAPLG4	10	10.05
BANANA PLUGS – 4MM RED	BAPLR4A	10	10.05
BANANA PLUGS – 4MM YELLOW	BAPLY4	10	10.05
	Side stacking – 4mm stem (Banana Lead Connectors – Stackable) Available in black / green / red / yellow (specify colour & code when ordering).		
BANANA PLUG WITH WIRES (SET OF 2)	BAPLW2	Pair	6.82
	Red & black side stacking 4mm stem banana plugs to stacking 4mm stem banana plugs with leads. Wire length: 400mm.		
BANANA PLUGS - PIGGY BACK - 4MM BLACK	BAPLPBBK4	1	2.75
BANANA PLUGS - PIGGY BACK - 4MM RED	BAPLPBR4	1	2.75
	Piggy Back Style - Another banana plug can be inserted into the back of the plug 4mm terminals (dia.) Red or Black		
BANANA PLUG PANEL MOUNT SOCKET - 4MM BLACK	BANSOCMTBK	1	1.20
BANANA PLUG PANEL MOUNT SOCKET - 4MM RED	BANSOCMTR	1	1.20
	4mm Panel Mount Sockets to suit Banana plugs. 4.0mm (I.D.) 11.3mm (O.D.) 16.5mm (length)		
BANANA SOCKET TO ALLIGATOR CLIP – BLACK	BASOCALLICLB	1	4.75
BANANA SOCKET TO ALLIGATOR CLIP – RED	BASOCALLICLR	1	4.75
	Banana Socket to Alligator Clip – Black or Red (specify colour/code when ordering).		



ITEM NAME	CODE	PRICE	ITEM NAME	CODE	PRICE
BANANA PLUG-BANANA PLUG - 4MM STACKABLE - BLACK 300MM CABLE	PA0695-001	7.35	BANANA PLUG-BANANA PLUG - 4MM STACKABLE - BLACK 300MM CABLE	PA0695-002	7.35
	300mm long black cable with 4mm end stackable IEC banana plugs at each end. Is available as spare part for IEC's Electricity Kits.			300mm long blue cable with 4mm end stackable IEC banana plugs at each end. Is available as spare part for IEC's Electricity Kits.	
BANANA PLUG-BANANA PLUG - 4MM STACKABLE - GREEN 300MM CABLE	PA0695-003	7.35	BANANA PLUG-BANANA PLUG - 4MM STACKABLE - RED 300MM CABLE	PA0695-004	7.35
	300mm long green cable with 4mm end stackable IEC banana plugs at each end. Is available as spare part for IEC's Electricity Kits.			300mm long red cable with 4mm end stackable IEC banana plugs at each end. Is available as spare part for IEC's Electricity Kits.	
BANANA PLUG-BANANA PLUG - 4MM STACKABLE - YELLOW 300MM CABLE	PA0695-005	7.35	BANANA PLUG-BANANA PLUG - 4MM STACKABLE - BLACK 600MM CABLE	PA0700-001	8.25
	300mm long yellow cable with 4mm end stackable IEC banana plugs at each end. Is available as spare part for IEC's Electricity Kits.			600mm long blue cable with 4mm end stackable IEC banana plugs at each end. Is available as spare part for IEC's Electricity Kits.	
BANANA PLUG-BANANA PLUG - 4MM STACKABLE - BLUE 600MM CABLE	PA0700-002	8.25	BANANA PLUG-BANANA PLUG - 4MM STACKABLE - GREEN 600MM CABLE	PA0700-003	8.25
	600mm long blue cable with 4mm end stackable IEC banana plugs at each end. Is available as spare part for IEC's Electricity Kits.			600mm long green cable with 4mm end stackable IEC banana plugs at each end. Is available as spare part for IEC's Electricity Kits.	
BANANA PLUG-BANANA PLUG - 4MM STACKABLE - RED 600MM CABLE	PA0700-004	8.25	BANANA PLUG-BANANA PLUG - 4MM STACKABLE - YELLOW 600MM CABLE	PA0700-005	8.25
	600mm long red cable with 4mm end stackable IEC banana plugs at each end. Is available as spare part for IEC's Electricity Kits.			600mm yellow cable with 4mm end stackable IEC banana plugs at each end. Is available as spare part for IEC's Electricity Kits.	

<p>BANANA PLUG-BANANA PLUG - 4MM STACKABLE - BLACK 1200MM CABLE</p> <p>PA0705-001</p>	<p>9.35</p>	<p>BANANA PLUG-BANANA PLUG - 4MM STACKABLE - BLACK 1200MM CABLE</p> <p>PA0705-002</p>	<p>9.35</p>
 <p>1200mm long black cable with 4mm end stackable IEC banana plugs at each end. Is available as spare part for IEC's Electricity Kits.</p>		 <p>1200mm long blue cable with 4mm end stackable IEC banana plugs at each end. Is available as spare part for IEC's Electricity Kits.</p>	
<p>BANANA PLUG-BANANA PLUG - 4MM STACKABLE - GREEN 1200MM CABLE</p> <p>PA0705-003</p>	<p>9.35</p>	<p>BANANA PLUG-BANANA PLUG - 4MM STACKABLE - RED 1200MM CABLE</p> <p>PA0705-004</p>	<p>9.35</p>
 <p>1200mm long green cable with 4mm end stackable IEC banana plugs at each end. Is available as spare part for IEC's Electricity Kits.</p>		 <p>1200mm long red cable with 4mm end stackable IEC banana plugs at each end. Is available as spare part for IEC's Electricity Kits.</p>	
<p>BANANA PLUG-BANANA PLUG - 4MM STACKABLE - YELLOW 1200MM CABLE</p> <p>PA0705-005</p>	<p>9.35</p>	<p>BANANA PLUG-BANANA PLUG - 4MM STACKABLE - RED & BLACK 300MM CABLE</p> <p>PA0710-001</p>	<p>15.40</p>
 <p>1200mm yellow cable with 4mm end stackable IEC banana plugs at each end. Is available as spare part for IEC's Electricity Kits.</p>		 <p>Pair of red and black 600ml cables, together in a clear sleeve with 4mm end stackable IEC banana plugs at each end. These are available as spare part for IEC's Electricity Kits.</p>	
<p>BANANA PLUG-BANANA PLUG - 4MM STACKABLE - RED & BLACK 600MM CABLE</p> <p>PA0710-002</p>	<p>17.90</p>	<p>BANANA PLUG-BANANA PLUG - 4MM STACKABLE - RED & BLACK 1200MM CABLE</p> <p>PA0710-003</p>	<p>21.70</p>
 <p>Pair of red and black 600ml cables, together in a clear sleeve with 4mm end stackable IEC banana plugs at each end. These are available as spare part for IEC's Electricity Kits.</p>		 <p>Pair of red and black 1200ml cables, together in a clear sleeve with 4mm end stackable IEC banana plugs at each end.</p>	
<p>BANANA PLUG-BANANA PLUG - 4MM STACKABLE - RED & BLACK 1500MM CABLE</p> <p>PA0710-004</p>	<p>23.10</p>	<p>BANANA PLUG-BANANA PLUG - 4MM STACKABLE - RED & BLACK 2000MM CABLE</p> <p>PA0710-005</p>	<p>28.00</p>
 <p>Pair of red and black 1500ml cables, together in a clear sleeve with 4mm end stackable IEC banana plugs at each end.</p>		 <p>Pair of red and black 2000ml cables, together in a clear sleeve with 4mm end stackable IEC banana plugs at each end.</p>	


ITEM NAME	CODE	Qty. per Pack	PRICE
MAGLEADS			
MAGLEADS – BLACK – 150MM	MAGLDB	10	25.00
MAGLEADS – RED – 150MM	MAGLDR	10	25.00
 	150mm leads with magnet on both ends. Eliminates the use of alligator or banana clips when connecting electrical items. Choice of red or black (<i>please specify</i>). Pack of 10. (CLEARANCE ITEM - WHILE STOCKS LAST)		

IC TEST CLIPS		Qty.	1-19	20+
TEST CLIPS	TESTCL	1	2.10	1.80
	Red IC Test Clip with syringe action. Suitable for working with small components, multimeters, transistors, etc. Approx. 57mm.			

OTHER CONNECTORS

ITEM NAME	CODE	PRICE	ITEM NAME	CODE	PRICE
CONNECTOR SCREW-ON	CONN-SC	6.95	CONNECTOR – LED STRIP TO BARE WIRES	CONN-LEDSTR	3.50
	3.8mm Twist on connector for joining 2-3 wires together without soldering (Grey). Pack of 100.			A simple clip-on connector suitable with any single colour 5050/5060 SMD LED strip lights. A 12V or 24V battery can be connected depending on the LED strip light without the need for soldering the connections. Will work with both 10mm & 8mm LED strips. 170mm (l) x 10mm (w) Features: Voltage: 12/24VDC Current: 4A (12V) 2A (24V) LED Type: 5050/5060 LED Colour: Single 2 Pin	

<p>TERMINAL BLOCK 12 WAY</p> 	<p>TERMBLK12</p> <p>6 Amp 12-way screw terminal strip. Capable of being divided with a sharp knife. Temperature -35°C to 110°C (approx.). Cable diameter: 3.3mm; Length 114.5mm, Pitch: 10mm. Supplied with sturdy retention hole on a fixed patch.</p>	<p>2.95</p>	<p>PLUG TO PLUG JUMPER LEADS 40 PCE</p>  <p>PLJUMPLD40</p> <p>A pack of 40 jumper leads of various colours for prototyping. Ideal for Arduino®, Raspberry Pi & DIY projects. Each flexible lead has pins to suit breadboards or PCB headers. Overall length 20cm.</p>	<p>7.95</p>
<p>SOCKET TO SOCKET JUMPER LEADS 40 PCE</p> 	<p>SOCJUMPLD40</p> <p>A pack of 40 jumper leads of various colours for prototyping. Ideal for Arduino®, Raspberry Pi & DIY projects. Each flexible lead has pins to suit breadboards or PCB headers. These sockets also fit LED legs, thus eliminating the need to solder. Overall length 20cm.</p>	<p>7.95</p>	<p>IC SOCKET 20 PIN STRIP</p>  <p>PIN20</p> <p>2.54 strip tin PCB panel IC breakable 20 pin header socket round female pin header. Compatible for Arduino® projects.</p>	<p>0.90</p>
<p>BRACKET – POTENTIOMETER</p> 	<p>BRKTPOT</p> <p>1mm thick zinc plated steel mounting bracket for 25K Linear Potentiometer (POT25). Comprises of 7mm diameter hole for potentiometer shaft. and two 3mm mounting holes on base. Dimensions (approx.): 35 x 25 x 19mm</p> 	<p>1.00</p>	<p>ELECTRIC MOTOR MOUNT FOR GENERATOR (GENDC)</p>  <p>EMCL-GEN</p> <p>This consists of a clip with self-adhesive tape on the bottom, with a wide cable tie to clamp and hold the <i>GENERATOR (GENDC)</i> or other large items. Pack of 5. (<i>GENDC sold separately. Colour of cable tie may vary.</i>)</p>	<p>2.75</p>

ITEM NAME	CODE	Qty. Per Pack	PRICE (1-4 PK)	PRICE (5-19 PK)	PRICE (20+ PK)
	<p>EMCL</p> <p>Self-adhesive clip. Securely holds <i>MOT12</i> to <i>MOT30</i> motors.</p>	<p>5</p>	<p>8.55</p>	<p>7.40</p>	<p>7.25</p>

FISHING LINE

FISHING LINE – REEL

FLINE

Per Roll

6.70



200m roll.
Suitable for racing *DRAGSTERS* and for *CAPTIVE AIRPLANE*.

SPACERS

ITEM NAME

CODE

Description

Qty.

PRICE



2.9mm Solar Wheel
Spacers

2.9MM SOLAR WHEEL
SPACER

SPACERSW2.9

2.9mm spacer for mounting gear onto solar wheel
SW70B using 3.0mm fiberglass or carbon fibre rods.
28mm O.D x 4mm thick with a 2.9mm hole.

12

5.75



8mm PCB Mounting
Spacers



24mm Mounting
Spacers

8MM SPACER

SPACER8

8mm PCB mounting spacer.

12

1.96

24MM SPACER

SPACER24






24mm mounting spacer. Ideal for various projects
(used with BOLT40 & NUTM3).

12

4.40

3D PRINTING

PLEASE NOTE: We do not keep stock of these. They are ordered in as required.

ITEM NAME	CODE	PRICE
CREALITY CR-30 LARGE FORMAT 3D PRINTER 	<p>TL4610 <i>CURRENTLY OUT OF STOCK</i></p> <p>Thanks to its infinite-Z conveyor belt and unique 45° angled nozzle, this large format belt 3DPrintMill can print infinite length 3D prints or continuous bulk 3D prints. The rolling conveyor belt is made of wear-resistant Nylon and provides excellent model adhesion. Prints simply detach themselves once they reach the end of the belt, which means you can print batches of prints continuously and unattended. An Extender Bracket Kit TL4611 (<i>sold separately</i>) can be attached to support prints that extend well beyond the conveyor belt.</p> <p>Other features include a high-quality dual gear metal extrusion mechanism, high-performance power supply, and filament sensor that pauses prints when a filament run-out or break is detected. Printing automatically resumes after new filament is fed in. CrealityBelt printing software prdes a simple and easy operation interface for novice to advanced users. Easy to assemble, tools included. Check out the timelapse video online of a 6 metre long print made by the CR-30.</p> <ul style="list-style-type: none"> • Rolling Conveyor Belt for Infinite Length 3D Prints • Colour LCD with Rotary Control • Stable CoreXY Structure • Filament Run-out Sensor • SD Memory Card Slot <p>SPECIFICATIONS Build Volume: 200mm wide x 170mm tall x infinite length Filament: PLA/TPU/PETG</p> <p>Filament Diameter: 1.75mm Interface: SD Card Extruders: 1 Layer Resolution: 0.1mm Layer Thickness: 0.1mm - 0.4mm Nozzle Diameter: 0.4mm Extruder Temperature: < 240°C Bed Temperature: < 100°C Screen: LCD</p>	1450.00
CREALITY CR-30 EXTENDER KIT UPGRADE 	<p>TL4611</p> <p>This extension bracket attaches to a Creality CR-30 3DPrintMill 3D printer so that your model fabricates longer than the stand-alone CR-30 conveyor belt supports.</p> <ul style="list-style-type: none"> - Six stainless steel rollers - Easy to install - Supplied with mounting hardware <p>SPECIFICATIONS - 304 Stainless Steel</p> 	275.00
CREALITY ENDER-3 V3 SE 	<p>TL4751</p> <p>Introducing the Creality 3D Ender 3 V3 SE, a compact and powerful 3D printer with smooth filament feeding for PLA, PETG, and TPU. Print with speed and precision - up to 250mm/s - while enjoying easy assembly and intuitive UI display. Experience worry-free auto leveling and dual Z-axis for exceptional print quality. Simplify filament management with one-tap loading/unloading. Unleash your creativity with the Ender 3 V3 SE's exceptional performance and user-friendly design.</p> <p>Maximum print size: 220 x 220 x 250mm Filament size: 1.75mm Maximum printing speed: 250mm/s PC interface: SD card</p> <p>FEATURES Dual Z-axis rods & linear Y-axis shafts Direct drive "Sprite" extruder Start printing within 20 minutes Auto filament load & unload CR-Touch sensor for auto leveling Strain sensor for auto Z offset</p> 	370.00

CREALITY ENDER-3 S1 PLUS

TL4756

799.00



The Ender 3 S1 Plus 3D printer is a high-performance 3D printer that is designed for both beginners and advanced users. It features a large build volume of 300 x 300 x 300mm, and a precision of 0.05mm at speeds of up to 150mm/s.

The Ender 3 S1 Plus is equipped with a filament run-out sensor that automatically pauses the printing process when the filament runs out, allowing users to easily change the filament. The printer also has a resume printing feature, which enables users to continue printing from where they left off in the event of a power failure or other interruption.

Overall, the Ender 3 S1 Plus is a high-performance and versatile 3D printer that is suitable for both beginners and advanced users. It offers a large build volume, precision, and a range of features that make it easy to use and maintain. Quick assembly – 96% pre-installed – 6-step assembly.

FEATURES:

- 260°C high temperature nozzle
- Full-metal dual gear direct drive extruder
- CR-touch auto leveling
- PEI magnetic build plate



FLASHFORGE ADVENTURER 4 PRO 3D PRINTER WITH AIR FILTER

TL4431

1175.00






One of the most user friendly and powerful printers by Flashforge yet. Featuring an auto calibration sensor, large build capacity, quick heat nozzle, and a HEPA13 air filter, the Adventurer 4 is a great choice for everyone from beginner to expert.








The Adventurer 4 Pro offers a number of benefits. A larger size means larger builds and the optional 265°C nozzle means exotic filaments are no problem. The levelling free platform minimises set-up time and the 110°C platform with magnetic PEI build plate and double holder spring plate simplify the removal of models. Resume printing after a power failure, HD camera and app based remote control enhance 24/7 management of your print jobs. The package is rounder out with a 1kg spool capacity and HEPA 13 filter. This is a well-priced larger capacity unit has the following features:

- Multiple nozzle extruder options: compatible with 0.3/0.4/0.6mm extruders, max temperature 240°C & 265°C.
- Print Speed up to 300mm/s
- Quiet operation at 50db
- Quick-release nozzle design: patented buckle design, replace in 3 seconds.
- Real FREE-level platform: unbox to print, no need to level or adjust platform.
- Filament detection: auto-detects filament usage status, avoids filament waste, ensures printing efficiency.
- Magnetic flexible build platform: easy model removal within 5 seconds.
- 4.3-inch touchscreen: easy 3d print setup and control.
- Resume printing: resume 3D printing from power failure.
- Remote printing control by Wi-Fi or Ethernet.
- Compatible with ABS, PLA, PC, PETG, PLA-CF, PETG-CF materials.
- Open slicing software: FlashPrint, Cura, Slic3r.
- Cloud printing: manage 3d printers and printable files on cloud platform freely.
- Built-in-camera: remotely monitor and control 3d printing in Flashprint slicing software.
- HEPA13 air filter: filters dust and odors effectively, healthy for indoor use.
- Energy-saving mode: only 1KWH power consumption when standby overnight.
- One spool of PLA filament is included (1kg).



PLEASE NOTE: We do not keep stock of these. They are ordered in as required. Please contact us for available stock before ordering.

<p>CREALITY ENDER-2 S1 PRO</p> 	<p>TL4754</p> <p>The Ender 3 S1 Pro 3D printer is a high-performance 3D printer that is designed for both beginners and advanced users. It features a large build volume of 220 x 220 x 270mm, and a precision of 0.05mm at speeds of up to 150mm/s.</p> <p>The Ender 3 S1 Pro is equipped with a filament run-out sensor that automatically pauses the printing process when the filament runs out, allowing users to easily change the filament. The printer also has a resume printing feature, which enables users to continue printing from where they left off in the event of a power failure or other interruption.</p> <p>Overall, the Ender 3 S1 Pro is a high-performance and versatile 3D printer that is suitable for both beginners and advanced users. It offers a large build volume, precision, and a range of features that make it easy to use and maintain. Filament size: 1.75mm.</p> <p>Features:</p> <ul style="list-style-type: none"> • 300°C high temperature nozzle • Full-metal dual gear direct drive extruder • CR-touch auto leveling • PEI magnetic build plate 	<p>549.00</p>
<p>CREALITY K1 MAX FILAMENT FULL FRAME HIGH SPEED 3D PRINTER</p> 	<p>TL4762</p> <p>The Creality K1 Max is a dynamic FDM 3D printer that marries striking aesthetics with impressive functionality. Boasting a spacious square build volume of 300 x 300 x 300 mm, this model is designed to handle large scale projects with ease. Its robust construction enables the K1 Max to reach high print speeds, all while maintaining excellent print quality. Truly a high-speed FDM giant that doesn't compromise on delivering top-notch results!</p> <p>Features:</p> <ul style="list-style-type: none"> • 600mm/s printing speed • Versatile Ai LiDAR • Observant AI Camera • Large 300x300x300mm Build Area • 1.75mm filament size • 0.4mm nozzle diameter • 0.100 – 0.350 mm layer resolution 	<p>1499.00</p>
<p>WALKING ROBOTS 3D PRINTER PEN STENCIL</p> 	<p>KJ9400</p> <p>Design, build, and play with our Walking Robot 3D Pen Kit. Ignite your child's imagination as they create their own walking robots with the included stencils. It's a hands-on, interactive experience that combines art, engineering, and endless fun. For ages 6 and up.</p> <p>NOTE: Requires a 3D Pen - try our kid-friendly 3D pen! (TL4580) - (sold separately).</p>	<p>24.95</p>

<p>3D PRINTER ENCLOSURE 60 X 48 X 72CM</p> 	<p>TL4615</p> <p>This Protech Universal 3D Printer Enclosure is an insulated, easy to assemble (and disassemble), printing enclosure that allows you to print materials like ABS.</p> <p>Some filaments such as ABS require an enclosure to stop the part cooling too fast and warping, Protech's insulated print enclosure allows you to do this safely and effectively, it can be set up and packed away easily to be used only when you need it.</p> 	<p>69.95</p>
<p>PRINTER PEN – LOW TEMPERATURE PCL FILAMENT PEN KIT</p>  <p>Download Manual </p>	<p>TL4580</p> <p>Specifically designed for children thanks to its compact design & non-toxic filament that prints with low heat and leaves no mess. Includes a rechargeable battery which can be charged via any free USB socket using the included cable. Extra PCL Low Temperature Filament available for refills (TL4581).</p> <p>Features</p> <ul style="list-style-type: none"> • Compact size • 2-speed settings • Charge indicator • Child safe low-temperature nozzle <p>Kit Contents</p> <ul style="list-style-type: none"> • PCL 3D Pen • 3 rolls of assorted PCL filament • USB charging cable • User manual 	<p>59.95</p>
<p>3D PEN KIT – HIGH TEMP PLA</p>  <p>Download Manual</p>	<p>TL4582</p> <p>Create amazing 3D artwork with this 3D printing pen, or use it to weld existing prints together, or repair a broken print! This 3D printing pen allows you to create amazing 3D artwork. The pen is easy to handle and operates smoothly. The machine will recognize new PLA and ABS filament when you insert them and is great for gluing together or cleaning up your 3D printed models. A USB cable and an AC adapter are included. Recommended for ages 14+. Extra filament is available separately.</p> <p>Features</p> <ul style="list-style-type: none"> • PLA / ABS filament compatible • Adjustable feed rate • Adjustable temperature • Includes sample rolls of PLA filament (TL4255) 	<p>99.95</p>

FILAMENTS & RESINS

FILAMENTS

ESUN PLA+ FILAMENT 1KG 1.75MM



TL4454	BLACK	39.95
TL4455	WHITE	39.95
TL4456	PINK	39.95
TL4457	PURPLE	39.95
TL4458	FIRE ENGINE RED	39.95
TL4459	BLUE	39.95
TL4460	RED	39.95
TL4461	YELLOW	39.95
TL4462	GREEN	39.95
TL4463	ORANGE	39.95
TL4464	GOLD	39.95
TL4583	GREY	39.95

The all new eSUN PLA+ filaments are suitable to use on your FDM (Fused Deposition Modeling) 3D printer with little to no change to your regular PLA (PolyLactic Acid) settings. Exquisitely smooth and glossy finish (easy to paint!) and rarely tangles on spool. 100% biodegradable and FDA approved Food Safe. Beautiful selection of colours.

Features

- Good balance of strength, rigidity and toughness for strong impact resistance.
- Extracted and purified from corn grain for an environmentally friendly composition.
- Ready to print on any open source desktop or industrial printer.
- Low shrinkage rate means a uniform diameter so you won't get any cracking or issues being brittle.
- Up to ten times stronger than standard PLA.
- Delivers exceptional performance consistently.
- The easiest to work with and most importantly USER FRIENDLY!

Printing Settings

- Best Printing Temperature : 200-220°C.
- Bed Temperature : 0-70°C.
- Printing Speed : 30-90mm/s.
- Movement Speed : 90-150mm/s.

(NOT ALL COLOURS ARE DISPLAYED)

eSUN ABS+ FILAMENT 1KG 1.75MM

TL4472	BLACK	39.95
TL4473	WHITE	39.95
TL4474	RED	39.95
TL4475	SILVER	39.95

eSUN ABS+ filaments are an extremely durable, lightweight alternative to PETG and PLA. Able to withstand heat, finished prints will hide blemishes and minor print issues. It's highly resistant to chemicals: suitable for gluing, sanding and painting.



ABS+ is an enhanced version of ordinary ABS (Acrylonitrile Butadiene Styrene). Instances of cracking and warping has been significantly improved, especially when printing larger items. It has high strength, better toughness, excellent impact strength, wear resistance and heat resistance.

NOTE: If you are going to leave your printer inactive after use, please retract the filament to protect your printer nozzle.

[Download msds](#)

FEATURES

- Superior post-print finishing flexibility.
- Made from great, high performance materials.
- Ready to print on any open source desktop or industrial printer.
- Delivers exceptional bonding and adhesion.

PRINTER SETTINGS

- Best Printing Temperature : 220-260°C.
- Bed Temperature : 90-110°C.
- Printing Speed : 30-90mm/s.
- Movement Speed : 90-150mm/s

ESUN eSILK FILAMENT 1KG 1.75MM

TL4477	GOLD ESILK	39.95
TL4480	RAINBOW ESILK	49.95



The eSUN eSilk filaments are made from a modified formula of PLA+ (PolyLactic Acid) to give a glossy, lustrous and satin smooth appearance when printed. Particularly popular with the Cosplay community, this range will bring your printing creativity to a higher level. eSUN Silk PLA is a breeze to work with! This rainbow option gives you a gentle ombre of hues, gently transitioning from one colour to the next.

NOTE: Due to a slight increased tendency of this filament becoming brittle, it is best to store in an air tight, humid control location.

FEATURES

- 100% biodegradable and environmentally friendly.
- Made from great, high performance materials.
- Ready to print on any open source desktop or industrial printer.
- Delivers exceptional performance consistently.

PRINTER SETTINGS

- Best Printing Temperature : 190-230°C.
- Bed Temperature : 0-80°C.
- Printing Speed : 30-90mm/s.
- Movement Speed : 90-150mm/s.

ESUN PLA FILAMENT 1KG 1.75MM

TL4481	CLEAR	39.95
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The all new eSUN PLA filaments are suitable to use on your FDM (Fused Deposition Modeling) 3D printer with little to no change to your regular PLA settings. PLA (modified PolyLactic Acid) is extracted and purified from corn grain for an environmentally friendly composition. It is low odour and users report a slight, sweet aroma while printing.

Exquisitely smooth and glossy finish (easy to paint!) and rarely tangles on spool. 100% biodegradable and FDA approved Food Safe.

FEATURES

- Good balance of strength, rigidity and toughness for strong impact resistance.
- 100% bio-degradable and FDA food safety approved.
- Ready to print on any open source desktop or industrial printer.
- Low shrinkage rate means a uniform diameter so you won't get any cracking or issues being brittle.
- Up to ten times stronger than standard PLA.
- Delivers exceptional performance consistently.
- The easiest to work with and most importantly USER FRIENDLY!

PRINTER SETTINGS

Best Printing Temperature : 200-220°C.
 Bed Temperature : 0-70°C.
 Printing Speed : 30~90mm/s.
 Movement Speed : 90~150mm/s.

[Download msds](#)

ESUN PETG FILAMENT 1KG 1.75MM



TL4465	BLACK	PETG-P175SB1	39.95
TL4466	WHITE	PETG-P175SW1	39.95
TL4468	BLUE	PETG-P175U1	39.95
TL4469	YELLOW	PETG-P175Y1	39.95
TL4470	GREEN	PETG-P175SG1	39.95
TL4471	RED	PETG-R175SR1	39.95

The eSUN PETG (PolyEthylene Terephthalate Glycol-modified) filaments are stronger than regular PLA, having similar properties to that of ABS without necessitating a temperature controlled print chamber. It's widely used for it's temperature resistance and has the added benefit of being food safe.



FEATURES

- Higher temperature resistance and strength than PLA, easier to use than ABS.
- Low shrinkage rate means a uniform diameter and no cracking or brittle issues.
- Ready to print on any open source desktop or industrial printer.
- Delivers exceptional performance consistently.

PRINTER SETTINGS

- Best Printing Temperature : 230-250°C. (240°C recommended).
- Bed Temperature : 75-90°C. (80°C recommended).
- Printing Speed : 40~100mm/s. (60mm/s recommended).
- Movement Speed : 90~150mm/s.

[Download msds](#)




PCL FILAMENT FOR LOW TEMPERATURE 3D PEN

TL4581	18.95
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Let your creativity run wild and create something unique with this vivid array of PCL replacement filament designed for your Low Temperature 3D Printing Pen! ([TL4580](#)).

A pack of 15 coloured 1.75mm PCL filament to suit PCL 3D printing pens. Colours include red, orange, yellow, green, blue, purple, brown, light pink, white, light grey, black, sky blue, pink, light green and light gold.



<p>PLA FILAMENT FOR 3D PRINTING PEN</p> 	<p>TL4255</p> <p>Unleash your imagination with this pack of 10 Duinotech coloured 1.75mm PLA (Polylactic acid) filament to suit the 3D Printing Pen (TL4582). Convenient 3m lengths in silver, pink, grey, white, black, brown, red, orange, yellow, and green.</p> <p>PLA is a biodegradable, environmentally friendly plastic that can produce a variety of finishes. It doesn't have the notable smell of hot plastic, compared to ABS during the printing process.</p>	<p>18.95</p>
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RESIN
ESUN PLA PRO RESIN

	<table border="1"> <tr> <td>TL4440</td> <td>GREY</td> <td>ERESINPLAPRO-H</td> <td>1KG</td> <td>59.95</td> </tr> <tr> <td>TL4441</td> <td>BLACK</td> <td>ERESINPLAPRO-B</td> <td>1KG</td> <td>59.95</td> </tr> <tr> <td>TL4442</td> <td>WHITE</td> <td>ERESINPLAPRO-W</td> <td>1KG</td> <td>59.95</td> </tr> <tr> <td>TL4550</td> <td>GREY</td> <td>ERESINPLAPRO-H05</td> <td>500G</td> <td>39.95</td> </tr> </table> <p>eSUN PLA (PolyLactic Acid) Pro Resin is a Bio-Based formula extracted from corn, which is environmentally friendly and low odour. This product has excellent resolution and is well suited to a wide range of applications that require more intricate detail.</p> <div style="display: flex; justify-content: space-between;"> <div data-bbox="525 568 1029 836"> <p>FEATURES</p> <ul style="list-style-type: none"> • Environmentally friendly and low odour • High strength and toughness (balanced performance) • High precision • High resolution <p>Download msds</p> </div> <div data-bbox="1029 568 1879 836"> <p>SPECIFICATIONS</p> <ul style="list-style-type: none"> • Wavelength (nm) : 355-410 • Density (g/m3) : 1.09-1.10 • Viscosity (25°, mPa.s) : 200-300 • Hardness (Shore D) : 78-80 • Tensile Strength (MPa) : 37-48 • Elongation at Break (%) : 25-28 • Flexural Strength (MPa) : 36-49 </div> </div>	TL4440	GREY	ERESINPLAPRO-H	1KG	59.95	TL4441	BLACK	ERESINPLAPRO-B	1KG	59.95	TL4442	WHITE	ERESINPLAPRO-W	1KG	59.95	TL4550	GREY	ERESINPLAPRO-H05	500G	39.95	
TL4440	GREY	ERESINPLAPRO-H	1KG	59.95																		
TL4441	BLACK	ERESINPLAPRO-B	1KG	59.95																		
TL4442	WHITE	ERESINPLAPRO-W	1KG	59.95																		
TL4550	GREY	ERESINPLAPRO-H05	500G	39.95																		

	<table border="1"> <tr> <td>TL4433</td> <td>RED</td> <td>ERESIN-PLAY-R</td> <td>1KG</td> <td>59.95</td> </tr> <tr> <td>TL4434</td> <td>YELLOW</td> <td>ERESIN-PLA-Y</td> <td>1KG</td> <td>59.95</td> </tr> <tr> <td>TL4435</td> <td>WHITE</td> <td>ERESIN-PLA-W</td> <td>1KG</td> <td>59.95</td> </tr> <tr> <td>TL4436</td> <td>BLACK</td> <td>ERESIN-PLA-B</td> <td>1KG</td> <td>59.95</td> </tr> <tr> <td>TL4437</td> <td>GREY</td> <td>ERESIN-PLA-H</td> <td>1KG</td> <td>59.95</td> </tr> <tr> <td>TL4438</td> <td>SKY BLUE</td> <td>ERESIN-PLA-SB</td> <td>1KG</td> <td>59.95</td> </tr> <tr> <td>TL4439</td> <td>CLEAR</td> <td>ERESIN-PLA-T</td> <td>1KG</td> <td>59.95</td> </tr> <tr> <td>TL4530</td> <td>GRASS GREEN</td> <td>ERESIN-PLA-GG05</td> <td>500G</td> <td>29.95</td> </tr> <tr> <td>TL4531</td> <td>ORANGE</td> <td>ERESIN-PLA-O05</td> <td>500G</td> <td>29.95</td> </tr> <tr> <td>TL4532</td> <td>BEIGE</td> <td>ERESIN-PLA-BG-0</td> <td>500G</td> <td>29.95</td> </tr> <tr> <td>TL4533</td> <td>RED</td> <td>ERESIN-PLA-R05</td> <td>500G</td> <td>29.95</td> </tr> <tr> <td>TL4534</td> <td>YELLOW</td> <td>ERESIN-PLA-Y05</td> <td>500G</td> <td>29.95</td> </tr> <tr> <td>TL4535</td> <td>WHITE</td> <td>ERESIN-PLA-W05</td> <td>500G</td> <td>29.95</td> </tr> <tr> <td>TL4536</td> <td>BLACK</td> <td>ERESIN-PLA-B05</td> <td>500G</td> <td>29.95</td> </tr> <tr> <td>TL4537</td> <td>GREY</td> <td>ERESIN-PLA-H05</td> <td>500G</td> <td>29.95</td> </tr> <tr> <td>TL4538</td> <td>SKY BLUE</td> <td>ERESIN-PLA-SB05</td> <td>500G</td> <td>29.95</td> </tr> <tr> <td>TL4539</td> <td>CLEAR</td> <td>ERESIN-PLA-T05</td> <td>500G</td> <td>29.95</td> </tr> <tr> <td>TL4540</td> <td>GREEN</td> <td>ERESIN-PLA-G05</td> <td>500G</td> <td>29.95</td> </tr> </table>	TL4433	RED	ERESIN-PLAY-R	1KG	59.95	TL4434	YELLOW	ERESIN-PLA-Y	1KG	59.95	TL4435	WHITE	ERESIN-PLA-W	1KG	59.95	TL4436	BLACK	ERESIN-PLA-B	1KG	59.95	TL4437	GREY	ERESIN-PLA-H	1KG	59.95	TL4438	SKY BLUE	ERESIN-PLA-SB	1KG	59.95	TL4439	CLEAR	ERESIN-PLA-T	1KG	59.95	TL4530	GRASS GREEN	ERESIN-PLA-GG05	500G	29.95	TL4531	ORANGE	ERESIN-PLA-O05	500G	29.95	TL4532	BEIGE	ERESIN-PLA-BG-0	500G	29.95	TL4533	RED	ERESIN-PLA-R05	500G	29.95	TL4534	YELLOW	ERESIN-PLA-Y05	500G	29.95	TL4535	WHITE	ERESIN-PLA-W05	500G	29.95	TL4536	BLACK	ERESIN-PLA-B05	500G	29.95	TL4537	GREY	ERESIN-PLA-H05	500G	29.95	TL4538	SKY BLUE	ERESIN-PLA-SB05	500G	29.95	TL4539	CLEAR	ERESIN-PLA-T05	500G	29.95	TL4540	GREEN	ERESIN-PLA-G05	500G	29.95	
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eSUN PLA Resin is a Bio-Based formula designed to be easier to work around than epoxy resins. Its' properties of low odour, high precision and a smooth surface that can be sanded or drilled make it an easy choice.

eSUN PLA (PolyLactic Acid) Resin is a Bio-Based formula extracted from corn, which is environmentally friendly and EN71-3 toy standard certified.

FEATURES

- Environmentally friendly.
- Low smell.
- High precision.
- High hardness and good wear resistance.
- Good moisture-resistance.

[Download msds](#)

SPECIFICATIONS

- Wavelength (nm): 395-405
- Density (g/m3): 1.07-1.13
- Viscosity (25°, MPa.s): 200-300
- Hardness (Shore D): 75-80
- Tensile Strength (MPa): 35-50
- Elongation at Break (%): 20-50
- Flexural Strength (MPa): 40-60

(NOT ALL COLOURS ARE DISPLAYED)

3D PRINTING ACCESSORIES

HEAT GUN – ADJUSTABLE TEMPERATURE

TH1609

55.95

A powerful 2000W 240V mains powered heat gun with 2 heat settings. Supplied with four nozzle attachments, making it suitable for many DIY applications, including shaping plastic tubing, shrinking heatshrink sleeving, removing paint, softening adhesives, defrosting metal water pipes, and more. Mains powered.

NOTE: It is advisable to run the lower setting first for a period of time before switching to the higher setting as per instruction in the manual.



Features:

- Mains Powered
- 2 Heat Settings
- Four Nozzle Attachments
- 1.8m Cable

Temperature/Air Flow:

Low: 400°C, 250L/min
High: 600°C, 500L/min



[Download Manual](#)

3D PRINTER TOOLBOX KIT

TL4594

78.00

All the tools you'll need to keep your 3D printer in top condition. 18-piece kit that includes all the tools you will need to service your printer, as well as a nozzle cleaner to unclog blocked print heads and scraper for removing prints. Comes in a compact storage case that can be kept near your 3D printer for convenient use.

Tools Included: Nylon tube cutter, Slotted screwdriver, Phillips screwdriver, Nozzle cleaners, Allen key set (1.5, 2, 2.5, 3/4/5/6mm), M6 & M8 elbow sleeves, Feeler gauge, Wrenches, Carving knife with blades, Tweezers, Needle nose & diagonal pliers, Side cutter, Spatula, SD Card reader.



NOZZLE CLEANING NEEDLES KIT

TL4592







14.95





This compact kit holds 30 nozzle cleaners and 2 sets of tweezers to allow cleaning and maintenance of filament 3D printer nozzles.

This includes 2 needle sizes: 0.4 x 75mm long and 0.35 x 60mm long.



POWER SUPPLIES & TRANSFORMERS

ITEM NAME	CODE	PRICE	ITEM NAME	CODE	PRICE
POWER PACK 12V	POWPK2	24.80	POWER PACK 16VAC 1.25A UNREGULATED WITH BARE ENDS	POWPK16AC	33.95
	AC 100-240V-Converter-Adapter DC-12V-500mA-1.0A. 5.5mm-x-2.1mm			Power Pack supplied with 1.8 metre cable stripped & terminated bare ends. Size: 55(W) x 90(H) x 60(D)mm.. For use with PLUGDC2.1 . AC Current Rating: 1.25 A AC Current Tolerance: 5% AC Voltage Rating: 16 V Frequency: 50.0 Hz Efficiency: 81%	
POWER SOCKET MOUNT	POWSOCMT	1.88	PLUG – 2.1MM DC POWER LINE CONNECTOR	PLUGDC2.1	2.45
	5.5 x 2.1mm Female Plastic Chassis Mount DC Power Socket			2.1mm 2 pole power cable terminal. Suitable for DC power supplies. Suitable for use with POWPK16AC .	
POWER SUPPLY – VARIABLE – HIGH VOLTAGE 0-500V.DC/50MA – DIGITAL METER 2 X 6.3V	LB2612-002	640.00	POWER SUPPLY VARIABLE EXTRA HIGH VOLTAGE 0-6000V.DC/3MA	LB2615-002	693.00
	The <i>HIGH VOLTAGE POWER SUPPLY</i> (2x 6.3V.AC @ 4amps, 0-300V..AC / 0-500V.DC @50mA) from <i>IEC</i> is a general purpose power supply that can supply high voltage up to 50mA. The overload trip is electronic and is reset by turning off the high voltage output. The low voltage is provided as 2x 6.3V.AC. 4A outputs which are normally used for running heaters of electron tubes. See also LB2611-001 for 300V.DC. unit. Australian made. Instruction Sheet included.			The Extra High Voltage Power Supply (2x 6.3V.AC @ 4amps, 3,000 / 0 / 3,000V.DC) by <i>IEC</i> is an important and special, compact laboratory power supply for running IEC Spectrum tubes or Teltron tubes or for charging IEC Aepinus capacitors or many other functions. Designed to have very poor regulation such that as current is drawn, the voltage falls quickly. Upon a short circuit, the current is limited to 3mA for safety for students. The low voltage is provided as 2x 6.3V.AC. 4A outputs which are normally used for running heaters of electron tubes. Australian made product. Instruction Sheet included.	

<p>POWER SUPPLY VAR CONST. CURRENT 30mA/30V.DC. MAX METER</p> <p>LB2618-002</p>  <p>The Constant Current Power Supply is a special power supply that holds constant current in the load. If the resistance changes, the voltage changes automatically to hold the current constant. A large meter is provided to monitor the load and it can be switched from mA to then monitor the output voltage. Max current is 30mA and maximum voltage available to maintain 30mA in the load is 30V.DC.</p>	<p>365.00</p>	<p>POWER SUPPLY AC ONLY 240/6V & 12V.AC</p> <p>LB2610-001</p>  <p>Instruction Sheet</p> <p>This very compact IEC Power source is a simple transformer with outputs of 6V.AC. and 12V.AC. with a total load of 4 amps and is supplied complete with a power cable for connecting to mains. It is particularly suitable for the 'HODSON' LIGHT BOX because it can fit the reserved compartment inside the styrene foam housing. It is suitable for lamps of all types including the IEC low voltage Microscope Lamps. Each output is fitted with a self-resetting overload that trips above 4 amps and resets when the overload is removed.</p>	<p>103.40</p>
<p>POWER SUPPLY VARIABLE CONSTANT CURRENT ADJ. 0 - 2A / 12V DC</p> <p>LB2619-001</p>  <p>Suitable for when it is important to maintain a preset current through a load which might be changing. In this type of power supply, the voltage automatically adjusts to maintain the preset current into the load. This unit is useful for studies in "electroplating". The 4mm socket head terminals are provided for the DC output to permit the clamping of wires and also to accept standard 4mm banana plugs. Genuine IEC product.</p> <p>Click here for IEC product instruction sheet.</p>	<p>374.00</p>	<p>POWER SUPPLY "DIGI-PAK" 2- 12V SW & 1-16V REGULATED DIGITAL DISPLAY</p> <p>LB2628-002</p>  <p>An advancement to the "school workhorse" LB2633-001 Power Supply. This unit has the same outputs as the beloved LB2633-001 but, in addition, it provides a regulated DC output up to 16V.DC. and up to 3 amp max. This regulated output is SMOOTH DC and is monitored by a red LED digital display. Electronic experiments almost always require a smooth DC supply (like a battery).</p> <p>The term "regulation" means that the voltage setting does not vary whether no load or full load ... the set voltage remains constant. The outputs of unregulated power sources fall as the load current increases and also with changes in mains voltages. A "Regulated" output should not vary for any of these reasons.</p> <p>This low cost instrument is not precision regulated, but the regulation is to a useful degree.</p> <p>Instruction Sheet</p>	<p>465.00</p>

<p>POWER SUPPLY GENERAL PURPOSE 2 -12V AC/DC 5A</p>  <p>OUT OF STOCK – DUE BACK FEBRUARY 2024 (Backorders welcome)</p>	<p>LB2633-001</p> <p>A compact, general purpose power supply to provide switched AC and DC voltages at 2, 4, 6, 8, 10 and 12V.AC and DC at about 5 to 6A. The DC output is full wave rectified but not filtered.</p> <p>The illuminated mains switch is on the front panel. Removable mains cable. Overload protection is by an automatically resetting overload that provides an audible 'click' when tripped and reset. Housing has carry handles and rubber feet.</p> <p>Product Instruction Sheet included.</p>	<p>230.00</p> <p>220.00 (ea. 5-9 units) 215.00 (ea. 10+ units)</p>	<p>POWER SUPPLY SW GENERAL PURPOSE 2-12V AC/DC 10AMP</p>  <p>LB2631-001</p> <p>This IEC Power Supply is a compact, general purpose power supply to provide switched AC and DC voltages at 2, 4, 6, 8, 10 and 12V.AC and DC at about 8 to 10A. The DC output is full wave rectified but not filtered. It is almost the same unit as the famous 'workhorse' LB2633-001 power supply, but provides a larger output current. The illuminated mains switch is on the front panel and overload protection is by an automatically resetting overload that provides an audible 'click' when tripped and reset. The housing is a little larger than the LB2633-001 unit.</p> <p>Instruction Sheet</p>	<p>298.00</p>
<p>POWER SUPPLY VARIABLE 0 - 25V AC DC DIGITAL VOLTMETER</p> 	<p>LB2641-002</p> <p>Variable power supply 0 - 25V AC/DC 10/6 Amp.</p> <p>This digital Power Supply is a robust and compact unit designed for general laboratory use. Suitable for most laboratory experiments where large current and smooth adjustment from 0 to 25 volts of both AC and DC is required. The dual digital voltmeters with large bold illuminated digits monitor both DC and AC output voltages simultaneously. Separate 4mm, socket head, spin free terminals are provided for both AC and DC outputs.</p> <p>Genuine IEC product. Product instruction sheet available.</p>	<p>870.00</p>	<p>POWER SUPPLY VARIABLE "DUAL MODE" REGULAR & SWITCHED V/A DIGITAL METER</p>  <p>LB2643-002</p> <p>Suitable for both general lab work and electronic studies where a smooth and regulated output is necessary.</p> <p>This "Dual Mode" Power Supply by IEC combines both AC/DC switched and DC smooth and regulated power outputs. Overload protection is automatic for both modes of operation. The meter on the regulated section can be switched to monitor either output volts or output amps. The switched section provides AC and DC at 2, 4, 6, 8, 10 and 12V at 8A and the regulated section provides 1.3V to 20V.DC. at 5A reducing to 2A at the lower voltages.</p> <p>Instruction Sheet.</p>	<p>690.00</p>
<p>POWER SUPPLY SMOOTHING UNIT UP TO 8AMP DC</p> 	<p>LB2639-001</p> <p>This Smoothing Unit can be applied to a DC, unfiltered output from a power supply to change the output to smooth DC. Consists of capacitors and a choke to provide very effective filtering of the DC.</p> <p>Genuine IEC product.</p> <p>Product instruction sheet available.</p>	<p>106.70</p>	<p>POWER SUPPLY VARIABLE – GENERAL PURPOSE 0-10V.DC 10A A/V METERS</p>  <p>LB2663-102</p> <p>This IEC DC Power Supply was designed originally designed for the electroplating laboratories but is useful for general classroom use. It is suitable for most laboratory experiments where smooth adjustment from zero to 10V.DC at 10A. The DC output is full wave rectified but not smoothed. Output protection is by a lever operated circuit breaker that can be used as an output on/off switch.</p> <p>Instruction Sheet</p>	<p>710.00</p>

POWER SUPPLY – VARIABLE – FOR MASS OF ELECTRONS EXPERIMENT	LB2622-002	630.00	POWER SUPPLY "SELECTAVOLT" - REGULATED	LB2635-001	290.00
	<p>This special purpose <i>IEC</i> Power Supply is designed for the <i>IEC</i> "MASS OF ELECTRON" experiment (AP2120-001). It is powered by 220/240V. Mains. The outputs are: 250V.DC. Fixed voltage, at about 1mA, 12V.AC. at about 1A, 0.1A - 2A adjustable and regulated current. The high voltage is for the anode connection of the Magic Eye tube, the 12V is for the tube's heater and the regulated current is to control the current and thus the magnetic field in <i>THE AIR CORED SOLENOID</i> (EM0090-001). A switch permits the large meter to monitor either the regulated current or the output volts.</p> <p>OTHER USES: Although designed specifically for the "Mass of an Electron" experiment, it is a useful general purpose power supply where a preset constant current is required through a load, up to a maximum of 2 amps and 25V.DC. Some experiments in electronics require such a supply for producing special waveforms and for performing certain experiments on capacitors and charging.</p>			<p>The 'Selectavolt' Power Supply by <i>IEC</i> is a small unit designed for general school laboratory use, with a slide switch on the rear panel to select regulated output voltages of 1.5V, 3V, and 6V.DC. at 2A continuous or 3A intermittent. There are no AC outputs. The regulated outputs are smooth DC and it is designed to simulate dry cell batteries.</p> <p>4mm sockets on the rear panel permit the trickle charging of NiCd cells from 1.5V to 6V. Input: 220/240V. AC. 50/60Hz 0.5A with removable mains cable. Output is via 4mm spin free IEC terminals.</p> <p>Dimensions (approx.): 180 x 180 x 180mm - 1.7kg Australian made.</p> <p>Instruction Sheet included.</p>	
POWER SUPPLY VARIABLE HIGH VOLTAGE 0-300V/DC/50MA	LB2611-001	540.00			
	<p>The <i>IEC</i> High Voltage Power Supply (2x 6.3V.AC @ 4amps, 0-200V..AC / 0-300V.DC @50mA) is a general purpose power supply that can supply high voltage up to 50mA. The overload trip is electronic and is reset by turning off the high voltage output.</p> <p>The low voltage is provided as 2x 6.3V.AC. 4A outputs which are normally used for running heaters of electron tubes. see also LB2612-002 for 500V. DC. unit.</p> <p>Instruction Sheet</p>				



Specially designed for selectable (by a stop rotary knob) AC & DC output voltage with a current rating up to 6Amps. This power supply is sturdy and economic, for most low-voltage experiments. The unit is equipped with a primary fuse and overload protection. Thermal reset circuit breaker for overload protection. Color coded safety sockets.

Selectable AC/DC output voltage.
Safety socket for earthing.
Rigid ABS construction with ergonomic feet. Stackable housing.
Input Voltage: 110V / 220V AC (Selectable)
Frequency: 50-60Hz
Current Rating: 0.4A
Power: 100W (max.) @ 220V AC
Fuse (Primary): 2A
Output Voltage AC: 2-12V – 1V Steps
Output Voltage DC: 2-12V – 1V Steps
Output Current: 6A (max.)
Operating Temperature Range: Room Temperature (24°C approx.)
Ingress Protection Code: IP20

This power supply unit is suitable for the *WIND TUNNEL* (**AR1021470**) and is used in the *FIELD LINES AND EQUIPOTENTIAL LINES* kit (**AR1090142**)








Power your devices with accuracy and the confidence that only comes with a professional lab power supply. Select precise voltage level and current limits to prevent overheating, burnout, and over-current. Of course the output is short-circuit protected too. The compact construction uses surface mount technology and a powerful internal cooling system to deliver a highly flexible power source. With ripple voltage a tiny 1mV, you know you're getting precisely the voltage required, reducing the risk of burnout or damage when testing and prototyping sensitive components. Output voltage is adjustable from 0 to 30VDC, and output current can be limited between 0 and 5A. Banana plug/binding posts provide output on the front of the unit, while a bright LED display keeps you informed. Includes a short banana to alligator lead set and mains lead.

Features / Specifications:

- Precise voltage level and current limit settings
- 1mV ripple voltage
- Avoid overheating, burnout, and over-current
- Easy-to-use LEDdisplay panel
- Input voltage: 220-240AC 50-60Hz
- Output voltage: 0-30VDC adjustable (10mV accuracy)
- Output current: 0-5A adjustable (1mA accuracy)
- Ripple current: 3mA
- Dimensions: 270 x 120 x 185mm (LxWxH)
- Weight: 4.8kg

[Download Manual](#)

<p>USB TO DC POWER CABLE USBCAB</p>  <p>USB to DC 5.5 x 2.1mm 5V Jack Barrel Male.1 metre Power Cable.</p>	<p>3.95</p>	<p>USB CABLE A-B FOR ARDUINO UNOCAB</p>  <p>USB 2.0 A to B Male/Male type cable. Suitable to run a Arduino compatible controller from your computer or other 5V source. 30cm long cables.</p>	<p>2.50</p>
<p>USB ADAPTOR USBPL</p>  <p>Accepts All USB Charge Cables. Charge quickly and efficiently. Smart Fuse Circuit-Breaker Protection. Input Voltage AC 90 ~ 264V 50/60 HZ Output Voltage 5 Vdc Total Output Current DC 3 A Application Mobile Phone, iPad, iPod, etc. Working Environment 0°C to 40°C Storage Environment -20°C to 85°C</p>	<p>9.50</p>	<p>TRANSFORMER 240V/12V LB4090-001</p>  <p>Genuine IEC transformer 240V / 12V AC Supplies 12V AC to 3 separate circuits up to a load of 12 Amps Can run 3x 'Hodson' Light Boxes or similar. The mains cable is not removable. Outputs are via 3 pairs of 4mm socket head spin free IEC terminals.</p>	<p>229.00</p>
<p>MAINS POWER METER MS6115</p>  <p>This intelligent power meter simply plugs into a normal power point (GPO) and turns it into a real-time power monitoring outlet. You can enter the local price of your electricity and the meter will tell you exactly how much the appliance is costing to run. In addition, the power meter tracks the power(W) used and it can display the mains voltage(V) or current(A) an appliance is drawing. The meter has backup batteries so it will not lose the stored data during a blackout or moving from point to point. Simple to install and a valuable tool for monitoring you power consumption.</p>	<p>19.95</p>		

LABORATORY & GENERAL EQUIPMENT

BALANCES

ADAM HIGHLAND PORTABLE PRECISION BALANCES



HCB6001 model

Highland® balances are well-suited for lab work, field use, and many industrial applications. The Highland features HandiCal® internal calibration with a built-in mass, and ShockProtect® as a safeguard against shock loading and accidental overload.

Features include:

- Vivid, backlit LCD & 14 weighing units
 - Programmable backlight can be set to “always on,” “always off” or “light only when weighing”
 - Can be stacked efficiently (120mm pan size only)
 - Colour-coded keys for quick recognition of the most frequently used buttons
 - Dual tare keys
 - Large, grade 304 stainless steel and removable 132 x 90mm draught shield
 - Solid durable ABS housing
 - Three-point ShockProtect® feature helps prevent overload damage to internal components
 - Hook included for weighing below the balance
 - Internal calibration
 - USB and RS-232 interfaces
 - Audible overload alarm warns when capacity has been exceeded
 - Memory accumulation totals results
 - Zero-tracking feature ensures display returns to zero reading
 - AC adapter included
 - Rechargeable battery
 - Programmable auto power-off
- 3 year manufacturer’s warranty

****BULK PRICES APPLY FOR 6+ UNITS – CONTACT US FOR PRICES**

Click [here](#) for more information on Adam Highland Portable Precision Balances.

Find out more about the Highland Series Shock Protection on this video: <https://www.youtube.com/watch?v=42U65Z4QxaY>

ITEM NAME	CODE	CAPACITY (g)	READABILITY (g)	PAN SIZE (dia.) (mm)	PRICE
ADAM HIGHLAND PORTABLE PRECISION BALANCE 120G X 0.001G	HCB123	120	0.001	120	\$689.00
ADAM HIGHLAND PORTABLE PRECISION BALANCE 150G X 0.005G	HCB153	150	0.005	120	\$675.00
ADAM HIGHLAND PORTABLE PRECISION BALANCE 300G X 0.01G	HCB302	300	0.01	120	\$620.00
ADAM HIGHLAND PORTABLE PRECISION BALANCE 600G X 0.02G	HCB602	600	0.02	120	\$620.00
ADAM HIGHLAND PORTABLE PRECISION BALANCE 600G X 0.01G	HCB602H	600	0.01	120	\$675.00
ADAM HIGHLAND PORTABLE PRECISION BALANCE 1000G X 0.01G	HCB1002	1000	0.01	120	\$740.00
ADAM HIGHLAND PORTABLE PRECISION BALANCE 1500G X 0.05G	HCB1502	1500	0.05	120	\$620.00
ADAM HIGHLAND PORTABLE PRECISION BALANCE 2200G X 0.01G	HCB2202	2200	0.01	120	\$920.00
ADAM HIGHLAND PORTABLE PRECISION BALANCE 3000G X 0.1G	HCB3001	3000	0.1	120	\$620.00
ADAM HIGHLAND PORTABLE PRECISION BALANCE 6000G X 0.1G	HCB6001	6000	0.1	145	\$695.00

ADAM CB COMPACT BALANCES



Portable and lightweight compact balance that is efficient and easy to use. Ideal for science labs, weighing in the field or small parcel weighing. Features:

- 130mm (diameter) grade 304 stainless steel pan - easily cleaned
- Sealed keyboard - protects against dirt & spills
- Easy to read LCD display - bright backlit making it easy to read in any light conditions
- Low battery indicator
- Powered by 2 x AA batteries (*included*) or can use an optional 6VDC 200mA adapter (*not included*)
- Built-in level indicator
- Adjustable feet
- 2 year manufacturer's warranty

Click [here](#) for Adam Equipment Compact Balances series PDF.

ITEM NAME	CODE	CAPACITY (g)	READABILITY (g)	PAN SIZE (dia.) (mm)	PRICE
ADAM CB COMPACT BALANCE 500 X 0.1G	CB501	500	0.1	130	\$135.00
ADAM CB COMPACT BALANCE 1000 X 0.1G	CB1001	1000	0.1	130	\$162.00
ADAM CB COMPACT BALANCE 3000 X 1G	CB3000	3000	1.0	130	\$135.00

ADAM TRIPLE BEAM BALANCES (MECHANICAL)



Mechanical balance with sturdy metal housing and a stainless steel weighing pan offers the stability needed for laboratory, industry, field and school use. With a larger body than other triple-beam balances,

Features

- Optional integrated hook enables below-balance weighing for density and specific gravity determination
 - Security slot for optional Kensington-type lock and cable to help prevent theft
 - Magnetic damping for faster stability
 - Ruler for measuring cm
 - Large, grade 304 stainless steel pan allows easy cleaning
 - Magnetic damping slows pointer movement for faster readings
 - Notched, tiered, graduated beams ensure positive positioning and accurate reading of results
 - Storing space for weights included
 - The **TBB2610T** is equipped with a 225g tare range (not available in the **TBB2610S**).
- 5 year manufacturer's warranty.

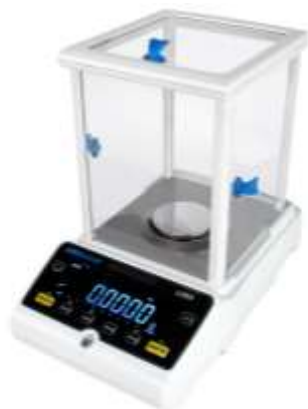
Click [here](#) for Adam TBB range PDF.

****BULK PRICES APPLY FOR 8+ UNITS – CONTACT US FOR PRICES**

ITEM NAME	CODE	CAPACITY (g)	READABILITY (g)	PAN SIZE (dia.) (mm)	PRICE
ADAM TRIPLE BEAM BALANCE 2610 X 0.1G	TBB2610S	2610	0.1	150	\$310.00
ADAM TRIPLE BEAM BALANCE 2610 X 0.1G (TARED)	TBB2610T	2610	0.1	150	\$355.00

ADAM LUNA ANALYTICAL BALANCES

Adam Luna Analytical Balances range from a capacity of 80g to 250g with a readability of 0.0001g. These eight models offer improved performance for faster, more accurate readings, with stylish, modern backlighting. They are available with external calibration (codes ending with "E") or internal calibration (codes ending with "I"). Easily switch between a variety of weighing units that include mg, g, ct, GN, N, dr, oz, ozt, dwt, mm, tl.T, tl.H, tl.S, T, custom units. USB and RS-232 interfaces are available for speedy connection to computers and printers.



Other features:

- Vivid, backlit LCD easily visible in any lighting conditions.
- Colour-coded keys facilitate quick recognition of the most frequently used buttons.
- Level indicator and adjustable feet ensure proper balance setup for optimum weighing results.
- Large, grade 304 stainless steel pan allows easy cleaning.
- Sealed keypad protects against dirt and spills.
- AC adapter included.
- External calibration allows for verification and adjustment with weights.
- Multilingual display.
- Parts counting with preset sample sizes.
- Printouts include date and time for data tracking within Good Laboratory Practices (GLP) guidelines.
- Selectable digital filtering for animal/dynamic weighing enables consistent results for moving subjects.
- Auto power-off to save energy.
- Security slot for optional lock and cable to help prevent theft.
- Hook included for weighing below the balance.
- A 5-year warranty means quality assured for years of use.

****BULK PRICES APPLY FOR 4+ UNITS – CONTACT US FOR PRICES**

For more info visit: https://adamequipment.com.au/media/docs/data_sheets/LAB-Luna-DS-A4-EN.pdf

ITEM NAME	CODE	CAPACITY (g)	READABILITY (g)	PAN SIZE (dia.) (mm)	PRICE**
ADAM LUNA ANALYTICAL BALANCE 80 x 0.0001G	LAB84E	80	0.0001	80	\$2,380.00
ADAM LUNA ANALYTICAL BALANCE 120 X 0.0001G	LAB124E	120	0.0001	80	\$2,400.00
ADAM LUNA ANALYTICAL BALANCE 210 X 0.0001G	LAB214E	210	0.0001	80	\$2,570.00
ADAM LUNA ANALYTICAL BALANCE 250 X 0.0001G	LAB254E	250	0.0001	80	\$2,730.00
ADAM LUNA ANALYTICAL BALANCE 80 x 0.0001G INTERNAL CALIBRATION	LAB84I	80	0.0001	80	\$2,600.00
ADAM LUNA ANALYTICAL BALANCE 120 X 0.0001G INTERNAL CALIBRATION	LAB124I	120	0.0001	80	\$2,690.00
ADAM LUNA ANALYTICAL BALANCE 210 X 0.0001G INTERNAL CALIBRATION	LAB214I	210	0.0001	80	\$2,790.00
ADAM LUNA ANALYTICAL BALANCE 250 X 0.0001G INTERNAL CALIBRATION	LAB254I	250	0.0001	80	\$2,980.00

ADAM LUNA PRECISION BALANCES



For more info visit:

https://adamequipment.com.au/media/docs/data_sheets/LPB-Luna-DS-A4-EN.pdf

Luna precision balances are designed with an array of features and functions to accommodate most lab applications. The Luna range offers improved performance for faster, more accurate readings. With stylish, modern back lighting, Luna's impressive display gives an aura of smart sophistication. The LCD features large, readily discernible 24 mm digits in white on a black background.

They are available with external calibration (codes ending with "E") or internal calibration (codes ending with "I"). Available models with capacities ranging from 220 grams to 15,000 grams and 0.001 gram to 0.1 gram readability.

Other features:

- Internal calibration for automatic calibration at the push of a button.
- Vivid, backlit LCD easily visible in any lighting conditions.
- Color-coded keys facilitate quick recognition of the most frequently used buttons.
- Level indicator and adjustable feet ensure proper balance setup for optimum weighing results.
- Security slot for optional Kensington-type lock and cable to help prevent theft.
- Large, grade 304 stainless steel 120mm round pan allows swift cleaning.
- ABS plastic construction.
- Sealed keypad protects against dirt and spills.
- USB and RS-232 interfaces provide speedy communication with computers and printers.
- Multilingual display permits use in various countries.
- Parts counting with preset sample sizes.
- Printouts include date and time for data tracking within Good Laboratory Practices (GLP) guidelines.
- Selectable digital filtering for animal/dynamic weighing enables consistent results for moving subjects.
- Auto power-off to save energy.
- AC adapter included.
- 5-year warranty means quality assured for years of use.

****BULK PRICES APPLY FOR 4+ UNITS – CONTACT US FOR PRICES**

ITEM NAME	CODE	CAPACITY (g)	READABILITY (g)	PAN SIZE (dia.) (mm)	PRICE**
ADAM LUNA PRECISION BALANCE 220 x 0.001G	LPB223E	220	0.001	120	\$1,529.00
ADAM LUNA PRECISION BALANCE 420 X 0.001G	LPB423E	420	0.001	120	\$1,644.00
ADAM LUNA PRECISION BALANCE 620 X 0.001G	LPB623E	620	0.001	120	\$2,150.00
ADAM LUNA PRECISION BALANCE 820 X 0.001G	LPB823E	820	0.001	120	\$2,614.00
ADAM LUNA PRECISION BALANCE 220 x 0.001G INTERNAL CALIBRATION	LPB223I	220	0.001	120	\$1,881.00
ADAM LUNA PRECISION BALANCE 420 X 0.001G INTERNAL CALIBRATION	LPB423I	420	0.001	120	\$2,007.00
ADAM LUNA PRECISION BALANCE 620 X 0.001G INTERNAL CALIBRATION	LPB623I	620	0.001	120	\$2,400.00
ADAM LUNA PRECISION BALANCE 820 X 0.001G INTERNAL CALIBRATION	LPB823I	820	0.001	120	\$2,800.00

Contact us for prices on Adam Luna Precision Balances with capacities 2,600g to 15,000g.

LUNA DENSITY KIT

[1060014262](#)

\$950.00



The Luna Density Kit allows the users of the Luna series of analytical and precision balances to determine the density of solids and liquids directly using the internal program of the balance.

ADAM CORE PORTABLE COMPACT BALANCES



Core® portable compact balances are well-suited for lab work, field use and industrial use. They feature ShockProtect® as a safeguard against shock loading and accidental overload.

Features include:

- Vivid, backlit LCD with 18mm high digits & 9 weighing units
 - Programmable backlight can be set to “always on,” “always off” or “light only when weighing”
 - Can be stacked efficiently (120mm pan size only)
 - Colour-coded keys for quick recognition of the most frequently used buttons
 - Dual tare keys (left or right hand operation)
 - Large, grade 304 stainless steel and removable 130mm diameter round draught shield (120mm pan size only)
 - Solid durable ABS housing
 - Three-point ShockProtect® feature helps prevent overload damage to internal components
 - Hook included for weighing below the balance
 - Audible overload alarm warns when capacity has been exceeded
 - Zero-tracking feature ensures display returns to zero reading
 - AC adapter included
 - Can also operate using batteries (not included)
 - Auto power-off
 - Security slot for optional Kensington-type lock and cable to help prevent theft
- 3-year manufacturer’s warranty

****BULK PRICES APPLY FOR 6+ UNITS – CONTACT US FOR PRICES**

ITEM NAME	CODE	CAPACITY (g)	READABILITY (g)	PAN SIZE (dia.) (mm)	PRICE**
ADAM CORE PORTABLE COMPACT BALANCE 200G X 0.01G	CQT202	200	0.01	120	\$400.00
ADAM CORE PORTABLE COMPACT BALANCE 250G X 0.1G	CQT251	250	0.1	120	\$245.00
ADAM CORE PORTABLE COMPACT BALANCE 600G X 0.1G	CQT601	600	0.1	120	\$283.00
ADAM CORE PORTABLE COMPACT BALANCE 1500G X 0.1G	CQT1501	1500	0.1	120	\$405.00
ADAM CORE PORTABLE COMPACT BALANCE 2600G X 0.1G	CQT2601	2600	0.1	145	\$465.00
ADAM CORE PORTABLE COMPACT BALANCE 2000G X 1G	CQT2000	2000	1	145	\$242.00
ADAM CORE PORTABLE COMPACT BALANCE 5000G X 1G	CQT5000	5000	1	145	\$270.00

ADAM ABW-S STAINLESS STEEL WATERPROOF SCALES





For ultimate dependability, the Aqua ABW-S boasts IP68 waterproof protection, meaning it’s suitable for weighing messy or dusty materials in washdown environments.

Features include:





- IP68-rated for protection against water and dust
- Grade 304 stainless steel casing for a premium, professional look, easy cleaning and ultimate durability
- Sealed keypad protects against dirt and spills
- Clear, hidden-until-needed function indicators keep focus where it’s needed
- Heavy-duty rubber feet ensure stability of unit
- Bright LED display for easy viewing in most environments
- External calibration allows for verification and adjustment with weights
- Overload protection helps prevent damage to internal components
- The auto power-off feature conserves battery life
- Rechargeable battery included for operation almost anywhere
- AC adapter included
- Stabilization time of within 1 second
- Front LED display 20mm, rear LED display 15mm for dual use
- 1:600,000 internal counting resolution
- A 3-year warranty means quality assured for years of use.

ITEM NAME	CODE	CAPACITY (g)	READABILITY (g)	PAN SIZE (dia.) (mm)	PRICE**
ADAM ABW-S STAINLESS STEEL WATERPROOF SCALES 4KG X 0.1G	ABW4S	4000	0.1	245 X 180	650.00
ADAM ABW-S STAINLESS STEEL WATERPROOF SCALES 8KG X 0.5G	ABW8S	8000	0.5	245 X 180	650.00
ADAM ABW-S STAINLESS STEEL WATERPROOF SCALES 16KG X 1G	ABW16S	16000	1	245 X 180	650.00
ADAM ABW-S STAINLESS STEEL WATERPROOF SCALES 32KG X 2G	ABW32S	32000	2	300 X 210	680.00






ITEM NAME	CODE	PRICE (ea)
	BENCH SCALE – 1KG - DIGITAL QM7264 Precision 1kg electronic scale with resolution of 0.01g for when a high degree of accuracy is required. Weighs in grams, ounces, pounds, grains, carats, troy ounces and also supplied with a wind shield and a built-in bubble level to provide maximum accuracy. Particularly suited to calculating quantities as it counts pieces by weight. Powered by 4 x AA batteries (<i>not included</i>) or mains adaptor. Suitable for kitchen, lapidary, jewellery, reloading etc. Dimensions: 175 x 75 x 260mm. Features: <ul style="list-style-type: none"> • Auto power-off after 60 seconds • Automatic calibration • Backlit LCD • Mains powered or 4 x AA Batteries 	\$225.00 (1-4)
		\$215.00 (5+)

	MINI SCALE – 200G WITH BACK LIGHT QM7259 Extremely accurate mini scale suitable for a variety of applications. Measuring up to 200g, the large LCD is backlit and has a 100g calibration weight included. Resolution is .01g and it weighs in grams, carats and pennyweight.	74.95 ea (1 – 5)
		70.95 ea (6+)

GENERAL EQUIPMENT

ITEM NAME	CODE	PRICE	ITEM NAME	CODE	PRICE
ELECTROMETER	LB1840-101	465.00	ENERGY METER (JOULE) DIGITAL AC/DC 1mA-10A STD LOW VOLTAGE	LB1829-001	710.00
	Used for the measurement of extremely small voltages, electric charges and currents. The ranges are: 0-2, -20, -200, -2,000 mV with very high impedance. 0-2, -20, -200, -2,000nA (nanoamps) with very high impedance. 0-2,000nC (nanocoulombs) of electric charge. Used for measuring electrostatic charges, currents passing through an insulator, charge around an electrostatic rod, capacitor charging and measurements on Aepinus Capacitors plates, etc. <i>Genuine IEC product.</i>			A useful digital instrument designed to measure Joules and Watts in low voltage AC and DC circuits. The unit is powered from 240V.AC.mains but the circuits that it measures must be low voltage. Currents from 0.01mA to 10 amps can be handled and voltages up to 20V.DC. Or 15V.AC. Frequency from 50Hz up to 1kHz can be handled. Measures energy up to 999kJ and power up to 200W. The simplest connection is for power source to be connected to the 2x Input sockets and the load is connected to the 2x Output sockets. The range is selected by button and the zero offset is by knob. Instruction sheet available. <i>Genuine IEC product.</i>	
20MHZ USB OSCILLOSCOPE	QC1929	249.00	SPARK GENERATOR FOR AIR TRACK	LB0118-001	684.00
	This unit does away with more of the hardware and provides a highly accurate interface to allow software to provide the display. Provides 20MHz bandwidth and high accuracy and physical probe couplings but takes up a fraction of the bench-space. Use the included software to provide just about all standard oscilloscope functions, and even output waveforms to excel/word files. Convenient function in a small form factor, ideal for the traveling or compact workbench. Dimensions: 206x123x37mm; 0.453kg. Includes: 2 x 1:1/10:1 Switchable Probes included in box 1 x USB cable Features:- USB interface plug & play- Automatic setup- Waveforms can be exported as Excel/Word files- Spectrum analyser (FFT)- External trigger input- Cursor measurements- Operating Systems: Windows 2000/XP/Vista/7/8			The <i>IEC</i> Spark Generator is used with Linear Air Tracks where measurement is to be performed by 'Spark Recording' rather than Photo Gates. For Spark Recording, a metal electrode fixed to 2x gliders causes a spark to jump the small gaps from a long metal track on one side of the Air Track to a strip of paper tape on the other side. The Spark Generator is the source of the 2x sets of sparks which can be very accurately adjusted in rate from 2.5 through to 50 per second. A pair of high voltage cables joins the instrument to the spark tracks. The paper tape will have black dots representing each spark so that velocity and accelerations can be calculated. With Instruction Sheet.	

Download manual, download driver & download software available.

<p>GEIGER TUBE – HOLDER & CABLE – WITH MX168 TUBE FITTED</p>	<p>PA1885-050</p>	<p>730.00</p>	<p>AIR BLOWER WITH HOSE</p> <p>LB0115-002</p>	<p>352.00</p>
 <p>Geiger Tube Holder with current model GM tube (PA1885-020) fitted, with cable & BNC plug, connected and tested. Ready to plug directly to any model of IEC Geiger Counter.</p> <p><i>Genuine IEC product.</i></p>			 <p>This air blower is very compact, easy to use, it has a variable speed to suit requirements. It is very quiet in operation and comes complete with an outer shroud of styrene foam to reduce noise to a minimum, but it can be used with or without this shroud.</p> <p>Suitable for IEC Linear Air Track & Air Table.</p>	
<p>MICROSCOPE LAMP 12VX20W LOW VOLTAGE</p>	<p>LB2162-001</p>	<p>59.00</p>	<p>100MHZ DIGITAL OSCILLOSCOPE</p> <p>QC1938</p>	<p>569.00</p>
 <p>This Low Voltage Microscope Lamp is a general purpose illuminator used for microscope or other laboratory work. Also useful for generating energy from solar cells. Normally the microscope lamp is used on the bench to top illuminate subjects under the microscope or to provide illumination into the mirror below the microscope stage. The low voltage reflector lamp provides a very efficient light but runs quite cool and the ventilated housing remains cool.</p> <p>A 2 core cable 1m long with moulded, stackable 4mm banana plugs fitted, connects the lamp to 12V.AC or DC power and one lamp can plug into the socket of any other lamp so there is no need to run each lamp back to the 12V power supply.</p> <p><i>Genuine IEC product.</i></p> <p>Instruction Sheet included.</p>			  <p>This Digitech 100MHz dual channel digital oscilloscope includes a 7" colour LCD screen (res. 800 x 480px) with easy-to-use interface, two independent channels and controls, 100Mhz bandwidth & 25MHz waveform generator, and an auto scale function that detects sine and square waves automatically. 14 trigger modes include Edge, Pulse, Video, Slope, Overtime, Window, Pattern, Interval, Under Amp, UART, LIN, CAN, SPI, and IIC, and 5 serial protocol triggers and decodes include RS232/UART, I2C, SPI, CAN, and LIN. Other features include two 3-digit digital voltmeters, 6-digit hardware frequency indicator and 8M memory depth (single channel). Has 32 kinds of auto measurements with statistics, real-time statistics of maximum, minimum, standard deviation, etc. Connect and control directly from a computer or plug in a USB thumb drive to save oscilloscope setups, waveforms, reference waveforms, CSV files and images. Mains powered. Supplied with 10:1 passive probe with 1.5m lead, 2 x BNC to clip test leads, USB cable, and power lead.</p> <p>Dimensions: 318 x 150 x 110mm – 1.9kg</p>	

CRO OSCILLOSCOPE PROBE
CABLE SET

QC1902

51.95

This quality probe set consists of a 1.2m quality cord terminated at one end with a moulded-on stainless steel BNC connector and 1 x, 10x attenuator probe at the other end. An earthing lead 180mm long with alligator clip to connect to the probe at the other end is provided. Also provided is an adaptor that slides on to the probe to change the probe tip to a spring hook. Suitable as a replacement probe for most oscilloscopes.

NOTE: Not to be used for EHT (Extra High Tension) voltage.

Features:
Attenuation 10:1

Bandwidth DC~40MHz (+/-1dB)
DC~60MHz (± 1 dB)
Input Resistance ~10Mohm
Input Capacitance ~22pF
Max Input Voltage: DC 600V
Attenuation 1:1

Bandwidth DC~3MHz (+/-3dB)
DC~6MHz (± 3 dB)
Input Resistance ~1Mohm
Input Capacitance ~180pF
Max Input Voltage: DC 600V



MICROSCOPES

1080P DIGITAL MICROSCOPE
WITH 7 INCH HD SCREEN

QC3185

285.00



This digital microscope with up to 1200X zoom enables you to inspect your electronics to identify poor solder joints, read labels printed on small components, etc. or get a close-up view of your biological-related object. Watch in real-time on the 7" HD colour LCD screen or save video or photos to a microSD card (not included) to playback or review on a computer or larger screen. Eight high-brightness LEDs help provide a clearer view. Its adjustable bracket lets you adjust the angle up to 45° to avoid reflections or to provide space for using tweezers, soldering iron, and other technician's tools under the microscope. Other features include a screensaver, automatic shutdown, and date & time stamps on photos and videos. Power the microscope by connecting it to an available USB power source. Connect the USB cable to a PC and use it as a PC camera, access the optional memory card or charge the battery.

Features:

- 1200x Zoom with Continuous Amplification
- 12MP Camera
- 1024x600 pixel screen resolution
- 10mm to infinity distance between object
- Save photos and videos to microSD card
- Adjustable angle up to 45°

Specifications:

- Magnification: 1200X (Continuous amplification)
- Focus Range: 10-130mm
- Camera: 12MP
- Resolution: 1080FHD
- Screen Dimensions: 185(W) x 122(H)mm
- Microscope Dimensions: 240-360(H) x 165(D) x 120(W)mm
- Powered by Lithium Iron rechargeable battery - 1m MicroUSB
- Cable included

[Download Manual](#) here.

720P DIGITAL MICROSCOPE
WITH 4.3 INCH HD SCREEN

QC3193

139.00



Digital microscope with built in 4.3" OLED display. Collect items from around the house and take a closer look to satisfy your curiosity! The microscope provides its own illumination via LEDs to see the objects even more clearly. Great for hobbyists and curious young minds. Can work for more than 6 continuous hours.

Features / Main Parameters:

- 3.6 megapixels CCD camera
- Magnification: 1 – 600x continuous amplification system
- Built-in rechargeable Lithium Ion battery

[Download Manual](#) 

5MP USB DIGITAL
MICROSCOPE

QC3199

255.00





Digitech microscope with a simple but incredibly useful stand that allows you to make fine adjustments to the height of the microscope and swivel the scope arm in a 360 degree range. This permits a greater level of viewing accuracy and stability. The microscope can be easily removed from its stand if required. On either side of the stand there are two metal holders to lock your object in place and a printed ruler to help you get an approximate feel for the length of objects. The optics built into this microscope are excellent. The sharpness of texture on magnified objects is incredible to look at. It comes with a great piece of software for capturing 5MP (2592x1944) res JPGs, BMPs, TIFs or PNGs and 1280x960 pixel AVI files. Excellent for educational purposes or a myriad of practical applications such as technicians, jewellers, laboratory work, etc.





Features:

- Image sensor: 5MP
- Focus range: Manual focus from 10mm to 150mm
- Snap shot: Button or software
- Shutter speed: 1 sec to 1/1000 seconds
- Still image resolution: 2592x1944, 2048x1536, 1600x1200, 1280x960 pixels

- Video capture resolution: 1280x960
- Flicker control: 50Hz/60Hz
- Light source: 8 x LEDs with adjustable brightness
- Magnification ratio: 10x, 300x (at 5MP resolution)
- Power source: USB
- Bundled software: Microcapture Pro with measurement function

[Download Manual](#)  [Download Software](#) 

PHOTOGATES

BEESPIV PHOTOGATE	GE1755-01	96.00	BEESPIV PHOTOGATE HOLDER	GE1755-02	60.50
	<p>Compact and easy to use BeeSpi V photogate by Narika Products. Use this handy photogate to measure free fall speeds, cars and projectile velocities. Two parallel photogates detect, measure and display speeds of any objects that pass through its 40 x 30mm tunnel, from zero to 99.99 km/h. Also measures in m/s. This unit can measure Lap time 0 to 99.99sec and Accumulated Lap Time 0 to 99.99sec. The BeeSpi's memory function can save up to the 5 latest measured data. Dimensions: 60 x 60 x 50mm (overall). 40 x 30mm (inner) - 55g (without batteries). Requires 2 x AAA batteries (<i>not included</i>). Click to see more INFORMATION here.</p>	91.00 (5+)		<p>Holder for the Beespi V photogate. This holder is designed to hold the Beespi V photogate firmly and easily so the angle and the height can be adjusted.</p> <p>Beespi V photogate sold separately. Click here to see Instruction Sheet.</p>	
AIR TRACK PHOTOGATE KIT	MF0138-001	284.00	PHOTOGATE "U"-SHAPED WITH SUPPORT ROD FOR GENERAL PURPOSES	LB2336-001	130.00
	<p>This <i>IEC PHOTOGATE KIT</i> contains 2 x universal Photo Gates with all the cables and plugs required for connecting them to the recommended optional digital timer (LB4064-101), although several types of IEC Timers perform well. Photogates can be used on tracks either with or without a Sub Base. A Photogate is a device that supports a small light source in line with a small light sensitive cell. A space between them permits a moving object to pass and break the light beam. On the Air Track, the Photogate sits directly on the track and permits a glider with a 'flag' taped to the side pass through the light beam. The Gates are supplied with special legs that can be pushed firmly into the sides of the Gates to permit them to engage firmly to the outer corners of the normal triangular Air Track so the Gates become integral with the Track and can be slid along the track to any position. See the PDF file for all information and details. Instruction Sheet</p>			<p>This Photogate by <i>IEC</i> is a universal type device for detecting of the breaking of a beam of red LED light as objects move to pass through the beam.</p> <p>Very useful for many types of measurement and adaptors are available to permit the standard gates to 'click' to the edges of the <i>IEC</i> Air Track so that gliders can pass through. 12V, AC or DC is required to run the LED and any of IEC's many electronic timers will respond to the PhotoGate signal to do your bidding.</p> <p>The gates developed for the new "Genius" timer (LB4055-001) permit powering the LED and retrieving the signal using the same cable and plug. The timer can run 2 gates simultaneously. Click here to see Instruction Sheet.</p>	

SMART TIMER – POCKET SIZE
– WITH PHOTOGATE

LBTIMERSPS


211.15






This pocket-sized digital timer has two built-in photogates that can measure time, speed and acceleration. Microprocessor control offers 0.01% accuracy. Requires 4 x AAA batteries (not included) for 2 hours continuous function. Large internal memory storing up to 20 data points. When used with an inclined plane, the acceleration results can be read directly if using 2 timers linked together (a 25mm diameter ball is required). A cable for linking up two timers so that a 4 photogate system can be quickly assembled is NOT provided.





SIGNAL GENERATORS, LOUD SPEAKERS & AMPLIFIERS




<p>TRI-MODE SIGNAL GENERATOR</p> <p>LB3758-001</p>	<p>850.00</p>	<p>SIGNAL GENERATOR "WAVE-LAB" DUAL DIGITAL 240V AC</p> <p>LB3756-101</p>	<p>1230.00</p>
<div data-bbox="115 479 451 673" data-label="Image"> </div> <p>A regulated power source, signal generator & audio amplifier with in-built speaker in one unit. The IEC "Tri-Mode" Signal Generator is really 3 instruments in one so that many electronic experiments can be performed without need of extra equipment.</p> <p>The TriMode provides the user with:</p> <ol style="list-style-type: none"> 1) A metered and regulated +/- 1.2-20V.DC power supply at 250mA output. 2) An excellent high power Signal Generator from 0.1 to 100kHz. 3) An audio amplifier with high and low sensitivity inputs, oscilloscope output and internal speaker. <p><i>Genuine IEC product.</i> Instruction Sheet supplied.</p>		<div data-bbox="1102 495 1417 657" data-label="Image"> </div> <p>The IEC digital "Wave-Lab" is a special dual wave Signal Generator for the study of wave theory. This microprocessor generates 2x sets of very accurate and absolutely stable frequencies up to 40kHz that can be added to one another, exactly shifted in phase relative to one another or modulated by one another.</p> <p>Waveforms can be selected as sine, triangular or sawtooth and high-power amplifiers permit the driving of large speakers or headphones for private listening. An oscilloscope can be used to view the waveforms and effects. Harmonics, beat frequencies and other phenomena can be studied. Output power is digitally controlled and a keyboard system allows any frequency to be entered. External signals can be applied and a microphone and headphones are included in the kit.</p> <p>A pair of suitable wide range speakers is available. See LB2065-001.</p> <p><i>Genuine IEC product.</i> Instruction sheet supplied.</p>	
<p>ELECTRONICS KITS SIGNAL GENERATOR 1-10KHZ</p> <p>PA1764-360</p>	<p>214.00</p>		
<div data-bbox="115 1055 409 1323" data-label="Image"> </div> <p>Electronics Kit, signal generator, mini, 1Hz-10kHz, 76x76mm base, 2mm sockets for connection. This provides both sine and square waves for all electronic experiments and for the demonstration bridge rectifier with LEDs.</p>			




<p>SIGNAL GENERATOR 0.1HZ-100KHZ HIGH POWER 240V AC LB3754-001</p>  <p>This High Power Signal Generator has now been designed in the small IEC housing with the sloping front panel. This instrument is very popular in schools and universities. Because of its high current output, it can run large speakers and other mechanical devices directly without an amplifier. Range 0.1Hz to 100kHz over 6 ranges by graduated knob.</p> <p>Output #1: 600ohm impedance, 0-10V peak. Output #2: 20 ohm impedance, output voltage adjustable 0-10V peak, output current limited at 0.5A. Selectable waveforms are: sine, triangular, square (+/- excursion), square (+ excursion only). Instruction Sheet included (click here to view). <i>Genuine IEC product.</i></p> <p>NOTE: IEC produces also a triple function instrument that includes a +/- regulated DC power supply and a very useful audio amplifier with speaker all in the one compact housing. This instrument is named the 'TRI-MODE'. (Code: LB3758-001).</p>	535.00	<p>SIGNAL GENERATOR DIGITAL 0.1HZ-100KHZ 1A "MINI-WAVE" LB3753-101</p>  <p>The "Mini-Wave" by IEC is a very compact Digital Signal Generator and provides waveforms of: Sine, Square, Triangle and Sawtooth. It is crystal locked, therefore the accuracy is extremely high (approx 0.01%) and stability is perfect. The instrument runs from 240V mains and provides an adjustable output of 15V peak to peak or 5V.AC. RMS. The output can supply up to 1 amp into the load. This is current limited against overload.</p> <p>The IEC "Quick Set" system permits very fast setting of the preset frequency required and resolution is 0.1Hz up to 10kHz. From 10kHz up to 100kHz, the resolution is 1 Hz. Used for experiments using Kundt's Apparatus, or audio experiments or resonance experiments using inductance and capacitance. Can be used to demonstrate the functions of an oscilloscope.</p> <p>The large output power permits the running of very large speakers or vibrators, such as (IEC's) Melde's Apparatus (SW4220-001). Instruction Sheet included.</p>	405.00
<p>LOUDSPEAKERS – PAIR – LARGE HIGH QUALITY FOR WAVE STUDY – 4 OHM LB2065-001</p>  <p>This pair of IEC Loudspeakers in Housings have 150mm diameter, 5 watt RMS twin cone speakers of 4 ohm impedance, of broad range and of good fidelity, mounted inside very strong housings. The metal grille protects the speaker cone from damage. Two 4mm sockets permit connection by banana plugs. These speakers were specially designed to operate with the IEC "Wave~Lab" dual wave generator (LB3756-101) but they can be used for general purpose work. To prevent coil burnout, these speakers have current limiting inbuilt. For smaller and lower cost speakers, see LB2064-010 and LB2064-001. Instruction Sheet included.</p>	198.00	<p>LOUDSPEAKER – LARGE EXTENSION IN HOUSING 8 OHM LB2064-001</p>  <p>This compact IEC Loudspeaker in Housing is a strong and neat unit designed for general laboratory use. It is suitable for most laboratory experiments where signals must be converted to sound. It is useful also as an extension speaker for other equipment. The front grille is expanded metal for protective strength, and it is complete with 4mm sockets for connection by banana plugs. The IMPEDANCE of the speaker is nominally 8 ohms at 400Hz. 75mm diameter speaker with a DC resistance of about 7 ohms. Dimensions: 130 x 100 x 40mm. 0.36kg.</p> <p>For smaller speaker, see LB2064-010. Instruction Sheet included.</p>	80.00

<p>LOUDSPEAKER – SMALL EXTENSION IN HOUSING 8 OHM</p>	<p>LB2064-010</p>	<p>69.00</p>	<p>AMPLIFIER AUDIO LARGE SPEAKER 240V AC</p>	<p>LB0081-001</p>	<p>217.00</p>
	<p>The small IEC Loudspeaker in Housing is a 56mm diameter speaker of 8 ohm impedance at 400Hz and of reasonable fidelity, mounted inside a very strong housing. It is suitable for most laboratory experiments where signals must be converted to sound. It is useful also as an extension speaker for other equipment. The front metal grille protects the speaker cone from damage. Two 4mm sockets permit connection by banana plugs.</p> <p>For higher power speaker with 75mm diameter speaker., see LB2064-001.</p> <p>Dimensions: 75 x 75 x 45mm. 0.26kg. Instruction Sheet included.</p>			<p>This IEC 240V mains Audio Amplifier is a rugged instrument with 75mm diameter inbuilt loudspeaker. The input can be by 3.5mm phone jack at 15mV max., or by banana plug at 150mV max. Output is either via loudspeaker with speaker on/off switch or by 4mm sockets to an oscilloscope to view the output signal. 500mW max. output power.</p> <p>The instrument is rugged enough to withstand student use. The unit is powered from 220/240V.AC mains. For the smaller portable battery model, see LB0080-001.</p> <p>Dimensions: 180 x 170 x 85mm. 1.1kg.</p> <p>Instruction Sheet included. <i>Genuine IEC product.</i></p>	
<p>AMPLIFIER AUDIO SMALL 12V AC/DC & INTERNAL 9V BATTERY</p>	<p>LB0080-001</p>	<p>193.00</p>			
	<p>This Audio Amplifier is a rugged instrument with inbuilt loudspeaker. The input can be by 3.5mm phone jack at 15mV max., or by banana plug at 150mV max.</p> <p>Output is either via loudspeaker with speaker on/off switch or by 4mm sockets to an oscilloscope to view the output signal. The instrument is rugged enough to withstand student use.</p> <p>The unit contains a 9V #216 dry cell but can be powered also by 12V.AC <i>PlugPak</i> or from any low voltage power supply at 12V.AC or DC.</p> <p>For the larger model for 240V mains operation, see LB0081-001.</p> <p>Instruction Sheet included. <i>Genuine IEC product.</i></p>				




TIMERS

<p>TIMER / COUNTER / FREQUENCY – 12V AC/DC PLUG PAK</p> <p>LB4063-001</p>	<p>507.00 (ea.1-4 units)</p>	<p>TIMER / COUNTER / FREQUENCY – 240V AC</p> <p>LB4063-101</p>	<p>555.00 (ea.1-4 units)</p>
 <p>This 'Timer-Counter / Frequency' from IEC is a very compact and powerful instrument that runs from a 240/12V.AC. PlugPak. The mains model version of this timer is <i>LB4063-101</i>. Has a bright red LED 6 digit display, times up to 99.9999s with a resolution of 0.1ms (0.0001s) and continues to 999.999 by 1ms (0.001s). A 'mode' button permits timing of Stop/Start, PhotoGate, Period and Pendulum (see PDF file for full information). Memory is stored up to 20 readings. The Counting function can be set to Continuous Count, Counts over 100S, Counts over 10S, Counts over 1S (or frequency in Hz). A rotary control permits sensitivity adjustment of the counting input. It does not perform Geiger Counting. An excellent and very versatile instrument for the laboratory. <u>Instruction Sheet</u> included.</p>	<p>500.00 (ea.5+ units)</p>	 <p>This 'Timer-Counter / Frequency' from IEC is a very compact and powerful instrument that runs from a 240V.AC. mains. The smaller, low voltage model of this timer is <i>LB4063-001</i>. It has a bright red LED 6 digit display and times up to 99.9999S with a resolution of 0.1mS (0.0001S) and continues to 999.999 by 1mS (0.001S). A 'mode' button permits timing of Stop/Start, PhotoGate, Period and Pendulum (see PDF file for full information). Memory is stored up to 20 readings. The Counting function can be set to Continuous Count, Counts over 100S, Counts over 10S, Counts over 1S (or frequency in Hz). A rotary control permits sensitivity adjustment of the counting input. An excellent and very versatile instrument. It does not perform Geiger Counting. Dimensions: <u>Instruction Sheet</u> included.</p>	<p>545.00 (ea.5+ units)</p>
<p>TIMER - MULTI FUNCTION 220/240V AC</p> <p>LB4064-101</p>	<p>430.00</p>	<p>TIMER – MULTI FUNCTION LED 999.999S X 0.1MS 12V AC/DC</p> <p>LB4064-001</p>	<p>370.00</p>
 <ul style="list-style-type: none"> • Versatile timer with a bright red 6 -digit digital LED display for classroom work • Auto-ranging permits times up to 999.999S x 0.0001S and up to 999.999S by 0.001S • AC lamp or LED power is provided on rear panel for PhotoGates • A special constant current output is provided on the rear panel for the IEC 'Free Fall' experiment (MF1871-401) to energise the solenoid that holds the steel balls. The instant the timing begins, automatically the ball is made to drop. This makes the 'Free Fall' experiment very easy and accurate. Timer is microprocessor controlled and is very fast. Selectable modes are: Start/Stop, PhotoGate, Period and Pendulum. Stores 20 memories that can be added, averaged, purged or cleared. 		 <p>Versatile low voltage Timer with a bright red digital display for classroom work. It is compact version and is run by 240/12V.AC PlugPak (not supplied). Very similar to the LB4064-101, but is lower cost because it has no power for Photo Gates or automatic solenoid ball release control for the 'Free Fall' experiment. Timer is microprocessor controlled and is very fast. Autoranging permits times up to 99.9999s by 0.0001s and up to 999.999s by 0.001s. Selectable modes are: Start/Stop, PhotoGate, Period and Pendulum. Stores 20 memories that can be added, averaged, purged or cleared. PDF file available for full details. Refer also to LB4064-101 and LB4064-201 for variations to this model.</p>	





<p>"MULTI-TIMER" 4.5 DIGITAL LCD – 200S X 0.1MS</p> 	<p>LB4057-001</p> <p>This 'Multi-Timer' has been a favourite laboratory timer for Physics. It is microprocessor controlled for extreme accuracy and runs from 3 x 'AA' dry cells.</p> <p>Runs only one external circuit, however 2 x Photo Gates can be used for starting and stopping the timer in different modes. Auto ranging permits times up to 1.9999s with a resolution of 0.1ms, 19.999s by 1.0ms and 199.99s by 10ms. The 20 memories can be averaged, totalled, purged or cleared. This rugged timer is very fast, is safe in the hands of students, is low cost and offers a good range of functions.</p> <p><i>Genuine IEC product.</i> Instruction Sheet available.</p>	<p>281.00</p>	<p>SMART TIMER – POCKET SIZE – WITH PHOTOGATES</p> <p>LBTIMERPS</p>  <p>This pocket-sized digital timer has two built-in photogates that can measure time, speed and acceleration. Microprocessor control offers 0.01% accuracy. Requires 2 x AA batteries (not included) for 2 hours continuous function.</p> <p>Large internal memory storing up to 20 data points.</p> <p>When used with an inclined plane, the acceleration results can be read directly if using 2 timers linked together (a 25mm diameter ball is required). A cable can be used for linking up two timers is provided so that a 4 photogate system can be quickly assembled (<i>not provided</i>).</p>	<p>205.00</p>
<p>DUAL TIMER FOR PHOTOGATES & FREE FALL</p> 	<p>LB4065-101</p> <p>This <i>IEC</i> multi-function Dual Timer is designed for use with 2 x Air Track Photo Gates from <i>IEC</i> operating simultaneously and the <i>IEC</i> Free Fall instruments that use a solenoid release system. It is high speed with resolution to 0.0001s and has two counting modes. The rear panel has sockets for powering photogates and a power source and special socket for the Free Fall solenoid release at the instant that timing begins.</p> <p>For <i>LINEAR AIR TRACKS</i>, this mains operated Dual Timer can connect to 2 separate Photo Gates and can measure and store the 2 times separately for later recall. When not using an Air Track with Photogates, the timer can be used as a general Lab Timer.</p> <p>This Timer is a variation to LB4064-101 high speed timer which can time to 0.1 milliseconds. Large LED display for easy reading in the classroom.</p> <p>This timer can control also the dropping of a ball on an <i>IEC</i> Free Fall Apparatus and accurately measure the time for the fall. Socket for this application is on the rear face of the instrument.</p> <p>Instruction Sheet included.</p>	<p>445.00</p>		

<p>MULTI COUNTER – TIMER/COUNTER/FREQ/GEIGER 220/240V AC</p> <p>LB4071-101</p>  <p>This '<i>MULTI COUNTER</i>' is a compact and versatile instrument for general laboratory timing to 0.1 mS, counting, measuring frequency or rate and for performing Geiger counting. The IEC Multi Counter with frequency, Geiger counting and audio amplifier with speaker is the most powerful of all the IEC Timer range. It is 220/240V.AC mains operated with a bright red LED display and sloping front panel for ease of using and viewing. Each of the 3x modes (Timing, Counting/Freq and Geiger) has a set of 'Functions' to select the type of function you want for the mode you selected. All selection is by LED and the indication reminds you always of the mode and function that is operating. It is a fully featured fast Timer with 20 memories and the same performance as the LB4063-101 but it has power for PhotoGates on the front panel. It is complete with Geiger tube output with adjustable HV to the tube. The suitable tube and cable is PA1885-050 (<i>not supplied</i>). A special output is provided for a 'solid state Alpha Detector', but this device is no longer available as an accessory. Geiger counts can be measured over preset times, rate/S or continuous. The audio amplifier has volume control for the internal speaker and 4mm sockets for output to oscilloscope.</p> <p>SPECIFICATIONS: POWER: 220/240V.AC 50/60Hz. ACCURACY: All operations relating to timing and frequency are crystal locked ensuring an accuracy of better than: 0.01% +/-1 least significant digit. All functions are microprocessor controlled. Instruction sheet supplied.</p> <p><i>Genuine IEC product.</i></p>	749.00
<p>RECORDING TICKER TIMER 12V – 25/50 DOTS/SEC</p> <p>LB2671-005</p>  <p>This DC Recording Timer by IEC is a simple, low cost velocity measuring device that permits a long narrow strip of paper tape, dragged by a moving object, to pass under a carbon paper disc and a vibrating hammer which makes dots on the paper strip. The rate of hammering and the distance between the dots permits velocity to be calculated. The heavy base and the rubber feet makes the timer stable on the table and clamps are not required. The extension rod allows the timer to be held vertically by a retort stand and the knob at the end is for safety by stopping the timer from falling through the support clamp if it becomes loose.</p> <p>The kit consists of:</p> <ul style="list-style-type: none"> • 1 pce. Recording timer, with hammer and platform • 1 roll/30m White paper tape PA2670-005 • 1 pack/25 Carbon paper discs. PA2670-007 <p>Instruction sheet included. <i>IEC product.</i></p>	148.00
<p>RECORDING TICKER TIMER & KIT - 8-12V AC 50 DOTS/SEC</p> <p>LB2670-001</p>  <p>This AC Recording Timer from IEC is a simple, low cost velocity measuring device that permits a long narrow strip of paper tape, dragged by a moving object, to pass under a carbon paper disc and a vibrating hammer which makes dots on the paper strip. The rate of hammering and the distance between the dots permits velocity to be calculated. The heavy diecast base with the rubber feet allows the device to vibrate at 50Hz without the need to clamp it to the bench.</p> <p>The kit consists of:</p> <ul style="list-style-type: none"> • 1 Recording timer, with hammer and platform. • 1 roll/30m White paper tape PA2670-005 • 1 pack/25 Carbon paper discs. PA2670-007 <p><i>Genuine IEC product.</i> Instruction sheet included.</p>	94.00









FOG MACHINES & ACCESSORIES









<p>MINI FOG MACHINE WITH RGB LEDS</p>	<p>AF1225</p>	<p>89.95</p>	<p>FOG MACHINE</p>	<p>AF1214</p>	<p>189.00</p>
	<p>This 400W compact fog machine by Digitech has bright built-in RGB LEDs to produce amazing lighting effects. It is an ideal machine for laser and light experiments in the lab. Features a wired remote control and suitable for either desk or lighting stand mount. Sprays fog up to 3.5m.</p>	<p>It has an onboard reservoir to hold the fog liquid (<i>available separately</i>) and can be triggered from the included wired remote control. The fog machine can be positioned on the floor or attached to a lighting stand using the supplied mounting bracket. Dimensions: 140 x 130 x 250mm – 1.8kg.</p>		<p>The unit produces clouds of white fog on demand – ideal for laser and light experiments in the lab. Operates with the use of an illuminated 3m wired remote control. Features an adjustable mounting bracket, tough metal construction and fluid gauge. 800ml fluid capacity.</p>	<p>Dimensions: 330 x 160 x 140mm.</p>
<p>Features:</p> <ul style="list-style-type: none"> • 3 x 1W RGB LED Lights • 5 Minute Heat Up Time • 300ml Tank Capacity • Mains Powered – power cable incl. • Mounting Bracket Included • Wired Remote Control 	<p>NOTE: Use machine in a well-ventilated area when in operation. Fog may potentially trigger your smoke detector.</p>	<p>Features:</p> <ul style="list-style-type: none"> • 240VAC operation • 70 cubic metres/minute fog output • Fog liquid available separately (AF1212) 	<p>NOTE: Use in a well-ventilated area - this product may also potentially trigger your smoke detector.</p>		
<p>FOG MACHINE LIQUID – WATER BASED – 5L</p>	<p>AF1223</p>	<p>99.95</p>	<p>FOG MACHINE LIQUID – WATER BASED – 1L</p>	<p>AF1212</p>	<p>29.95</p>
	<p>Water-based, non-toxic, non- irritant, environmentally friendly fog machine liquid for your 400W mini fog machine (AF1225), that leaves no oily residue.</p>	<p>Caution:</p> <ul style="list-style-type: none"> - Keep out of reach of children - Do not swallow - Do not dilute or add any other fluids or substances - Use fog generating machinery only in well-ventilated areas, not for any other usage. 		<p>Water-based, non-toxic, non- irritant, environmentally friendly fog machine liquid for your both fog machines (AF1225 & AF1214), that leaves no oily residue.</p>	<p>Caution:</p> <ul style="list-style-type: none"> - Keep out of reach of children - Do not swallow - Do not dilute or add any other fluids or substances - Use fog generating machinery only in well-ventilated areas, not for any other usage.
<p>NOTE: This product may also potentially trigger your smoke detector.</p>	<p>NOTE: This product may also potentially trigger your smoke detector.</p>				

HEADPHONES





<p>STEREO HEADPHONES</p> <p>AA2061</p>	<p>29.95</p>	<p>RECHARGEABLE DIGITECH HEADPHONES WITH BLUETOOTH®</p> <p>AA2129</p>	<p>44.95</p>
 <p>These 80g Yoga lightweight stereo headphones provide outstanding performance, clarity and comfort. Featuring high output drivers with neodymium magnets, they produce crystal clear sound with crisp highs and smooth bass.</p> <p>Connection: 3.5mm stereo jack plug Driver Diameter: 30mm Frequency Range: 120Hz, 20kHz Sensitivity: 107dB Continuous Power Rating: 50.0W Impedence rating: 32 Ohms</p>	<p>(1-9)</p> <p>25.95 (10+)</p>	 <p>Wireless headphones that are comfortable to wear and have amazing sound quality. These foldable, rechargeable Bluetooth® over-ear headphones are amazingly versatile and great value with a long battery life.</p> <p>Pair via Bluetooth® to your Smartphone, Tablet, or computer and take phone calls using the integrated microphone. The rechargeable battery provides up to 18 hours of playback time or 14 hours of talk time. Connect to a USB power source to recharge. They fold up when not in use. Includes 3.5mm to 3.5mm auxiliary cable and USB charging cable.</p> <p>Driver diameter: 40mm Sensitivity: 96dB Frequency Range: 20Hz – 20kHz Impedence rating: 32 Ohm USB Voltage Input: 5V USB Input Current: 500mA Bluetooth Version & Range: V5.0 / 10m Download Manual</p>	
<p>RECHARGEABLE DIGITECH BLUETOOTH HEADSET WITH CHARGING CRADLE</p> <p>AA2180</p>	<p>69.95 (1-9)</p>	<p>HEADPHONES FOR WAVE-LAB WITH CABLE & PLUG</p> <p>PA3756-010</p>	<p>25.50</p>
 <p>This lightweight Bluetooth® V5.0 headset can connect to two Bluetooth® devices at the same time! Using the Bluetooth function speak hands-free while driving or use Skype, Teams, and other chat programs hands-free. Offers noise cancelling technology for crystal clear conversations, a multi-function button for voice command, redialling the last number, and call rejection. An onboard Li-Po (Lithium Polymer) battery is charged via USB or when placed in its dock (USB cable included). Can be paired with any Bluetooth mobile phone or smartphone. Working Time: About 15 hours at 50% volume. Bluetooth Range: 10m. Download Manual</p>	<p>65.95 (10+)</p>		




CLAMPS – BENCH CLAMPS, RETORT CLAMPS, BOSSHEADS & OTHER CLAMPS

ITEM NAME	CODE	PRICE	ITEM NAME	CODE	PRICE
BENCH CLAMP – ALLOY – UNIVERSAL FOR 13MM MAX RODS	LB0858-001	30.80	G-CLAMP 100MM	CLAMPG100	13.50
	A useful device in the lab. Can fit to benches up to 40mm thick. When clamped can carry rods 5 to 13mm diameter both vertically and horizontally. Can carry a pulley mounted on a rod (MF2600-001 or MF2600-020), which then converts either one to a bench mounted pulley. <i>Genuine IEC product.</i> Instruction sheet included.			100mm (4 inches) working distance. <i>NOTE: Supplied with black body.</i>	
G-CLAMP 50MM	CLAMPG50	8.00	RETORT CLAMP – FOUR PRONG – POWDER COATED	CH0682	11.50
	50mm (2 inches) working distance.			Steel retort clamp approx. 25cm in length. Cork lined to protect labware. Jaws can open up to 75mm in diameter. Requires bosshead to attach to lab stand.	
RETORT CLAMP - THREE PRONG	ARLW2070440-1	10.40 (1-5)	RETORT CLAMP - THREE PRONGED, STEEL CLAMP SCREW	ARLW2070440-2	10.40
	Die-cast on alloy, with clamping screw of plated brass. Jaws are covered in rubber. Clamp accepts items up to 75mm dia., actuated by nickel plated pummels and twin screw. Fitted with 15cm long aluminium rod.	9.30 (6+)		Clamp Retort with clamping steel screw having moulded plastic head. Jaws mounted on metal rod of length 250mm; Jaw capacity 100mm. Fitted with 15cm long mild steel or aluminium rod. Accepts articles up to 75mm diameter. Requires bosshead to attach to lab stand.	
BOSSHEAD - RIGHT ANGLE - HIGH TORSIONAL STRENGTH	PRBH01	11.33	BOSSHEAD – DOUBLE “V”	AR2070160-1	5.15
	High grade zinc alloy composition, finished with non-toxic powder coating. Two stainless steel thumb screws. Non-ferrous, rust free & long lasting. Holds rods orthogonally (90 degrees) to one another. Designed to carry heavy loads & prevent torque damage. Threaded metal, single piece clamping screws, able to hold rods up to 16mm (dia.).			Die-cast metal alloy. Black. Two V-grooves orthogonal to each other, to accept rods up to 16.5mm diameter, which are secured through nickel-plated thumb screw. For use with laboratory retort stand in school and colleges.	







<p>BOSSHEAD WITH METAL THUMB SCREW</p> <p>CH0663BK</p>	<p>5.95</p>	<p>RETORT CLAMP – DOUBLE JAW 360 DEGREE SWIVEL</p> <p>LW1669-01</p>	<p>25.30</p>
 <p>Die-casted in black finish, accepts rods up to 16 mm dia., at right angle to each other.</p>		 <p>One jaw grips up to 45mm, the other jaw grips up to 25mm.</p>	
<p>SUSPENSION CLAMP – 110MM FROM SUPPORT ROD</p> <p>CH0667</p>	<p>13.50</p>	<p>THERMOMETER CLAMP (WITH BOSSHEAD)</p> <p>CH0667A</p>	<p>12.30</p>
 <p>Used to suspend a thermometer over a hot plate or a specific heat specimen. Holds item 110mm from the support rod. Adjustable hook that locks at any angle.</p>		 <p>Adjustable 360° jaw rotation. For attaching to support rods up to 16 mm in diameter. Will accommodate thermometers 6 to 12 mm in diameter. The clamp is die-cast with thumbscrews & jaws are made of phosphor-bronze. Overall Length 140 mm.</p>	
<p>BURETTE CLAMP DOUBLE DIECAST ALLOW FISHER TYPE</p> <p>LW1627-01</p>	<p>29.15</p>	<p>BURETTE CLAMP – POLYPROPYLENE DOUBLE</p> <p>LW1637-01</p>	<p>9.65</p>
 <p>Fisher Type Burette Clamp used to hold and secure a burette on a stand. Also available in polypropylene - single and double.</p>		 <p>A polypropylene Burette Clamp used to hold and secure a burette on a stand. Also available in double metal and single polypropylene.</p>	
<p>BURETTE CLAMP – POLYPROPYLENE SINGLE</p> <p>LW1647-01</p>	<p>6.60</p>	<p>THERMOMETER CLIPS – METAL</p> <p>LW1676-10</p>	<p>64.50</p>
 <p>A polypropylene Burette Clamp used to hold and secure a burette on a stand. Also available in double metal and double polypropylene.</p>		 <p>Metal thermometer clips used to hold thermometer in beaker. Pack of 10.</p>	

LABORATORY EQUIPMENT – RETORT STANDS







RETORT STANDS			RETORT STANDS		
ITEM NAME	CODE	PRICE	ITEM NAME	CODE	PRICE
4 PIECE RETORT STAND SET - 20 X 12.5CM BASE, 59CM ROD, SUPPORT RING & 4- PRONGED CLAMP	MTST1	51.00	RETORT STAND: 20 X 12.5 CM PRESSED STEEL BASE & 50CM MILD STEEL ROD	LW2071600-2SET	25.50
	The retort stand is made of corrosion & scaling resistant, powder coated pressed steel, and features a tapped hole, suitable for connecting the included rod, or any other rods with a 10mm x 1.5mm metric thread. Stand measures 20cm long, 12.55cm wide and is approximately 2.5cm in height. Included S/S rod measures 59cm tall, 10mm in diameter and features a 10x1.5mm metric thread. 7.5cm diameter support ring. Ring features a zinc plated steel shank secured to a screw clamp. Distance from each of the rings centers to the center of the support measures 11.8cm. Clamp is four-pronged with a cork lining.			Die pressed, rectangular, steel base with threaded hole for 12.5mm diameter rod at the center of one of the shorter sides. Finished in blue. Base is recessed at the bottom with two shorter sides having rubber feet for added stability and preventing damage to the worksurface. Mild Steel, Nickel plated rod with one end threaded with shoulder ensures straight vertical, upright fit on base. Reduced diameter at threaded portion enabling rod to sit flat on base. Rounded top and provided with a through hole just above shoulder to permit insertion of tommy bar for tightening rods to base. Base size: 200x125mm. Rod size: 12.5mm (dia.) x 500mm (l).	
RETORT STAND: 20 X 12.5 CM SHEET METAL BASE & 50CM MILD STEEL ROD	LW2071480-2SET	17.20	RETORT STAND: 25 X 15.5CM PRESSED STEEL BASE & 60CM STEEL ROD	CH0652SET	30.00
	Depressed sheet metal with threaded hole at the centre of one of the shorter sides for the 12.5mm (dia.) x 500 mm (long) mild steel, nickel plated rod <i>(See LW2071600-2SET for rod description).</i>			2-piece set comprising of rectangular 25 x 15.5cm, high quality powder coated pressed steel base (CH0652C) and 60cm tall, 12mm diameter high quality steel rod (CH0657B). The rod has a 10 x 1.5mm thread on one end.	


RETORT BASE: 25 X 15.8CM PRESSED STEEL	CH0652C	22.65	RETORT ROD – 60CM STEEL	CH0657B	11.30
	<p>Replacement base for <i>RETORT STAND (CH0652SET)</i>. Rectangular retort base made of corrosion resistant, powder coated pressed steel, dimensions (approx.) 25cm x 15.8cm x 2.5cm. Weighs approximately 1.18kg. Tapped hole at one end for rod with 10mm x 1.5mm thread. Suited for Eisco Lab Rod Series: CH0657, CH0658 & CH0659.</p>			<p>60cm tall, 12mm diameter high quality steel rod. The rod has a 10 x 1.5mm thread on one end.</p> <p>If you have misplaced your rod for your <i>RETORT STAND (LWCH0652SET)</i>, this is the replacement rod. Fits in any Eisco retort base.</p>	
RETORT STAND – BASE & ROD FOR ARCHIMEDES PRINCIPLE KIT	CH0653E1RD3	48.00			
	<p>Rod & base set. Stable 2.25kg base made of corrosion-resistant powder coated pressed steel – 27.5 x 15cm. Features tapped hole to fit the included rod, or other rods with a 10mm x 1.5mm metric thread. 60 x 1.2 cm steel rod.</p> <p>Suitable for <i>ARCHIMEDES PRINCIPLE KIT (PH0121)</i>.</p>				

TRIPODS & STANDS FOR BUNSEN BURNERS AND ALCOHOL BURNERS

ITEM NAME	CODE	HEIGHT (MM)	PRICE (EACH)			ITEM NAME	CODE	HEIGHT (MM)	PRICE (each)		
			1-9	10-29	30+				1-9	10-29	30+
TRIPOD – ROUND TOP – 110MM DIA. 	META1814-150	150	40.50	34.35	34.35	TRIPOD – TRIANGULAR TOP – 120MM 	META1816-150	150	40.50	34.35	34.35
	META1814-205	205	41.00	34.85	34.85		META1816-205	205	41.00	34.85	34.85
	META1814-205E*	205	17.05	15.40	15.40		META1816-205E*	205	17.05	15.40	15.40
	META1814-250	250	44.90	39.80	39.80		META1816-250	250	44.90	39.80	39.80
Stackable tripod with 110mm OD cast iron top painted in heat resistant silver. Supplied with three zinc plated legs. <i>*Supplied unassembled.</i>						Stackable triangular tripod with 120mm long sides. Cast iron top painted in heat resistant silver. Supplied with three zinc plated legs. <i>*Supplied unassembled.</i>					
TRIPOD – ROUND TOP – 150MM DIA. 	META1820-205	205	48.50	43.50	43.50	TRIPOD– STAINLESS STEEL – 150MM SIDES 	LW4828-01	230	14.30	14.30	13.90
	META1820-250	250	55.30	47.45	47.45		Stainless Steel tripod stand 230mm high with triangular top - 150mm long. Rubber feet. Used to safely hold equipment over Bunsen burner.				
Stackable tripod with 150mm OD cast iron top painted in heat resistant silver. Supplied with three zinc plated legs											
TRIPOD – TRIANGULAR TOP – 200 x 125MM 	LWLTRI125/200	200	14.50	14.50	14.10	ALCOHOL BURNER STAND – STAINLESS STEEL – 130MM 	LW1578-01		16.00		
General purpose 200mm high x 125mm wide tripod used for supporting beakers or other glassware on gauze mats, while they are cooling or being heated over a Bunsen burner.						Stainless Steel stand for use with Alcohol Burner. 105mm (l) x 130mm (h) x 70mm (w).					





ALCOHOL BURNERS, BUNSEN BURNERS & RELATED PRODUCTS

ITEM NAME	CODE	PRICE	ITEM NAME	CODE	PRICE
ALCOHOL BURNER – 125ML WITH CAP & WICK	LW1557-01	9.10	ALCOHOL BURNER – SPARE WICK	LW1577-01	0.55
	Also known as spirit burner and used as an open flame source in classrooms and laboratories. Safety instructions below. Spare wicks available (Code: LW1577-01). Can be used with stainless steel Alcohol Burner Stand (Code: LW1578-01). INSTRUCTIONS Included.			Spare wick for LW1557-01 .	
BUNSEN BURNER – NATURAL GAS	LW1617-01	22.55	BUNSEN BURNER – LPG	LW1607-01	22.55
	Bunsen Burner for use with natural gas. Blue epoxy coated zinc casted base with air regulator. 140mm h x 13mm tube. Nickel plated tube. Jet size: 0.7mm Weight: 300gm Barb diameter: 8.9mm The natural gas burners can achieve the hottest temperature of 900 to 1000°C at the tip of the blue flame, while temperatures of the yellow airless flame are around 750 to 800°C. Please note that the exact temperatures depend on the gas pressure and chemical composition of the gas, which will vary from site to site. See Operator Information here.			Bunsen Burner for use with LP gas. Red epoxy coated zinc casted base with air regulator. 140mm h x 13mm tube. Nickel plated tube. Jet size: 0.45mm Weight: 300gm Barb diameter: 8.9mm Specified Calorific value approx. 38MJ/m ³ . The LPG burners are designed to work with propane at 35 millibars or Butane at 28 millibars - an appropriate pressure reduction valve should be fitted to the gas cylinder. See Operator Information here.	
BUNSEN BURNER 11MM OD WITH REGULATOR – NATURAL GAS	META1220NG	29.00	BUNSEN BURNER 11MM OD WITH REGULATOR – LPG	META1220LPG	29.00
	Australian made product. 11mm OD., 125mm. high, with rotatable air regulator and gas inlet tube. Comes with a 9.5mm inlet. Base diameter: 82mm (approx.) There is a model also available for LPG (META1220LPG). Bulk pricing (per unit): \$29.00 (1-9) \$27.50 (10+) NOTE: Base colour may vary slightly from photo. Tubing suitable: PA1394-01.			Australian made product. 11mm OD., 125mm. high, with rotatable air regulator and gas inlet tube. Comes with a 9.5mm inlet. Base diameter: 82mm (approx.) There is a model also available for Natural Gas (META1220NG). Bulk pricing (per unit): \$29.00 (1-9) \$27.50 (10+) NOTE: Base colour will be red. Tubing suitable: PA1394-01.	







<p>BUNSEN BURNER 18MM OD WITH REGULATOR – NATURAL GAS</p> <p>META1230NG</p>	<p>34.00</p>	<p>BUNSEN BURNER 18MM OD WITH REGULATOR – LPG</p> <p>META1230LPG</p>	<p>34.00</p>
 <p>Australian made product. 11mm OD., 125mm. high, with flame retention collar, rotatable air regulator and gas inlet tube. Comes with a 9.5mm inlet. Base diameter: 82mm (approx.) There is a model also available for LPG (META1230LPG).</p> <p>Bulk pricing (per unit): \$34.00 (1-9) \$33.00 (10+)</p> <p>NOTE: Base colour may vary from photo. Tubing suitable: PA1394-01.</p>		 <p>Australian made product. 18mm OD., 125mm. high, with flame retention collar, rotatable air regulator and gas inlet tube. Comes with a 9.5mm inlet. Base diameter: 82mm (approx.) There is a model also available for Natural Gas (META1230NG).</p> <p>Bulk pricing (per unit): \$34.00 (1-9) \$33.00 (10+)</p> <p>NOTE: Base colour may vary from photo. Tubing suitable: PA1394-01.</p>	








WARNING: Never use Bunsen burners or other ignition sources in a fume hood – fires in this location can get out of control quickly due to chimney effect, and the common use of fume hoods to store solvents and solvent wastes. For use in a laboratory setting under adult supervision.



TUBING / HOSES FOR BURNERS

<p>NEOPRENE TUBING FOR BUNSEN BURNER– 60CM</p> <p>CH0100A</p>	<p>12.65</p>	<p>NEOPRENE TUBING FOR BUNSEN BURNER – 90CM</p> <p>CH0100F</p>	<p>13.10</p>
 <p>Reinforced at both ends, this 600mm flexible long hose is designed for connecting to a standard 8-10mm diameter gas inlet jet to basic, flame stabilizing, Bunsen, Tirrill, Meker and other laboratory burners. It can be used with LPG, butane or natural gas. ID (tube): 7mm (approx.) OD (tube): 12mm (approx.)</p>		 <p>Reinforced at both ends, this 900mm flexible hose is used to connect your lab burner to a fuel source. Can accept inlet burner diameter up to 8mm.</p> <p>ID (tube): 5mm (approx.)</p> <p>Available as single units or supplied in packs of 10.</p>	<p>119.00 (PK/10)</p>
<p>TUBING FOR BUNSEN BURNER – SILICON – 8MM X 2MM WALL</p> <p>PA1394-01</p>	<p>7.70</p>	<p>TUBING FOR BUNSEN BURNER – RUBBER – 7-8MM X 1.5MM</p> <p>PA1390-01</p>	<p>3.85</p>
 <p>This grey 100% silicone tubing is ideal for Bunsen Burners. It is specially ribbed to allow for durability and stability while in use. Sold by the metre so you can cut to your requested length. Tubing (ID): 8mm (Inlet diameter) Tubing (OD): 12mm</p> <p>NOTE: All tubing should be checked for cracks, splits or hardening prior to using.</p>		 <p>Good quality gas rubber tubing to suit most Bunsen Burners. Sold by the metre.</p> <p>NOTE: All tubing should be checked for cracks, splits or hardening prior to using.</p> <p>Not suitable for META1220 and META1230 burners.</p>	







CHEMISTRY LABORATORY EQUIPMENT







ITEM NAME	CODE	PRICE	ITEM NAME	CODE	PRICE
CLAMP FOR GAS SYRINGE (100ML SIZE)	CH0860-001	42.00	COLORIMETER – DIGITAL	CH1003-001	534.00
 <p>This safety clamp is designed to hold a 100ml 'Gas Syringe' firmly by a retort stand or similar to reduce the chance of breakage and to make the use of the syringe far more convenient.</p> <p>Also, for volumetric work, the end of the clamp prevents the piston from accidentally falling out and also provides a reference point for measuring the distance travelled by the syringe piston. Finish is powder coated for smooth finish and to avoid corrosion.</p> <p>Size: 300 x 140 x 40mm.</p> <p>Instruction Sheet included.</p>		 <p>This Australian made Colorimeter by IEC is a high-quality student instrument for the measuring of concentrations of chemical solutions. The LCD display can provide either 'Transmission' or 'Absorption' measurements.</p> <p>The automatic zero and calculations are performed by the internal microprocessor. Light source is internal and can be selected as Red, Yellow, Green or Blue. Operates from 9V battery for full portability, but can be run from standard 240/12V.AC. Plug Pak if battery is flat. 'Lo Batt' indication is provided.</p> <p>Supplied complete with 6x cuvettes and 4x test tubes for samples, with selectable 0-4V or 0-5V analogue output signal for logging software. Instruction sheet & experiment manual included.</p>			
DEFLAGRATING SPOON – ALUMINIUM CAP / BRASS CUP	CH1681-001	10.45	DEFLAGRATING SPOON – ALUMINIUM CAP / IRON CUP	CH1683-001	9.90
 <p>Deflagrating Spoon, brass cup. Classical pattern, with aluminium cap to cover the mouth of the gas jar and deep drawn and smoothly rounded brass cup at the end of the rod. With cork stopper in the cap to support the rod. Instruction Sheet included.</p>		 <p>Deflagrating Spoon, iron cup. Classical pattern, with aluminium cap to cover the mouth of the gas jar and deep drawn and smoothly rounded iron cup at the end of the rod. With cork stopper in the cap to support the rod. Instruction Sheet included.</p>			
THERMOMETER STAND	ARLW2073040	25.25	LENS CLEANING TISSUES – PACK OF 25	CH0629	2.00
 <p>Made of sheet aluminium, rectangular Z-shaped. Supports 18 thermometers in three rows each of 6 holes. Baseplate has foam cushions to protect the thermometer bulbs.</p> <p><i>Thermometers are not included with stand.</i></p>		 <p>25 leaves of soft, non-abrasive lens cleaning tissue. Tissue leaves measure (approx. 14 x 9.5cm). Use tissue to clean lenses, filters, or polished glass surfaces, etc. No better way to clean cameras, microscopes, or spectrometers. Perfect to have on hand in the lab or at home.</p>			

<p>GAUZE WIRE MATS – PLAIN CH0525D</p>  <p>150mm plain wire. Pack of 10.</p> <p>NOTE: Run out stock – priced to clear (limited quantities).</p>	12.00	<p>GAUZE WIRE MATS – CERAMIC CENTRE CH0525B</p>  <p>150mm mat with ceramic centre. Extra strong quality. Pack of 10.</p>	31.00									
<p>ROTARY PIPETTE STAND - HOLDS 94 PIPETTES VERTICALLY CH0595</p>  <p>Polypropylene rotary pipette stand with 228mm diameter base. Measures around 482mm tall. Holds 94 pipettes. This will hold a number of variations of sizes of pipettes. Max size diameter pipette to be stored would 12.7mm or less. Autoclavable and chemical resistant.</p> <p>NOTE: Glass Pipettes are not included with stand. Item supplied may vary slightly from photo.</p>	28.00	<p>PIPETTE STAND – HORIZONTAL CH0592</p>  <ul style="list-style-type: none"> Horizontal, polypropylene pipette stand that holds 12 pipettes Autoclavable <p>NOTE: Run out stock – priced to clear (limited quantities). Glass Pipettes are not included with stand.</p>	10.00									
<p>PIPETTE STAND – CIRCULAR CH0594</p>  <ul style="list-style-type: none"> Holds 94 vertically Rotary moulded in polypropylene <p>NOTE: Run out stock – priced to clear (limited quantities). Glass Pipettes are not included with stand. Item supplied may vary slightly from photo.</p>	10.00	<p>FLASK STAND LW4707-01</p>  <p>High quality polypropylene stand for round bottom flasks up to 10 litres. 160mm diameter.</p>	14.30									
<p>KIPPS APPARATUS GAS GENERATOR</p>  <table border="1" data-bbox="472 1250 934 1372"> <tr> <td>250ml</td> <td>GE2945-01</td> <td>59.00</td> </tr> <tr> <td>500ml</td> <td>GE2955-01</td> <td>80.00</td> </tr> <tr> <td>1000ml</td> <td>GE2965-01</td> <td>107.00</td> </tr> </table> <p>High-density polyethelene. Kipp's apparatus, also called Kipp generator, is an apparatus designed for preparation of small volumes of gases.</p>	250ml	GE2945-01	59.00	500ml	GE2955-01	80.00	1000ml	GE2965-01	107.00		<p>TILE CAVITY SPOTTING PLATE – 12 DEPRESSIONS LW5507-01</p>  <p>12 cavity white solid plastic spotting plate. 120 x 90mm. Each cavity holds 2.5ml (approx.) of liquid.</p>	6.60
250ml	GE2945-01	59.00										
500ml	GE2955-01	80.00										
1000ml	GE2965-01	107.00										







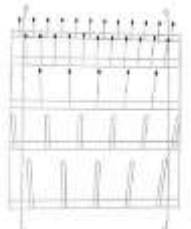
<p>TILE CAVITY SPOTTING PLATE - PORCELAIN – 12 DEPRESSIONS</p> <p>LW5517-01</p>	<p>5.50</p>	<p>TILE CAVITY SPOTTING PLATE - PORCELAIN – 6 DEPRESSIONS</p> <p>LW5519-01</p>	<p>3.30</p>
 <p>12 cavity porcelain spotting plate. 115 x 93mm.</p>		 <p>6 cavity porcelain spotting plate. 88 x 54mm.</p>	

TEST TUBE RACKS

<p>TEST TUBE RACK & DRAIN – HOLDS 8 X 10MM / 12 X 16MM TUBES</p>	<p>CH3989-401</p>	<p>20.35</p>	<p>TEST TUBE RACK & DRAIN – HOLDS 8 X 25MM TUBES</p>	<p>CH3989-601</p>	<p>20.35</p>																							
 <p><i>TEST TUBE RACK & DRAIN</i>, combination support rack and drying rack for 8 x test tubes of 10mm diameter and 8 x test tubes of 16mm diameter.</p> <p>Construction is of high density, filled polypropylene so that it does not float in water. Used for general laboratory work and is suitable for high temperature washing and autoclaving applications. Suitable for use in IEC Water Bath.</p> <p>Instruction Sheet included.</p>			 <p><i>TEST TUBE RACK & DRAIN</i>, combination support rack and drying rack for 8 x test tubes of 25mm diameter.</p> <p>Construction is of high density, filled polypropylene so that it does not float in water. Used for general laboratory work and is suitable for high temperature washing and autoclaving applications. Suitable for use in IEC Water Bath.</p> <p>Instruction Sheet included.</p>																									
<p>TEST TUBE UNIVERSAL COMBI RACK</p>	<p>LW4408-01</p>	<p>20.90</p>	<p>TEST TUBE RACK – SELF ASSEMBLED FOR 21 X 30MM TUBES</p>																									
 <p>The Universal Combi Rack is designed to hold a variety of tube sizes. The rack may be rotated to any of the four positions.</p> <p>Combinations: 40 place - 12mm tubes (hole dim: 13mm) 8 place - 50ml capacity tubes (hole dim: 30mm) 24 place - 15ml capacity tubes (hole dim: 17mm) 20 place - 20mm tubes (hole dim: 21mm)</p> <p>Instruction Sheet included.</p>			 <table border="1" data-bbox="1457 651 2034 802"> <tr> <td>RED</td> <td>LW4224-01</td> <td>7.70</td> </tr> <tr> <td>BLUE</td> <td>LW4224-02</td> <td>7.70</td> </tr> <tr> <td>WHITE</td> <td>LW4224-03</td> <td>7.70</td> </tr> <tr> <td>GREEN</td> <td>LW4224-04</td> <td>7.70</td> </tr> </table> <p>3 x 7 rows for 21 x 30mm tubes. Polypropylene. Self-assembly. Choice of red, blue, white or green.</p> <p>250mm (l) x 120mm (w) x 70mm (h).</p>	RED	LW4224-01	7.70	BLUE	LW4224-02	7.70	WHITE	LW4224-03	7.70	GREEN	LW4224-04	7.70													
RED	LW4224-01	7.70																										
BLUE	LW4224-02	7.70																										
WHITE	LW4224-03	7.70																										
GREEN	LW4224-04	7.70																										
<p>TEST TUBE RACK – SELF ASSEMBLED FOR 24 X 25MM TUBES</p>			<p>TEST TUBE RACK – SELF ASSEMBLED FOR 40 X 20MM TUBES</p>																									
 <table border="1" data-bbox="478 1127 1037 1273"> <tr> <td>RED</td> <td>LW4222-01</td> <td>7.70</td> </tr> <tr> <td>BLUE</td> <td>LW4222-02</td> <td>7.70</td> </tr> <tr> <td>WHITE</td> <td>LW4222-03</td> <td>7.70</td> </tr> <tr> <td>GREEN</td> <td>LW4222-04</td> <td>7.70</td> </tr> </table> <p>3 x 8 rows for 24 x 25mm tubes. Polypropylene. Self-assembly. Choice of red, blue, white or green.</p> <p>250mm (l) x 105mm (w) x 70mm (h)</p>	RED	LW4222-01	7.70	BLUE	LW4222-02	7.70	WHITE	LW4222-03	7.70	GREEN	LW4222-04	7.70			 <table border="1" data-bbox="1457 1127 2034 1273"> <tr> <td>RED</td> <td>LW4220-01</td> <td>7.70</td> </tr> <tr> <td>BLUE</td> <td>LW4220-02</td> <td>7.70</td> </tr> <tr> <td>WHITE</td> <td>LW4220-03</td> <td>7.70</td> </tr> <tr> <td>GREEN</td> <td>LW4220-04</td> <td>7.70</td> </tr> </table> <p>4 x 10 rows for 40 x 20mm tubes. Polypropylene. Self-assembly. Choice of red, blue, white & green.</p>	RED	LW4220-01	7.70	BLUE	LW4220-02	7.70	WHITE	LW4220-03	7.70	GREEN	LW4220-04	7.70	
RED	LW4222-01	7.70																										
BLUE	LW4222-02	7.70																										
WHITE	LW4222-03	7.70																										
GREEN	LW4222-04	7.70																										
RED	LW4220-01	7.70																										
BLUE	LW4220-02	7.70																										
WHITE	LW4220-03	7.70																										
GREEN	LW4220-04	7.70																										

TEST TUBE RACK – SELF ASSEMBLED FOR 60 X 16MM TUBES		TEST TUBE RACK – SELF ASSEMBLED FOR 90 X 13MM TUBES																												
	<table border="1"> <tr> <td>RED</td> <td>LW4218-01</td> <td>7.70</td> </tr> <tr> <td>BLUE</td> <td>LW4218-02</td> <td>7.70</td> </tr> <tr> <td>WHITE</td> <td>LW4218-03</td> <td>7.70</td> </tr> <tr> <td>YELLOW</td> <td>LW4218-04</td> <td>7.70</td> </tr> <tr> <td>GREEN</td> <td>LW4218-05</td> <td>7.70</td> </tr> </table> <p>5 x 12 rows for 60 x 16mm tubes. Polypropylene. Self-assembly. Choice of red, blue, white, yellow or green.</p>	RED	LW4218-01	7.70	BLUE	LW4218-02	7.70	WHITE	LW4218-03	7.70	YELLOW	LW4218-04	7.70	GREEN	LW4218-05	7.70	 <table border="1"> <tr> <td>RED</td> <td>LW4215-01</td> <td>7.70</td> </tr> <tr> <td>BLUE</td> <td>LW4215-02</td> <td>7.70</td> </tr> <tr> <td>WHITE</td> <td>LW4215-03</td> <td>7.70</td> </tr> <tr> <td>GREEN</td> <td>LW4215-04</td> <td>7.70</td> </tr> </table> <p>6 x 15 rows for 90 x 13mm tubes. Polypropylene. Self-assembly. Choice of red, blue, white or green.</p>	RED	LW4215-01	7.70	BLUE	LW4215-02	7.70	WHITE	LW4215-03	7.70	GREEN	LW4215-04	7.70	
RED	LW4218-01	7.70																												
BLUE	LW4218-02	7.70																												
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BLUE	LW4215-02	7.70																												
WHITE	LW4215-03	7.70																												
GREEN	LW4215-04	7.70																												
TEST TUBE RACK - POLYCARBONATE FOR 24 MICRO TUBES	LW4207-01	16.50	TEST TUBE RACK – Z-SHAPED – ALUMINIUM	LW4417-01	16.50																									
	<p>Holds 10mm x 75mm long tubes. Dimensions: 165 x 90mm.</p>		 <p>Z-shaped, aluminium test tube rack for various sized test tubes. Includes 5 x 29mm holes, 6 x 19mm holes and 8 x 13mm holes. Dimensions: 203 x 115 x 76mm (w x d x h).</p>																											
TEST TUBE RACK WITH PEGS - WOODEN	LW4416-01	14.30	TEST TUBE RACK WITH PEGS – POLYPROPYLENE	LW4297-01	6.60																									
	<p>Wooden test tube rack – 200mm (l) x 90mm (h) with 6 x 25mm holes and pegs.</p>		 <p>Polypropylene test tube rack with pegs. Drying rack for 6 x 25mm tubes. Minimum tube height: 90mm. Overall dimensions: 240 x 70 x 90mm (l x w x h). Simple assembly required.</p>																											

DRAINING / DRYING BASKETS & RACKS

<p>DRAINING BASKET</p>  <p>LW0055-01 shown above</p>	<p>LW0055-01</p> <p>Polypropylene draining basket 400 x 400 x 100mm. Autoclavable.</p> <hr/> <p>LW0017-01</p> <p>Polypropylene draining basket 110 x 120 x 150mm. Autoclavable.</p>	<p>25.30</p> <hr/> <p>8.80</p>	<p>DRAINING BASKET WITH LID</p>  <p>LW0037-01</p> <p>Polypropylene draining basket with lid 180 x 170 x 160mm. Autoclavable.</p> <hr/> <p>LW0047-01</p> <p>Polypropylene draining basket with lid 230 x 230 x 230mm. Autoclavable.</p>	<p>13.20</p> <hr/> <p>26.40</p>
<p>DRAINING / DRYING RACK 20 PEGS</p> 	<p>LW4139-01</p> <p>Wall mounted 20 peg draining / drying rack with drip tray and hold for draining tube. Constructed from acrylopintrile butadiene styrene / polycarbonate. 140mm long pegs spaced 6.5cm apart. Size: 500 x 350mm.</p> <p>NOTE: Draining hose & wall mounting screws not included.</p>	<p>160.00</p>	<p>DRAINING / DRYING RACK 27 PEGS</p>  <p>LW4139-02</p> <p>27 peg bench top or wall mounted draining / drying rack with 12.9cm detachable pegs. With water outlet hose – rack is suitable for bench mounting over a sink. Constructed of high density polypropylene. Size: 550 x 400 x 110mm.</p>	<p>110.00</p>
<p>DRAINING / DRYING RACK - COATED WIRE 32 POINTS</p> 	<p>LW4138-01</p> <p>90mm long pegs – 32 drying points. Bench top or wall mounted. For drying test tubes, boiling tubes, conical flasks and beakers. Size: Approx 400 x 300mm. Depth: 150mm (at deepest point).</p>	<p>49.00</p>	<p>DRAINING / DRYING RACK - COATED WIRE 48 POINTS</p>  <p>LW4138-48</p> <p>90mm long pegs – 48 drying points. Bench top or wall mounted. For drying test tubes, boiling tubes, conical flasks and beakers. Size: Approx. 520 x 360mm. Depth: 180mm (at deepest point).</p>	<p>60.00</p>
<p>DRAINING / DRYING RACK - COATED WIRE 39 POINTS – WALL MOUNTED</p> 	<p>LW4140-01</p> <p>39 point wall mounted drying rack. 790 x 580mm (including attachment hooks). For drying test tubes, boiling tubes, conical flasks and beakers.</p>	<p>115.00</p>		

CENTRIFUGES

CENTRIFUGE – HAND OPERATED FOR 4 TUBES

GE1895-01

77.00



Hand operated centrifuge, suitable for four 10 – 15ml tubes (see [PA1896-01](#)). Plastic body with metal side plate and metal clamping plate. This simple hand driven centrifuge comes with a table mounting clamp and is ideal for field work.

Overall length: 280mm
 Ring (ID): 22mm (where plastic tube sits)
 Plastic tube (ID): 18mm
 Plastic tube (OD): 24mm (measurement taken at rim)

NOTE: Handle should only be turned clockwise. For use in a laboratory or educational setting only.

CENTRIFUGE - MINI FOR 0.2ML/0.5ML/1.5ML/5ML TUBES

GE1874-01

650.00






Electronic locks. Will only run when the lid is closed and locked. The lid opens automatically after centrifugation. Fast rise and fall in speed. Low Noise. Capacitive touchpad. LCD display. Real-time display of speed, time and operating status. Centrifugal time and speed are adjustable in standby or during centrifugation. Suitable for 0.2mL / 0.5mL / 1.5mL / 5mL centrifuge tubes without changing the rotor.

NOTE: For use in a laboratory or educational setting only.

Click here for [Instructions](#).

HOT PLATES & MAGNETIC STIRRERS / HOT PLATES

ITEM NAME	CODE	PRICE	ITEM NAME	CODE	PRICE
HOT PLATE - THERMOSTAT CONTROL – PTFE (TEFLON) PLATE	CH1923-001	539.00	HOT PLATE – THERMOSTAT CONTROL	CH1922-001	506.00
 <p>General purpose <i>IEC</i> laboratory hot plate, 240V.AC. 600 watts. Rectangular 200x180mm area, with high temperature alloy plate for even plate temperature.</p> <p>'Thermostat' temperature control provides heat adjustment from 50 to 320deg.C and the plate maintains the set temperature. This model has PTFE (Teflon) coated plate.</p> <p>NOTE: For general boiling of water etc.to overcome heat losses, it is necessary for the plate to achieve maximum temperature of about 450°C, therefore the 'Simmerstat' control model is recommended for this purpose.</p> <p>Instruction Sheet included.</p>			 <p>General purpose <i>IEC</i> laboratory hot plate, 240V.AC. 600 watts. Rectangular 200x180mm area, with high temperature alloy plate for even plate temperature.</p> <p>'Thermostat' temperature control provides heat adjustment from 50 to 320°C and the plate maintains the set temperature.</p> <p>NOTE: For general boiling of water etc. it is necessary for the plate to achieve maximum temperature of about 450°C, therefore the 'Simmerstat' control model is recommended for this purpose.</p> <p>Instruction Sheet included.</p>		
HOT PLATE – SIMMERSTAT CONTROL – PTFE (TEFLON) PLATE	CH1921-001	445.00	HOT PLATE – SIMMERSTAT CONTROL	CH1920-001	412.00
 <p>General purpose <i>IEC</i> laboratory hot plate, 240V.AC. 600 watts. Rectangular 200x180mm area, with high temperature alloy plate for even plate temperature.</p> <p>'Simmerstat' temperature control provides heat adjustment from zero to full over a scale from 1 to 10. At the setting of 10, maximum plate temperature is approx. 450°C.</p> <p>Ideal for general laboratory use. This model has PTFE (Teflon) coated top plate.</p> <p>Instruction Sheet included.</p>			 <p>General purpose <i>IEC</i> laboratory hot plate, 240V.AC. 600 watts. Rectangular 200x180mm area, with high temperature alloy plate for even plate temperature.</p> <p>'Simmerstat' temperature control provides heat adjustment from zero to full over a scale from 1 to 10. At the setting of 10, maximum plate temperature is approx. 450°C.</p> <p>Ideal for general laboratory use.</p> <p>Instruction Sheet included.</p>		

<p>MAGNETIC STIRRER VARIABLE SPEED – TEFLON COATED TOP PLATE</p>  <p>CH2081-001</p> <p>474.00</p>	<p>MAGNETIC STIRRER VARIABLE SPEED – EPOXY COATED TOP PLATE</p>  <p>CH2080-001</p> <p>434.00</p>
<p>MAGNETIC STIRRER / HOT PLATE - SIMMERSTAT CONTROL</p>  <p>CH2090-001</p> <p>594.00</p>	<p>MAGNETIC STIRRER / HOT PLATE – SIMMERSTAT CONTROL – TEFLON PLATE</p>  <p>CH2091-001</p> <p>627.00</p>

Magnetic Stirrer from *IEC*, with electronic speed control from approx. 150 to 1500 RPM. Strong magnet stirs effectively up to the viscosity of glycerine.

Rectangular alloy plate, 200x180mm, is PTFE (Teflon) coated to resist corrosion and for easy cleaning. Front panel provides user with the mains on/off switch and speed control.

[Instruction Sheet](#)

Magnetic Stirrer from *IEC*, with electronic speed control from approx. 150 to 1500 RPM. Strong magnet stirs effectively up to the viscosity of glycerine.

Rectangular plate, 200x180mm, is epoxy coated to resist corrosion. Front panel provides user with the mains on/off switch and speed control.

[Instruction Sheet](#) included.

Magnetic Stirrer & Hot Plate combination from *IEC* with 'Simmerstat' temperature control. 'Simmerstat' temperature control provides heat adjustment from zero to full over a scale from 1 to 10. At the setting of 10, maximum plate temperature is approx. 450°C.

Magnetic Stirrer with electronic speed control from approx. 150 to 1500 RPM. Strong magnet stirs effectively up to the viscosity of glycerine.

Front panel provides the user with mains switch, heat control and speed control for stirring. Plain, rectangular, high temperature alloy top plate 200x180mm.



[Instruction Sheet](#) included.

Magnetic Stirrer & Hot Plate combination from *IEC* with 'Simmerstat' temperature control. 'Simmerstat' temperature control provides heat adjustment from zero to full over a scale from 1 to 10. At the setting of 10, maximum plate temperature is approx. 450°C.



Magnetic Stirrer with electronic speed control from approx. 150 to 1500 RPM. Strong magnet stirs effectively up to the viscosity of glycerine.

Front panel provides the user with mains switch, heat control and speed control for stirring. Rectangular, high temperature alloy top plate 200x180mm with PTFE (Teflon) coating to resist corrosion and for easy cleaning.



[Instruction Sheet](#) included.

<p>MAGNETIC STIRRER / HOT PLATE – THERMOSTAT CONTROL</p>	<p>CH2092-001</p>	<p>676.00</p>	<p>MAGNETIC STIRRER / HOT PLATE – THERMOSTAT CONTROL – TEFLON PLATE</p> <p>CH2093-001</p> <p>709.00</p>
 <p>Magnetic Stirrer & Hot Plate combination with 'Thermostat' temperature control from IEC.</p> <p>'Thermostat' temperature control provides heat adjustment from 50 to 320°C and the plate maintains the set temperature.</p> <p>Magnetic Stirrer, with electronic speed control from approx.150 to 1500 RPM. Strong magnet stirs effectively up to the viscosity of glycerine.</p> <p>Front panel provides the user with mains switch, Thermostat heat control from 50 to 320deg.C. and speed control for stirring.</p> <p>NOTE: For general boiling of water etc. to overcome heat losses, it is necessary for the plate to achieve maximum temperature of about 450°C, therefore the 'Simmerstat' control model is recommended for this purpose.</p> <p>Plain, rectangular, high temperature alloy top plate 200x180mm.</p> <p>Instruction Sheet included.</p>		 <p>IEC Magnetic Stirrer & Hot Plate combination with 'Thermostat' temperature control.</p> <p>'Thermostat' temperature control provides heat adjustment from 50 to 320deg.C and the plate maintains the set temperature. This model has PTFE (Teflon) coated plate.</p> <p>Magnetic Stirrer, with electronic speed control from approx.150 to 1500 RPM. Strong magnet stirs effectively up to the viscosity of glycerine.</p> <p>Front panel provides the user with mains switch, Thermostat heat control from 50 to 320deg.C. and speed control for stirring.</p> <p>NOTE: For general boiling of water etc. to overcome heat losses, it is necessary for the plate to achieve maximum temperature of about 450°C, therefore the 'Simmerstat' control model is recommended for this purpose.</p> <p>Rectangular, high temperature alloy top plate 200x180mm with PTFE (Teflon) coating for corrosion resistance and easy cleaning.</p> <p>Instruction Sheet included.</p>	
<p>MINI MAGNETIC STIRRER – MS5S – 2L</p>	<p>GE4261-01</p>	<p>245.00</p>	<p>MINI MAGNETIC STIRRER – MS3 – 1L</p> <p>GE4260-01</p> <p>88.00</p>
 <p>Rotary knob / LCD display. Brushless Motor. 135mm diameter PVC work plate. Speed: 200-2000RPM Power: 5W Max. Stirring Volume: 2l Stir Bar Size: 20-30mm Rotating Direction: Clockwise Protection rating: IP42 Voltage: 100-240 V 50/60Hz Allowable temperature: 5-4 °C, 80% RH Weight: 460gm Overall size: 168x160x47mm</p>		 <p>Rotary knob Brushless Motor. 125mm diameter PVC work plate. Speed: 200-1800RPM Power: 3W Max. Stirring Volume: 1l Stir Bar Size: 20-30mm Rotating Direction: Clockwise Protection rating: IP42 Voltage: 100-240 V 50/60Hz Allowable temperature: 5-4 °C, 80% RH Weight: 220gm Overall size: 138x130x41mm</p>	

SPIN BARS FOR MAGNETIC STIRRER





SPIN BAR FOR MAGNETIC STIRRER – 25 X 6MM - PTFE	PA3802-005	10.10	SPIN BAR FOR MAGNETIC STIRRER – 40 X 8MM - PTFE	PA3802-005	11.75
	Spin Bar used by Magnetic Stirrers for stirring inside beakers. Straight bar with central raised rib, PTFE coated. Medium size - 6mm (d) x 25mm (l).			Spin Bar used by Magnetic Stirrers for stirring inside beakers. Straight bar with central raised rib, PTFE coated. Large size - 8mm (d) x 40mm (l).	

OVENS

OVEN – SMALL DIGITAL CONTROL & FAN – 600W - 250 X 250 X 250MM	CH2251-001	1640.00
	<p>This digital 'Student Oven' by IEC has fan circulation & electronic digital temperature control. It is a low-cost, general-purpose laboratory oven with enamelled steel exterior and stainless steel interior with two shelves. The door is fitted with a high temperature silicone rubber seal and a simple and effective door catch. Stainless steel is high grade 316 and the insulation and lagging used is NOT asbestos.</p> <p>Oven temperature is controlled by a digital electronic system with a range of 30oC to 150oC +/-1oC. For close temperature control, the air inside the oven is circulated by a fan. Indicator LEDs monitor 'Power On' and 'Heater Cycling'. The 600 watt heating element is visible in the base of the oven but is protected from touching by a perforated protection plate. Oven is complete with removable 3 core flex and plug.</p> <p>Interior dimensions: 250 x 250 x 250mm. Exterior dimensions: 310 x 330 x 435mm – 15kg. Power: 220-240V.AC. 50/60Hz 3 Amps Instruction Sheet included.</p>	
OVEN – SMALL – STUDENT MODEL – 250 X 250 X 250 – STAINLESS STEEL INTERIOR	CH2250-001	1310.00
	<p>This IEC Oven, for student use, has a thermostat control to 120deg.C. Constructed with a stainless steel interior, type 316 for good corrosion resistance.</p> <p>Simple convection oven with accuracy of approx. +/-5deg.C. Front door is fitted with a high temperature silicone rubber seal with simple catch and with 3 shelves adjustable for height. With indicators for power on and heater cycling. Hole in top face to take rubber stopper with thermometer (not supplied).</p> <p>No Asbestos has not been used in this product.</p> <p>Internal dimensions: 250 x 250 x 250mm. External dimensions: 310 x 330 x 435mm – 15kg. 240V.AC Instruction Sheet included.</p>	

The ovens are not kept in stock. We will confirm their arrival time when order is placed. They can be backordered.




TONGS & HOLDERS

TONGS – BEAKER	LW5536-01	8.25	TONGS – CRUCIBLE	LW5557-01	15.40
	Rubber sleeved tongs for handling hot beakers. Overall length: 260mm. Opening width: 130mm. <i>(Sleeve colour may vary from illustration).</i>			Stainless Steel forged tongs for handling crucibles. Overall length: 200mm. Maximum opening width: 110mm.	
TEST TUBE HOLDER – WOODEN – PEG TYPE	CH0726A-10	21.50	TONGS – EVAPORATING DISH	LW5558-01	13.20
	18cm long wooden test tube holder with metal spring for tubes 11 - 19mm diameter. Jaws open to approx. 3.15cm (1.25in). Can also be used for developing photographs in darkroom. Pack of 10.			240mm long. Used for picking up HOT evaporating dishes. Suitable for dishes up to 125mm.	

TUBE CLIPS


MOHR CLIP FOR TUBING - 60MM	LW1701-01	6.60	HOFFMAN SCREW COMPRESSOR		
	Clip/clamp designed to quickly and efficiently stop air or gas flow through flexible tubes.			31mm opening	META1411 44.00
				38mm opening	META1412 50.00
				50mm opening	META1414 57.00
				Australia-made Hoffman type screw compressor of various opening sizes, with hinged bottom part. Made of nickel-plated brass.	
HOFFMAN SCREW COMPRESSOR			HOFFMAN SCREW COMPRESSOR		
		17mm opening	LW1677-01	5.50	
		20mm opening	LW1687-01	6.50	
		25mm opening	LW1697-01	7.25	
	Nickel plated brass used to block off air or gas flow by pinching the sides of the flexible tube together. Has projecting plate to prevent damage to the tubing by the screw. Hinged side bar for fitting and removal without access to the ends of the tube.			30mm opening	LW1698-01 8.70
				40mm opening	LW1699-01 9.35
				Nickel plated brass used to block off air or gas flow by pinching the sides of the flexible tube together. Has projecting plate to prevent damage to the tubing by the screw. Hinged side bar for fitting and removal without access to the ends of the tube.	

WATER BATH

<p>WATER BATH FOR USE WITH IEC HOT PLATE (BATH ONLY)</p>	<p>CH4240-001</p> <p>A useful Water Bath that is powered by an IEC Hot Plate.</p> <p>Two test tube stands can fit so biological work is low cost and convenient. The ends of the bath slide down to rest on the work bench for a stable support but also slide up to provide the smallest size for storage. The bath can be used also as a dry oven and will form an important part of IEC's new Gas Chromatograph.</p> <p>A Thermostat Control (CH4240-101) fits to the edge of the bath to control the Hot Plate so the water temperature is held constant.</p> <p>This control is purchased separately. For an approximate temperature control, the careful adjustment of the heat regulator of the Hot Plate can keep the water bath reasonably steady but not as regulated and accurate as the Thermostat unit.</p> <p>Instruction Sheet included.</p>	<p>278.00</p>
	<p>CH4240-101</p> <p>This Thermostat Control (CH4240-101) fits to the edge of the IEC Water Bath to control the Hot Plate so the water temperature in the Water Bath is held constant. This control is purchased separately from the Bath. The thermostat element slides down to the inner corner of the bath so that it is submerged when only a small volume of water is used. The bath can be used also as a dry oven and will form an important part of IEC's new Gas Chromatograph. The Temperature Controller can maintain a set temperature in the bath either wet or dry and, when dry, to avoid overheating it is best that the probe presses against the inside face of the bath so it checks the temperature of the metal bath itself.</p> <p>For an approximate temperature control, the careful adjustment of the heat regulator of the Hot Plate can keep the water bath reasonably steady but not as regulated and accurate as the Thermostat unit.</p> <p>Instruction Sheet</p>	<p>207.00</p>
<p>WATER BATH TEMPERATURE CONTROLLER FOR HOT PLATE</p>	<p>CH4240-101</p> <p>This Thermostat Control (CH4240-101) fits to the edge of the IEC Water Bath to control the Hot Plate so the water temperature in the Water Bath is held constant. This control is purchased separately from the Bath. The thermostat element slides down to the inner corner of the bath so that it is submerged when only a small volume of water is used. The bath can be used also as a dry oven and will form an important part of IEC's new Gas Chromatograph. The Temperature Controller can maintain a set temperature in the bath either wet or dry and, when dry, to avoid overheating it is best that the probe presses against the inside face of the bath so it checks the temperature of the metal bath itself.</p> <p>For an approximate temperature control, the careful adjustment of the heat regulator of the Hot Plate can keep the water bath reasonably steady but not as regulated and accurate as the Thermostat unit.</p> <p>Instruction Sheet</p>	<p>207.00</p>
	<p>META-WB14</p> <p>META-WB5</p> <p>Inexpensive, robust, safe & aesthetic design – suitable for use in clinical, industrial & school labs. The seamless transparent polycarbonate tank can withstand temperatures of up to 120°C. A fast acting thermostat that serves as a low-water level protector, preventing heating element burn-out and fire hazard.</p> <p>Temperature setting in C, from ambient to + 95°C. Temperature control accuracy of approx. + - 0.3°C, ensures precise test conditions.</p> <p>Bath size dimensions – on top (14 litre): 43 x 27 x 18.5cm – 750 Watts Bath size dimensions – on top (5 litre): 27 x 21 x 14cm – 400 Watts</p>	<p>1250.00</p> <p>890.00</p>
<p>WATER BATH – POLYCARBONATE 14L</p>	<p>META-WB14</p> <p>META-WB5</p> <p>Inexpensive, robust, safe & aesthetic design – suitable for use in clinical, industrial & school labs. The seamless transparent polycarbonate tank can withstand temperatures of up to 120°C. A fast acting thermostat that serves as a low-water level protector, preventing heating element burn-out and fire hazard.</p> <p>Temperature setting in C, from ambient to + 95°C. Temperature control accuracy of approx. + - 0.3°C, ensures precise test conditions.</p> <p>Bath size dimensions – on top (14 litre): 43 x 27 x 18.5cm – 750 Watts Bath size dimensions – on top (5 litre): 27 x 21 x 14cm – 400 Watts</p>	<p>1250.00</p> <p>890.00</p>
	<p>META-WB14LID</p> <p>META-WB5LID</p> <p>BATH COVER FOR 14L WATER BATH</p> <p>BATH COVER FOR 5.5L WATER BATH</p>	<p>260.00</p> <p>140.00</p>

Water baths are not kept in stock. We will confirm their arrival time when order is placed. They can be backordered.

PIPETTE FILLERS

	PIPETTE FILLER – 3 VALVE	PF-1	Red	12.65
		LW3867-01	Black	12.65
		LW3877-01	Blue	12.65
		Synthetic rubber. 3 valves. Choice of red, black or blue (<i>specify when ordering</i>).		

GLASSWARE

BEAKER – LOW FORM – BOROSILICATE GLASS



CAPACITY (ml)	CODE	ID / OD (mm)	HEIGHT (mm)	GRADUATIONS (ml)	PRICE (per pack)
400	CH0126HPK6	77.5 / 80	107	50	39.00
600	CH0126JPK6	87.5 / 90	125	50	55.00
800	CH0126J8PK6	97.5 / 100	135	100	81.00

Packs of 6 low form beakers made of Borosilicate 3.3 Glass. Each beaker features white graduations, as per DIN 12231. Spout for easy pouring. Uniform walls provide excellent strength against breakage.

Designed for use in professional laboratories, but ideal for classroom, garage and home education use.

Heat tolerances:
 Strain Point -515°C
 Annealing Point 565°C
 Softening Point 820°C.



CAPACITY (ml)	CODE	DIAMETER (mm)	HEIGHT (mm)	DESCRIPTION	PRICE (ea)
50	ARLW2060420-4	42	60	Beaker, borosilicate 3.3, low form with graduation and spout.	3.05
100	ARLW2060420-5	50	75		3.15
250	ARLW2060420-6	68	95		4.00
500	ARLW2060420-9	80	115		5.90
1000	ARLW2060420-11	105	150		9.55

BEAKER – LOW FORM – BOROSILICATE GLASS – SET OF 30

[ARLW2060420SET](#)

Set of 30 low form, borosilicate glass beakers.
 6 x 50ml, 6 x 100ml, 6 x 250ml, 6 x 500ml, 6 x 1000ml

138.00

BOROSILICATE GLASSWARE SAFETY PACK - SET OF 9

[CH196061](#)


86.00




Essential Glassware set made of high quality, heavy duty, borosilicate 3.3 glass. Includes three, narrow low form Beakers in 50ml, 100ml & 250ml capacities, three ASTM, Class A Measuring Cylinders in 10ml, 50ml & 100ml capacities and three Erlenmeyer Flasks in 50ml, 100ml & 250ml capacities. Beakers and flasks feature white, printed graduations, and beaded rims. Cylinders feature blue printed graduations, hexagonal bases and removable, plastic protective collars for added stability. Uniform, thick walls provide excellent strength against breakage. Set is packaged in a custom fit, thick foam casing, for safe storage and worry free transport. Designed for use in professional laboratories, but is ideal for classroom, garage and home education use.

Microwavable and autoclavable at 121°C, with superior chemical durability. Low temperature gradient- can withstand high temperatures & thermal shocks. Eisco Labs Borosilicate glass has the following heat tolerances: Strain Point -515°C | Annealing Point 565°C | Softening Point 820°C.

ERLENMEYER (CONICAL) FLASK – NARROW NECK

	CAPACITY (ml)	CODE	NECK OD (mm)	OD X HEIGHT (approx.) (mm)	QTY / PACK	DESCRIPTION	PRICE Each or per pack
	50	ARLW2064140-3	22	51 x 90	10	In accordance with DIN/ISO 1773 and ASTM E-438 standards. Manufactured from heat resistant, low expansion 3.3 Borosilicate glass Uniform wall thickness distribution makes these flasks ideal for heating. The conical form makes them suitable for mixing liquids. The easy to read scale and large labeling field facilitate easy marking. Sold individually or in pack.	3.60 / 34.00
	100	ARLW2064140-4	28	64 X 105	6		4.25 / 24.00
	250	ARLW2064140-6	34	85 x 145	6		5.25 / 30.00
	500	ARLW2064140-7	34	105 x 180	6		7.50 / 42.00


VOLUMETRIC FLASK – BOROSILICATE GLASS

	CAPACITY (ml)	CODE	TOLERANCE (ml)	NECK SIZE	DESCRIPTION	PRICE (ea)
	50	ARLW2064420-5	0.06	12/21	Class A Volumetric Flask with polypropylene stopper. Conforms to DIN ISO 1042.	6.85
	100	ARLW2064420-6	0.10	14/23		7.80
	250	ARLW2064420-8	0.15	14/23		10.55
	500	ARLW2064420-9	0.25	19/26		11.75
	1000	ARLW2064420-10	0.40	24/29		20.40

SALE – Take 7% off prices of Erlenmeyer & Volumetric Flask range. Valid until 30th April 2024 or while stocks

MEASURING CYLINDER – BOROSILICATE GLASS


Class A, hexagonal base, borosilicate 3.3, with spout. Graduated. Conforms to EN ISO 4788

	CAPACITY (ml)	CODE	GRADUATIONS (ml)	TOLERANCE (ml)	DESCRIPTION	PRICE (ea)
	25	ARLW2063050-3	0.5	±0.25	Class A, hexagonal base, borosilicate 3.3, with spout. Graduated. Conforms to EN ISO 4788.	7.10
	50	ARLW2063050-4	1.0	±0.5		8.55
	100	ARLW2063050-5	1.0	±0.5		9.50
	250	ARLW2063050-6	2.0	±1.0		16.50
	500	ARLW2063050-7	5.0	±2.5		26.00
	1000	ARLW2063050-8	10.0	±5.0		41.75



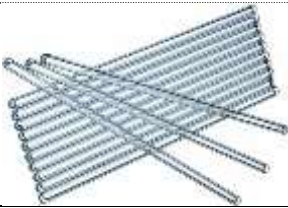
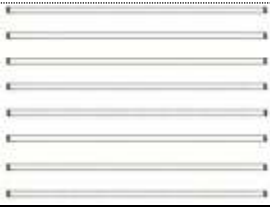


MEASURING CYLINDER – BOROSILICATE GLASS – 34 PIECE SET

ARLW2063050SET34	Set of 34 hexagonal base, borosilicate glass measuring cylinders. 6 x 25ml, 6 x 50ml, 6 x 100ml, 6 x 250ml, 6 x 500ml, 4 x 1000ml	533.00
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WATCH GLASS / BEAKER COVER

	DIAMETER (mm)	CODE	DESCRIPTION	PRICE
	50	LW6187-01	Available in a variety of sizes. Choose from 50, 60, 75, 100, 125 or 150mm diameter watch glasses. Used for a variety of purposes in the lab: -hold solids while being weighed -heat small samples -beaker cover -use as surface to evaporate a liquid. Packs of 12.	6.60
	60	LW6197-01		7.70
	75	LW6207-01		11.00
	100	LW6217-01		14.30
	125	LW6227-01		29.70
	150	LW6237-01		31.90

STIRRING RODS

STIRRING RODS – GLASS – 300 X 6MM WITH PADDLE END LW4548-01	16.50	STIRRING RODS – GLASS – 150 X 6MM WITH PADDLE END LW4547-01	9.90
 Made from solid borosilicate. 300mm length; 6mm diameter with paddle end. Pack of 10.		 Made from solid borosilicate. 150mm length; 6mm diameter with paddle end. Pack of 10.	
STIRRING RODS – GLASS – 200 X 7MM – FLAT ENDS LW4547-02	9.90	STIRRING RODS – GLASS – 300 X 7MM – FLAT ENDS LW4548-02	13.20
 General purpose glass stirring rod. 200mm length; 7mm diameter with flat ends. Pack of 10.		 General purpose glass stirring rod. 300mm length; 7mm diameter with flat ends. Pack of 10.	
STIRRING ROD – POLYPROPYLENE 250 X 10MM CH0757	15.00	STIRRING RODS – POLYPROPYLENE - POLICEMAN TYPE LW4549-01	15.40
 Multipurpose stirring rods made of high-quality, heavy-duty polypropylene. 250 mm (l) x 10 mm (dia.). Unbreakable plastic. Packs of 12. <i>(Beaker & Hot Plate not included)</i>		 245mm long x 6mm diameter propylene stirring rods. A stirrer as well as a spatula. The flattened ends of this rod form two small spatulas. Pack of 12.	

GLASS BEADS – 500GM

3 – 4MM DIA.	LW0057-01	18.70
4 – 5MM DIA.	LW0067-01	19.80
5 – 6MM DIA.	LW0077-01	20.90



500gm pack of solid soda glass beads. Useful for packing into distillation column, mixing beads and boiling stones.

DROPPING BOTTLES

DROPPING BOTTLES – AMBER GLASS



CODE	CAPACITY	PRICE
LW0677-01	30ml	4.95
LW0687-01	60ml	4.95
LW0697-01	125ml	7.70

Amber glass dropping glass with Polystopper.

(Please specify capacity when ordering).

DROPPING BOTTLES – CLEAR GLASS



CODE	CAPACITY	PRICE
LW0727-01	30ml	4.95
LW0737-01	60ml	4.95
LW0747-01	125ml	5.50

Clear glass dropping glass with Polystopper.

(Please specify capacity when ordering).

REAGENT BOTTLES

AMBER GLASS – NARROW MOUTH WITH POLYSTOPPER



CODE	CAPACITY	STOPPER SIZE	OVERALL HEIGHT	NECK I.D.	BOTTOM O.D.	PRICE
LW0887-01	30ml	14/23				5.50
LW0897-01	60ml	19/26	95mm	20mm	40mm	5.80
LW0907-01	125ml	19/26	110mm	20mm (27mm O.D)	55mm	6.50
LW0927-01	250ml	24/29				8.80
LW0947-01	500ml		165mm	28mm	80mm	13.20
LW0967-01	1000ml					18.70



Narrow mouth amber glass reagent bottle with polystopper. For storing chemicals in liquid or powder form for laboratories and stored in cabinets or on shelves.

(Please specify capacity when ordering. Photos not to scale. Not all bottle sizes are shown. Item supplied may vary slightly from photo).

AMBER GLASS – GRADUATED WITH BLUE SCREW CAP


	CODE	CAPACITY	PRICE		CODE	CAPACITY	PRICE
	LW0978-01	100ml	8.80		LW0979-01	250ml	11.00
	Dimensions (h x d): 100 x 56mm Cap: GL45				Dimensions (h x d): 138 x 70mm Cap: GL45		
	LW0980-01	500ml	15.40		LW0981-01	1000ml	22.00
	Dimensions (h x d): 176 x 86mm Cap: GL45				Dimensions (h x d): 225 x 101mm Cap: GL45		
	LW0982-01	2000ml	50.60	Reagent bottles made of 3.3 amber borosilicate glass with blue screw caps. <i>(Please specify code & capacity when ordering. Photos not to scale).</i>			
	Dimensions (h x d): 505 x 299mm Cap: GL45			SPARE CAPS FOR REAGENT BOTTLES – G45	LW0983-01		1.65
					GL45. For glass reagent bottles. Maximum temperature 145°C.		

CLEAR GLASS – GRADUATED WITH BLUE SCREW CAP


	CODE	CAPACITY	PRICE		CODE	CAPACITY	PRICE
	LW1068-01	100ml	6.60		LW1069-01	250ml	7.70
	Dimensions (h x d): 100 x 56mm Cap: GL45				Dimensions (h x d): 138 x 70mm Cap: GL45		
	LW1070-01	500ml	9.90		LW1071-01	1000ml	16.50
	Dimensions (h x d): 176 x 86mm Cap: GL45				Dimensions (h x d): 225 x 101mm Cap: GL45		
	LW1072-01	2000ml	46.20	Reagent bottles made of 3.3 borosilicate clear glass with blue screw cap and ring. <i>(Please specify code & capacity when ordering. Photos not to scale).</i>			
	Dimensions (h x d): 260 x 136mm Cap: GL45						

TEST TUBES & GLASS TUBES


TUBES – GLASS

CODE	PRICE
 <p>PA1896-01</p> <p>10ml conical shaped glass tube suitable as spares for hand-operated centrifuge (GE1895-01). OD: 16mm Height: 110mm</p>	2.09

TEST TUBES WITH RIM

CODE	SIZE (MM)	PACK SIZE	PRICE
 LW5397-01	125 X 15	100	44.00
LW5417-01	150 X 16	100	52.80
LW5427-01	150 X 18	25	16.50
LW5427-05	150 X 18	100	60.50
LW5437-01	150 X 21	25	20.90
LW5437-02	150 X 21	100	73.70
LW5447-01	150X 25	25	31.90
LW5447-02	150X 25	50	61.60
Borosilicate Glass.			

TEST TUBES WITHOUT RIM

CODE	SIZE (MM)	PACK SIZE	PRICE
 LW5389-01	150 X 16	100	52.80
LW5390-01	150 X 18	100	52.80
LW5388-01	150 X 25	25	31.90
LW5388-02	150 X 25	50	62.70
Borosilicate Glass.			

WASH BOTTLES

WASH BOTTLES - LABELLED



LABEL	COLOUR	CODE	DESCRIPTION	PRICE
Acetone	Red	LW1300-01	500ml Safety Wash Bottle suitable for handling hazardous chemicals. Printed with chemical name, codes and symbols. Curved dispensing tube. Self-venting.	7.70
Distilled Water	White	LW1301-01		7.70
Ethyl Alcohol	Blue	LW1302-01		7.70
Isopropanol	Yellow	LW1303-01		7.70
Methanol	Green	LW1304-01		7.70

WASH BOTTLE – INTEGRAL JET TYPE



CAPACITY	CODE	DESCRIPTION	PRICE
125ml	LW1325-01	Polypropylene wash bottle - a squeeze bottle with a nozzle, used to rinse various pieces of laboratory glassware, such as test tubes and round bottom flasks.	3.30
250ml	LW1327-01		4.40
500ml	LW1337-01		5.50

WASH BOTTLE – REMOVABLE JET



CAPACITY	CODE	DESCRIPTION	PRICE
125ml	LW1347-01	Polypropylene wash bottle - a squeeze bottle with a nozzle, used to rinse various pieces of laboratory glassware, such as test tubes and round bottom flasks. With a removable jet type cap & nozzle.	2.20
250ml	LW1357-01		2.75
500ml	LW1377-01		3.30
1000ml	LW1387-01		6.05

SYRINGES

DISPOSABLE SYRINGE – PLASTIC – NO NEEDLE



CAPACITY	CODE	DESCRIPTION	QTY PER PACK	PRICE
1ml	GE4296-01	All purpose plastic disposable syringe. No needle. Luer Slip and eccentric nozzle. Pack of 100.	100	20.90
2ml	GE4297-01		100	16.50
3ml	GE4298-01		100	12.10
5ml	GE4299-01		100	14.30
10ml	GE4300-01		100	24.20
20ml	GE4301-01		100	48.40

BASINS & DISHES

EVAPORATING BASINS – ROUND BOTTOM WITH SPOUT - PORCELAIN



CODE		CAPACITY (ML)	DIAMETER (MM)	HEIGHT (MM)	PRICE
LW0010-01	C48	50	70	28	2.55
LW0012-01	C50	70	82	32	3.10
LW0013-01	C51	100	90	35	3.30
LW0015-01	C53	125	98	38	4.40
LW0100-01	C55	150	104	40	5.70
LW0103-01	C57	200	110	44	6.60
LW0106-01	C61	300	126	52	10.20

Porcelain basin/dish with round bottom & pouring spout.
Maximum temperature 1050°C. No recommended to be used multiple times at the maximum temperature.

EVAPORATING DISH – ROUND BOTTOM WITH SPOUT - GLASS



TOP OD (MM)	HEIGHT (MM)	CODE	PRICE
60	30	LW2297-01	7.70
90	45	LW2298-01	8.45
150	75	LW2317-01	9.65
230	100	LW2288-01	40.70

EVAPORATING DISH – ROUND BOTTOM WITH SPOUT - GLASS



TOP OD (MM)	HEIGHT (MM)	CODE	PRICE
120	60	LW2307-01	8.80

CRYSTALLIZING DISH WITH SPOUT – BOROSILICATE GLASS



OD (MM)	HEIGHT (MM)	CODE	PRICE
90	50	LW2266-02	12.10
100	50	LW2267-01	12.10
125	65	LW2277-01	14.30
150	65	LW2287-01	16.50
230	115	LW2288-01	40.70

A crystallizing dish is a flat bottomed dish with a large diameter and low height. Its large surface allows for the solution to evaporate faster.

90mm dish illustrated

Although similar to evaporating dishes, the crystallizing dish is not generally used to completely evaporate the solution.

PETRI DISH – 3.3 BOROSILICATE GLASS



DIA. (MM)	HEIGHT (MM)	CODE	PRICE
60	15	LW2387-01	2.55
75	15	LW2397-01	3.65
90	15	LW2407-01	4.85
100	20	LW2417-01	5.50
120	20	LW2427-01	8.80
150	30	LW2428-01	18.70

BURETTES

ACRYLIC BURETTES WITH PTFE STOPCOCK



CODE	CAPACITY (ML)	GRADUATIONS (ML)	OVERALL LENGTH (MM)	OD (MM)	ID (MM)	PRICE
LW1497-01	25	0.1	570	12.2	9.2	20.90
LW1507-01	50	0.1	750	15		25.30
LW1509-01	100	0.2	820	18	13.5	35.20

Acrylic burettes with PTFE Stopcock. Acrylic with Teflon flap. Maximum temperature: 27°C.
Not suitable for acids.

PLASTICWARE

MEASURING CYLINDER – POLYPROPYLENE – GRADUATED WITH HEXAGONAL BASE



CAPACITY (ml)	CODE	DESCRIPTION	PRICE (ea)
25 x 0.5 mL	ARLW2063150-2	Translucent polypropylene measuring cylinder. Autoclavable. Gas and disinfectant sterilization also possible. Specific Gravity: 0.9 Flexibility: Rigid Water Absorption %: <0.02	3.55
50 x 1.0 mL	ARLW2063150-3		4.25
100 x 1.0 mL	ARLW2063150-4		5.25
250 x 2.0 mL	ARLW2063150-5		7.35
10 x 0.2 mL	LW1947-01	Translucent graduated propylene measuring cylinder. Autoclavable. Gas & disinfectant sterilization also possible.	1.80

BEAKER – EURO DESIGN - POLYPROPYLENE



CAPACITY (ml)	CODE	DESCRIPTION	PRICE (ea)
50	ARLW5010800-2	Translucent polypropylene beakers. Autoclavable. Gas and disinfectant sterilization also possible. Specific Gravity: 0.9 Flexibility: Rigid Water Absorption %: <0.02	2.50
100	ARLW5010800-3		2.75
250	ARLW5010800-4		3.30
500	ARLW5010800-5		4.65
1000	ARLW5010800-6		6.60

BEAKER COVERS - SILICONE




SUITS BEAKER SIZE:	CODE	DESCRIPTION	PRICE
250ml	PA0680-01	Re-useable silicone beaker covers. Helps avoid spillages and keeps contents contamination free. Packs of 10.	17.60
500ml, 600ml, 800ml	PA0680-02		17.60
1,000ml	PA0680-03		18.70
2,000ml	PA0680-04		19.80

PIPETTE TRANSFER – DISPOSABLE – NON-STERILE




CAPACITY	CODE	DESCRIPTION	PRICE
1ml	LW3960-01	Pack of 500 disposable Pipette Transfer Graduated 1ml. Non-Sterile. 25-26 drops per ml. Brand: Nest.	20.90
3ml	LW3964-01	Pack of 500 disposable Pipette Transfer Graduated 3ml. Non-Sterile. 64-65 drops per 3ml. Brand: Nest.	20.90

MEASURING JUGS – POLYPROPYLENE – GRADUATED


		CAPACITY	CODE	DESCRIPTION	PRICE
	250ml	LW3619-01	Autoclavable food grade polypropylene measuring jug with handle. Graduated.	Graduations: 10ml Dimensions (h x w): 95 x 75mm	2.75
	500ml	LW3620-01		Graduations: 10ml Dimensions (h x w): 120 x 95mm	3.85
	1000ml	LW3622-01		Graduations: 10ml Dimensions (h x w): 135 x 120mm	4.95
	2000ml	LW3624-01		Graduations: 20ml Dimensions (h x w): 170 x 145mm	7.70
	3000ml	LW3625-01			13.20

FUNNELS – FILTER - POLYPROPYLENE




		CAPACITY	CODE	DESCRIPTION	PRICE
	50ml	LW3227-01	Polypropylene filter funnels.	50mm (dia.) x 45mm (stem).	1.30
	75ml	LW3247-01		75mm (dia.) x 70mm (stem). Stem ID: 7.6mm	1.75
	100ml	LW3257-01		100mm (dia.) x 85mm (stem). Stem ID: 10mm.	2.95
	150ml	LW3277-01		150mm (dia.) x 110mm (stem) tapering to 100mm. Stem ID / OD: 11.5mm / 15mm (approx.). Overall height: 240mm.	5.25

For porcelain Buchner funnels, see "Filtration".


SCOOPS – PLASTIC

		CAPACITY (ml)	CODE	DESCRIPTION	PRICE
	2	PA1088-02	Polypropylene sampling scoops. Packs of 12.	9.90	
	5	PA1088-05		13.20	
	10	PA1088-10		15.40	
	25	PA1088-25		19.25	
	50	PA1088-50		25.30	
	100	PA1088-01		35.20	
	250	PA1088-03		55.00	

CONTAINERS & JARS

ITEM NAME	CODE	PRICE	ITEM NAME	CODE	PRICE
JAR – POLYPROPYLENE – 70ML WITH SCREW CAP	JAR744	212.00	JAR – POLYPROPYLENE – 100ML WITH SCREW CAP	JAR300 JAR300B	61.00 309.00
	Multipurpose transparent container. 70ml sample volume. 55 x 44 (h x dia.). 44mm diameter opening. Graduated. Variety of applications including urine collection & storage. Yellow screw cap. Box of 500.			Multipurpose transparent container. 100ml sample volume. 76 x 57 (h x base dia.). 62mm diameter opening. Graduated. Variety of applications including urine collection & storage. White screw cap. Available in bags of 50 (JAR300) or box of 250 (JAR300B).	
JAR – POLYPROPYLENE – 70ML WITH WHITE SCREW CAP	JAR723	209.00			
	Multipurpose translucent container. 70ml sample volume. 55 x 44 (h x dia.). Graduated. Variety of applications including storage. White screw cap. Box of 500.				

WEIGH BOATS

44 X 44MM – SQUARE 7ML	PA1640-04	12.10	140 X 140MM – SQUARE 250ML	PA1640-02	52.80
80 X 80MM – SQUARE 100ML	PA1640-01	26.40	85 X 85MM – DIAMOND SHAPE 30ML	PA1640-03	17.60
	<ul style="list-style-type: none"> • Manufactured in high impact Polystyrene • Ideal for handling both liquids and solids • Rounded corners for easy removal of samples. • Recesses at the corners for controlled pour-off • Suitable for exposure to diluted acids, alcohols, bases and aqueous solutions • Flat bottoms ensure stability and prevent tipping • Non-graduated • Antistatic • Non-sterile Supplied in bags of 250.			<ul style="list-style-type: none"> • Manufactured in high impact Polystyrene • Ideal for handling both liquids and solids • Rounded corners for easy removal of samples. • Recesses at the corners for controlled pour-off • Suitable for exposure to diluted acids, alcohols, bases and aqueous solutions • Flat bottoms ensure stability and prevent tipping • Non-graduated • Antistatic • Non-sterile Supplied in bags of 250.	

CUVETTES

CUVETTES FOR
SPECTROMETER &
COLORIMETER

PA3792-005

14.50



Pack of 10 plastic Cuvettes, for Spectrometer or Colorimeter. These are small, transparent, square shaped tube containers with very flat surfaces, used to carry samples of chemicals in instruments for measuring clarity or colour.

Light is shone through the walls of the cuvette and through the solution under study.

FILTRATION

FILTER PAPER - QUALITATIVE



CODE	SIZE (CM)	PACK SIZE	PRICE
LW3721-01	7	100	5.50
LW3722-01	9	100	7.15
LW3723-01	11	100	9.90
LW3724-01	12.5	100	12.10
LW3725-01	15	100	13.50
LW3726-01	18	100	17.00

#102 Medium Flow

Typical Properties:

Max Pore size (um) : 15-20

Filtration Speed (s) : 35-70

Ash content: <-0.15

Basis weight (g/m²) : 80+-4

MEMBRANE FILTERS



MCE

CODE	um	OD (MM)	PACK SIZE	PRICE
LW6606-08	0.22	13	200	77.00
LW6606-09	0.45	13	200	77.00
LW6606-11	0.45	25	200	66.00
LW6606-45	0.45	47	200	104.00

NYLON

LW6603-45	47	0.45	200	110.00
LW6603-02	47	0.22	200	110.00

HYDROPHILIC PTFE

LW6604-45	47	0.45	100	104.00
LW6604-22	47	0.22	100	104.00

FUNNELS – BUCHNER FILTRATION - PORCELAIN



DIAMETER (MM)	CODE		OVERALL LENGTH	CAP	OD (MM)	ID (MM)	NO. OF PERFORATIONS	FILTER PAPER SIZE	PRICE
50	LW3118-01	C144	114mm	50ml	62.1	53.77	19	50mm	11.00
70	LW3119-01	C145	144mm	120ml	83	74		70mm	13.20
80	LW3120-01**	C147-1	137mm		81	73	37	70mm	14.30
90	LW3121-01	C146	169mm	200ml	100.89	91.6	61	90mm	16.50
110	LW3122-01	C147	190mm	400ml	125.58	116	91	110mm	24.20
125	LW3123-01	C148	170mm		140.48	125.43	127	125mm	36.30
150	LW3124-01	C149	220mm	1000ml	153.12	140.73	127	125mm	45.10

Buchner funnel with perforated filter disc. Glazed. Average hole sizes: 0.5 - 1mm due to glazing thickness.

**Takes 28mm Gooch rubber adapter.

FILTER FLASK – GLASS












CAPACITY (ML)	CODE	HOSE DIA. (MM)	HEIGHT (MM)	STOPPER SIZE	PRICE
100	LW2747-01	9	110	10	17.60
250	LW2757-01	9	145	12	18.70
500	LW2767-01	9	185	13	23.10
1000	LW2777-01	9	245	14	40.70
2000	LW2778-01	11		12 or 13	56.10




Buchner or Vacuum flasks. 3.3 borosilicate glass. Temperature resistant: 560°C.

TOOLS, TEST EQUIPMENT, SAFETY EQUIPMENT, STORAGE SOLUTIONS & BOOKS

MEASURING TOOLS– Tachometer, Meter Rulers Vernier Callipers, Electronic Balance

ITEM NAME	CODE	DESCRIPTION	PRICE (EACH)
 <p data-bbox="457 480 869 505">HANDHELD DIGITAL TACHOMETER</p>	<p data-bbox="934 480 1058 505">TACHOHH</p>	<p data-bbox="1157 370 1856 618">Non-contact digital laser photo tachometer. Large 18mm, 5 digit LCD display. Testing Range: 2.5 ~ 99,999 RPM (rate / min). Has a wide range of applications including measuring rotating speed of machine, motors, model cars, wheels, lathe for metal or wood cutting work etc. Resolution: 0.1 RPM (2.5 ~ 999.9 RPM) / 1 RPM (over 1,000 RPM) Requires 9V battery (not included)</p>	<p data-bbox="1927 480 1990 505">31.25</p>
 <p data-bbox="457 833 716 857">DIGITAL LIGHTMETER</p>	<p data-bbox="934 833 1031 857">QM1587</p>	<p data-bbox="1157 678 1871 867">A handy digital lightmeter for photography, lab work, architectural, engineering and construction applications. It includes an integrated stand and will measure incident light in 4 ranges: 0.01 to 200, 200 to 2,000, 2,000 to 20,000 and 20,000 to 50,000 lux. The photo detector is wired on a curly cord which extends to 1 metre, allowing the user to take light measurements at the optimum position. Sensor cover included. Requires 1x12V, A23 battery (not supplied).</p> <p data-bbox="1157 889 1268 914">Features:</p> <ul data-bbox="1157 915 1808 997" style="list-style-type: none"> • 1999 Count LCD • 3.5 Digit Readout • Auto Zeroing • Data Hold • 4 Ranges • Separate Photo Detector <p data-bbox="1577 959 1772 984">Download Manual</p> <p data-bbox="1577 985 1801 1010">Download Datasheet</p>	<p data-bbox="1927 833 1990 857">75.95</p>
 <p data-bbox="457 1222 856 1279">PROFESSIONAL 400K LUX METER WITH CARRY CASE</p>	<p data-bbox="934 1239 1031 1263">QM1584</p>	<p data-bbox="1157 1019 1871 1263">This professional light meter is brimming with features that should be part of every lighting technician's arsenal. It uses photopic spectral sensitivity which closely mimics the response of the human eye to changes in light. It is extremely accurate with a rapid response and can store min and max values for easy comparisons. Measurement can be switched between LUX and FC (foot candles) and a data hold function is included for pausing the reading. All this is output to an easy to read backlit LCD. A carry plastic case with handle is included for easy and safe transportation.</p> <p data-bbox="1157 1268 1268 1292">Features:</p> <ul data-bbox="1157 1294 1864 1481" style="list-style-type: none"> • Data hold • Relative mode • Auto zeroing • Long-life silicon photo diode sensor • Selectable Lux or fc scale • Auto power off: 30 minutes • Compatible with LED lighting • Spectral response: CIE Photopic • Spectral accuracy: CIE VA function f1 Cosine response: f2 <p data-bbox="1528 1425 1864 1466">Accuracy: +/-5% +/-10d (10000 lux)</p>	<p data-bbox="1927 1239 1990 1263">219.00</p>

			<ul style="list-style-type: none"> • Display: 4,000 count with 41 segment bargraph • Max and min measurements • Easy to read backlit display • Includes carry case • Accuracy for C.I.E. standard illuminance A(2856K) • Sampling rate: 1.5 times/second <p>PLEASE NOTE: this does not have a calibration certificate, however you can calibrate it yourself using the process detailed on the datasheet.</p>	
	METER RULER – WOODEN	MRPH0062	One metre, graduated on both edges in centimetres & millimetres. One edge reads 0 – 100 left to right, the other in reverse.	12.00
	METER RULER – PLASTIC	MREX100	One metre, graduated on one side in 0.5cm & numbered in centimetres. Reverse side graduated in millimetres & from 0 -100 in centimetres.	15.00
	ARCHITECT SCALE TRIANGULAR RULER	RULEM30TECH	Durable, sturdy aluminium alloy construction. Easy to read triangular Crafright 300mm ruler. Scales: 1:20, 1:25, 1:50, 1:75, 1:100, 1:125.	10.95
	CRAFTRIGHT 3M / 10FT TAPE MEASURE	TAPEM30ENC	3 metre / 10ft Crafright tape measure! Ideal with durable rubberised case for non-slip grip and ease of use. Features both Metric and fractional measurements and an easy read 13mm wide blade. Belt clip for easy access	4.05
	OPEN REEL 30M TAPE MEASURE	TAPEM30E	30m / 100ft fibreglass open reel tape measure. Metric and imperial. Heavy duty ABS housing with handle. Lightweight. Crank handle folds in.	21.35
	TROJAN OPEN REEL 30M TAPE MEASURE	TAPEM30D	30m fibreglass open reel. High impact case with handle. Model TJ14075.	35.00

	MEASURING SQUARE 100	SQUARE100	Measuring Square Type: Engineer 100mm blade. Solid Steel. Ideal for workshop and inspection applications.	8.50
	VERNIER CALIPERS- IME TYPE – 0 -15CM WITH CASE	VERNCAL	IME type, plated steel with dual scale 0-15cm x 0.1mm & 6x1/128". Thumb movement. In case.	27.50
	VERNIER CALIPER 15 CM DIGITAL CARBON COMPOSITE	VERNCALDB	This carbon composite digital caliper is ideal for general use and suited to the home handyperson who finds traditional calipers hard to read. The 8.3 mm high digital display is calibrated in imperial and metric units with a corresponding vernier scale etched onto the caliper slide. CR2032 battery included. 245 mm long. Excellent value for money. DISCONTINUED PRODUCT – LIMITED QUANTITY – WHILE STOCKS LAST!	17.95










(Model or colour supplied may vary from illustration)








ANEMOMETERS

ITEM NAME	CODE	PRICE (each)	ITEM NAME	CODE	PRICE (each)
ANEMOMETER LCD WIND SPEED GAUGE	ANEMOLCD	40.33	ANEMOMETER – CUP	1055043	28.00
	Wind speed gauge with LCD.ind Measures maximum and average air velocity; temperature and wind chill factor. Displays Beaufort scale. Air Velocity Range: 0-30 m/s; 0-55 Knots; 0-90km/h; 0-65mph. Operating temperature: -10°C to +45°C Operating humidity: Less than 90%RH Current consumption: 3mA (approx.). Manual / Auto power shut off. Battery: CR2032 3.0V (included)			Working model wind speed 4 cup anemometer. · Mounted on a low friction bearing and consisting of 3 black plastic & 1 red plastic cup · 210mm x 180mm (h) · Anemometer is sensitive at wind speed of 1.5km/h; Student can determine the wind speed quantitatively by counting the number of rotations Worksheet included (suitable for both senior primary school and junior secondary school students)	

(Model or colour supplied may vary from illustration)

THERMOMETERS

ITEM NAME	CODE	PRICE (each)	ITEM NAME	CODE	PRICE (each)
DIGITAL THERMOMETER WITH K-TYPE THERMOCOUPLE	QM1602	51.00	K-TYPE THERMOCOUPLE	QM1282	16.95
	<p>A handy pocket-size digital thermometer, suitable for the lab, workshop or in the field. It features an excellent measurement range from -50 to 750°C and a hold function to lock the reading on the display. Thermocouple included.</p> <p>Requires 2 x AAA batteries (included).</p> <p>NOTE: <i>Measuring up to 750°C will require the use of an additional thermocouple probe available separately (QM1282)</i></p> <p>Accepts standard K-type thermocouples.</p> <p>Download Manual</p>			<p>This plug in Thermocouple Probe allows you to measure external temperature readings on DMMs. Will measure temperatures from below minus 50C to over 900C. Actual range depends on the DMM it is used with. Suitable for use in gas and liquid, both with very good accuracy. Accuracy 2.5deg C or 0.75% of temperature.</p>	
			WIRE K-TYPE THERMOCOUPLE	QM1282	13.95
				<p>This is essentially the same as the QM-1282 probe, except that the sensor is mounted on the end of the cable - noprobe. 1m long. Suits digital multimeters. Measures from minus 50°C to over 250°C, actual range depends on the DMM it's used with.</p>	
DIGITAL MULTI-PURPOSE THERMOMETER	PA-171	29.00	THERMOMETER – IMMERSION GENERAL PURPOSE -10°C to +50°C	PH0470A	7.00
	<p>Pocket stem digital thermometer with 145mm stainless steel probe; automatic shut off. Range: - 50°C to 300° C in 1 degrees C.</p> <p>Hold function. Max./ Min. key to view maximum and minimum.</p> <p>Overall length 235mm</p> <p>Supplied with plastic storage tube.</p> <p>Battery included.</p>			<p>Yellow enameled back and reinforced bulbs filled with red spirit. General purpose stirring thermometer. Supplied with non-roll fitting & plastic case. Range: -10°C to 50°C. Graduate 0.5°C, Immersion 76mm. 6.5mm (Dia.) & 305mm (Length).</p>	
THERMOMETER -50°C to +150°C	PH0471C	7.00	THERMOMETER – PARTIAL IMMERSION GENERAL PURPOSE -20°C to +150°C	GE4925-01	13.20
	<p>Yellow enameled back and reinforced bulbs filled with red spirit.</p> <p>Length 305 mm</p> <p>Graduations: 1° C</p>			<p>-20°C to +150°C x 1.0. 305mm white back, red spirit general purpose partial immersion thermometer. Fitted with Brannan non-roll end cap with ring.</p>	
THERMOMETER – PARTIAL IMMERSION GENERAL PURPOSE -35°C to +50°C	GE4700-01	13.20	THERMOMETER – IMMERSION GENERAL PURPOSE -35°C to +50°C	GE4705-01	13.20
	<p>Lo Tox -35°C to +50°C x 1.0. 305mm lab thermometer. Partial immersion to 76mm. Fitted with Brannan non-roll end cap with ring.</p>			<p>Lo Tox -35°C to +50°C x 1.0. 305mm lab thermometer. Total immersion. Fitted with Brannan non-roll end cap with ring.</p>	

<p>THERMOMETER – GENERAL PURPOSE -10°C to +300°C</p> <p>GE4702-01</p>	<p>14.30</p>	 <p>Lo Tox -10°C to +300°C x 1.0. 305mm Partial Immersion - 76mm. Initial™ Brand Thermometer Green Fill. Fitted with Brannan non-roll end cap with ring.</p>	<p>THERMOMETER – PARTIAL IMMERSION GENERAL PURPOSE -20°C to +110°C</p> <p>GE4730-01</p> <p>Lo Tox -20°C to +110°C x 1.0. 305mm Partial Immersion - 76mm. Initial™ Brand Thermometer Blue Spirit Fill. Fitted with Brannan non-roll end cap with ring.</p>	<p>13.20</p>
<p>THERMOMETER – IMMERSION GENERAL PURPOSE -20°C to +100°C</p> <p>GE4740-01</p>	<p>13.20</p>	 <p>Lo Tox -20°C to +100°C x 1.0. 305mm Immersion, Initial™ Brand Thermometer Blue Spirit Fill. Fitted with Brannan non-roll end cap with ring.</p>	<p>THERMOMETER – PARTIAL IMMERSION GENERAL PURPOSE -20°C to +50°C</p> <p>GE4750-01</p> <p>Lo Tox -20°C to +50°C x 1.0. 305mm Partial Immersion - 76mm. Initial™ Brand Thermometer Blue Spirit Fill. Fitted with Brannan non-roll end cap with ring.</p>	<p>14.30</p>
<p>THERMOMETER – GENERAL PURPOSE IMMERSION -20°C to +150°C</p> <p>GE4760-01</p>	<p>16.50</p>	 <p>Lo Tox -20°C to +150°C x 1.0. 305mm lab thermometer. Fitted with Brannan non-roll end cap with ring.</p>	<p>THERMOMETER – PARTIAL IMMERSION GENERAL PURPOSE -10°C to +360°C</p> <p>GE4703-01</p> <p>Lo Tox -10°C to +360°C x 2.0. 305mm Partial Immersion lab thermometer. Fitted with Brannan non-roll end cap with ring.</p>	<p>17.60</p>
<p>THERMOMETER – PARTIAL IMMERSION GENERAL PURPOSE -1°C to +51°C</p> <p>GE4716-01</p>	<p>38.50</p>	 <p>Lo Tox -1°C to +51°C x 0.1. 405mm Partial Immersion lab thermometer. Fitted with Brannan non-roll end cap with ring.</p>	<p>THERMOMETER – PARTIAL IMMERSION GENERAL PURPOSE -1°C to +51°C</p> <p>GE4718-01</p> <p>Lo Tox -1°C to +51°C x 0.2. 405mm Partial Immersion lab thermometer. Fitted with Brannan non-roll end cap with ring.</p>	<p>38.50</p>
<p>THERMOMETER – PARTIAL IMMERSION GENERAL PURPOSE -10°C to +260°C</p> <p>GE4701-01</p>	<p>33.00</p>	 <p>Lo Tox -10°C to +260°C x 1.0. 405mm Partial Immersion lab thermometer. Fitted with Brannan non-roll end cap with ring.</p>	<p>THERMOMETER – PARTIAL IMMERSION GENERAL PURPOSE -1°C to +101°C</p> <p>GE4719-01</p> <p>Lo Tox -1°C to +101°C x 0.2. 405mm Partial Immersion lab thermometer. Fitted with Brannan non-roll end cap with ring.</p>	<p>33.00</p>
<p>THERMOMETER - CLINICAL – DIGITAL – ORAL WITH CASE & CLIP</p> <p>BI1901-01</p>	<p>18.70</p>	 <p>Temperature Range: +32 to +42°C Ambient Temperature during use: +5 to +35°C (<80% RH) Storage Temperature: -25 to +55°C (<95% RH) Divisions: 0.1°C Accuracy: +/-0.1°C between 35.5 and 42°C, otherwise +/-0.2°C Battery: LR41 or equiv. x 1 piece (incl.).</p>	<p>THERMOMETER – DIGITAL - WITH PROBE & TIMER</p> <p>GE0980-01</p> <p>Digital handheld test thermometer/meat thermometer with alarm function, twin displays, 1m cable and 235mm stainless steel probe. Featuring data hold and max min function, wide measurement range, maximum/minimum temperature memory. Includes battery, and hanger, stand and magnetic attachment.</p> 	<p>99.00</p>

THERMOMETER – HIGH TEMPERATURE NON-CONTACT WITH K-TYPE PROBE SUPPORT & USB

QM7430

299.00

A professional non-contact thermometer with dual laser pointers to provide fast, easy and accurate readings of most surface temperatures between -50°C to 1650°C! The impressive 30:1 distance to spot ratio measures smaller surface areas at greater distances, with a 1% accuracy and a rapid 150ms sampling time.

Features include automatic data hold & trigger lock, min, max, difference, average temperature displays, high/low alarms, and digitally adjustable emissivity (0.1 to 1.0) for more accurate readings of different materials. Provision for a K-Type thermocouple (supplied) enables you to take direct measurements up to 1370°C, and a USB port lets you transmit the data to a PC for further analysis. Supplied with a tripod, K-type probe, USB cable and carry case.



Features:

- Rapid detection function
- Built-in dual laser pointer
- 30:1 Distance to spot ratio
- Automatic Data Hold
- Emissivity Digitally adjustable from 0.10 to 1.0
- MAX, MIN, AVG, DIF temperature displays
- Backlight LCD display
- Trigger lock
- Set high and low alarm
- USB Interface
- Class 2 laser product

Specifications:

Response Time: 150ms
Spectral Response: 8~14um
Over Range Indication: LCD will show "----"
Polarity: Automatic (no indication for positive polarity); Minus (-) sign for negative polarity

IR Measurement:

IR Temp. Range: -50 to 1650°C
Distance to Spot Ratio 30:1
Resolution: 0.1°C<1000; 1°C>1000
Basic Accuracy: +/- 1%
Repeatability: -50 to 20°C ± 1.5°C, 20 to 1650°C ± 0.5%

Thermocouple:

Temp. Range: -50 to 1370°C
Resolution: 0.1°C<1000; 1°C > 1000
Basic Accuracy: +/- 1.5%
Repeatability: -50 to 1370°C ± 1.5%

[Download Manual](#)
[Download software](#)

THERMOMETER - NON-CONTACT -50°C TO 500°C

QM7410

64.95

A safe way to measure temperatures in hard to reach places, and hot or hazardous areas. It is compact and easy to use - simply aim the built-in laser at the target area and read the temperature between -50°C to 500°C from the backlit LCD screen. Features include a 12:1 distance to spot ratio, rapid 500ms detection, max/min, data hold, and auto-power off functions.

9V battery included.

NOTE: This unit only measures surface temperature not internal body temperatures.

Features:

- -50°C to 500°C
- Rapid detection function
- Built-in laser pointer
- 12:1 Distance to spot ratio
- Automatic data hold
- Max/min function

Specifications:


Distance to Spot Ratio: 12:1
Repeatability: ±1°C (1.8°F)
Spectral Response: 8~14um
Over Range Indication: LCD will show "----"
Relative Humidity: 10% to 90%
RH operating; <80% RH storage


Accuracy:

±3°C (5.4°F) at -50 to 20°C (-58 to 68°F),
±2.0% ±2°C (3.6°F) at 20 to 500°C (68 to 932°F)

[Download Manual](#)



NON-CONTACT THERMOMETER WITH DUAL LASER TARGETING	QM7420	129.00
	<p>Safely measure temperatures from -40°C up to 650°C in hard to reach places, and hot or hazardous areas. The circular laser targeting from the two built-in lasers and 16:1 distance to spot ratio provides more accurate and repeatable measurements. The rugged design with IP54 rating offers protection against dust and water. Features include min, max, average, difference temperature displays, data hold, and high and low alarms with backlight. It has a large white backlit LCD, a rapid response time of less than 150ms, and a digitally adjustable emissivity from 0.1 to 1.0, which helps improve accuracy depending on the materials you are measuring. Supplied in a carry case.</p> <p>Download Manual</p> <p>Please note this unit only measures surface temperature not internal body temperatures.</p> <p>Features: -40 to 650°C Rapid detection function Built-in dual laser pointer 16:1 Distance to spot ratio Automatic data hold Max/min function Emissivity Digitally adjustable from 0.10 to 1.0 MAX, MIN, AVG, DIF temperature displays High and Low alarms with red backlight Class 2 laser product</p>	<p>Specifications: Repeatability: ± 0.8% or ±2°F(1°C) (used the max reading) Response Time: Less than 150ms Spectral Response: 8~14um Over Range Indication: LCD will show "----" Polarity: Automatic (no indication for positive polarity); Minus (-) sign for negative polarity</p> <p>Accuracy: -40 ~ 0°C: (± 2°C + 0.2°C Per degree) 0~650°C: ± (1.5°C) OR ± 1.5%</p>

THERMOMETER – BASIC INDOOR	TH11820	3.50
	<p>Basic indoor wall thermometer. -60°C to +50°C. 22.5cm (long) x 5cm (wide) (approx.) Recessed in moulded plastic. Not for use in boiling water.</p> <p>(LIMITED STOCK)</p>	

(Model or colour supplied may vary from illustrations)

THERMAL CAMERAS

THERMAL CAMERA –
HANDHELD

QC1950

599.00



This non-contact thermal imaging camera helps you instantly pinpoint overheating components on a circuit board, identify any areas of wasted heat energy, or spot any thermal insulation gaps in equipment or a building. To operate, simply point the camera to the region you want to test and see the warm components or areas show up as yellow, orange or red, and cool areas as blue and green on the 2.4" display.

Measures temperatures between -20° C to 400°C .
Features include: 120x90 WLP IR sensor, 130:1 distance-to-spot ratio, IP54 rating, and built-in rechargeable battery. USB Type-C charging cable included.
[Download Manual](#)



pH METERS

pH METER – HANDHELD

QM1670

99.95



A simple and accurate device for checking pH levels in water. The unit is equally valuable for keeping your fish tank at the proper pH level for optimum fish health or checking your swimming pool for the right balance. The meter is simple to use and the large liquid crystal display gives clear and precise readings that are much more accurate than messy chemicals. The unit has an extendable probe that can be adjusted to suit each application.

The meter is supplied with a 9 volt battery, a bottle of pH 7.0 buffer solution and calibration tool.






Operating temperature: 0°C - 50°C
pH Measurement range: 1pH - 14pH
pH Measurement accuracy +/-: 0.2%
pH Resolution: 0.1pH-0.1pH-0.1pH





BUFFER SOLUTION TO SUIT
HANDHELD pH METER
QM1670



QM1671

11.95

TEST EQUIPMENT


ITEM NAME	CODE	Qty.	PRICE (ea)	
			1-19	20+
CALIBRATED SUNLIGHT METER	SUNMETER10	1	21.00	21.00
	<p>This sunlight meter has a calibrated solar panel. It allows easy determination of Sun intensity. This is a valuable tool when testing solar powered vehicles or boats, or considering the effect that different positions of the sun have on solar power generation. This enables students to take into account the prevailing Sun level during testing of any sort.</p> <p>Additional item required to use this: Digital Multimeter with 4mm banana plugs on leads.</p>			
DRAGSTER RACING KIT	DRAG-RACE	1	10.75	10.75
	Comprises of a reel of fishing line and two stopwatches (Code: STOP).			
SPORTS TIMER	STOP	1	1.85	1.85
	<p>Basic quartz sports timer 1/100th second stopwatch Split / lap time Hours, minutes, seconds Day, date, month <i>(Colour of item supplied may vary)</i></p>			
MINI LED TESTER	LEDTEST	1	7.20	7.20
	Tests standard LEDs and Superflux LEDs			
TRANSISTOR TESTER	TRANT	1	22.75	21.98
	Build a transistor tester & fault-finder (it tests transistors in-circuit)			
TEST CLIPS	TESTCL	1	2.10	1.80
	<p>Red IC Test Clip with syringe action. Suitable for working with small components, multimeters, transistors, etc. Approx. 57mm.</p>			

DIGITAL MULTIMETER WITH NON CONTACT VOLTAGE SENSOR	MULTIM1527	1	32.95	29.95
	<p>Economical multimeter with all the features expected, suitable for basic testing of electrical systems. LCD display.</p> <ul style="list-style-type: none"> • Measure AC and DC voltage, DC current, and Resistance • Continuity test with audio alert • Non-contact voltage sensing <p>Black and red banana plug test leads included. Dimensions: 65mm (w) x 145mm (h) x 35mm (d). 9V battery included.</p>			
DIGITAL MULTIMETER	MULTIM	1	16.95	16.95
	<p>3.5 digits LCD display, 8 functions, 19 ranges Dimensions: 132mm x 70mm x 25mm.</p> <p>DC Voltage Range: 200mV/2V/20V/200V/500V AC Voltage Range: 200V/500V DC Current Range: 2mA/20mA/200mA Resistance: 200Ω/2kΩ/20kΩ/200kΩ/2MΩ Battery Test: 1.5V/9V</p>			
DIGITAL MULTIMETER 1527 SET	MULTIM1527SET	1	44.50	44.50
	<p>MULTIM1527SET consists of the Multimeter 1527, a soft, foam lined zip up case, a pair of leads with banana plugs at both ends, and both insulated and plain shank alligator clips to add onto the banana plugs for greater versatility.</p>			
DIGITAL MULTIMETER KIT	KG9250	1	38.95	35.95
	<p>Build your own multimeter. Learn everything there is to know about component recognition and basic electronics with this comprehensive kit. From test leads to solder, everything you need for the construction of this meter is included together. With test questions and schematic supplied in the manual, the kit can be geared to an individual or class learning environment. Kit includes DMM case, LCD, solder, battery, test leads, PCB and electronic components. Comprehensive 18 page learning manual included.</p> <p>Soldering iron required (not supplied).</p> <p><i>(NOTE: One ex-sample kit for sale - never used or assembled. Special sale price \$20.50)</i></p>			

MULTI-FUNCTION ENVIRONMENTAL METER WITH DIGITAL MULTIMETER	QM1594	1	175.00	175.00
	<p>A multi-function environment meter that combines the functions of a sound level meter, light meter, humidity meter and temperature meter. Typical sound applications include checking acoustics of recording studios, auditoriums and professional hi-fi installations. The light and humidity meters are ideal for video photographers, greenhouse and hydroponic setups, etc. Others who should find this meter essential include interior designers, factory and office managers, record and archive keepers, schools, hospitals, laboratories and, of course, universities.</p> <p>Features:</p> <ul style="list-style-type: none"> • Sound level meter • Light level meter • Indoor temperature and humidity measurement • Non-contact voltage • Display: 4000 count <ul style="list-style-type: none"> • Safety Category: Cat IV 600V • Basic DCV accuracy: 1% • Temperature: -20°C to 750°C (±1.2%) • Ave/RMS: Ave • Input impedance: 10M • Special features: Lux, SPL, Humidity <p>Requires 9V battery (included). Download Manual</p>			
PEN LIGHT	PENLT	1	4.50	4.50
	<p>Pen-shaped LED work flashlight with narrow angle beam – ideal for <i>ROBOBUG</i></p> <p>(2x AAA batteries not supplied).</p>			

*Colours and models of tools may vary from illustrations above.

TEST & TROUBLESHOOTING KIT

ITEM NAME	CODE	Qty.	PRICE
TEST & TROUBLESHOOTING KIT	TESTKIT	1	42.00
	<p>Contains a Digital Multimeter, Transistor Tester, LED Penlight, Mini LED Tester and a bundle of 6 alligator clips with wires.</p> <p>Includes a carry pouch for easy storage.</p>		

BENCH METERS

DIGITAL BENCH METERS (+) (-)



Use also as a Galvanometer (+) (-)

- Extra strong, plastic case (14cm x 10cm)
- 13mm LCD display
- Simple to use
- Simplifies circuit studies
- **Standard size**

APRIL SALE SPECIAL - 5% off listed price of all bench meters listed on this page with code beginning with "PA-". Valid until 30th April, 2024 or while stocks last.

DIGITAL AMMETERS

ITEM NAME	CODE	Specifications/Description	PRICE
AMMETER	PA-211	0 – 10A DC	45.15
AMMETER	PA-212	0 – 1.999A DC	45.15
MILLIAMETER	PA-213	0 – 1.999mA DC	45.15
MICROAMMETER	PA-214	0 – 1.999uA DC	45.15

DIGITAL VOLTMETERS

VOLTMETER	PA-202	0 – 1.999A DC	45.15
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(Items supplied may vary from illustration)

STUDENT DUAL (AMP/VOLT) BENCH METER



The Ultimate Teacher Meter For Amps / Volts!

- 100mV / 1V / 10V / 50V & 100uA / 100mA / 1A / 5A
- Versatile, Space Saving, Concept Enhancer
- Switch from V to A
- Convenient for integrating into Circuits
- Volts measured in DC
- Input is made via a dual 4mm or terminal type connection.

DIGITAL AMMETERS

ITEM NAME	CODE	Specifications/Description	PRICE
STUDENT DUAL (AMP/VOLT) BENCH METER	PA-221	100mV / 1V / 10V / 50V & 100uA / 100mA / 1A / 5A	45.00

(Items supplied may vary from illustration)

ANALOGUE BENCH METERS



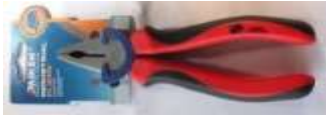






ANALOGUE BENCH METERS





















ITEM NAME	CODE	Specifications/Description	PRICE
AMMETER	PA-6	0 – 1A / 0 – 5A in 20mA/100mA DC	23.65
AMMETER	PA-10	Range 0 – 10A in 200mA	23.65
VOLTMETER	PA-111	Range 0 – 3V/15V/30V DC in 0.1V/1V/1V	23.65
GALVANOMETER	PA-14-1	500 – 0-500uA in \pm 20uA	23.65









(Items supplied may vary from illustration)










TOOLS

ITEM NAME	CODE	Qty.	PRICE (each)	ITEM NAME	CODE	Qty.	PRICE (each)
ALLEN KEY	HEX1.5 HEX1.5-5	1 5	2.60 9.80	CRAFT KNIFE - 18MM SNAP BLADE	CRKNF	1	5.97
	For the collar's grub screw.				Heavy duty locking knife - 18mm snap blade		
BULL NOSED PLIERS - INSULATED	PLIERBN	1 (1-25) (26+)	25.96 24.50	CRIMP TOOL – LARGE	CRIMP	1	12.50
	175mm long pliers.				600mm crimping tool for crimp swages 		
COMPONENT LEAD FORMING TOOL	COMPLFT	1	10.95	CRAFT KNIFE 18MM REPLACEMENT BLADES	CRKNFREP20	20	6.45
	This forming tool provides uniform hole spacing from 10 to 38mm (0.4" to 1.5") for resistors and diodes to fit into PCBs. The tool is double sided: one side for use with DO47 outline diodes (e.g. 1N914) and 1W zener diodes; the other side for 1/5W resistors, DO41 outline diodes (e.g. 1N4004).				Craftright replacement snap blades of SK5 hardened steel construction. Fits most 18mm snap-off blade knives. This Craftright snap off knife replacement pack contains 20 x 18mm blades that suits most 18mm snap off blade knives. Ideal all general purpose cutting, each blade provides 8 fresh, sharp cutting points.		
GLUE GUN MINI – LOW TEMPERATURE	GLUEGUNMINLT	1	8.75	GLUE STICK – LOW TEMPERATURE 7 X 100MM (PACK OF 12)	GLUESTKLT-12	12	3.00
	This 10W power Low Temperature Glue Gun is great for craft projects, quick repairs, at school or in a home education setting. The Glue Gun has a protective nozzle cover and is suitable for paper, fabric, foam and even some plastics. Each pack contains 2 free low temperature sticks. Replacement glue sticks are also available in packs of 12 (Code: GLUESTKLT-12) or 24 (GLUESTKLT-24).				Pack of 12 low temperature glue sticks for use with Glue Gun Mini - Low Temperature (GLUEGUNMINLT). 7mm (dia.) x 100mm (l.). Bonds to paper, wood, plastic and more. Suitable in a primary school or home education setting (under adult supervision). Ages 5+.		

<p>GLUE STICK – LOW TEMPERATURE 7 X 100MM (PACK OF 24)</p>	<p>GLUESTKLT-24</p>	<p>24</p>	<p>4.30</p>	<p>GLUE MAT – SILICONE</p>	<p>GLUEMAT</p>	<p>1</p>	<p>8.00</p>
	<p>Pack of 24 low temperature glue sticks for use with Glue Gun Mini - Low Temperature (GLUEGUNMINLT). 7mm (dia.) x 100mm (l.).</p> <p>Bonds to paper, wood, plastic and more.</p> <p>Suitable in a primary school or home education setting (under adult supervision). Ages 5+.</p>				<p>Gloo Silicone Mat makes an excellent glue-up and finishing mat. It can protect larger surface of your work area. Resists most types of glue with heat resistant.</p> <p>Dimensions: 194 x 270 x 0.75 mm.</p> <p>Ideal for school and home education environment or for your hobby needs.</p>		
<p>HAMMER - CLAW</p>	<p>HAMMERCL</p>	<p>1</p>	<p>8.68</p>	<p>HAMMER – CROSS PEIN</p>	<p>HAMMERCPC</p>	<p>1</p>	<p>8.53</p>
	<p>Fibreglass hammer with claw to remove nails. Ergonomic grip. Suitable for students to use (under teacher supervision) to create new projects.</p>				<p>100g cross pein hammer. Fibreglass shaft. Soft grip handle</p>		
<p>5.5MM HEX NUT HAND DRIVER</p>	<p>HEXDR5.5</p>	<p>1</p>	<p>5.90</p>	<p>PLASTIC BOTTLE CUTTER DIY ROPE TOOL</p>	<p>PLBOTTCUT</p>	<p>1</p>	<p>18.50</p>
	<p>5.5mm Hexagonal Nut (Wrench) Hand Driver/Tool</p>				<p>A tool that provides a simple way to reuse the material from old plastic PET bottles. A great way to turn them into long plastic strips to use as rope, gardening rope, for weaving.</p> <p>Size: 2.2cm x 2.2cm x 14cm. Constructed of wood & metal.</p>		
<p>HOT GLUE GUN</p>	<p>GLUEGUN</p>	<p>1</p>	<p>22.85</p>	<p>HOT GLUE STICKS</p>	<p>GLUESTK</p>	<p>5</p>	<p>6.12</p>
	<p>100W; 11mm. For use with <i>Hot Glue Sticks</i> (GLUESTK).</p>				<p>For <i>Hot Glue Gun</i>. 300mm (l) x 11mm (dia).</p>		

<p>HOT GLUE GUN – MINI</p> 	<p>GLUEGUNMIN</p> <p>30W, 240V; for use with 7mm Hot Glue Sticks (GLUESTK7). Smaller glue gun suitable for primary level students.</p>	<p>1</p>	<p>14.95</p>	<p>HOT GLUE STICKS 7MM</p> 	<p>GLUESTK7-5 GLUESTK7</p> <p>For Hot Glue Gun Mini (<i>GLUEGUNMIN</i>). 7.4mm (dia) x 100mm (l) Available in packs of 50 or packs of 5.</p>	<p>5 50</p>	<p>3.90 11.95</p>
<p>HOT WIRE FOAM CUTTER</p> 	<p>HOTWIRE</p> <p>Useful for cutting or sculpting Styrofoam and polystyrene.</p>	<p>1</p>	<p>29.60</p>	<p>REPLACEMENT HOT WIRE</p> 	<p>REPLHOTWIRE</p> <p>Replacement Hot Wire for <i>HOT WIRE CUTTER</i>. 5 metre roll.</p>	<p>Per roll</p>	<p>10.15</p>
<p>IC EXTRACTOR</p> 	<p>ICEXTRACT</p> <p>IC Extractor for 8-40 Pin Integrated circuit chips. Designed to reduce the risk of bending the IC's legs when pulling the IC out of a socket or PCB.</p>	<p>1</p>	<p>5.95</p>	<p>IC INSERTER</p> 	<p>ICINSERT</p> <p>IC Inserter for 14/16-Pin Integrated circuit chips. Designed to reduce the risk of bending the IC's legs when inserting them into an IC socket or PCB.</p>	<p>1</p>	<p>12.50</p>
<p>IC STRAIGHTENER</p> 	<p>ICSTRAIT</p> <p>Straightens pins on integrated circuits.</p>	<p>1</p>	<p>22.90</p>	<p>MINI BOLT CUTTER</p> 	<p>BOLT CUTMIN</p> <p>200mm long bolt cutters. 3mm cutting capacity.</p>	<p>1</p>	<p>12.50</p>
<p>MINI BULL NOSE PLIERS 115MM</p> 	<p>PLIERBNMIN</p> <p>Hobby & electronic use. Hardened steel polished serrated multi-grip teeth tip and nut grab pliers. Double molded handles. Non-slip soft grips. Wire cutting blades. Spring return. Excellent value.</p>	<p>1</p>	<p>5.45</p>	<p>MINI LONG NOSE PLIERS – 125MM</p> 	<p>PLIERLNMIN</p> <p>Hobby & electronic use. Hardened steel polished. Serrated multi-grip teeth tip and nut grab pliers. Double mold rugged handles with non-slip soft grips. Wire cutting blades. Excellent value.</p>	<p>1</p>	<p>4.35</p>

<p>LONG NOSE PLIERS – INSULATED</p> <p>PLIERLN</p>	<p>1 (1-25)</p>	<p>25.96</p>	<p>MINI CRIMPING TOOL</p> <p>CRIMPT</p>	<p>1</p>	<p>23.00</p>
 <p>165mm long pointy nose pliers</p>	<p>1 (26+)</p>	<p>24.50</p>	 <p>Crimping tool for non-insulated lugs. Suits large terminals (<i>TERML</i>) & small terminals (<i>TERMS</i>).</p>		
<p>MINI SIDE CUTTER</p> <p>SIDECUTMIN</p>	<p>1</p>	<p>6.60</p>	<p>SIDE CUTTER - INSULATED</p> <p>SIDECUT</p>	<p>1 (1-25)</p>	<p>25.96</p>
 <p>Mini Side Cutters. 120mm long.</p>			 <p>150mm long side cutter</p>	<p>(26+)</p>	<p>24.50</p>
<p>SCREWDRIVER PHILIPS HEAD#0 X 60MM</p> <p>SCREWDRPH0/60</p>	<p>1</p>	<p>9.95</p>	<p>SCREWDRIVER PHILIPS HEAD#1 X 80MM</p> <p>SCREWDRPH1/80</p>	<p>1</p>	<p>9.95</p>
 <p>Trade quality insulated screwdriver which is one of the most comfortable screwdrivers.</p> <p>The ergonomic handle has a soft rubber coating for a secure, comfortable grip that can be used for hours on end.</p> <p>TUV and GS approved and rated up to 1kV.</p>			 <p>Trade quality insulated screwdriver which is one of the most comfortable screwdrivers.</p> <p>The ergonomic handle has a soft rubber coating for a secure, comfortable grip that can be used for hours on end.</p> <p>TUV and GS approved and rated up to 1kV.</p>		
<p>SCREWDRIVER PHILIPS HEAD#2 X 100MM</p> <p>SCREWDRPH2/100</p>	<p>1</p>	<p>11.95</p>	<p>SCREWDRIVER FLAT HEAD 3.0 MM X 100MM</p> <p>SCREWDRFL3/100</p>	<p>1</p>	<p>9.95</p>
 <p>Trade quality insulated screwdriver which is one of the most comfortable screwdrivers.</p> <p>The ergonomic handle has a soft rubber coating for a secure, comfortable grip that can be used for hours on end.</p> <p>TUV and GS approved and rated up to 1kV.</p>			 <p>This flat head, single driver, trade quality insulated screwdrivers is one of the most comfortable screwdrivers.</p> <p>The ergonomic handle has a soft rubber coating for a secure, comfortable grip that you can use for hours on end. TUV and GS approved and rated up to 1kV. A size for any application.</p> <p>Flat Blade 3.0 x 100mm.</p>		

PRECISION SCREWDRIVER SET – 6 PIECE	SCREWDRPREC	1	11.50	PRECISION SCREWDRIVER SET - INSULATED - 6 PIECE	SCREWDRINS6	1	39.00 ea (1-5) 37.50 ea (6+)
	<p>6 piece metal jeweller's screwdriver set in handy storage case. Also suitable for watchmakers, model making and more.</p> <ul style="list-style-type: none"> • Slotted: 1.0, 1.2 & 1.6mm • Phillips: #00, #0 & #1 <p><i>NOTE: Item supplied may vary slightly from illustration.</i></p>				<p>Ergonomic fully insulated 6-piece screwdriver set for precision work. Suitable for working with electrical components.</p> <ul style="list-style-type: none"> • Slotted sizes 2mm, 2.5mm, and 3mm • Phillips sizes #00, #0, and #1 • 1kV insulation rating 		
MULTI-USE TOOL / SPANNER	MULTITOOL	10	5.00	NIBBLING TOOL	NIBBLER	1	14.95
	<p>Can be used as a Gear pusher or as a Spanner for M3 nuts.</p> <p>5.6mm opening.</p>				<p>Will cut any shape out of aluminium, plastic, copper and other unhardened metals up to 18 gauge.</p> <p>Tool is designed to fit into the palm of your hand for easy use, simply drill a 1/4 hole to start.</p>		
SCRIBE	TD2120	1	9.95	TWEEZERS – ANTI MAGNETIC	TWANTIMAG	1	5.90
	<p>This 110mm pen type tool will scribe on metal, glass, plastic, ceramics and tools. Stylus is made of tungsten steel. Looks like a pen and has a pocket clip.</p>				<p>High quality 110mm long tweezers made from anti magnetic, anti-acid steel. Perfect for handling SMD components or general electronic components. Supplied with protective nylon cap.</p>		
TWEEZERS - NON CONDUCTIVE (4 PCE)	TWST83	4	18.95	WIRE STRIPPER	WIRESTR	1	22.95
	<p>Set of 4 non-conductive tweezers. Ideal for SMT & small parts. Suitable for any static-sensitive devices. Overall length 11.25cm (approx.)</p>				<p>TRex design – Automatically adjusts to insulation diameter, and is one handed operation</p>		
WIRE STRIPPER 3	WIRESTR3	1	12.10				
	<p>Adjustable wire stripper. Return spring. Cushion grip 12.5cm (approx.) long.</p>						



Convert your standard power drill or rotary tool into a drill press with this adjustable stand. Substantially cheaper than purchasing a full drill press, the stand still has all the necessary features expected in a full size press.

It includes separate adjustments for limiting press depth and drill height so you can change drill position with minimal risk of over-drilling into the stand. The drill collar can be adjusted to suit a variety of tools. Heavy duty cast metal base and frame provides excellent stability.






Features:

- Allen key supplied for tightening drill collar
- Drilling depth: Up to 60mm
- Maximum collar diameter: 43mm
- Minimum collar diameter with insert: 35mm










Colours and models of tools may vary from illustrations above.


TOOL KITS


<p>PRECISION TOOL KIT WITH CASE - 35 PIECES</p>    <p>TD2117</p> <p>A multi-purpose precision screwdriver tool set with a quality zipped storage case. This tool set consists of 30 bits, two cutters, two pliers and a flexible shaft adaptor for those tricky to reach screws. Ideal for electronic service tradesmen and hobbyists.</p> <p>Features:</p> <ul style="list-style-type: none"> • 30 pcs assorted bits: <ul style="list-style-type: none"> - Slotted: SL1.0, SL1.5, SL2.0, SL2.5, SL3.0, SL3.5, SL4.0mm - Philips: PH000, PH00, PH0, PH1 - Pozzi: PZ0, PZ1 - Torx: T4, T5, T6, T7, T8, T9, T10, T15, T20 - Hex: H0.7, H0.9, H1.3, H1.5, H2.0, H2.5, H3.0, H4.0mm • Needle nose pliers • Diagonal cutters • Flexible shaft • Stainless tweezers • Easy grip screwdriver handle • Durable zippered storage case 	<p>56.95</p>	<p>PRO TOOL KIT WITH 30W SOLDERING IRON</p> <p>SOLDTLKIT</p>  <p>The Pro tool kit contains: 30W soldering iron with fine tip</p> <ul style="list-style-type: none"> • 2mm chisel tip for the soldering iron • Soldering iron stand • Solder sucker • Tube of lead free solder • Multimeter with test leads with probes (batteries not included – uses 2 x AA batteries) • Jewellers screwdriver set • 120mm sidecutters • Tweezers. 	<p>57.00</p>
<p>TOOL KIT WITH CASE – 30 PIECES</p>  <p>TD2166</p> <p>Minor repairs in the lab or workshop are made simple with this 30 piece mini tool kit. The tools are held securely in a convenient zip-up case.</p> <p>Features:</p> <ul style="list-style-type: none"> • Side cutters • Long nose pliers • Snap-blade knife • Tape measure: Measures up to 2m • Precision screwdriver with bits • Driver handle with: PH1, PH2, PZ1, PZ2, 5, 6mm slotted, T10, T15, T20 • 6, 7, 8, 9, 10mm sockets • Folding Allen keys 1.5, 2, 3, 4, 5, 6mm <p>Case dimension: 210 x 160 x 48mm Internal volume: 1.7738L Boxed weight: 0.87kg.</p> <p>RETIRED ITEM – LIMITED STOCK ONLY</p>	<p>32.95</p>		

WORK MATS & BENCH MATS

<p>BENCH MAT – 200 X 200MM CH0101C</p>  <p>Heat resistant bench mat made from calcium silicate and ideal for use under Bunsen burner. Well finished edges. Pack of 10.</p>	32.00	<p>MAGNETIC WORK MAT & WHITE BOARD MAGWMTH1867</p>  <p>This is a fully magnetic rectangular project mat that will stop small screws with a will of its own from jumping away from your disassembled device.</p> <p>This 254(L) x 203(W)mm (8 x 10 inches) mat is great for keeping nuts and bolts in place when disassembling all kinds of gadgets and phones.</p> <p>NOTE: The magnetic side of the mat is the "Whiteboard" side which allows you to write references or notes next to the nuts and bolts.</p>	14.95 (1-5) 13.45 (6+)															
<p>SILICONE BENCHTOP WORK MAT HM8102</p>  <p>The ultimate working mat for the advanced hobbyist or technician. The mat measures 389 x 269mm and is made from heat resistant silicone - suitable for soldering applications. It has multiple indentations to hold screws, parts, and components, and various magnetic areas to hold metal parts securely in place. It has a 28cm ruler and an area to hold up to 12 jeweller type screwdrivers.</p> <p>Ideal if you perform delicate work with tiny screws and parts to ensure you don't lose them while you're working.</p>	24.00	<p>SELF HEALING CUTTING MAT - A3 CUTMATA3</p>  <p>Suitable when using either a utility knife, scalpel or a rotary cutter. Protects the work surface from damage and prevents your blade from dulling quickly. Constructed from a durable 3mm laminated surface. Cutting blades create tiny scratches in the mat surface that reclose afterward; thus the description "self-healing."</p> <p>Mat is numbered up the left side and across the bottom.</p> <p>Has clear metric grid markings.</p>	24.72															
<p>BENCH MAT – CEMENT SHEET</p>  <table border="1" data-bbox="451 1023 924 1096"> <tr> <td>100 X 100mm</td> <td>LW3152-01</td> <td>5.28</td> </tr> <tr> <td>300 x 300mm</td> <td>LW3153-01</td> <td>9.24</td> </tr> </table> <p>Asbestos free. Heat resistant. 6mm thick.</p>	100 X 100mm	LW3152-01	5.28	300 x 300mm	LW3153-01	9.24		<p>BENCH MAT – SILICONE RUBBER</p>  <table border="1" data-bbox="1417 1023 1890 1136"> <tr> <td>150 x 150mm</td> <td>LW3154-01</td> <td>6.60</td> </tr> <tr> <td>250 x 250mm</td> <td>LW3155-01</td> <td>13.20</td> </tr> <tr> <td>400 x 300mm</td> <td>LW3156-01</td> <td>23.10</td> </tr> </table> <p>Hard wearing, long lasting. Heat resistant (220°C). Non-slip. 2.3mm thick. Grey.</p>	150 x 150mm	LW3154-01	6.60	250 x 250mm	LW3155-01	13.20	400 x 300mm	LW3156-01	23.10	
100 X 100mm	LW3152-01	5.28																
300 x 300mm	LW3153-01	9.24																
150 x 150mm	LW3154-01	6.60																
250 x 250mm	LW3155-01	13.20																
400 x 300mm	LW3156-01	23.10																
<p>GLUE MAT – SILICONE GLUEMAT</p>  <p>Gloo Silicone Mat makes an excellent glue-up and finishing mat. It can protect larger surface of your work area. Resists most types of glue with heat resistant.</p> <p>Dimensions: 194 x 270 x 0.75 mm.</p> <p>Ideal for school and home education environment or for your hobby needs.</p>	8.00																	



DRILL BITS

	ITEM NAME	CODE		Qty. per pack	PRICE
	DRILL BIT 1.0MM	DB1.0	High Speed Steel Drill Bit - 1.0 mm	5	8.12
	DRILL BIT 1.9MM	DB1.9	High Speed Steel Drill Bit - 1.9 mm	5	8.12
	DRILL BIT 2.3MM	DB2.3	High Speed Steel Drill Bit - 2.3 mm	5	8.12
	DRILL BIT 2.6MM	DB2.6	High Speed Steel Drill Bit - 2.6 mm	5	8.12
	DRILL BIT 2.9MM	DB2.9	High Speed Steel Drill Bit - 2.9 mm	5	9.43
	DRILL BIT 3.5MM	DB3.5	High Speed Steel Drill Bit - 3.5 mm	5	9.43
	DRILL BIT 3.9MM	DB3.9	High Speed Steel Drill Bit - 3.9 mm	5	9.43

	ITEM NAME	CODE		Qty. per pack	PRICE
	BALADONIA METRIC FORSTNER DRILL BIT 18MM	DBFORST18		1	9.25
	BALADONIA METRIC FORSTNER DRILL BIT 28MM	DBFORST28		1	12.50
	BALADONIA METRIC FORSTNER DRILL BIT 30MM	DBFORST30		1	13.50
	BALADONIA IMPERIAL FORSTNER DRILL BIT 38.1MM (1 1/2)	DBFORST38		1	15.90
	<p>These Forstner drill bits are used for drilling wood - guided by the rim and not a centre point, therefore not easily deflected by timber's natural differences, such as knots or strong grain patterns. Main advantage is that it can be used to drill large, shallow holes (useful for the <i>LUMA LED DESK LAMP</i> kit) or very deep holes.</p>				

PADLOCKS

Suitable for locking out machinery. Keyed alike.


PADLOCK - 2.0MM SHACKLE	PL-5	5	1.38	PADLOCK - 4.0MM SHAKLE	PLL-5	5	2.20
	Small padlock. 20mm body. 3 keys per padlock.				PLL-25 25mm body. 3 keys per padlock.	25	8.75


NOTE: A free sample of these padlocks can be sent to you with your next order, if desired. Please include request on your next purchase order for your free sample.

MAGNIFYING

ITEM NAME	CODE	PRICE (each)	ITEM NAME	CODE	PRICE (each)
MAGNIFIER WITH TRIPOD	MG0255	10.91	LED MAGNIFIER LAMP – DESK MOUNT	LEDMGLAMP	66.00
	5cm diameter			High quality desk mount magnifier lamp with multi-position G-clamp mounting bracket; spring balanced metal arms and locking knobs that allow the unit to be secured in any position. 5 diopter (2.25x magnification) with 5-inch glass lens. Provides shadow-free light with no heat emissions which makes it ideal for intricate work such as when working on electronics and hobbies. Features a high magnification area and dust cover for then the desk lamp is not in use.	
FIELD MAGNIFIER	MGHJ2118	14.00	HANDISCOPE	MGHJ2126	17.00
	Loupe. Magnification - 10 times. 10 x 21mm. Stainless Steel. Includes Perspex travel box.			Go anywhere microscope. No batteries required. Ambient light & reflective mirrors provide strong 30x magnifications. Examine anything that will not fit under a traditional microscope.	


SAFETY WEAR

ITEM NAME	CODE	PRICE (each)	ITEM NAME	CODE	PRICE (each)
SAFETY GLASSES	LWSN150	6.60	SAFETY GOGGLES	LW457701	6.60
 <p>Polycarbonate. Unisafe. Snug fit. One-piece wraparound design. Australian Standards.</p>			 <p>Polycarbonate Lenses.</p>		
ULTRASAFE ECONOMICAL EARMUFFS – BLUE	EARM500021	15.95	MASKS – TITAN P2 VALVED DISPOSABLE RESPIRATOR	600622	20.50
 <p>Ultrasafe Economical Earmuff with a lightweight adjustable headband that provides an effective solution for everyday use. SLC80:29 dB, Class 5.</p> <p>Features:</p> <ul style="list-style-type: none"> - Thick blue ABS cup shell with earmuff cup size 7.5 x 10cm - Sound block solid cup for optimal noise protection - Cushioned pads with memory foam that create an excellent seal - Certified to AS/NZS 1270 Standard 		 <p>BULK PRICING: Carton contains 12 boxes of masks: each carton with 120 masks (=\$19 per box)</p>	<p>Pack of 10 single use latex free disposable masks. N95 Certified to NIOSH & Australian Standard. Polypropylene inner & outer layers provide comfortable feel. Sealed soft edges for minimised leakage. Heavy duty head straps with soft foam nose insert for added protection. Moulded nose piece and low breathing resistance for increased comfort.</p>	228.00 (carton)	
MASKS – TITAN P2 DISPOSABLE RESPIRATOR	606020	\$30.00	GLOVES – ULTRA TOUCH NITRILE BLUE POWDER FREE	468417	16.50
 <p>Pack of 20 single use flat fold preformed design disposable masks. N95 Certified to NIOSH & Australian Standard. Latex free, polypropylene inner & outer layers provide comfortable feel. Sealed soft edges for minimised leakage. Helps to prevent inhalation of dust & particles. Carbon layer added to reduce odours & ozone. Heavy duty head straps with soft foam nose insert for added protection. Adjustable nose piece & blow breathing resistance for added comfort.</p> <p>BULK PRICING: Carton contains 20 boxes of masks: each carton with 400 masks (=\$27.50 per box)</p>	\$550.00 (carton)	 <p>Box of 100 Nitrile Latex free, powder free blue disposable examination gloves. Suitable for a variety of applications including educational and lab settings. Certified to HACCP and ARTG listed. Chemo rated. Excellent puncture resistance for heavy duty work. Ambidextrous design. Beaded cuff. Odour free. Textured fingers for extra touch.</p> <p>Variety of sizes: XS (468417XS); S (468417S); M (468417M); L (468417L) & XL (468417XL)</p>			









<p>GLOVES – ULTRA FRESH VINYL POWDER FREE</p> <p>468402</p>  <p>Box of 100 clear vinyl powder free & latex free disposable gloves. HACCP certified. Available for a variety of purposes. Cost effective & basic barrier protection. Double layers of PVC/PU film to provide extra safety. Smooth inner surface for easy donning & beaded cuff helps prevent roll back. Ambidextrous.</p> <p>Variety of sizes - better fitting and dexterity: S (468402S); M (468402M); L (468402L) & XL (468402XL).</p>	<p>9.90</p>	<p>GLOVES – ULTRA FRESH POWDER FREE LATEX</p> <p>468405</p>  <p>Box of 100 powder free clear latex examination gloves. HACCP certified. Variety of uses. Contains natural rubber latex for enhanced basic barrier protection against unwanted or dangerous substances. Good puncture resistance. Ambidextrous. Smooth inner surface for easy donning and beaded cuff helps to prevent roll back.</p> <p>Variety of sizes - better fitting and dexterity: XS (468405XS); S (468405S); M (468405M); L (468405L) & XL (468405XL)</p>	<p>15.40</p>
<p>GLOVES – ULTRA FEEL NITRILE BIODEGRADABLE POWDER FREE</p> <p>468494</p>  <p>Box of 100 Nitrile Latex free green disposable examination gloves. Suitable for a variety of applications including educational and lab settings. HACCP Certified. Powder-free nitrile examination gloves. Full textured fingertips enhance wet and dry grip. Protection against unwanted and dangerous substances. Optimal industrial strength with excellent puncture resistance. Available in various sizes for better fitting and dexterity. Smooth inner surface for easy donning and beaded cuff helps to prevent roll back. Ambidextrous.</p> <p>Variety of sizes – better fitting & dexterity: S (468494S); M (468494M); L (468494L) & XL (468494XL)</p>	<p>17.60</p>	<p>RUBBERISED LABORATORY APRONS – BLACK</p>  <p>Perfect for the lab or even the art department. Built for durability and protection. Waterproof, chemical resistant. Won't stain and easy to wipe clean.</p> <p>Variety of sizes: Small - 92 x 69cm (LW0001-01) Medium - 107 x 69cm (LW0001-02) Large - 106 x 92cm (LW0001-03)</p>	<p>19.80</p>

MORE MASKS & DISPOSABLE GLOVES ON THEIR WAY TO SCORPIO TECHNOLOGY.

TABLES & BENCHES


ITEM NAME	CODE	PRICE
 <p>The image shows a rectangular table with a dark, possibly black, top surface. In the center of the top surface is a lighter-colored, square-shaped area, which is the granite slab mentioned in the text. The table has a sturdy, silver-colored metal frame with four legs. The legs are slightly angled outwards for stability. The table is shown from a three-quarter perspective, highlighting its compact and functional design.</p>	<p>104008036</p> <p>Ergonomically styled, the AVT offers a solid, stable surface developed specifically to help decrease vibration during measurement. When used in tandem with a balance, the table allows the balance to perform with marked precision, despite air currents or movements that might cause readings to fluctuate. The AVT is easy to assemble, with all necessary tools supplied.</p> <p>The internal working surface measures 400 X 450mm, allowing ample space for a balance. Its large, scratch-resistant dark granite slab sits on shock-absorbing rubber mounts, while leveling feet accommodate uneven surfaces. The balance fits in the middle of the AVT's granite surface, stabilizing the base and enabling greater precision.</p> <p>Features and Benefits</p> <ul style="list-style-type: none"> • Two-table construction keeps the granite slab in the middle and reduces interference. • Large work surface of 400 x 450mm. • Scratch-resistant granite slab. • Resin laminate tabletop provides ample work surface for resting samples or documents. • Resistant coating to help protect the table from acid and alkaline spillages. • Lightweight tubular aluminium frame. • Adjustable levelling feet for uneven surfaces. • Polished finish is easy to clean. • Total weight of table and work surface 55kg. • A 5-year warranty means quality assured for years of use. <p>Assembly required.</p> <p>NOTE: Oversized item. Will incur additional shipping costs.</p>	<p>\$1,639.00</p>

STORAGE SOLUTIONS


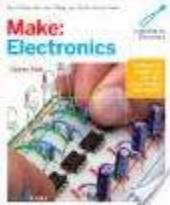
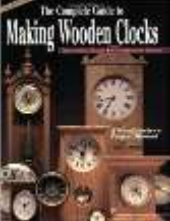
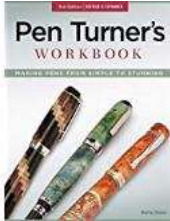
ITEM NAME	CODE	PRICE (each) 1-19	PRICE (each) 20+	ITEM NAME	CODE	PRICE (each) 1-19	PRICE (each) 20+
CASE – METAL ENCLOSED 150MM	CASEM150	18.85	18.47	JIFFY CASE (to suit WIND-UP TORCH)	JIFCASE	4.95	3.95
	Aluminium case, 150 x 61 x 102 mm, finished in grey with black finish steel cover. Ventilated and supplied with rubber feet. Weight: 260g.				This Jiffy Case is the perfect size to fit the <i>WIND-UP TORCH</i> into. Dimensions 130mm (L) x 67mm (W) x 43mm (H)		
CONTROL BOX	CBOX	2.90	2.90	JIFFY CASE –SMALL	JIFCASELD	3.75	3.35
	Clear plastic control box. Dimensions: 94msss mm x 68mm x 32mm. With hinged lid.				Dimensions (approx.) 83mm x 54mm x 31mm. This jiffy case is suitable to mount the Protoboard (PCB-PROTO) onto, using the 8mm Spacer (SPACER8). Suits <i>ELECTRONIC DICE</i> (ELDICE).		
DVD CASE	CASEDVD	0.27	0.25	PLASTIC STORAGE BOX	CASE	5.95	5.95
	Slim-line black transparent plastic CD/DVD storage case.				Dimensions (approx.) 340mm x 220mm x 47mm. 23 adjustable compartments. Removable dividers so it can be configured to store larger items.		
PLASTIC STORAGE BOX – 18 COMPARTMENT	CASE18	5.95	5.50	MULTIMETER CARRY CASE	CASEMULTIM	8.95	8.95
	Plastic storage case comprising of 3 rows with removable dividers so that it can be configured for longer parts. Total of 18 compartments: 3.7 x 3.7 x 3cm. Overall storage case dimensions: 23 x 11.5 x 3.5cm.				Zip up carry case for digital multimeters. Spacious 190 x 125 x 45mm size foam lined bag has room for additional leads.		

PLASTIC STORAGE BOX WITH LID – 3.5L	CASE3.5L	3.85	3.85	PLASTIC STORAGE BOX WITH LID – 5L	CASE5L	4.25	4.25
 <p>Max 3.5l plastic Storage Container with Lid</p> <p>10.5 x 25.5 x 18 (h x l x w). Made in Australia. Made from virgin Polypropylene. BPA Free.</p>				 <p>5l plastic Storage Container with Lid.</p> <p>10 x 31 x 22cm (h x l x w). BPA Free. Also suitable for freezer, fridge, dishwasher & microwave (with lid removed).</p>			







SNAP LOCK BAGS – CLEAR


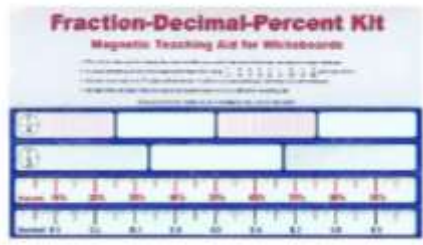

	ITEM NAME	CODE	BAG SIZE (cm)	DESCRIPTION	PRICE
	PLASTIC BAGS 50 X 75MM	BAG2X3	5 X 7.5	Multi-purpose resealable polythene magic seal bags. Reusable, reclosable, press-seal, low density bags.	1.85
	PLASTIC BAGS 75 x 100MM	BAG3X4	7.5 x 10		2.95
	PLASTIC BAGS 100 X 150MM	BAG4X6	10 x 15	Can be used for component, kit, sample & specimen storage. Made from high quality virgin LDPE.	4.60
	PLASTIC BAGS 125 X 205MM	BAG5X8	12.5 x 20.5		6.70
	PLASTIC BAGS 150 X 230MM	BAG6X9	15 x 23	50 microns thick (um).	9.40
	PLASTIC BAGS 205 X 305MM	BAG8X12	20.5 x 30.5	Supplied in bags of 100.	13.50

BOOKS & RESOURCES

ITEM NAME	CODE	PRICE
<p>MAKE: EASY ELECTRONICS</p> 	<p>BOOKEASYELEC</p> <p>By Charles Platt. Paperback. An excellent book filled with fun experiments to provide students with a simple, yet quick, introduction to electronics. 12 experiments to introduce students to a variety of electronic components (Our INTRODUCING ELECTRONICS kit is based on the book).</p>	<p>18.48</p>
<p>MAKE: ELECTRONICS: LEARNING BY DISCOVERY</p> 	<p>BOOKMAKEELEC</p> <p>By Charles Platt. Paperback. A fun, hands-on way to learn the fundamentals of electronics. Learn all the basic components and important principles. From basic circuits to more complex concepts. Teaches the basics of soldering, use of hand & bench tools. Suitable for beginners or those with intermediate skills.</p>	<p>51.25</p>
<p>THE COMPLETE GUIDE TO MAKING WOODEN CLOCKS</p> 	<p>BOOKWOODCL</p> <p>By John A. Nelson.</p> <p>This book shows how to make beautiful timber clocks. Each clock has been photographed in colour, has instructions and plans. Suitable for a range of skill levels.</p>	<p>50.59</p>
<p>THE PEN TURNER'S WORKBOOK: MAKING PENS FROM SIMPLE TO STUNNING</p> 	<p>BOOKPENTURN</p> <p>By Barry Gross.</p> <p>This stunning book shows a large variety of techniques and ideas to make beautiful lathe turned pens. The book is full of close-up photos showing step by step instructions. An excellent resource.</p>	<p>44.26</p>

WHITEBOARD ACCESSORIES

ITEM NAME	CODE	Qty.	PRICE
MAGNETIC WHITEBOARD COMPASS	WBEM05	1	25.00
	The spring penholder which allows any size pen to be snapped in position. 18-22mm. Designed for whiteboard / dry erase markers. 40cm arms - 70cm radius. Suction cup on a ball swivel		
MAGNETIC PEN RING	WBEM014	Pack of 4	1.00
MAGNETIC COUNTING BUTTONS	WBEM07	Pack of 25	4.50
	Choice of green, blue or red (<i>please specify colour</i>).		
MAGNETIC SQUARE BULLDOG CLIP	WBEM08	2	6.00
	40mm wide square magnetic bulldog clips. Sturdy chrome steel clip for use on magnetic boards. Strong ferrite magnet. Pair.		
MAGNETIC WHITEBOARD ERGONOMIC ERASER	WBEM012	1	9.25
	With replaceable pads. Includes 4 spare pads.		
WHITEBOARD ERASER SPARE PADS	WBEM043	Pack of 10.	6.50
BLACKBOARD CHALK HOLDER	WBEM019	1	1.00
	(LIMITED STOCK)		
PROTRACTOR 180° DEMONSTRATION	WB10096	1	29.00
	36cm in diameter with vortex indicator & handle. Extra large for teacher demonstration in the classroom.		

<p>MAGNETIC WHITEBOARD CLOCK</p> 	<p>WBEM021</p> <p>30x35cm, screen printed magnetic sheeting. Moveable plastic clock hands.</p> <p>Teaches reading of analogue clock.</p>	<p>1</p>	<p>10.00</p>
<p>MAGNETIC FRACTION/DECIMAL/ PERCENT KIT</p> 	<p>WBNT018</p> <p>Screen printed – magnetic plastics. Excellent teaching aid. Clearly demonstrates connection between fractions, decimals and percentages.</p>	<p>1</p>	<p>15.00</p>
<p>MAGNETIC STRIP</p> 	<p>WBEM2415</p> <p>Rubberised adhesive, 19mm (w) magnetic strip, can be cut to any size.</p>	<p>Per metre</p>	<p>6.00</p>

PLEASE NOTE: All whiteboard accessories available - while stocks last.

APPENDIX A - SCORPIO KITS LEVEL SELECTION SUMMARY TABLE

TECHNOLOGY & SOLAR KITS		
MYOB CODE	NAME OF KIT / ITEM	LEVEL
AUTOMAX	Automax	Solar Challenge
AXBKTK	Axle Bracket kit	Solar Challenge
AXFRK	Axle and Frame kit	Solar Challenge
BALAN	Balance Plane	Introductory
BALAN-NS	Balance Plane (No Solder)	Introductory
BEETLE	Beetle	Advanced
BEEPA	Beepa	Advanced
BELTCAR	Belt Driven Car	Introductory
BELTCAR-NS	Belt Driven Car (No Solder)	Introductory
BLUEBIRD	Bluebird – Blue Brothers	Primary
BLUEFIN	Blue Fin Fan Cart	Introductory
BLUESKY	Blue Sky – Blue Brothers	Primary
BLUEY	Bluey – Blue Brothers	Primary
BREEZY	Breezy – Blue Brothers	Primary
BUBBLE-NS-GF	Bubble Blower – No Solder – GF	Introductory
BUBBLEV2	Bubble Blower	Introductory
BUBBLEV2-NS	Bubble Blower (No Solder)	Introductory
BUGGY2WD	Buggy 2WD Robot***	Introductory
CAPTIVE	Captive Aeroplane	Introductory
CAPTIVE-NS	Captive Aeroplane (No Solder)	Introductory
CHALLENGERV2	Challenger Solar Car Kit V2	Solar Challenge
CONTROLLER	Controller	Subsystem
DIZZY	Dizzy	Advanced
DRAG	Dragster	Intermediate
DRAG-NS	Dragster (No Solder)	Intermediate
DRAG-RACE	Dragster Racing Kit	Testing
ELDICE***	Electronic Dice	Electronics
ELGENDEM	Electricity Generation Demonstration	Intermediate

EXPLORER	Explorer	Intermediate
FAUMMK	Faulhaber Mounting Kit	Solar Challenge
FAUMOTK	Faulhaber Motor & Mounting Kit	Solar Challenge
FERRV2*	Ferris Wheel V2	Intermediate
FERRV2-NS*	Ferris Wheel V2 (No Solder)	Intermediate
FERRV3	Ferris Wheel V3	Intermediate
FERRV3-NS	Ferris Wheel V3 (No Solder)	Intermediate
FORKLIFT	Forklift	Advanced
FRONT	Front Wheel & Steering Linkage	Subsystem
FWLV	Follow White Line Vehicle	Advanced
GOM	Generator Output Monitor	Subsystem
HARNESS26	Wiring Harness Kit (Solar 26)	Solar Challenge
HOVER	Hovercraft	Intermediate
INTROELEC	Introducing Electronics	Electronics
IRCU	Infra-Red Control Unit	Subsystem
IRCU with PCBIR6-A	INFRA-RED CONTROL UNIT – 6 BAND With Assembled PCBS	Subsystem
IRCU with PCBIR6-UN	INFRA-RED CONTROL UNIT – 6 BAND with Unassembled PCBS	Subsystem
JOUST with PCBIR6-A	Jouster – with assembled 6 Band PCBs	Intermediate
JOUST with PCBIR6-UN	Jouster – with unassembled 6 Band PCBs	Intermediate
JOUSTU with PCBIR6-A	Jouster – with unassembled gearbox & assembled 6 Band PCBs	Intermediate
JOUSTU with PCBIR6-UN	Jouster – with unassembled gearbox & unassembled 6 Band PCBs	Intermediate
LEDTLK	LED Touch Lamp	Intermediate
LEDTOR	LED Torch	Intermediate
LEDTORSING	Single LED Torch	Introductory
LINETRACKER	Intelligent Line Tracking Car	Intermediate
LORIDER	Lo-Rider	Introductory

LUMA	LUMA LED Desk Lamp	Intermediate
MARK	Mark's Monster	Intermediate
MARK-NS	Mark's Monster (No solder)	Intermediate
MMWTL	Mark's Monster with the lot	Primary
MORSE	Morse Code Kit	Electronics
MRWALK	Mr Walker	Intermediate
MSC	Motor Speed Controller	Subsystem
OLED	OLED Module	Subsystem
PICSPPC08M2	Picaxe 08M2 SPPC	Subsystem & Solar
POWADJ	Adjustable Power Supply	Intermediate
POWADJBUND1	Adjustable Power Supply + 12V Power Pack + Enclosed Metal Case	Intermediate
POWADJBUND2	Adjustable Power Supply + 12V Power Pack + Enclosed Metal Case + Plug	Intermediate
PROPC	Propelled Driven Car	Introductory
PROPC-NS	Propelled Car (No Solder)	Introductory
RCU + PCBRCRT-A	Radio Controlled Unit + Assembled PCB	Advanced
RCV + PCBRCRT-UN	Radio Controlled Vehicle (Includes RCU) With Unassembled PCBs	Advanced
REVDRIVE	PCB-Reverse & IC 93MC Set	Subsystem
REVPCB	Reverse PCB Kit	Subsystem
ROBARM	Robot Arm Kit	Advanced
ROBARMCONT	Robot Arm Controller (Conversion Kit)	Advanced
ROBARMWTC	Robot Arm with Controller	Advanced
ROBOBUG	Robobug	Intermediate
SBTADV	Advanced Solar Boat	Solar Challenge
SBTINT	Intro Solar Boat	Intermediate
SBTJUN	Junior Solar Boat	Intermediate
SCOR	Scorpio Constellation	Intermediate
SCRINT	Intro Solar Car	Intermediate
SEEKERV2	Seeker v2 Unassembled Gearbox	Advanced

SEEKERV2YEL	Seeker v2 Yellow	Intermediate
SHERIDAN	Sheridan Car Challenge	Solar Challenge
SIMPCFAHN	Simple Circuits – Fahnstock	Electronics
SIMPCIRC	Simple Circuits	Electronics
SIMPCEXT1	Simple Circuits – Extension Kit 1	Electronics
SIMPCEXT2	Simple Circuits – Extension Kit 2-EM	Electronics
SIMPLE	Simple Vehicle	Intermediate
SM403MMK	SM403 Motor Mounting Kit	Solar Challenge
SM403MOTK	SM403 Motor & Mounting Kit	Solar Challenge
SOCCER	Soccer 'Bot	Introductory
SOCCER-NS	Soccer 'Bot (No solder)	Introductory
SOLARB	Solar Car (Basic)	Introductory
SOLARB-NS	Solar Car (Basic), (No solder)	Introductory
SOLARINTRO	Introducing Solar Energy Kit	Electronics
SOLARv2	Solar Car (V2)	Introductory
SOLCOMP	Solar House Project Components Kit	Solar Project
SOLDPRAC	Solder Practice Kit	Intro Electronics
SOLDV	Solar Car (Advanced)	Intermediate
SOLCOMP	Solar House Project – Components Kit	Solar Project
SOLCORHOUSE	Solar House Project – Corflute	Solar Project
SOLHOUSEK	Solar House Kit	Solar Project
SOLPROJBRD	Project Board Kit	Solar Project
SPPCL	Solar Panel Power Controller – Low Voltage	Subsystem & Solar
SPPCS	Solar Panel Power Controller – Standard Voltage	Subsystem & Solar
STEADY-NS	Steady Hand Game (No Solder)	Introductory
STEADYSEC	Steady Hand Game	Introductory
STOMPER	Stomper	Intermediate
TRANT	Transistor Tester	Tools
TRAY26	Aluminium Tray Kit for Solar26	Solar Challenge

WANDV2	Wanderer v2 Unassembled Gearbox	Advanced
WHIRL	Whirly	Introductory
WHIRL-NS	Whirly (No Solder)	Introductory
WINDGEN	Wind Generator	Intermediate
WINDT	Wind-Up Torch	Intermediate
WOMBATV2	Wombat v2	Advanced

**This version is being phase out and replaced by V3.*

****Suitable for Arduino projects*

PAT'S MICROCONTROLLER KITS (PROGRAMMABLE)		
BUGGY	Robot Buggy	Introductory Micro- controller
ELDICE***	Electronic Dice	
HCMDRIVE	Motor Drivers (Suit Collector Current Up To 1.2a)	
HEXAPODBOTACR	Hexapod Robot - Clear acrylic	
HEXAPODBOTPLY	Hexapod Robot - Plywood	
LCMDRIVE	Motor Drivers (suit Collector current up to 0.5A)	
PATSCOUNT	Basketball Counter	
PATSDISC	Animated LED Disc	
PATSIR	Infra Red Add On	
PATSMICRO	Pat's Microcontroller	
PATSMICRONLB	Pat's Microcontroller – No LEDs or Buzzer	

GEARBOXES		
GADVAN	Multi-Ratio Advanced Gearbox Kit	Subsystem
GBASIC	Basic Gearbox & Motor	
GFOUR	Four Ratio Gearbox (Changeable)	
GINTER	Intermediate Gearbox Kit	
GMULTI	Multi-Ratio Gearbox	
GRED	Gearbox & Motor / Generator Kit	
GSHALL	Shallow Gearbox	
GTWORKIT	Two Ratio Gearbox Kit	
GVERS6	Versatile Gearbox Kit – 6 Speed	

APPENDIX B – SUBSYSTEMS - GEARBOX SUMMARY TABLE

KIT NAME	CODE	REQUIRES ASSEMBLY	MOTORS	GEAR RATIO					
				FIRST	SECOND	THIRD	FOURTH	FIFTH	SIXTH
BASIC GEARBOX & MOTOR	GBASIC	YES	MOT17	50:12	21:12	---	---	---	---
FOUR RATIO GEARBOX*** (Changeable) - Variations listed:		ASSEMBLED	3.0V					---	---
	GFOUR-1:12			1:12	---	---	---	---	---
	GFOUR-1:32			1:32	---	---	---	---	---
	GFOUR-1:84			1:84	---	---	---	---	---
	GFOUR-1:236			1:236	---	---	---	---	---
FOUR RATIO GEARBOX*** SINGLE SIDED (Changeable) - Variations listed:		ASSEMBLED	3.0V						
	GFOURS-1:12			1:12	---	---	---	---	---
	GFOURS-1:32			1:32	---	---	---	---	---
	GFOURS-1:84			1:84	---	---	---	---	---
	GFOURS-1:236			1:236	---	---	---	---	---
GEARBOX & MOTOR/GENERATOR KIT	GREDD	YES	GENDC	---	---	---	60:1	---	---
INTERMEDIATE GEARBOX KIT	GINTER	YES	MOT17	1:4	1:16	1:64	1:256	---	---
MULTI-RATIO ADVANCED GEARBOX KIT	GADVAN	YES	MOT17 or MOT30	1:5	1:18	1:64	1:228	---	---
MULTI-RATIO GEARBOX KIT	GMULTI	YES	MOT17 or MOT30	1:5	1:25	1:125	1:625	---	---
SHALLOW GEARBOX KIT	GSHALL	YES	MOT17	1:30	1:125			---	---
VERSATILE GEARBOX KIT – 6 SPEED	GVERS6	YES	MOT22	1:22	1:48	1:88	1:192	1:242	1:290

*** All four variants of the Four Ratio Gearboxes (both single sided and double sided) are available pre-assembled.

APPENDIX C – SOLAR CHALLENGE (TECHNICAL GUIDE)

MODEL SOLAR BOAT CHALLENGES

KITS FOR INTRODUCING SOLAR (NON COMPETITIVE)	STARTER KITS FOR SOLAR CHALLENGE PROJECTS
INTRO SOLAR BOAT (SBTINT)	JUNIOR SOLAR BOAT KIT (SBTJUN)
	ADVANCED SOLAR BOAT KIT (SBTADV)

TECHNICAL GUIDE – REQUIREMENTS TO DESIGN AND BUILD A MODEL SOLAR BOAT

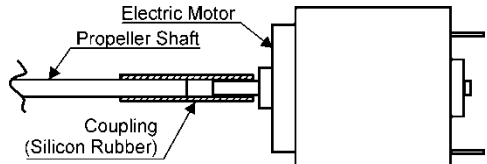
WHAT PARTS ARE REQUIRED?	WHAT TOOLS ARE NEEDED?
<ul style="list-style-type: none"> 1 x Solar panel and wiring 1 x Electric motor 1 x Propeller and Propeller shaft, etc. 1 x Hull material/s 1 x Switch (3 position) 1 x Solar Panel Power Controller (Low Volt)** 2 x Guide wire followers <p>Various other components and sundry items, for example: adhesives, cable ties, velcro (hook and loop) ...</p>	<p>The basic tools needed to make a boat include:</p> <ul style="list-style-type: none"> Side cutters and wire strippers Small hammer Soldering iron and stand, solder Craft knife and scissors Ruler and pen / marker Cutting tools (e.g. Hacksaw, mini bolt cutters) Shaping tools for the hull (e.g. Hot wire cutter, rasp, flat file, sandpaper)

*Always check your State's current Solar Challenge Regulations to ensure you comply

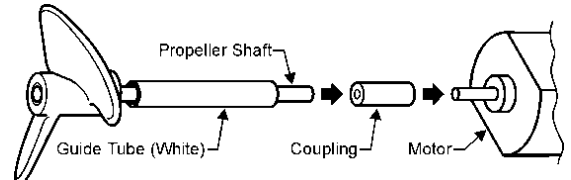
**Advanced Division only.

MODEL SOLAR BOAT - PROPELLERS & SHAFTS

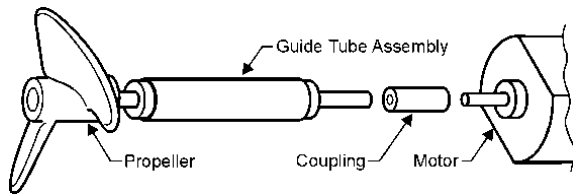
HOW DOES IT GO TOGETHER? WHAT CHOICES ARE THERE? Our range of components starts with a basic economical set up when starting out, and extends to carbon fibre propeller shafts and Driveline bearings.

 <p>Assembling a motor to a Propeller shaft</p>	<p>The coupling provides a flexible connection between motor and propeller shafts.</p> <p>The silicon-rubber coupling (COUP1.8) has an inner diameter of 1.8mm and will stretch over both the 2.0mm motor shaft and the 2.5mm propeller shaft.</p>
---	--

There are a number of options for making the propeller shaft and tube, and are shown below:

 <p>The Propeller shaft and guide tube (using GUIDW)</p>	<p>There are 2 choices in propeller shaft material:</p> <ul style="list-style-type: none"> - 2.5mm steel rod (STR2.5) - 2.5mm carbon fibre rod (CFR). <p>The drawing on the left shows the more economical set up, using 2.7mm ID guide tube (GUIDW).</p>
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THIS IS THE RECOMMENDED SET UP FOR COMPETITION:

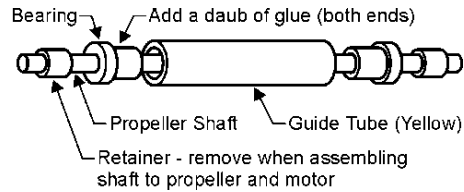


Propeller shaft and guide tube (using GUIDY & Boat bearings (BEARBT))

There are 2 choices in propeller shaft material:

- 2.5mm steel rod (STR2.5)
- 2.5mm carbon fibre rod (CFR).

The drawing on the left shows the recommended set up, using 4.5mm ID guide tube (GUIDY) and a Bearing (BEARBT) at each end. This reduces friction to a minimum, as the shaft only has 2 contact points.



Assembling the Low-friction Guide tube assembly (using GUIDY)
(using short pieces of coupling as retainers)

The drawing on the left shows the assembly procedure for the Guide tube and bearings.

The chart below summarises the pictorial information above. Each line (Option) spells out which parts go together for that option.

2.5MM PROPELLER SHAFT	MOTOR	COUPLING	SHAFT		GUIDE TUBE		DRIVELINE BEARING BEARBT	PROPELLER #2
		COUP1.8 (1.8mm ID)	STR2.5	CFR	GUIDEW	GUIDY #1		
Option 1: Steel	✓	✓	✓		✓			✓
Option2: Carbon Fibre	✓	✓		✓	✓			✓
Option3: Steel	✓	✓	✓			✓	✓	✓
Option4: Carbon Fibre	✓	✓		✓		✓	✓	✓

#1 This tube has a larger inner diameter, so that Driveline bearings are used to reduce friction and reduce power consumption, and is for use with the 2.5mm carbon fibre or steel rod

#2 The 2 and 3 blade boat propellers are an interference-fit onto a 2.5mm shaft.

APPENDIX C2 – SOLAR CHALLENGE (TECHNICAL GUIDE)

MODEL SOLAR CAR CHALLENGES

KITS FOR INTRODUCING SOLAR (NON COMPETITIVE)	STARTER KITS FOR SOLAR CHALLENGE PROJECTS
INTRO SOLAR CAR (SCRINT)	CHALLENGER SOLAR CAR v2 (CHALLENGERV2)
	SHERIDAN KIT CAR (SHERIDAN)

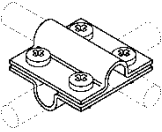


TECHNICAL GUIDE – REQUIREMENTS TO DESIGN AND BUILD A MODEL SOLAR CAR.

WHAT PARTS ARE REQUIRED?	WHAT TOOLS ARE NEEDED?
<ul style="list-style-type: none"> 1 x Solar panel and wiring 1 x Electric motor, mounting and gearing 1 x Wheels, bearings and axles Frame / body materials 1 x Switch (3 position) 1 x Solar Panel Power Controller (Low Volt / AutoMax **) Guide rail followers Various other components and sundry items, for example: Adhesives (such as silicon roof and gutter sealant), cable ties, velcro (hook and loop) ... 	<p>The basic tools needed to make a boat include:</p> <ul style="list-style-type: none"> Side cutters and wire strippers Small hammer Craft knife and scissors, Ruler and pen / marker Drill and drill bits, Hot glue gun Soldering iron and stand, solder Cutting tools (e.g. fine blade hacksaw, mini bolt cutters) Shaping tools for the hull (e.g. Hot wire cutter, rasp, flat file, sandpaper) Screwdrivers, Allen keys

* Always check your State's current Solar Challenge Regulations to ensure you comply

** Advanced Division only.

MODEL SOLAR CAR - FRAMES / CHASSIS (using 6mm Carbon Fibre tube)

HOW CAN I CONSTRUCT A FRAME / CHASSIS FOR MY CAR using 6.0mm CARBON FIBRE TUBES?:	
<p>AXLE BRACKET KIT (AXBKTK) consists of 8 axle brackets, nuts and bolts to assemble 6mm carbon fibre tubes into a rectangle.</p> 	
<p>AXLE & FRAME KIT (AXFRK) consists of the Axle Bracket Kit and two 650mm long 6mm diameter carbon fibre tubes.</p>	
<p>ELBOWS can be used to create a 3-dimensional frame – the Elbows are glued into the end of the tubes to create right angle joints.</p>	

MODEL SOLAR CAR - FAULHABER MOTOR MOUNTING

The Faulhaber 2232 motor can be mounted onto a solar Car using a *FAULHABER MOTOR MOUNTING KIT* – either by bolting the motor mounting kit to a car body, or by using the included Axle bracket to attach it to 6mm carbon fibre tube.

FAULHABER & MOUNTING KIT (FAUMOTK). This consists of:

- 1 x *FAULHABER MOTOR MOUNTING KIT*
- 1 x Faulhaber 2232 motor



FAULHABER MOTOR MOUNTING KIT (FAUMMK). This consists of an adjustable mounting bracket and plate and includes one Axle Bracket (to mount this onto 6mm tube)



MODEL SOLAR CAR - AXLES AND WHEELS

WHAT CHOICES DO I HAVE for AXLES AND WHEELS? HOW DO I ASSEMBLE THEM?

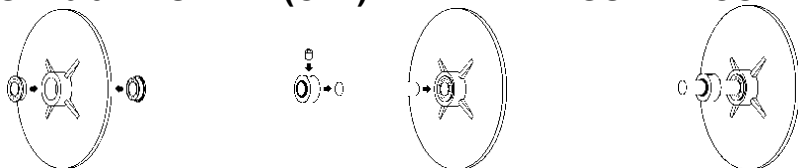
Our broad range allows for a lot of choices, from basic (wheel & axle) up to carbon fibre tubes with bearings and collars. The first listed option is the recommended set-up for competing, and other options are listed below that.

THIS IS THE RECOMMENDED SET UP FOR COMPETITION:

This is based around the use of 6mm Carbon fibre tube, which is light and strong and is integrated into the chassis.

- The wheel hub accepts two flanged 10mm bearings side by side, and they are press-fitted in the hub.
- The wheels are held onto the tube by the use of collars on either side.
- SW70E are plain wheels (2mm thick – 10mm ID). For providing friction to the surface, wheel SW70E-GR has a wider outside surface and is grooved, to allow an O-ring (ORING55) to be used to provide traction to the track.
- Three wheels are usually used without friction material to keep friction on the track to a minimum.
- One driving wheel should have a “tyre” to increase friction on the track.

USING A 6.0MM SHAFT (CFT) AND BEARINGS AND COLLARS



Step 1 Insert the bearings from both sides

Step 2 Insert the shaft

Step 3: Add and fasten collars from both sides

THE WHEELS AND TYRE:



SW70E



SW70E-GR

USING O-RINGS AS TYRES: The 55mm O-Ring is stretched to fit over the wheel. It sits in the groove around the wheel.





Axle & wheel setup	Wheels		Bearings	Tyre	Axle	Collar
	SW70E	SW70EGR	BEAR10F	ORING55	CFT	COLLAR
6.0mm Axle	✓	✓	✓	✓	✓	✓

THESE SET UPS USE 3.0mm SHAFTS AND BEARINGS TO PROVIDE A LOW FRICTION DRIVELINE:

There are choices in wheels, for the options listed below:

1. *SW70A* are plain wheels (2mm thick – 7.0mm ID). For providing friction to the surface, wheel *SW70A-GR* has a wider outside surface and is grooved, to allow an O-ring (**ORING55**) to be used to provide traction to the track.
2. *SW70E* are plain wheels (2mm thick – 10mm ID). For providing friction to the surface, wheel *SW70E-GR* has a wider outside surface and is grooved, to allow an O-ring (**ORING55**) to be used to provide traction to the track.
3. If *TYRE* material is chosen, then 4 of the same type of wheels (non-grooved) will be required.
 - #a: Three wheels are usually used without friction material to keep friction on the track to a minimum.
 - #b: One driving wheel should have a “tyre” to increase friction on the track.
 - #c: The wheel hub accepts two bearings side by side, and they are press-fitted in the hub.

The use of these 3.0mm shafts requires the user to mount the axle and its axle tube to the body.

<p>USING A 3.0MM SHAFT AND BEARINGS</p>  <p>Step 1 Insert the bearings from both sides Step 2 Insert the shaft (gently tapping with a hammer)</p>	<p>The drawing on the left shows the a low friction set up using the 3.0mm shaft, using Ball Bearings. There are a variety of options using bearings.</p>  <p><i>BEAR7</i> <i>BEAR10</i></p> <p><i>BEAR10/3F</i> (Flanged)</p>
<p>THE WHEELS:</p>  <p><i>SW70A</i> <i>SW70E</i></p> <p><i>SW70A-GR</i> <i>SW70E-GR</i></p>	<p>USING O-RINGS AS TYRES: The O-Ring is stretched to fit over the wheel. It sits in the groove around the wheel</p> 

The chart below summarises the options available for 3.0mm shafts using bearings. Each line spells out which parts go together.

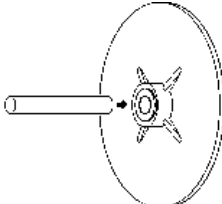
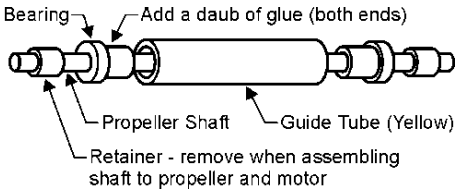
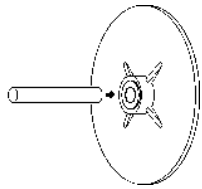
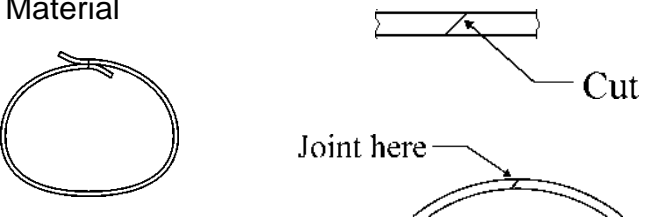
Axle and Wheel set up Options	Wheels #a & #b				Bearings #c			Tyre	Axle		Guide Tube
	SW70A	SW70AGR	SW70E	SW70EGR	BEAR7	BEAR10	BEAR10 /3F	ORING55	FIBGRD500	CFR3.0	GUIDG
3.0mm Axle using Grooved wheels and O rings											
... and 7.0mm Bearings											
Option 1: 3.0mm Fibreglass rod	✓	✓			✓			✓	✓		✓
Option 2: 3.0mm Carbon fibre rod	✓	✓			✓			✓		✓	✓
... and 10.0mm Bearings											
Option 3: 3.0mm Fibreglass rod			✓	✓		✓		✓	✓		✓
Option 4: 3.0mm Carbon fibre rod			✓	✓		✓		✓		✓	✓
... and Flanged 10.0mm Bearings											
Option 5: 3.0mm Fibreglass rod			✓	✓			✓	✓	✓		✓
Option 6: 3.0mm Carbon fibre rod			✓	✓			✓	✓		✓	✓

Axle and Wheel set up Options	Wheels		Bearings #c			Tyre	Axle		Guide Tube
	SW70A	SW70E	BEAR7	BEAR10	BEAR10/3F	TYRE / TY71	FIBGRD500	CFR3.0	GUIDG
3.0mm Axle using plain wheels and Tyre material									
... and 7.0mm Bearings									
Option 7: 3.0mm Fibreglass rod	✓		✓			✓	✓		✓
Option 8: 3.0mm Carbon fibre rod	✓		✓			✓		✓	✓
... and 10.0mm Bearings									
Option 9: 3.0mm Fibreglass rod		✓		✓		✓	✓		✓
Option 10: 3.0mm Carbon fibre rod		✓		✓		✓		✓	✓
... and Flanged 10.0mm Bearings									
Option 11: 3.0mm Fibreglass rod		✓	✓		✓	✓	✓		✓
Option 12: 3.0mm Carbon fibre rod		✓	✓		✓	✓		✓	✓

THESE SET UPS ARE AN ECOMICAL WAY TO START OUT, BUT ARE NOT RECOMMENDED FOR SERIOUS COMPETITORS:

The simplest set up is the use of 2.5mm or 3.0mm shafts with the 70mm wheels. The wheels are an interference fit onto the shaft and need to be have the shaft hammered into the them.

- The use of any of these shafts requires the user to mount the axle and its axle tube to the body.

<p>USING A 2.5MM SHAFT</p>  <p>Insert the shaft into the wheel</p>	<p>The simplest set up is the use of 2.5mm shafts with the 70mm wheels (<i>SW70D</i>).</p>
<p>Using a 2.5mm shaft (Low friction option)</p> 	<p>The drawing on the left shows how to assemble the low friction set up using the 2.5mm shaft, using 4.5mm ID guide tube (<i>GUIDY</i>) and a Bearing (<i>BEARBT</i>) at each end. This reduces friction to a minimum, as the shaft only has 2 contact points.</p>
<p>USING A 3.0MM SHAFT</p>  <p>Insert the shaft into the wheel</p>	<p>The 3.0mm shafts provides a stronger axle that the 2.5mm shaft, and is paired with the 70mm wheels (<i>SW70B</i>).</p>
<p>WHAT ABOUT THE WHEELS?</p> <p>TYRE Material</p> 	<p>Three wheels are usually used without friction material to keep friction on the track to a minimum.</p> <p>One driving wheel should have a “tyre” to increase friction on the track.</p> <p>USING TYRE MATERIAL: An adhesive such as Loctite 406 Retaining compound can be used to glue the tyre material ends together to form a tyre</p>

WHAT ABOUT WHEELS USING THE TYRE 71MM RUBBER EXTRUSION?

Install the tyres over the rear wheels, much the same as you would a bike tyre, starting at the bottom, and working up. As the wheels are very narrow, it can be fiddly to get the tyres to seat properly.

WARNING: Be careful when installing the tyres, as they are NOT rubber bands and have very little stretch in them – they can easily be broken at the join.

The chart below summarises the options available for 2.5mm and 3.0mm shafts – without the use of bearings. Each line (Option) spells out which parts go together for that option.

Axle Diameter and Options	Wheels #1 & #2		Tyre #2	Axle				Guide Tube			Bearing
	SW70B	SW70D	TYRE / TY71	STR2.5	CFR	FIBGRD 500	CFR3.0	GUIDW	GUIDG	GUIDY	BEARBT
2.5mm Axle											
Option 1: Steel		✓	✓	✓				✓			
Option 2: Carbon Fibre Rod		✓	✓		✓			✓			
Option 3: Steel		✓	✓	✓						✓	✓
Option 4: Carbon Fibre Rod		✓	✓		✓					✓	✓
3.0mm Axle (NO bearings)											
Option 5: Steel / Fibreglass Rod	✓		✓			✓			✓		
Option 6: Carbon Fibre Rod	✓		✓				✓		✓		

ESSENTIALS FOR BOTH CAR & BOAT...

ELECTRIC MOTORS	Solar Motor SM403 Faulhaber 2232	SM403 SMFAU
AUTOMAX SOLAR MPPT	Automax	AUTOMAX
PROGRAMMABLE SOLAR PANEL POWER CONTROLLER	Picaxe Programmable Solar Panel Power Controller	PICSPPC08M2
SOLAR PANEL POWER CONTROLLER	Solar Panel Power Controller – Low Voltage (Useful In The Solar Challenges)	SPPCL
SOLAR PANELS	Solar Panel No. 26 Solar Panel No. 10 Calibrated	SOLAR26 SOLAR10
SOLAR PANEL WIRING HARNESS FOR SOLAR26	Wiring Harness For Solar26	HARNESS26
SWITCHES	One Way Toggle Switch (SPDT “On-Off”) Two Way Toggle Switch (DPDT “On-Off-On”) Small Sliding Switch (On-Off) Large Sliding Switch (Series-Off-Parallel)	SW1W SW2W SSWS SSWL
PLATFORM & HULL MATERIAL (FOR EITHER CAR OR BOAT)	Corflute Sheet 300mm X 200mm X 5mm	CORF200/300/5
PROPELLER SHAFTS, AXLES & GUIDE TUBES	Various	

ESSENTIALS FOR SOLAR BOATS...		
PLATFORM & HULL MATERIAL	Styrofoam (For Monohull) 300mm X 200mm X 25mm	STYRO300/200/25A
	Styrofoam (For Catamaran) 300mm X 50mm X 25mm	STYRO300/50/25
COUPLING	Coupling 1.8/3.8mm	COUP1.8
	Coupling 2.0/4.0mm	COUP2.0Y
BOAT PROPELLERS	Propeller – 2 Blade	PROP2
	Propeller – 3 Blade	PROP3
DRIVELINE BEARINGS	Boat Driveline Bearings	BEARBT

ESSENTIAL FOR SOLAR CARS		
FAULHABER MOTOR MOUNTING	Faulhaber & Motor Mounting Kit	FAUMOTK
	Faulhaber Mounting Kit	FAUMMK
SM403 MOTOR MOUNTING	SM403 Motor & Mounting Kit	SM403MOTK
	SM403 Motor Mounting Kit	SM403MMK
ALUMINIUM TRAY FOR SOLAR26	Aluminium Tray Kit & Components	TRAY26
	Aluminium Tray (no components)	TRAYAL
FRAMING KITS	Axle Bracket Kit	AXBKTK
	Axle & Frame Kit	AXFRK
WHEELS	<u>See</u> Solar Wheels – Nylon Low Rolling Resistance, 70mm Diameter	
FRAMING & SOLAR WHEEL COMPONENTS	Carbon Fibre Tube	CFT
	Elbow	ELBOW
	Collar (Axle Retainer)	COLLAR
	Spur Gear to Wheel Adapter	GEARADAPT
	Guide Rollers	GUIDEROLLER
	Allen Key	HEX1.5
	Grub Screw (spares for collars & brass gears)	SCRGR
	Tyre Material	TYRE
	Tyre 71mm Rubber Extrusion	TYRE71
	Tyres (O-Rings)	ORING55
	7.0mm Plain Bearing	BEAR7
	10.0mm Plain Bearing	BEAR10
	10.0mm Flanged Bearing	BEAR10F
	10.0mm x 3mm Flanged Bearing	BEAR10/3F
	AXLES	Choices of Steel or Carbon Fibre or Fibreglass
PINION GEARS	Pinion Gears to suit Faulhaber Motor	BRGPXX

NOTE: Refer to “Propeller Shafts, Axles, Guide Tubes and Coupling” tables in the main part of the catalogue for a comprehensive listing of Guide Tubes and Steel Shafts (Rods) available.

WHAT ELSE WOULD BE HELPFUL?

To measure the intensity of the sunlight a Scorpio Calibrated Solar panel (SOLAR10) can be used together with a multi-meter.

- This shows the sun's intensity in % sunlight. And aids your testing by providing comparison data.



MODEL SOLAR CAR and BOAT - TECHNICAL INFORMATION SHEETS

INTRODUCTION TO SOLAR POWER: A brief introduction to solar power relating to small solar panels.

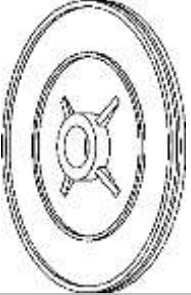

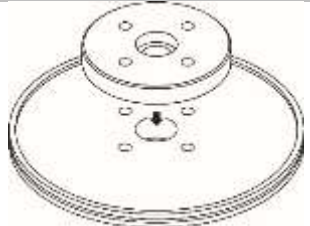
HOW DO I WIRE UP THE SOLAR PANEL? IN SERIES? IN PARALLEL??

Please e-mail a request for either sheet to sales@scorpiotechnology.com.au and we will e-mail that info to you.

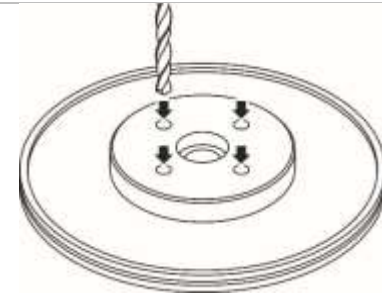
APPENDIX D – USING THE GEAR ADAPTOR FOR THE DRIVEN WHEEL

Below is a guide to the set up and production steps used.

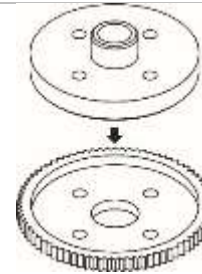
THE DRIVEN (GROOVED) WHEEL

<p>There is one x 70mm grooved low rolling resistance solar wheel required (the other 3 can be the normal un-grooved type), and before installing onto the axle, it needs to be assembled with the adaptor and a modified 80 tooth gear.</p>	
<p>PARTS REQUIRED: To make up the assembly above you need the following – part ordering codes are in brackets:</p> <ul style="list-style-type: none"> - 1 x 70mm grooved wheel (SW70EGR) - 1 x Gear Adaptor (GEARADPT) - 1 x modified 80T spur gear (GEAR80/2.9) ### - 4 x M3 Bolt x 12mm (BOLT12) - 4 x M3 Nut (NUTM3) - 4 x M3 Washer (WASHER) - 2 x 10mm Flanged bearings (BEAR10F) - 2 x Collars (COLLAR) 	
<p>### - This 80 Tooth gear starts as a GEAR80/2.9, with the centre machined out with a 12mm end mill, so that it fits over the gear adaptor.</p>	
<p>TOOLS REQUIRED:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Phillips (cross) screwdriver: #1 Point (SCREWDRPH1/80) <input type="checkbox"/> A small spanner / Multitool (for the M3 nuts) <input type="checkbox"/> 3mm drill bit and drill <input type="checkbox"/> 12mm end mill <input type="checkbox"/> Allen key (HEX1.5) 	
<ul style="list-style-type: none"> <input type="checkbox"/> Place the solar wheel onto a scrap piece of wood, with the flat side up. <input type="checkbox"/> Gently tap the adaptor with a small hammer until it is fully installed into the wheel's centre boss, on the flat side of the wheel. 	

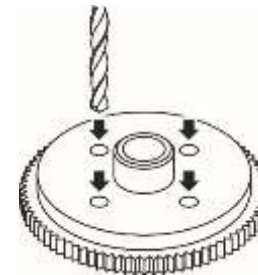
- Using the holes in the adaptor as guides, drill 3 mm holes through the wheels.



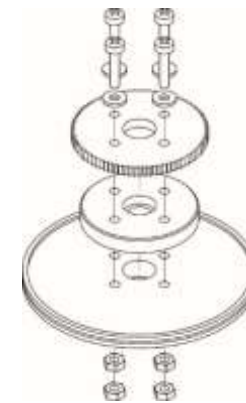
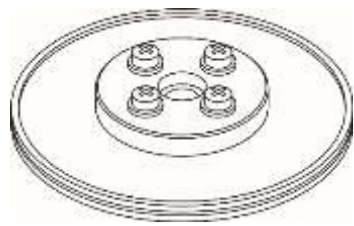
- Assemble the 80 Tooth gear onto the metal adaptor, so that it sits flat on the adaptor (the gear's inside lip will fit snugly over the adaptor)



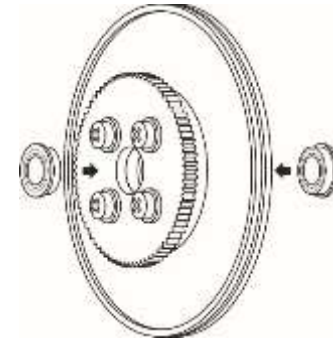
- Turn the adaptor over so that the gear sits flat: Rest it on a scrap piece of timber and using the holes in the wheel and adaptor as guides, drill 3 mm holes through the gear.



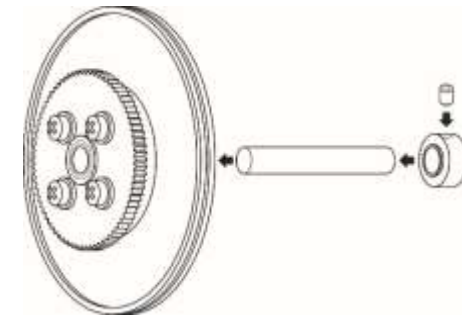
- Assemble the gear, adaptor and wheel assembly using the bolts, nuts and washers.



- Insert 2 off the 10mm flanged bearings into this gear / wheel / adaptor assembly, one from each side



- Slide one collar onto the axle at the end where the motor will be mounted and tighten the grub screw (work out how far in from the end the collar will be attached?).
- Slide the wheel, adaptor and gear assembly onto the axle.
- Add the second (outside) collar on and slide the collar against the wheel, making certain the wheel is against the inside collar and tighten the grub screw.



NOTE: Check that the wheel spins freely.

Revised: 14 September 2022

APPENDIX E – USING THE GUIDE ROLLERS

SETTING UP THE GUIDE ROLLERS

Guide Roller kit

- 4 x Guide rollers
- 8 x Bearings ID 3/OD 10mm (BEAR3/10F)
- 4 x Bolt - M3x40
- 24 x Nut M3
- 4 x Washer M3



Below is a guide to the set up and production steps used. Tick off each box as you complete a task and document it.

The guides consist of a POM Guide roller, fitted with flanged bearings and mounted on an M3 screw, with the required clearance.

1.1 ASSEMBLE THE FOUR GUIDE ASSEMBLIES:


Before fitting the Guide assembly to the axle bracket, assemble the Guides as detailed:

NOTE: There are 4 Guide assemblies in total. The instructions detail how to make one Guide assembly - that needs to be repeated for the other 3 guide assemblies.



- Push one of the flanged bearings into the recessed hole in the guide roller
- Slide the guide roller down the M3x40 bolt
- Slide a washer down the bolt (this will prevent the bearings crushing together)
- Slide and push in the other flanged bearing
- Spin an M3 nut down till it touches the bearing

- Tighten the nut with the spanner (Multitool) provided in the kit
- Spin a second nut and tighten it onto the first nut
 - hold the first nut (the one next to the bearing) with the Multitool and do not let this nut rotate
 - with the other spanner firmly tighten the second (outside) nut against the first.
- Spin on two more nuts to the height required for the guide rail. Leave these finger tight - they will be tightened after fitting the guide through the axle bracket

<ul style="list-style-type: none"> □ When you finish you should have made 4 of these assemblies, and ready to install. 	
---	--

1.2 ASSEMBLE THE GUIDE ASSEMBLIES TO THE AXLE BRACKET:

Put the chassis on a flat surface, with the tyre fitted to the drive wheel, and with all four wheels on a flat surface:

- Fit the guide bolt through the hole in the axle bracket
- Measure the guide screw head to track clearance at the front and the rear (that is - how above the track is the screw head)
- For each Guide assembly adjust the nut underneath and closest to the axle bracket until a clearance of between 3 and 4 mm is achieved between the screw head and the track surface
- Put one 3 mm nut on the bolt where it protrudes through the axle bracket, and tighten it onto the axle bracket
- Recheck the clearance between the screw head and track, and adjust the nuts on either side of the axle bracket if required.
- Put the second 3 mm nut on the bolt and spin it down to the first nut
- Next you need to tighten the lock nuts - the lock nuts are the second nuts shown in the photo (above and below the axle bracket) using the two spanners (the multitool provided in the kit and the second spanner):
 - hold the first nut (the one next to the axle bracket) with the Multitool and do not let this nut rotate
 - with the other spanner firmly tighten the second (outside) nut against the first.

NOTE: Both of these lock nuts must be tightened up against the inside nuts - this provides a locking action of the nuts against each other. The lock nuts help to prevent the bumps on the track and guide rails from loosening the clamping nuts

WARNINGS:

If this lock nut comes loose the guides will move out of place to the detriment of car performance - by creating more rolling resistance, or in an extreme case, allowing the car to leave the track.

When testing and racing, do keep checking that they remain tight and in position This is what it will look like when assembled to the axle bracket



APPENDIX F: SUGGESTED SPARES FOR KITS

Following is a list of spare parts that we suggest for some of Scorpio Technology kits:

DRAGSTER

- steel rod and plastic guide tube (*SRGTW* – 5 of each)
- both wheel sizes (*W30C*, *W52C2*)
- all pinion and spur gears (*GEAR8/1.9*, *GEAR10/1.9*, *GEAR12/1.9*, *GEAR50/10/2.4*, *GEAR60/10/2.4*)
- double sided tape (*TAPEDS*) - *optional*
- corflute (*CORF200/100/5*) - *optional*
- alkaline battery – pack of 40 (*BATTALK40*) - *optional*
- tools (*see Teaching Unit*)

DRAGSTER-NS

- steel rod and plastic guide tube (*SRGTW* – 5 of each)
- both wheel sizes (*W30C*, *W52C2*)
- all pinion and spur gears (*GEAR8/1.9*, *GEAR10/1.9*, *GEAR12/1.9*, *GEAR50/10/2.4*, *GEAR60/10/2.4*)
- switches and motors with wires should also be considered (*SSWS-W*, *MOT12W*)

BASIC SOLAR CAR:

- steel rod and plastic guide tube (*SRGTW* – 5 of each)
- wheels (*W52C2*)
- all pinion and spur gears (*GEAR8/1.9*, *GEAR10/1.9*, *GEAR12/1.9*, *GEAR50/10/2.4*, *GEAR60/10/2.4*)

BASIC SOLAR CAR-NS:

- steel rod and plastic guide tube (*SRGTW* – 5 of each)
- wheels (*W52C2*)
- all pinion and spur gears (*GEAR8/1.9*, *GEAR10/1.9*, *GEAR12/1.9*, *GEAR50/10/2.4*, *GEAR60/10/2.4*)
- switches and motors with wires should also be considered (*SSWS-W*, *MOT22W*)

PROPELLER DRIVEN CAR

- steel rod and plastic guide tube (*SRGTW* – 5 of each)
- wheels (*W38C*)

PROPELLER DRIVEN CAR-NS

- steel rod and plastic guide tube (*SRGTW* – 5 of each)
- wheels (*W38C*)
- switches and motors with wires should also be considered (*SSWS-W*, *MOT12W*)

BELT DRIVEN CAR

- steel rod and plastic guide tube (*SRGTW* – 5 of each)
- wheels (*W52C2*)
- pulleys (*PU5.5* & *PU30*)

BELT DRIVEN CAR-NS

- steel rod and plastic guide tube (*SRGTW* – 5 of each)
- wheels (*W52C2*)
- pulleys (*PU5.5* & *PU30*)
- switches and motors with wires should also be considered (*SSWS-W*, *MOT12W*)

LO-RIDER

- steel rod and plastic guide tube (*SRGTW* – 5 of each)
- wheels (*W38C*, *W52C2*)

SOLAR CAR V2

- steel rod and plastic guide tube (*SRGTW* – 5 of each)
- wheels (*W52C2*)
- all pinion and spur gears (*GEAR8/1.9*, *GEAR10/1.9*, *GEAR12/1.9*, *GEAR50/10/2.4*, *GEAR60/10/2.4*)

IMPORTANT INFORMATION

TECHNOLOGY KIT CONTENTS

Our kits contain **all the electrical, electronic and mechanical components needed** to build the device (only). The teacher supplies readily available material for wiring, making body parts etc. – **NO BODY PARTS OR WIRES ARE INCLUDED** in the kits. Each order includes comprehensive instructions /Teaching Unit.

TECHNOLOGY KIT SELECTION

The selection chart (following each kit description) shows how we have graded the kits. These are a guideline only – construction times can vary considerably, depending upon the student's existing knowledge, skills and experience, and the amount of research and design input expected.

Condensed teaching units (description / limited instructions) for all of our kits can be obtained from our website. Otherwise, you can phone or e-mail us, to send you a FREE copy of the teaching unit for any kits that you may be interested in.

OUR WEBSITE & ON-LINE CATALOGUES

Our website also contains a "*Solar Challenge Catalogue*", "*Introduction Solar Projects Catalogue*" and a "*Clearance Catalogue*".

Our listings will be progressively updated in our on-line catalogues.

YOUR SUCCESS STORIES!!

On our website we have a page called "*KITS IN ACTION*". This is *YOUR* chance to share your success stories and ideas with other teachers. We would appreciate photos and stories of what you have done, how you have adapted our kits or even how you have used the project afterwards – to test them and have fun with them.

FEEDBACK AND SUPPORT

FEEDBACK: Like everyone we love to be told that we have designed a range of great kits. However, we also welcome and appreciate feedback that tells us what we need to improve. Without feedback from you (based on your students' experience), we can't identify areas where we need to improve either our product or the Teaching Units.

We would like to thank everyone who has brought an issue to our attention and worked with us to improve our products.

TECHNICAL SUPPORT: For all the kits designed by *Scorpio Technology*, we provide general help or can put you in touch with electronics or programming consultants (usually the person who designed that project).

PARTS SUPPORT: We stock all the parts for the kits we design. The kits are packed locally, so you can be assured of availability of kits and can feel confident that we can supply you with replacement or spare parts.

OTHER PRODUCTS / RANGES / CATALOGUES:

We also have items for different subjects. To find out more, we'll send you a **FREE CATALOGUE**. They are:

• **SOLAR (MODEL SOLAR CHALLENGE) COMPONENTS** • **CLOCKS & PARTS** • **PENS & DESK SETS** • **PHYSICS (Coming soon)** • **PRIMARY SCHOOL STEM**

TECHNOLOGY CONSULTANT

Need some technical or electronic or kit related help or advice? Ask our Technology Consultant - E-mail your queries to:

scorpiotechnology@gmail.com (All General / sales queries: sales@scorpiotechnology.com.au)

SOLAR CONSULTANT

For Solar Technical assistance **ONLY**, e-mail our Solar Consultant at: ian@scorpiotechnology.com.au

SALES & OTHER QUERIES

All prices listed in Australian Dollars and **include** GST.

Every effort has been made to ensure content is accurate at the time of publishing and there may be circumstances that impact accuracy. This includes information sourced from supplier websites. From time to time the item supplied may vary to the catalogue illustration due to change of supplier or changes made by supplier. Prices subject to change without notice.

Pricing or other questions? Check our FAQ page on our website or e-mail your queries to:
sales@scorpiotechnology.com.au



CLOCK ORDER FORM

CUSTOMER DETAILS

Purchase Order No. _____
 Name / Teacher _____
 School Name _____
 Street Address _____ State _____ Postcode _____
 Teacher's Email _____ Tel: _____

QTY	CLOCK MOVEMENT
	MSSS – Very short shaft
	MSS – Short shaft
	MS – Standard shaft
	ME – Extended shaft
	ME-HB (with moulded hanging bracket)
	ML – Long shaft
	MR – Reverse Movement
	MP – Pendulum Movement (incl'd Hanger Bkt)
	PENDOP – Pendulum Operator (incl'd Bkt)

ADDITIONAL SECOND HANDS				
QTY	SECOND HANDS	RED	BLACK	GOLD
	SH102 – 102mm		N/A	N/A
	SH90 – 90mm			
	SH72 – 72mm		N/A	N/A
	SH57 – 57mm			
	SH40 – 40mm		N/A	N/A
	SH37 – 37mm		N/A	N/A

QTY	HANGER BRACKET
	HANG-BKT (for ME, MSSS, MR)

QTY	HANGER BRACKET
	HANG-BKT-RS (for ML, MS, MSS)

HOURLY & MINUTES HAND INCLUDES SECONDHAND				
QTY	CLOCK HANDS	BLACK	GOLD	RED
	H211 – 72mm x 102mm Second Hand 102R			N/A
	H219 – 60mm x 90mm Second Hand 90			N/A
	H227 – 32mm x 46mm Second Hand 57			N/A
	H231 – 50mm x 72mm Second Hand 72R			N/A
	H233 – 65mm x 100mm Second Hand 102R			N/A
	H240 – 72mm x 102mm Second Hand 102R			N/A
	H241 – 55mm x 79mm Second Hand 72R			N/A
	H257 – 39mm x 50mm Second Hand 57			N/A
	H270 – 91mm x 127mm Second Hand 102R			N/A

HOURLY & MINUTES HAND INCLUDES SECONDHAND				
QTY	CLOCK HANDS	BLACK	GOLD	RED
	H277 – 44mm x 63mm Second Hand 72R			N/A
	H2140 – 62mm x 95mm Second Hand 102R			N/A
	H2212 – 32mm x 45mm Second Hand 57			N/A
	H2282 – 38mm x 53mm Second Hand 57			N/A
	H2291 – 45mm x 62mm Second Hand 72R			N/A
	H2351 – 31mm x 40mm Second Hand 40R		N/A	N/A
	H2361 – 25mm x 34mm Second Hand 37R			N/A
	H2382 – 21mm x 30mm Second Hand 37R			N/A

QTY	NUMERALS - Arabic	BLACK	GOLD
	NUMA10		
	NUMA12		
	NUMA15		
	NUMA20		
	NUMA25		

QTY	NUMERALS - Roman	BLACK	GOLD
	NUMR10		
	NUMR12		
	NUMR15		
	NUMR20		
	NUMR25		

QTY	NUMERALS - Dots	BLACK	GOLD
	NUMD4.5		
	NUMD8		
	NUMAD10		

QTY	NUMERALS - Bars	BLACK	GOLD
	NUMB10		
	NUMB12		
	NUMB19		

QTY	SUNBURSTS - Arabic	GOLD
	NUMSUNA - 75mm	
	NUMSUNA - 100mm	
	NUMSUNA - 125mm	
	NUMSUNA - 150mm	

QTY	SUNBURSTS - Old English	GOLD
	NUMSUNOE - 75mm	
	NUMSUNOE - 100mm	
	NUMSUNOE - 125mm	

QTY	INSERT CLOCKS	BEZEL	FACE
	ICS36	GOLD	WHITE
	ICS36GG	GOLD	GOLD
	ICS38GW	GOLD	WHITE
	ICM56	GOLD	WHITE
	ICM56GG	GOLD	GOLD

QTY	INSERT CLOCKS	BEZEL	FACE
	ICMT63	GOLD	WHITE
	ICLC80	CHROME	WHITE
	ICLG80	GOLD	WHITE
	ICLLC130	CHROME	WHITE
	ICLLG130	GOLD	GOLD

QTY	MISCELLANEOUS
	CD WASHER – CD Washer
	ENUT5 – Extension Nut 5mm
	MOVEMENT COVER
	PENDULUM A
	PENDULUM B

QTY	PENS
	PEN COMPONENTS
	PEN HOLDERS – Black or Gold
	PEN POUCHES

QTY	ADDITIONAL ITEMS

HOW & WHERE DO I GET WHAT I NEED?

- ✓ E-mail, post or fax your official school order to us, including the teacher's name to speed up delivery
- ✓ An invoice will be included with the goods. Note: you do not need to open an account with us.
- ✓ Orders are dispatched promptly and are sent using Australia Post.
- ✓ Prices and stock availability are subject to change without notice.
- ✓ Payment is by cheque, cash, credit card or Electronic Fund Transfer.
- ✓ We have credit card facilities (VISA & Mastercard only). Please note: A 1.5% surcharge will apply to all orders over \$250

✓ ALL PRICES
INCLUDE GST

POSTAGE COSTS						
Weight	Under 0.5 kg	0.5 - 2.0 kg	2 - 5 kg	5 - 10 kg	10 - 25 kg	Over 25 kg
Victoria	\$11.40	\$14.76	\$16.75	\$20.13	\$26.85	Please enquire
NSW. SA. TAS	\$11.40	\$19.13	\$21.47	\$24.15	\$33.56	
Brisbane, Perth	\$11.40	\$21.47	\$24.15	\$30.19	\$40.24	
QLD, WA, NT (Rural)	\$11.40	\$23.48	\$26.85	\$33.56	\$46.96	

****PLEASE NOTE:**

Items over 25kg will incur an additional postage charge.

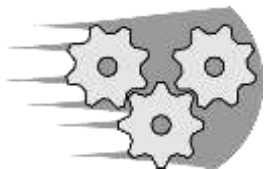
Bulky items such as the dynamics ramps & trolley runway, very large orders, special orders or any orders that cannot be shipped via Australia Post and will require freight. Special freight prices may apply.

Express post available or your couriers can be used upon request.

Postage to international destinations available on a case by case basis. Item prices will be ex-GST to international customers. Special conditions and freight rates apply.

Please enquire.

(We even have online sales items page that may contain the odd component or item that you may be interested in).



SCORPIO TECHNOLOGY VICTORIA PTY. LTD.

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Scorpio Technology office hours are: 9.00 am to 4:00 pm, Monday to Friday (EST)

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