

# PHYSICS CATALOGUE

## From The Logical Interface

Technology products including

● **electronic equipment**

*Power Supplies*

*Signal Generators*

*Fuel cells etc*

● **software**

● **videos and DVDs**

## TLI Computer Wave Lab Computer Dual Channel Signal Generator

**\$365.00**

Turn your computer into a powerful Wave Laboratory. Create sine, square and triangle waves. Demonstrate beats, interference and other wave properties with our Computer Wave Lab - the perfect companion to our range of data loggers.

### How it Works

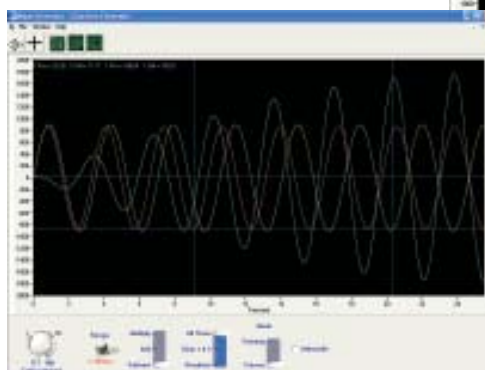
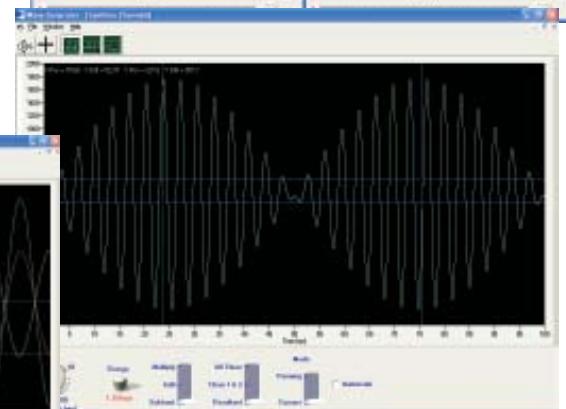
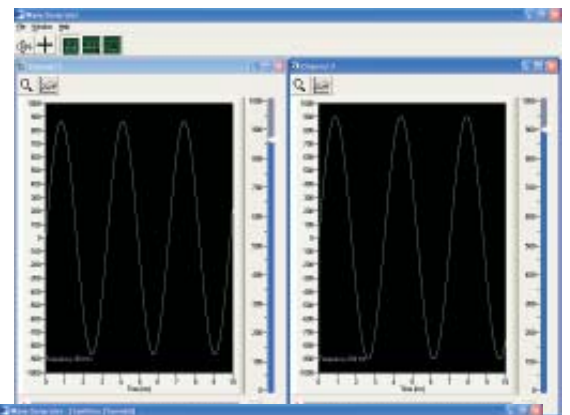
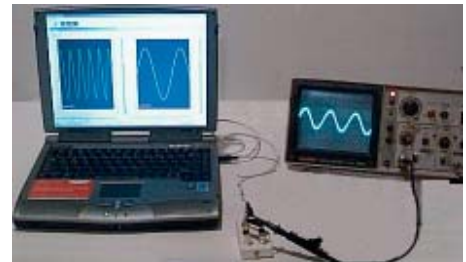
By developing software that uses your computer's internal oscillator and multimedia capabilities to drive our interface, we have created a powerful Computer Wave Lab that replaces traditional signal generators at a fraction the cost. As each channel (speaker) is controlled individually we can create two sources of waves from the one oscillator ensuring the frequencies do not 'wander'. These "sources" can then be output to the computer's speakers, or through the Wave Lab interface to your oscilloscope, or data logger.

### Features

- Generates waves of variable frequency to 20 kHz.
- Dual channel output to your data logger, or oscilloscope.
- Control phase difference.
- Simply play through your computer speakers.
- Use the software on its own, or with the Computer Wave Lab interface.
- Oscilloscope mode converts the TLI Wavelab into a dual channel signal generator and CRO for measurement of amplitude, period and phase difference.
- Use the oscilloscope mode to Add, subtract and multiply waves.

**Price includes school site  
licence and Wave Lab Interface**

**Made in Australia by  
The Logical Interface**



## Power Supplies

### Low Voltage

Input Voltage 220V-240V

Output AC/DC 2,4,6,8,10,12 V selectable by illuminated switch.

DC rectified and unfiltered

Current DC 5 A max. AC 6 A max.

AC and DC can be used concurrently

Terminals 4 mm with spin free head.

Ideal for classroom use.



Cat No: LB2633-001

\$142.00

### High Voltage

Input Voltage 220V-240V

Output 0-500V DC, 0-300V /AC 50 mA max.

Inbuilt Voltmeter

Terminals 4 mm with spin free head.



LB2612-001

\$510.00

### Extra High Voltage

Input Voltage 220V-240V

Output 0-5000V DC, 3 mA max.

Inbuilt Voltmeter

Terminals 4 mm with spin free head.



LB2615-001

\$605.00

### Constant Current

Input Voltage 220V-240V

Output 2-30 mA 30 V DC

Inbuilt Current/Voltage meter

Terminals 4 mm with spin free head.

Ideal for the study of magnetic fields and induction.



LB2618-001

\$223.00

## Regulator Modules

Ideal for data loggers where a true DC source is required. Provide metered and regulated voltage from an unregulated source, such as your standard laboratory power supply.

Model Input 12V \$155.00

Model Input 20V \$187.00



## Hodson INDUCTION KIT

The 'Hodson INDUCTION KIT' provides a comprehensive set of equipment for investigating Magnetic Induction, Transformers and AC/DC Motors.

Students can

- assemble their own transformers, motors and generators and
- connect them to our TLI Wave Lab to control input amplitude and frequency, and our data loggers, or oscilloscopes to view the output.
- construct and investigate Induction Motors.
- investigate AC theory and resonance.
- measure the holding strength of an electromagnet and compare the holding strength between an AC and a DC magnet
- make a vibrator or a buzzer etc.

**\$165.00**



## Signal Generator and Tri-Mode Signal Generator



Create

- sine waves,
- square waves,
- triangular waves.

Ideal for investigating properties of sound waves including

- ◆ frequency and pitch.
- ◆ amplitude.
- ◆ superposition and beats.

With over five ranges 0.1 Hz - 100 KHz and high power output these signal generators are ideal for use with our and other brands of data loggers.



Tri-Mode Signal Generator includes all the features of the standard signal generator plus

- Regulated DC power supply 1.5 - 10 V and
- Audio amplifier.

**Standard Model \$485.00**

**Tri-Mode Model \$759.00**

## Photo-Electric Effect

Uses a high sensitivity gas filled photo tube as a detector. Includes calibrated light filters of known wavelength and compact 12V light source.

Ideal for investigating

- ◆ the Photo-electric Effect and
- ◆ determining Planck's Constant

**\$561.00**



## Audio Amplifier

Compact Audio amplifier with gain control. Complete with internal 9V, small speaker, small speaker and output to CRO or data logger. Perfect for use with our signal generator.

**\$140.00**



## The Physics ComputerLab.

\$407.00

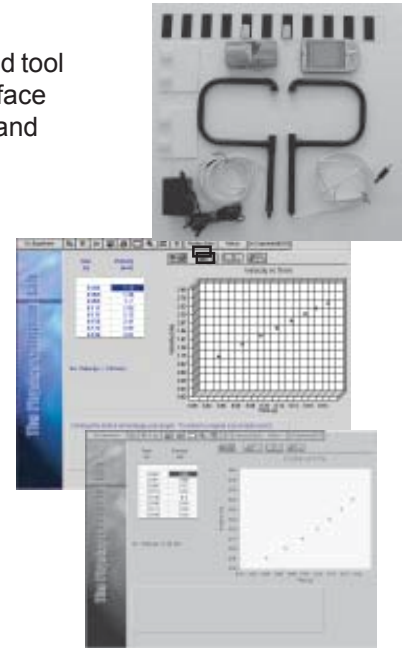
Connects directly to PC, Fourier Multilog Pro and Ezilog USB data loggers and now Pocket PC for remote data logging.

The Physics Computer Lab provides a precise way of measuring time and a sophisticated tool for data analysis. Included in your kit are two robust, infra-red photodetector gates, interface box that plugs directly into your computer, or data logger (see above), a calibration strip and glider flags. Perform experiments in:

- ◆ **Uniform Motion**
- ◆ **Elastic and Inelastic Collisions**
- ◆ **Conservation of Momentum**
- ◆ **Newton's Laws of Motion**
- ◆ **The Simple Pendulum**

Easy to use software for Windows '95 to XP includes

- Excel compatible spreadsheet .
- Sophisticated, customisable, charting tool.
- Save data as text file or Excel spreadsheet.
- Comprehensive Help and worksheets at the click of a button.



## The Intelligent Pulley

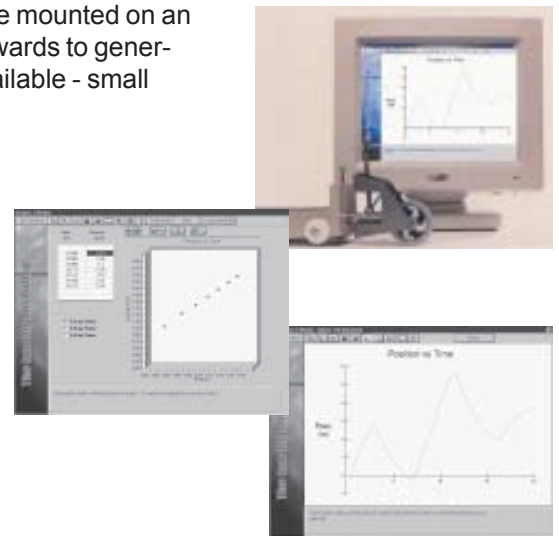
\$345.00

For use with I.B.M. and compatible computers. The Intelligent Pulley can be mounted on an airtrack, attached to a dynamics trolley or simply moved backwards and forwards to generate position vs time and velocity vs time graphs in real time. Two pulleys available - small light weight, or robust large metal pulley (pictured). Perform experiments in:

- ◆ **Uniform Motion**
- ◆ **Non-uniform Motion (bi-directional)**
- ◆ **Newton's Laws of Motion**

Easy to use software Windows '95 to XP includes

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- Sophisticated, customisable, charting tool.
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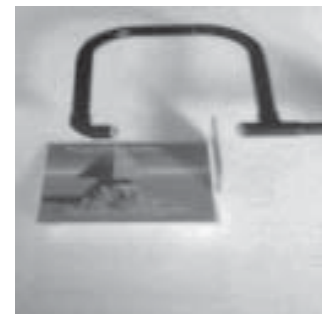
## Projectile Launcher/Lander

Launch a projectile and control

- launch angle and
- initial velocity.

Connected to our, or other manufacturer's photo gates, the projectile launcher can be used to determine the time of flight in combination with the projectile lander.

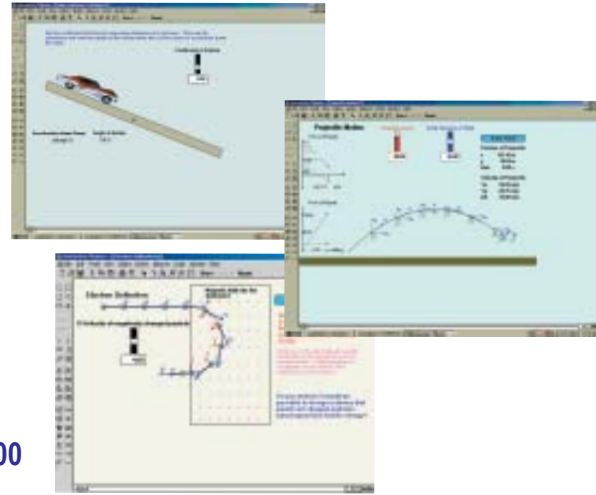
**Projectile Launcher \$95.00**  
**Projectile Lander \$50.00**



## Interactive Physics™

Interactive Physics makes it easy to integrate modeling and simulation into your physics curriculum. Create models by drawing onscreen with a powerful and easy-to-use graphic interface. Add objects like springs, dampers, ropes, and joints. Measure attributes of your objects like velocity, acceleration, momentum, and energy. You can also display these measurements as numbers, graphs, or animated vector displays. Then interact with your model in real time by changing parameters as the simulation runs. Widely adopted by many textbook publishers and with more than half a dozen awards and thousands of educational users, Interactive Physics is the standard in physics modeling and simulation solutions.

**Single User \$550.00, 5 user lab pack \$1,390.00, 10 user lab pack \$1,990.00**



## Advanced Physics Series

Suitable for senior and upper junior secondary physics students. Includes three separate CDs.

### Mechanics

#### Includes

- Vector addition and Relative Motion
- Projectile Motion and Circular Motion
- Collisions and Moment of Inertia
- Gravitational Force and Kepler's Laws
- Bernoulli's Equation and more ....

### Thermodynamics and Molecular Physics

#### Includes

- Maxwell's Distribution and Brownian Motion
- Isobaric and isothermal processes
- Carnot Cycle, evaporation and condensation
- Thermodynamic Cycles and Specific Heat of a Gas
- Kinetic Model and Gas Diffusion and more ....

### Oscillations and Waves

#### Includes

- Transverse and Longitudinal Waves
- Interference and superposition
- Standing waves on strings
- Doppler Effect, Beats and more ....

**Single User \$105.00 Site Licence 226.00 per title**

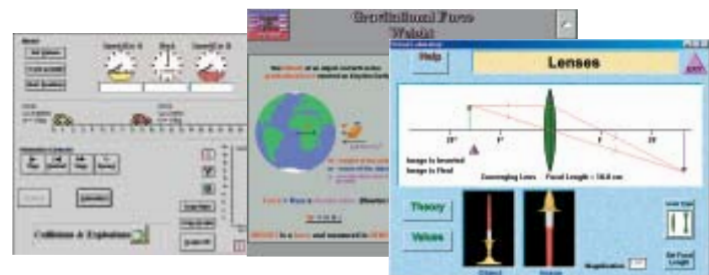
## Complete Physics Series

Suitable for junior and senior secondary physics students. Includes Quizzes and Worksheets.

**Five separate titles.**

- I **Electricity and Magnetism**
- II **Earth and Universe**
- III **Energy Resources**
- IV **Forces and Effects: Includes Virtual Laboratory**
- V **Light and Sound: Includes Virtual Laboratory**

**Single User \$105.00 Site Licence \$226.00 per title Single User \$105.00 Site Licence \$226.00 per title.  
Complete Series Single User \$319.00, Site Licence \$545.00**

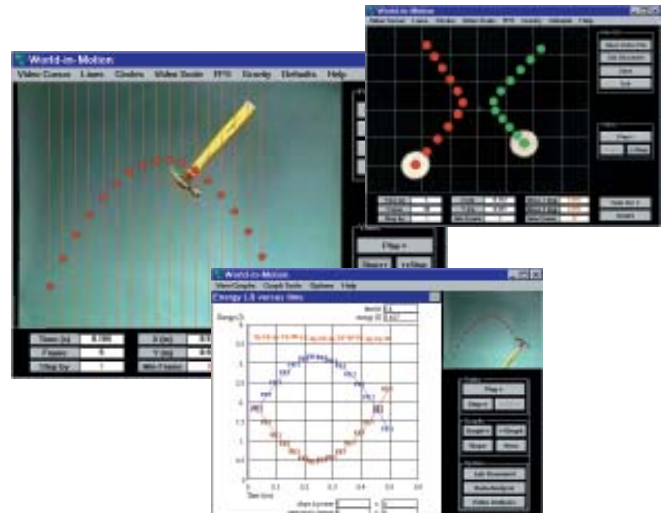


## World in Motion: Video Analysis Software

A revolutionary way to analyse motion.

View digitised video clips of real world physical events on your computer screen for frame by frame motion analysis. Collect Position-Time data on screen, then use the software's powerful analysis features to study velocity, acceleration, force, energy, momentum. After collecting a video the following quantities may be graphically analysed.

- Position
- Acceleration
- Momentum
- Angular Position
- Angular Acceleration
- Torque
- Velocity
- Force
- Energy
- Angular Velocity
- Angular Momentum



## The Physics Tutor

An innovative program that assists students to develop problem solving skills. The teacher development module allows teachers to add their own questions with worked solutions and examples.

### Features

- **Animation and video**
- **Teacher Development Module** allows teachers to add their own problems.
- **Student Database** - tracks student performance.
- **Video Enhanced Tutorial:** Overview of each topic.
- Over 240 problems with worked solutions.
- Random selection of problems ensures students cannot memorise answers.
- Each problem has a solved example to follow.

### Includes the following topics

- Motion
- Mechanical Interactions
- Electrostatics
- Electromagnetism
- Forces
- Work and Energy
- Electrodynamics
- Wave Motion

Site Licence \$218.00

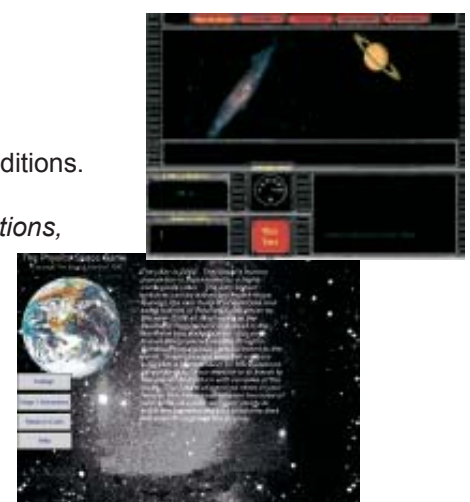


## Applied Physics

The Physics Space Adventure challenges your best students.

- Enhances problem solving techniques by placing students under exam-like conditions.
- Presents a sequence of physics problems to solve covering: *One dimensional Motion, Relative velocities, Work, Energy, Mechanical Interactions, Interpretation of Graphs*
- Presents a different set of problems each time it is visited.
- Storyline, animation and sound maintain interest.
- Each problem has an example to follow.

Site Licence \$218.00



## Radioactivity Series

**PENETRATION** Experiment with alpha, beta and gamma radiation and a selection of target materials! Examine the effect of putting different barriers between various radioactivity sources.

**DISTANCE** Experiment with the three types of radiation in both vacuum and air! Examine the relationship between radiation levels and distance from various radioactive sources.

**ALPHA SCATTERING** Simulate the work of Rutherford and more. Investigate the relationship between metal thickness, particle energy, target atomic number and alpha particle back scatter.

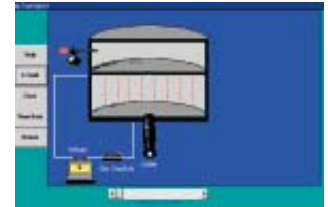


**Site Licence \$109.00 per Title**

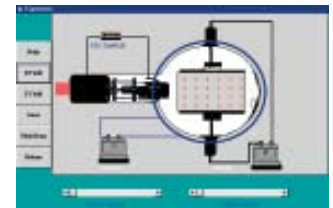
**All three only \$273.00 including site licence**

## Physics Series

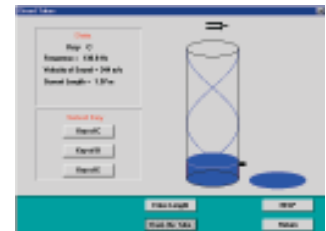
**MILLIKAN'S OILDROP EXPERIMENT** simulates Millikan's Oildrop experiment allowing students to determine the charge of the electron. The oildrop charge and mass are generated by a random number generator. After the student has adjusted the plate voltage to balance the drop this voltage and the oildrop mass can be saved. Data can be printed or saved to disk for use in any popular spreadsheet.



**THOMSON'S EXPERIMENT** simulates Thomson's famous "Charge to Mass Ratio" experiment. Both the magnetic field generated by the coils and the electric field between the plates can be varied. The values of voltage and coil current required to balance the electron beam can be saved and used to produce a graph, the slope of which is used to determine the charge to mass ratio of the electron. Data can be printed or saved to disk for use in any popular spreadsheet.



**STANDING WAVES IN TUBES** allows students to experiment with standing waves in open and closed tubes. This experiment asks students to determine the lengths of tubes for which resonance will occur. If their answer is correct the tube resonates in and plays the appropriate key and displays the standing wave.



**Site Licence \$109.00 per Title**

**All three only \$273.00 including site licence**

# PHYSICS

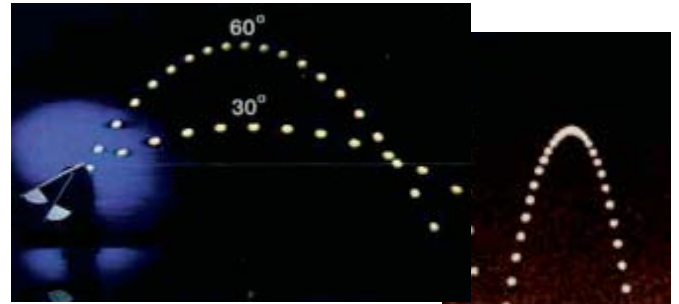
## Physics Demonstrations (Videos and DVDs)

### Physics Demonstrations in Mechanics

A six part video program which presents a full range of physical demonstrations in mechanics. The series contains a comprehensive collection of video demonstrations, including Newton's Laws, circular motion, projectile motion, conservation of momentum and energy and angular momentum.

**\$113 per tape.**

**Complete set of 6 tapes \$669.00**

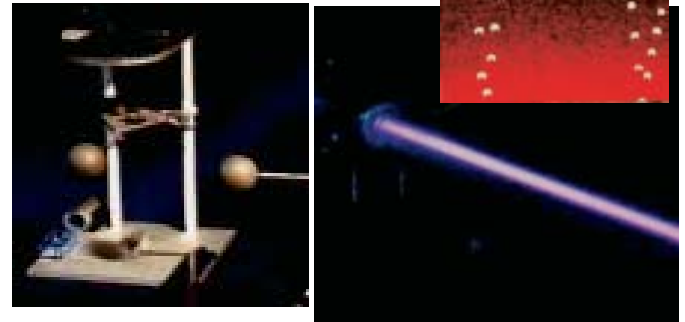


### Physics Demonstrations in Light

A two part series presenting a wide range of demonstrations in light including refraction and total internal reflection, resonance and standing waves, Rayleigh scattering, diffraction, double and single slit interference, laser theory and holography.

**\$113 per tape.**

**Complete set of 2 tapes \$219.00**



### Physics of Space Flight

A three part series which presents physics principles as they apply to space flight and space related events. Spectacular NASA footage and computer animation is used throughout.

Part I: Acceleration Machines: Launching a Space Vehicle

Part II: Physics in Space: Orbital Motion and Re-Entry

Part III: Gravity: A Broadened View - Newton's Law of Universal Gravity, "slingshot effect" etc

**\$113 per tape.**

**Complete set of 2 tapes \$219.00**



### Also available

**Physics Demonstrations in Electricity and Magnetism (3 video set) \$339.00**

**Physics Demonstrations in Sound and Waves (3 video set) \$339.00**

**Physics Demonstrations in Heat (3 video set) \$339.00**

## Fuel Cell Demonstration Kits

The H-Tec fuel cell models we stock are as follows:

### 1. Junior Basic

Solar hydrogen experimentation system consisting of solar module, PEM electrolyzer, hydrogen and oxygen storage tanks, PEM fuel cell, and electric load; mounted on a black base plate. Textbook included.

**Specifications:**

Electrolyser = 1W, Fuel Cell = 500mW  
Gas Storage = up to 20cc for each of hydrogen and oxygen  
Solar Module = 2.0V / 350mA, Fan = 10mW  
H x W x D = 200 x 300 x 150mm, Weight = 600g

**\$528.00**



### 2. Junior Set

Complete hydrogen system in a carrying case, consisting of solar hydrogen system **Junior Basic**, **Decade Resistor Junior**, 2 digital **Multimeter Junior**, 3 red and 3 black **Cable Junior**, 1 stopwatch, 250 ml distilled water. Textbook included.

**Specifications:**

As for Junior Basic plus  
H x W x D = 140 x 450 x 380mm, Weight = 2.8kg

**\$842.00**



### 3. PEM Fuel Cell Kit

PEM fuel cell for hydrogen/air operation. Can be pulled down and reassembled but it needs a source of hydrogen to run. The cathode side can use either air or oxygen. Ideal for use with a Junior Basic which can supply hydrogen, or hydrogen and oxygen, to the PEM FC Kit.

**Specifications:**

600mW (oxygen) or 200mW (air)  
H x W x D = 98 x 80 x 78mm, Weight = 258g

**\$303.00**



### 4. HyRunner Fuel Cell Car

The HyRunner fuel cell car uses a reversible cell rather than a dedicated electrolyser and a dedicated fuel cell like the Junior Basic. It needs a source of power for the electrolysis stage then you remove the power and the cell runs in reverse and acts as a fuel cell, driving the little electric motor. Ideal for use with the Junior Basic using the solar panel on the Junior Basic as the energy source for the electrolysis stage.

**Specifications:**

Electrolyser mode = 1W, Fuel Cell Mode = 500mW  
Gas storage = up to 15cc for each of hydrogen and oxygen  
H x W x D = 75 x 90 x 200mm, Weight = 260g

**\$533.00**

