



# Science Alive! Exhibits 2017

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Science Alive! Exhibits Ltd specialises in creative design solutions for all budgets. From the small to the large; single interactive to complete exhibitions, our interactive exhibits are found in science centres and museums all over the world.

Mobile and mechanical interactives are our speciality. We also have the capability to create high-tech products in multimedia, advanced graphics and augmented reality in partnerships with leading edge technology specialists.

### **Science Alive! Exhibits offers our clients**

- customised purpose-built exhibits to your requirements
- a full design and build service from concept to finished product
- proven international experience
- extraordinary value
- customer service

### **Mobile and mechanical exhibit specialists**

Our range of over 100 designs for mobile and mechanical interactives covers many subject areas; including health, human perception, technology and physical phenomena - electricity and magnetism, sound, light and colour, communications, fluid dynamics, ... and more. Mobile exhibits are easy to transport and pack in and out, and are also suitable for both outreach and display in the main venue.

### **Science Alive! exhibits are**

- low maintenance, durable and robust, designed for high usage environments
- manufactured from the highest quality components
- user friendly and attractive to visitors

### **Science exhibits from a science centre**

Science Alive! understands your interactive exhibit requirements. We design exhibits with visitor appeal in mind, providing fun challenging learning opportunities for all ages. Our exhibits communicate scientific principles in hands on and engaging ways, inviting visitors to explore and discover the excitement of science. We have over twenty years of exhibit design experience. Exhibits have been developed and tested in public environments.

**All exhibits in this catalogue can be adapted to meet your requirements. We design and custom build exhibits specifically for your organisation.**

**Science Alive! exhibits will enhance your visitors experiences with innovative exhibits at a competitive price.**

**Science Alive!  
Exhibits**

**custom-built to  
your requirements**



## Science Alive! Exhibits Client List

**Science Alive! Exhibits constructs interactives for science centres and museums all over the world. We have produced interactive exhibits for the following museums, science centres or organizations:**

**MTN ScienCentre, Capetown, South Africa:** 25 Puzzling Things and general science exhibits.

**OMP MTN ScienCentre, Umhalanga, South Africa:** 47 Puzzling Things and Sci tech on the Move exhibits.

**OMP MTN ScienCentre, Menlyn, South Africa:** Puzzling Things and Sci tech on the Move exhibits.

**PETROSAINS SDN BHD, Kuala Lumpur, Malaysia:** 22 tabletop, 90 petroleum and general exhibits, earthquake simulator.

**Calgary Science Centre, Calgary, Canada:** 25 Puzzling Things exhibits.

**Discovery Science Centre, Santa Ana, USA:** earthquake simulator, 2 shake tables.

**Sci-Quest, Huntsville, USA:** 18 fluid dynamics and earth science exhibits.

**Te Papa – Museum of New Zealand, Wellington, NZ:** 45 social science exhibits, including and earthquake simulator.

**Science Station, Cedar Rapids, USA:** 9 electricity exhibits.

**Bishop Museum, Honolulu, USA:** tsunami tank.

**Carnegie Science Center, Pittsburgh, USA:** earthquake simulator.

**Al Khobar, Saudi Arabia:** 14 exhibits.

**Guatemala Museum, Guatemala City, Guatemala:** 2 human performance exhibits.

**Atelier Markgraph, Frankfurt , Germany:** tornado simulator.

**Leonardo on wheels, Salt Lake City, USA:** 4 tabletop exhibits.

**Queensland Science Centre, Brisbane, Australia:** 2 perception exhibits.

**Oil and Gas Discovery Centre, Brunei:** 37 general and Sci tech on the Move exhibits.

**Wenzhou Science Center, China:** 45 general exhibits.

**National Science Centre, Kuala Lumpur, Malaysia:** Puzzling Things and Sci tech on the Move exhibitions.

**Sci Bono Science Centre, Johannesburg, South Africa:** 39 general and Sci tech on the Move exhibits.

**Gulf Coast Exploreum, Mobile, USA:** 8 exhibits.

**NIHERST, Trinidad:** 18 petroleum exhibits.

**Technopolis, Belgium:** 39 Puzzling Things and Sci tech on the Move exhibits.

**Exploratorium, San Francisco, USA:** harmonograph.

**Story Inc, New Zealand:** 3 electricity exhibits.

**NIHERST, Trinidad:** 7 environmental disaster exhibits

**NSM, Thailand:** 54 mobile outreach exhibits

**Exploratorium, San Francisco, USA:** harmonograph

**NSM, Thailand:** 4 Fluid Dynamics, 4 Earth Science and 6 mobile exhibits

**Exploratorium, San Francisco, USA:** harmonograph.

**Science Centre Singapore:** 6 earthquake related exhibits

**Kids City Phnom Penh, Cambodia:** 50 exhibits with 5 themes. Design of galleries, lighting systems, educational programmes.

**Iplayco Corporation, Las Vegas, USA:** Wind Erosion exhibit

**Techdome, Penang, Malaysia:** 52 exhibits, plus exhibition design and coordination.



## **body and senses exhibits**



Balance Tester

Blind Spot

How much water is in  
your body?

Iris Operation

Nutrition Wheel

Reaction Tester

## Key

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free-standing floor exhibit



wall-mounted exhibit



tabletop exhibit



whole body experience



power supply required



no power required



push button



augmented reality



suitable for a children's area

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### Balance Tester

A balancing board connected to a timer. Standing on the board the visitor presses the timer button and tries to balance. When the board becomes unbalanced the timer stops. The length of time the visitor remains stable is shown in seconds.

*Exhibit concepts: balance system - eyes, ears, brain and muscles.*



### Blind Spot

A dot and a cross on a panel. Closing the left eye and staring at the cross with the right eye, the visitor moves slowly toward the panel. Visitors will find their blind spot, the area on the retina with no rods or cones where the optic nerve enters the eye, when the dot disappears from view.

*Exhibit concepts: vision, parts of the eye.*



### Iris Operation

The visitor looks down into a small concave mirror to see a magnified view of the iris and pupil of one eye. Pushing a button changes the intensity of the light shining into the other eye. The visitor sees the iris of the eye they are looking at responding to the brightness of the light.

*Exhibit concepts: light and vision.*



### Nutrition Wheel

The visitor can find out how many kilojoules are in common foods, and how many are burned playing sports.

*Exhibit concepts: human nutrition and sport.*







## How much water is in your body?

When the visitor stands on a pressure pad their body weight triggers the tubes to fill with fluid. The volume of fluid in the tubes approximates with volume of water the visitor's body contains.

*Exhibit concepts: water and the human body.*



## Reaction Tester

A line of LEDs, reset and stop buttons and a dial to change the speed of the lights. A red arrow indicates the stop point. The visitor presses the reset button to start the lights flashing and attempts to stop the lights at the red arrow. How close to the arrow the visitor manages to stop the lights indicates their reaction time.

*Exhibit concepts: reaction time, hand-eye coordination.*







## earth and space exhibits

Braided River  
 Constructive Waves  
 Deconstructive Waves  
 Earthquake Simulator  
 Fault Ruptures  
 Gravity Well  
 High Run-off  
 How Oil is Trapped  
 Jupiter Boors  
 Lightning Discharge  
 Low Run-off  
 Meteorite Impact  
 Oil Drilling Geiger Counter  
 Porosity of Rock  
 Sand Dunes  
 Seismograph  
 Shake Table  
 Speed of Sound in Rocks  
 Tectonic Plates  
 Tectonic Plates Jigsaw  
 Tornado  
 Tsunami  
 Turbulent Planet  
 Underwater Volcano  
 Volcano Kiosk  
 Water Supply  
 Wave Tank  
 Wind Tunnel

## Key

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Earth's Fury exhibition

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## Braided River

Water flows down a gentle slope forming channels and islands in the sand. Visitors create new channels and divert water to experiment with the effects on sediments and water flow.

*Exhibit concepts: features of braided rivers, erosion, water management.*



## Constructive and Destructive Waves

Visitors place an object (representing sand, gravel or any material) on the 'beach' in the wave tank to see the effect of breaking waves and how the object moves up the 'shore'. A lever is pulled to operate the wave mechanism, while the magnitude of the wave is controlled with a knob.

*Exhibit concepts: wave formation and action, erosion & deposition.*



## Earthquake Simulator

A park bench, shed or other customised structure which holds several people. Press the button to start the 'earthquake'. The sensation is similar to that felt in the first few seconds of a small magnitude earthquake. Choose from three earthquakes, the largest moves the structure about 50mm each way per second. Programmable from actual accelerographs.

*Exhibit concepts: earthquakes, magnitude and intensity.*





### Fault Ruptures

Turn the handle and see how fault lines slide over each other causing disruption to landforms.

*Exhibit concepts: causes of earthquakes, fault lines.*



### Gravity Well

The visitor rolls the ball towards the hole. Because of the shape of the well the ball rolls slowly around the outside edge, but picks up speed as it moves closer to the central hole. Eventually the ball drops down the hole, and can be heard spinning around.

*Exhibit concepts: orbits, gravity.*



### High Run-off

See the effect of deforestation on water run-off. Visitors operate a pump to make rain, sending water down a 'hill', under a bridge and into a river. The exhibit shows the relationship between clearing forests, flooding and silt production.

*Exhibit concepts: erosion, deforestation, water cycle.*



### How Oil is Trapped

The visitor inverts a chamber containing oil droplets suspended in water. Being lighter than the water, the droplets float upwards and are trapped by an impermeable layer. Illustrates that petroleum deposits are found only in certain types of rock and rock formations.

*Exhibit concepts: geology, oil extraction, carbon cycle, fossil fuels.*





### Jupiter Boots

Try to negotiate an obstacle course while wearing the heavy Jupiter boots. Simulates what it might be like walking on planet Jupiter.

*Exhibit concepts: the planets, mass and weight, gravity.*



### Lightning Discharge

A Jacob's Ladder exhibit. Press the button and watch the spark travel up the electrodes.

*Exhibit concepts: lightning formation, ionisation, electricity.*



### Low Run-off

Visitors operate a pump to produce 'rain'. The water flows down the forested hill and into the ground, where it is absorbed. A comparison to the High Run-off exhibit.

*Exhibit concepts: forestation, water cycle.*



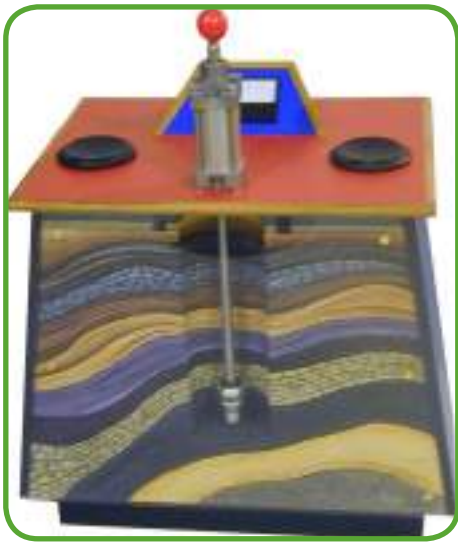
### Meteorite Impact

A meteorite (steel disk) is dropped directly or at an angle into the powder, creating an impact crater. Different impact craters are produced depending on the angle at which the disk hits the powder.

*Exhibit concepts: space, meteorites.*







### Oil Drilling Geiger Counter

A cutaway section of sedimentary layers of the Earth simulates how radioactive emissions are detected in rocks on the surface. The visitor lowers a Geiger counter through the strata to measure the radioactivity of the different layers, including oil bearing rocks.

*Exhibit concepts: radioactivity, strata, hydrocarbons, oil exploration.*



### Porosity of Rock

Illustrates that rocks have spaces in them which can hold fluids. The visitor inverts the three chambers containing different size aggregates and observes the speed at which the fluid moves through the spaces between the particles. The size of spaces is proportional to the size of the particles.

*Exhibit concepts: properties of rocks, petroleum geology.*



### Sand Dunes

A sand covered landscape with a variable speed rotational fan. Visitors can see the effect of the model building structures on the movement of wind blown sand.

*Exhibit concepts: aeolian landscapes, erosion, geology, weather.*



No image available.

### Seismograph

A bump sensor simulates how a seismograph detects and displays vibrations. When visitor thumps on the table a computerised seismometer detects the vibrations, which are then displayed on a monitor.

*Exhibit concepts: detecting and measuring earthquakes.*





### Shake Table

A mechanical shake table with variable frequency and amplitude allows visitors to manually vary the earthquake intensity. The visitor places model buildings of different heights on the shake tray to investigate the effects of an earthquake on the buildings. Buildings can also be placed on a tray of sand so that its supporting qualities when shaken can be seen.

*Exhibit concepts: effects of earthquakes on structures, wave generation from earthquakes, liquefaction.*



### Speed of Sound in Rocks

Demonstrates the speed of sound travelling through three rocks of different densities. The visitor pulls back a spring loaded lever which strikes a metal pad on the rock. The speed of sound in the rocks is displayed digitally in kph.

*Exhibit concepts: speed of sound in different mediums, petroleum exploration, properties of rocks.*



### Tectonic Plates

A large map of the world shows the position of the tectonic plates, land masses and oceans. Visitors push a button to light up a plate. Information panels describe relevant features of each plate, for example the direction of plate movement and plate boundaries.

*Exhibit concepts: tectonic plates, plate movement, fault lines.*



### Tectonic Plates Jigsaw

Visitors piece together a map of the earth divided into tectonic plates.

*Exhibit concepts: tectonic plates.*







## Tornado

An interactive twister with a rotating stream of airflow made visible with water droplets. Visitors stand inside the cabinet and touch the tornado. They can control the rotational speed and vortex production and see the effect on the 'tornado'.

*Exhibit concepts: formation of tornadoes.*



## Tsunami

Visitors create a miniature tsunami by pulling and pushing a handle, which displaces a mass of water. A 'wave' of moves up the harbour and sweeps across the land.

*Exhibit concepts: causes and formation of tsunamis.*



## Turbulent Planet

Spin the large fluid-filled orb to create random patterns of turbulence. Suspended pearlescent flakes make the swirling patterns visible.

*Exhibit concepts: weather patterns and systems, oceans and Earth's atmosphere.*





## Underwater Volcano

Visitors pump air into the 'underwater' volcano to cause an 'eruption'. A small boat floating above the volcano sinks when hit by the gas bubbles. Demonstrates how underwater volcanoes producing large amounts of gas may be hazardous to shipping and also generate tsunamis.

*Exhibit concepts: volcanic activity, tsunamis, natural hazards.*



## Volcano Kiosk

An augmented reality kiosk exhibit. As the visitor turns the pages of a small book a camera captures coded images on the pages, which are then enhanced by computer software. On the screen, the visitor sees three-dimensional animations of volcanoes, accompanied by text, images and sound effects, bringing volcanoes to life.

*Exhibit concepts: volcano formation, lava flow, eruptions, tectonic plates, rifts, subduction, Ring of Fire.*



## Water supply

Clear water flows from an 'aquifer' in the ground and through a tap. Press a button to contaminate the aquifer and see the effect on the water supply. Brown water now flows out of the tap. Shows the effect of pollution on ground water supplies.

*Exhibit concepts: pollution, water cycle, water supplies.*

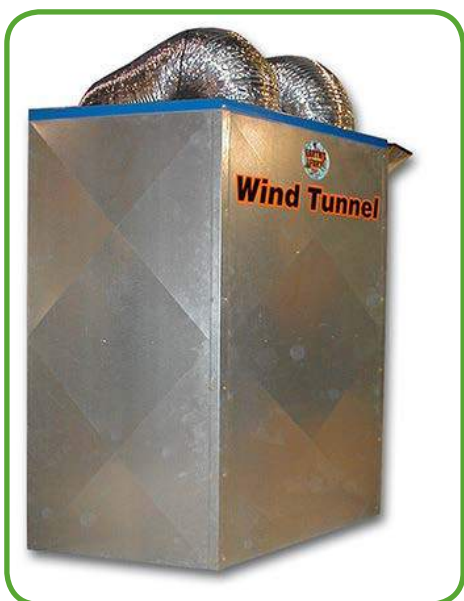




## Wave Tank

A tank with two non-mixing fluids is gently rocked to produce waves along the length of the tank. Demonstrates breaking wave motion.

*Exhibit concepts: wave formation and motion.*



## Wind Tunnel

A wind tunnel large enough for two adults to stand in has variable speed fans. Increase the fan speed to simulate winds of speeds up to hurricane force. Compare the wind speeds with the commonly-used Beaufort wind speed scale.

*Exhibit concepts: Beaufort scale, wind generation, natural hazards.*





## **electricity and magnetism exhibits**

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Chaotic Pendulum  
Eddy Current Braking  
Electricity Table  
Electromagnets  
Generator  
Hand Battery  
Heat to Electricity  
Magnetic Turntable  
Magnetic Garden  
Mighty Magnet  
Repulsive Magnets  
Wire Buzzer  
Plasma Tube

## Key

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free-standing floor exhibit



wall-mounted exhibit



tabletop exhibit



whole body experience



power supply required



no power required



push button



augmented reality



suitable for a children's area



Earth's Fury exhibition

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### Chaotic Pendulum

The visitor starts the pendulum swinging over an arrangement of magnets and observes its movements.

The pendulum swings erratically, pushed and pulled around by magnetic repelling forces.

*Exhibit concepts: properties of magnets, magnetic forces - attraction and repulsion.*



### Eddy Current Braking

Two slotted aluminium tubes with a magnet in one and a copper disk in the other. The visitor picks up the tubes and watches how the disks fall inside the tubes. The copper disk reaches the bottom of the tube first, while eddy currents slow the fall of the magnet.

*Exhibit concepts: eddy currents, properties of magnets.*



### Electricity Table

Using the cables, the visitor connects the components to make simple, parallel and series circuits. Light bulbs glow when a circuit is complete. The Electricity Table has a selection of materials to test for conductivity, and meters displaying Volts, Amps and Watts readings.

*Exhibit concepts: electrical circuits, insulators and conductors; Volts, Amps and Watts.*



### Electromagnets

The visitor holds the two pads together and tries to pull them apart. One pad contains an electromagnet and the other has an iron core. The visitor feels the pull of the electromagnet on the iron core.

Turning a dial increases or decreases the amount of current, and in turn the strength of the magnetic field.

*Exhibit concepts: electromagnetism.*





### Generator

The visitor pumps the red knob up and down to move a magnet in and out of a copper wire coil. The mechanical force of moving the magnet in the coil generates an electric current. A meter indicates the direction of current flow and the current generated.

*Exhibit concepts: electromagnetic induction, generators and electricity production.*



### Hand Battery

The visitor places their hands on the copper and aluminium plates. Together, the visitor (the electrolyte) and the metal plates make up a battery and simple circuit. A very weak electric current is generated and displayed on the meter. The visitor can find out which combination of plates gives the highest reading.

*Exhibit concepts: batteries, simple circuits.*



### Heat to Electricity

A ceramic Peltier panel connected to a voltage meter. When the visitor touches one side of the panel a temperature differential across the Peltier panel produces an electric current. The meter shows the current generated and the direction of flow. When the visitor touches the other side of the panel, the direction of current flow reverses.

*Exhibit concepts: the Seebeck Effect, generation of an electric current from a temperature differential.*



### Magnetic Turntable

Four bar magnets are suspended over four electromagnets with the same polar orientation. The visitor pushes buttons alternately to change the polarity of the electromagnets and make the turntable spin. Electric motors are turned by magnetic pushes and pulls.

*Exhibit concepts: electric motors, magnetic forces, electromagnetism.*







### Magnetic Garden

Use a variety of magnets suspended above a container filled with an iron filing in oil suspension. See magnetic field lines form in the suspension.

*Exhibit concepts: magnetic fields, properties of magnets.*



### Mighty Magnet

The visitor passes three bars of different materials between the poles of a powerful magnet to find out which material has magnetic properties. The steel bar is strongly attracted to the magnet, the plastic and copper bars are non-magnetic and can be easily passed through the magnet's prongs.

*Exhibit concepts: properties of magnets, magnetic materials.*



### Repulsive Magnets

Circular magnets appear to be floating around a shaft. The visitor pushes down on the top magnet to see the effect on the magnets underneath. The magnets are arranged so that similar magnetic poles face each other.

*Exhibit concepts: properties of magnets - polarity, repulsion and attraction.*



### Wire Buzzer

The visitor attempts to move the wand from one end of the wire to the other without the metal hoop touching the wiggly metal wire. If the hoop touches the wire, the buzzer sounds. A counter displays the number of times the wire is touched. This exhibit is also a test of hand-eye coordination.

*Exhibit concepts: electrical circuits, hand-eye coordination.*



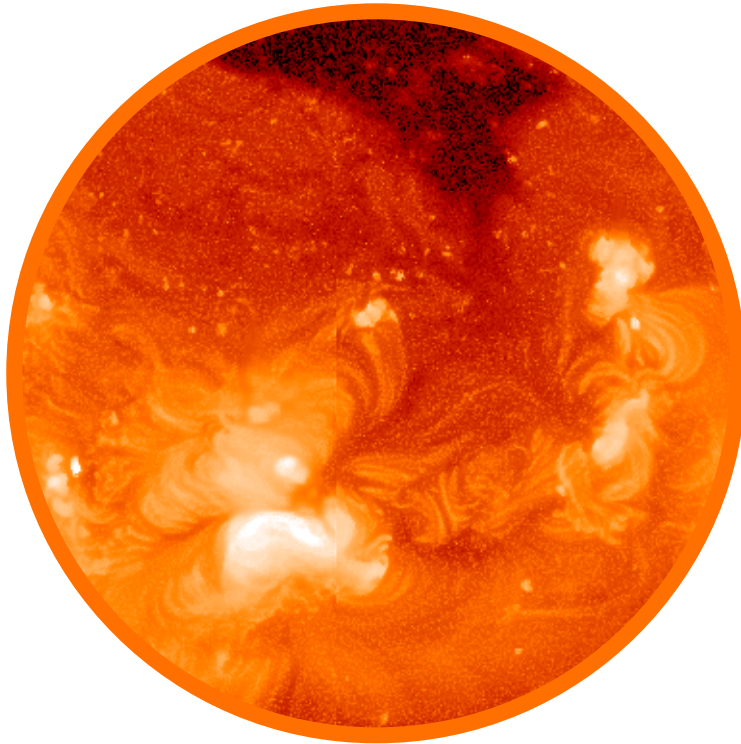


### Plasma Tube

Colourful streamers of light similar to lightning are produced in the tube as a high voltage electric current energises the gas inside. The glowing gas is plasma, a gas with charged particles known as the fourth state of matter - after solids, liquids and gases. When the visitor touches the glass colourful streamers of light follow the movements of their hand. Mirrors behind the tube enhance the visual effect.

*Exhibit concepts: states of matter, properties of plasma.*





## energy and heat exhibits

Electric Current to Heat

Heat to Electric Current

Heat Transfer

Hot Air Balloon

Radiometer

Solar Panel

## Key

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free-standing floor exhibit



wall-mounted exhibit



tabletop exhibit



whole body experience



power supply required



no power required



push button



augmented reality



suitable for a children's area



Earth's Fury exhibition

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### Electric Current to Heat

This exhibit demonstrates the Peltier Effect. The visitor puts their finger on the Peltier panel. When the current is turned on in one direction the visitor feels the pad heating up. When the current is reversed, the pad cools down. The direction of current flow is indicated by LEDs.

*Exhibit concepts: Peltier effect, semiconductors, electric current.*



### Heat to Electric Current

A Peltier panel is connected to a current meter. When the visitor touches one side of the panel it heats up, creating a temperature differential. This in turn generates an electric current. The visitor can see the direction of current flow on the meter. When the other side of the panel is touched and warms up the current reverses.

*Exhibit concepts: Seebeck effect, semiconductors, electric current.*



### Heat Transfer

When different materials are held, heat is transferred away from the hand at different rates. This exhibit can be made up in the shape of a giant hand.

*Exhibit concepts: thermal conductivity, molecular arrangements.*

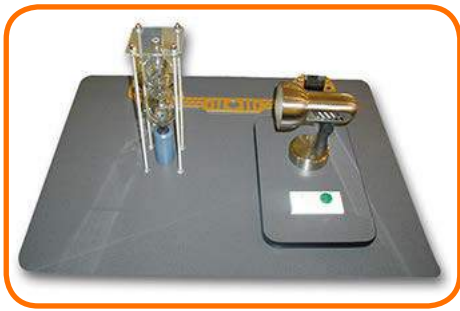


### Hot Air Balloon

A large foil balloon envelope and heater. The visitor presses a button and hot air flows into the envelope. As the balloon inflates it rises up into the air, tethered to a wire. When the air inside cools down the balloon descends.

*Exhibit concepts: hot air balloons, density and temperature.*





## Radiometer

A radiometer and light operated by a switch. A dial changes the light's intensity. The visitor turns on the light and watches the vanes of the radiometer spin. They can see the effect that varying light intensities have on the radiometer's spinning vanes.

*Exhibit concepts: thermodynamics, light energy and heat, convection currents.*



## Solar Power

Solar panels convert light energy from two lamps into an electric current. The energy generated powers a small fan which blows a ball up a transparent tube. The visitor can control the intensity of the light shining on the photovoltaic cells and see the effect this has on the distance the ball travels up the tube.

*Exhibit concepts: solar energy, photovoltaic cells.*





## fluid dynamics exhibits

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- Air Cannon
- Air Maze
- Air Tubes
- Bernoulli Blower
- Bubble Tubes
- Descartes Diver
- Eddies
- How much water in  
your body?
- Make it Blow
- Pneumatic Lifters
- Pneumatic Ratios
- Spinning Water
- Tennis Ball Launcher
- Vacuum Cleaner
- Viscosity Tubes
- Wind Tube



## Key

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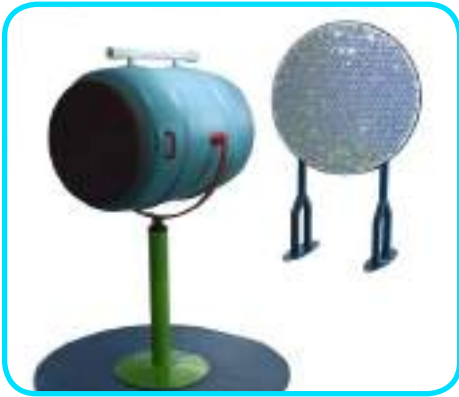
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### Air Cannon

Aiming at the target, the visitor taps on the back of the cannon. A burst of air shoots out through a hole in the front. If aimed accurately, the visitor will see the disks on the target flutter.

*Exhibit concepts: fluid dynamics, toroidal vortex.*



### Air Maze

By opening the side flaps, the visitor directs a ball through the maze using the power of air. Several visitors can race balls through the maze at the same time.

*Exhibit concepts: fluid dynamics, air pressure, ventilation systems.*



### Air Tubes

A maze of connected tubes with gates and air powered by a blower. Visitors place objects (scarves, foam balls, etc.) in the entrance hole and open and close the gates to move the objects through the maze.

*Exhibit concepts: fluid dynamics, air pressure, ventilation systems.*

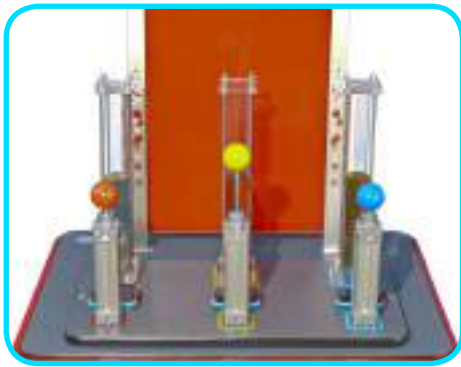


### Bernoulli Blower

The visitor experiments with a beach ball floating in the air flow from the blower. By moving the nozzle the visitor can steer the ball.

*Exhibit concepts: Bernoulli's principle, air pressure.*





### Bubble Tubes

Three tubes contain oils with different densities. The visitor pumps the ram handles attached to each of the tubes and observes the air bubbles forming in the oils.

*Exhibit concepts: viscosity, density.*



### Descartes Diver

Pump air into the acrylic tank and see the diver sink. Stop pumping and the diver rises.

*Exhibit concepts: relationship between buoyancy and density, floating and sinking.*



### Eddies

Spin the disk and watch the patterns created in the fluid. Swirling currents called eddies form in the fluid as it moves against the sides of the container.

*Exhibit concepts: eddy formation, fluid dynamics, ocean currents.*



### Make it Blow

Four tubes filled with colourful feathers, glitters and other lightweight objects. The visitor connects the pipe to one of the tubes and watches the colourful objects fly up in the air, then float down.

*Exhibit concepts: air, wind and moving things.*





### How much water is in your body?

When the visitor stands on a pressure pad their body weight triggers the tubes to fill with fluid. The volume of fluid in the tubes approximates with volume of water the visitor's body contains.

*Exhibit concepts: water and the human body.*



### Pneumatic Lifters

The visitor sits on one of the pads and pumps the handle. Each ram has a different ratio between the pump piston and the piston in the cylinder. The visitor notes the distance moved and the effort required to lift their body.

*Exhibit concepts: air pressure, pneumatics, mechanical advantage.*



### Pneumatic Ratios

Three interconnected cylinders with pistons. The visitor pushes down on one or more of the plungers to see how far the others move. The volume of air in the system stays the same, but is distributed according to the position of the pistons.

*Exhibit concepts: pressure, pneumatics, area and distance ratios.*





### Spinning Water

A partially-filled tank of coloured water on a rotating platform. The visitor spins the tank and observes the fluid. As the tank spins, Water moves up against the sides of the tank as it spins, forming a parabola on the surface.

*Exhibit concepts: fluid dynamics, parabolas, centrifugal force.*



### Tennis Ball Launcher

The visitor pulls on a rope to raise a heavy ball. When the ball is released it falls down the column and compresses the air in the base. This pushes up on the tennis ball in the other column and launches it toward the ceiling.

*Exhibit concepts: fluid dynamics, forces, air pressure, compressed air.*



### Vacuum Cleaner

The visitor places polystyrene balls in a receptacle and moves a flexible tube over the balls. A suction fan sucks the balls up the tube and deposits them in a transparent container.

*Exhibit concepts: air pressure, forces, components of a vacuum cleaner.*







### Viscosity Tubes

Pump air into the fluids of different densities to find out how easily the bubbles rise in low densities compared to higher density fluids.

*Exhibit concepts: fluid dynamics, density and viscosity.*



### Wind Tube

Visitors place small objects in the wind tube and watch what happens. Will the object spin, fly, float or hover? Visitors can design their own flying objects and test them in the tube.

*Exhibit concepts: fluid dynamics, aerodynamics, flight.*









## **forces and motion exhibits**

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Arch Bridge  
Balancing Balls  
Chaotic Pendulum  
Crane  
Cycloid Ball Run  
Energy Transfer Pendulums  
Gear Table  
Gravity Well  
Harmonograph  
High Wire Bicycle  
Hyperbolic Slot  
Inertia  
Mass Transfer 1  
Mass Transfer 2  
Lever Lifter  
Pick Up Points  
Pirouette  
Sand Pit Digger  
Pulley Power  
Uphill Cone

## Key

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### Arch Bridge

A plastic arch-shaped frame with seven interlocking blocks. The visitor builds an arch bridge with the blocks on top of the frame. When the frame is lowered, the arch bridge is free-standing. The visitor presses down on the arch to test its strength.

*Exhibit concepts: structures, transfer of forces through an arch bridge.*



### Arch Bridge

A frame and interlocking blocks. The visitor builds an arch bridge with the blocks on top of the frame. When the frame is lowered, the arch bridge is free-standing. The visitor walks over the bridge to test its strength.

*Exhibit concepts: structures, transfer of forces through an arch bridge.*



### Balancing Ball

An acrylic container with a ledge at each end and two stainless steel balls. The visitor attempts to balance a ball on each ledge. To start, the balls are at the bottom of a semi-circular dip between the ledges. A force must be applied to balance the balls - a flick of the wrists.

*Exhibit concepts: forces and motion, how a centrifuge works.*



### Chaotic Pendulum

A pendulum with four arms and rotating masses attached to pivot points. As the arms move the masses make its movements unpredictable. Sometimes the masses add together, while other times they cancel each other out. The parts may be swapped around to find out how this affects the motion.

*Exhibit concepts: forces and motion, how a pendulum works.*





### Crane

Visitors operate the crane to lift objects. The crane swivels and the boom and hook can be lowered and raised. This exhibit could be used in a children's construction area.

*Exhibit concepts: simple machines - levers and pulleys, mechanical*



### Cycloid Ball Run

Compare two ball runs - one straight and one curved. The visitor releases the balls and compares the times taken to reach the bottom of the run. The quickest path is not the straight line but the curved path - a cycloid.

*Exhibit concepts: cycloid curves, trajectory paths, velocity, acceleration.*



### Energy Transfer Pendulums

Two pendulums suspended from either end of a flexible cord. The visitor starts one pendulum swinging and the second begins to swing. Energy transfers from one pendulum to the other and back again, until stopped by friction and air resistance.

*Exhibit concepts: energy transfer, pendulums, friction, air resistance.*



### Gear Table

The visitor experiments with a set of four different sized gears. The gears can be arranged in different formations on the table top - large gears driving small gears, small gears driving large gears, and gear trains - a line of gears working together.

*Exhibit concepts: gear ratios, simple machines, mechanical advantage.*





### Gravity Well

The visitor rolls the ball towards the hole. The ball rolls slowly around the outside edge, but picks up speed as it moves closer to the central hole. Eventually the ball drops down the hole, and can be heard spinning around as it travels down the well.

*Exhibit concepts: orbits, gravity.*



### Harmonograph

Two pendulum, one with a pen and the other with a drawing platform, swing independently of each other to create patterns when set in motion by the visitor.

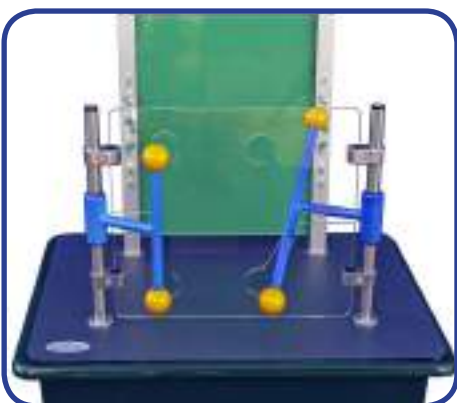
*Exhibit concepts: Lissajous curves, friction.*



### High Wire Bicycle

Under supervision, the visitor puts on a safety harness attached to the guide cable above the exhibit. The visitor rides out from the platform and on to the cable suspended above the floor. A counterweight attached beneath the bicycle makes the rider stable and safe. Even though they may tilt at times, the counterweight pulls them back and puts the visitor back in a vertical stable position.

*Exhibit concepts: centre of gravity/mass, balance.*



### Hyperbolic Slot

A ball attached to a straight rod with a vertical slot and a ball attached to an angled rod with a curved slot. The visitor moves the rods through the slots and observes the shapes traced by the rods. The angled rod traces the shape of a hyperbola and the path of the straight rod is circular.

*Exhibit concepts: geometry, curves, hyperbolas.*



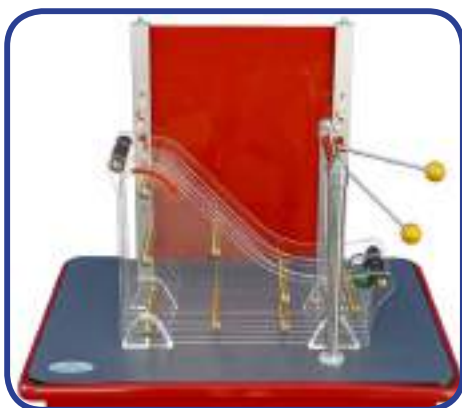




### Inertia

Three different rolling objects and a sloped runway. The visitor rolls the objects down the slope to find which reaches the bottom first. The rollers have equal mass and diameter, but accelerate at different rates. The roller with its mass distributed farthest from the centre is the slowest.

*Exhibit concepts: rotational inertia, forces and mass.*



### Mass Transfer 1

Two ramps of the same height with a yellow ball attached to a rod at the end of each slope, a heavy stainless steel ball and a lighter ball. The visitor releases the balls down the ramps to collide with the yellow balls. The stainless steel ball has more mass and moves the yellow ball farthest, transferring more energy.

*Exhibit concepts: mass, energy transfer, potential and kinetic energy.*



### Mass Transfer 2

Two ramps of different heights with a yellow ball attached to a rod at the end of each slope, two identical balls. The visitor releases the balls down the ramps to collide with the yellow balls. The ball released from the higher slope moves the yellow ball the farthest - it has more gravitational potential energy.

*Exhibit concepts: mass, energy transfer, potential and kinetic energy.*



### Lever Lifter

The visitor pushes down on each handle (the effort end of the lever) to lift the heavy engine block (the load). Each handle is a different distance to the fulcrum (the pivot point). The visitor will find it easier to lift the load at the farthest handle, although the lever moves a greater distance.

*Exhibit concepts: levers and simple machines, mechanical advantage.*







### Pick Up Points

Five metal cones of the same weight but with sides of different angles. Using only their fingers, the visitor attempts to lift each cone to compare. With more friction between the fingers and the steeper cones, they will be easier to lift.

*Exhibit concepts: principle of grip as "friction exerted on a surface".*



### Pirouette

Holding on firmly to the handlebars, the visitor spins around on the platform. They lean their body inwards and outwards and feel the affect this has on their spin speed.

*Exhibit concepts: forces, conservation of momentum.*



### Sand Pit Digger

Allows younger visitors to find out how a simple scoop bucket loader works. This exhibit could be included in a children's construction area.

*Exhibit concepts: simple machines, levers.*



### Uphill Cone

Two rollers, one consists of two cones joined together at their bases and the other is round. A track that slopes and diverges. When the cone is placed on the narrow, lower end of the track it travels along the track, appearing to travel uphill and defying gravity.

*Exhibit concepts: centre of gravity.*





## Pulley Power

The visitor sits on each seat and lifts up about 1 metre by pulling on the rope. Each seat has a different arrangement of pulleys - four pulleys (4:1 ratio), three pulleys (3:1 ratio) and two pulleys (2:1 ratio). With four pulleys it is much easier for the visitor to lift their bodyweight, but they need to move the rope a longer distance.

*Exhibit concepts: simple machines and pulleys, ratios, mechanical advantage.*





## light and optics exhibits

Bendy Mirror  
Black Box  
Colour Mixing  
Coloured Shadows  
Concave Mirror  
Convex Mirror  
Fresnel Lens  
Giant Kaleidoscope  
Horizontal Periscope  
Iris Operation  
Layer on Layer  
Pepper's Ghost  
Polarising Light  
Polarising Window  
Rainbow Kaleidoscope  
Strobe Light

## Key

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free-standing floor exhibit



wall-mounted exhibit



tabletop exhibit



whole body experience



power supply required



no power required



push button



augmented reality



suitable for a children's area



Earth's Fury exhibition

## Contact

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### Bendy Mirror

A large enclosed flexible acrylic mirror with an adjusting wheel. The visitor turns the wheel to bend the mirror. Some parts of the mirror are concave and others convex. The visitor notices that the image they see in the mirror changes and distorts as the shape of the mirror changes.

*Exhibit concepts: convex and concave mirrors, images and reflections.*



### Bendy Mirror (tabletop)

The visitor adjusts the flexible mirror with the knob, making the mirror either convex or concave. The visitor notices that the image they see in the mirror changes and distorts as the shape of the mirror changes.

*Exhibit concepts: convex and concave mirrors, images and reflections.*

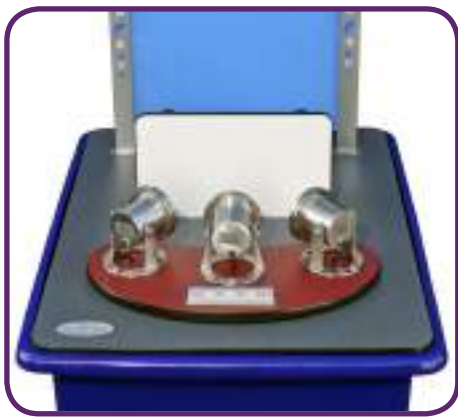


### Black Box

The visitor looks through the peep hole and sees only darkness. When the lid is lifted and light is able to enter the box, they will see that it is actually brightly coloured.

*Exhibit concepts: light and vision, colour.*





### Colour Mixing

Three coloured lights; red, green and blue, operated by switches and a white screen. The visitor turns on different combinations of lights to see the coloured shadows produced. When all three lights are on the colours combined are seen as white.

*Exhibit concepts: RGB primary colours of light, wavelengths, colour vision, colour mixing.*



### Coloured Shadows

The visitor controls the lights - red, green and blue - to make different colour combinations and observes the colours in the shadows. They can make interesting shadow effects by moving around in front of the screen.

*Exhibit concepts: RGB primary colours of light, wavelengths, colour vision, colour mixing.*



### Concave and Convex Mirrors

Convex and a concave wall-mounted mirrors. The visitor explores how the shape of the mirrors and their distance from them affects the images they see reflected.

*Exhibit concepts: reflections, light rays, convex and concave mirrors, focal point.*



### Fresnel Lens

A Fresnel lens mounted on supports. The visitor looks through the lens at their hand and notices that it appears bigger, but slightly blurry.

*Exhibit concepts: properties of lenses, magnification, light and vision.*







## Giant Kaleidoscope

A large free-standing three-mirrored kaleidoscope. The visitor ducks under the side panels and stands inside the kaleidoscope. Reflections seen in the mirrors appear to infinitely repeat.

*Exhibit concepts: light and reflections.*



## Horizontal Periscope

Angled mirrors arranged on the table top and a small hand-held periscope. The visitor looks through the arrangement of mirrors to see an image on the back panel. With the hand-held periscope they can view their surroundings.

*Exhibit concepts: light and reflections.*



## Iris Operation

The visitor looks down into a small concave mirror to see a magnified view of the iris and pupil of one eye. Pushing a button changes the intensity of the light shining into the other eye. The visitor sees the iris of the eye they are looking at responding to the brightness of the light.

*Exhibit concepts: light and vision.*



## Layer on Layer

A light box with four different coloured transparencies - cyan, magenta, yellow and black. The visitor places the transparencies on top of the light box to find out how to make a full-coloured picture. Colour printing processes use these colours to produce coloured images. The visitor slides the transparencies over each other to make moire patterns.

*Exhibit concepts: primary and secondary colours, printing processes, interference patterns.*

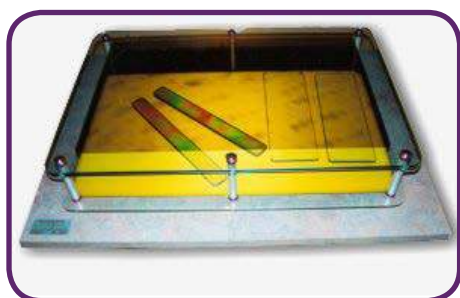




### Pepper's Ghost

The visitor places their hand through the hole and curls their fingers forward. Pushing a button turns on a light in the Pepper's Ghost box. The visitor sees an illusion of their fingers chopped off with a knife.

*Exhibit concepts: light and illusions, reflective and transparent*



### Polarising Light

Transparent plastic shapes and a polarised light and filter. The visitor bends and distorts the objects and observes brightly-coloured stress lines appearing and disappearing as the shapes flex.

*Exhibit concepts: polarising filters, light waves, stress patterns in materials.*



### Polarising Window

An illustrated perspex pane mounted in a framed box. The circular frame can be rotated, producing a colourful display.

*Exhibit concepts: light and colour.*

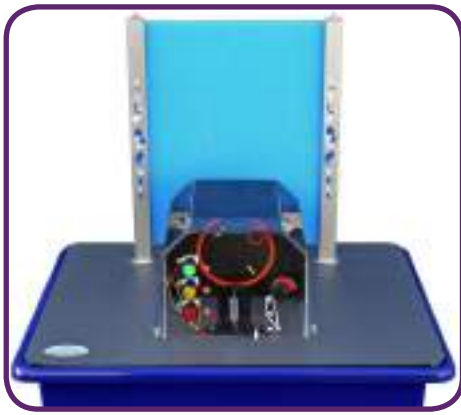


### Rainbow Kaleidoscope

Holding the handles, the visitor points the kaleidoscope at colourful objects and light sources in the room. Inside the kaleidoscope three mirrors, arranged in an equilateral triangle, reflect images between the mirrors, producing colourful changing patterns.

*Exhibit concepts: light and vision, reflections.*





## Strobe Light

A spinning disc and strobe light operated by a start button. The visitor starts the disc spinning. Both the strobe light and disc speed can be changed, allowing the visitor to experiment with strobe effects. Above a certain speed, the strobe is faster than what the eye can adjust to and two images will be seen.

*Exhibit concepts: light and vision, strobe effect.*







## puzzles and perception exhibits

Amazing Jungle  
 Blind Spot  
 Checker Board Illusion  
 Coloured Words  
 Dizzy Heights  
 Handcuffs  
 In the Centre  
 Leprechauns  
 Linked Links  
 Loop the Loop  
 Mirror Writer  
 Nice Dice  
 Optical Spinners  
 Packing Parcels  
 Pepper's Ghost  
 Pyramid Piles  
 Rotating Ames Window  
 Sheep Pen  
 Soma Cube  
 Squirmy Hand  
 Thread the Needle  
 T or Tree  
 Tower of Hanoi  
 Unlucky Seven  
 Vertical Nail Picture  
 Zoetrope

## Key

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free-standing floor exhibit



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Earth's Fury exhibition

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## Amazing Jungle

A tilting board with inset peg maze and a ball. Starting at the outside of the maze, the visitor aims to roll the ball through the pegs into the centre. Tilting the board controls the ball's direction. Visitors can choose a route through pegs of the same colour.

*Exhibit concepts: problem solving, hand-eye coordination.*



## Blind Spot

A dot and a cross on a panel. Closing the left eye and staring at the cross with the right eye, the visitor moves slowly toward the panel. Visitors will find their blind spot, the area on the retina with no rods or cones where the optic nerve enters the eye, when the dot disappears from view.

*Exhibit concepts: vision, parts of the eye.*



## Checker Board Illusion (table top)

A checker board with movable squares. The visitor offsets the squares on the board by moving the slider, then stands back and looks at the lines between the squares. The lines appear crooked, when they are actually straight and parallel.

*Exhibit concepts: optical illusions and perception.*



## Checker Board Illusion (free standing)

A checker board with movable squares. The visitor offsets the squares on the board by moving the slider, then stands back and looks at the lines between the squares. The lines appear crooked, when they are actually straight and parallel.

*Exhibit concepts: optical illusions and perception.*





### Coloured Words

A transparent panel with the names of four colours printed in different colours to the actual words. The visitor attempts to name the print colours (not the words). They will find this difficult because the brain is receiving conflicting messages.

*Exhibit concepts: senses and perception, reading as a learned response.*



### Dizzy Heights

The visitor attempts to walk the length of a slightly elevated rail, while looking down at a two dimensional image (similar to looking down a lift shaft). The image uses some visual tricks to create a sense of depth, which are confusing to the brain. The visitor may find their sense of balance affected, making it difficult to walk along the rail.

*Exhibit concepts: depth perception and visual cues, balance.*



### Handcuffs

Two pairs of handcuffs attached to chains. Two visitors attach the handcuffs to their wrists so they are linked together by the chains. Working together, they attempt to unlink themselves without taking off the handcuffs.

*Exhibit concepts: problem solving, spatial awareness, topology.*



### In the Centre

An acrylic map of an island with several holes is suspended on a stand. The visitor must find the map's centre of mass to find the location of the pirates treasure buried somewhere on the island. The map balances when it is suspended by the correct hole, its centre of mass. This can be found by intersecting lines from each of the holes.

*Exhibit concepts: problem solving, spatial awareness, centre of mass.*





## Leprechauns

A puzzle with images of leprechauns spread across three panels. The visitor counts the leprechauns, then swaps over the two top panels. There will be either one extra or one less leprechaun, depending on the placement of the panels.

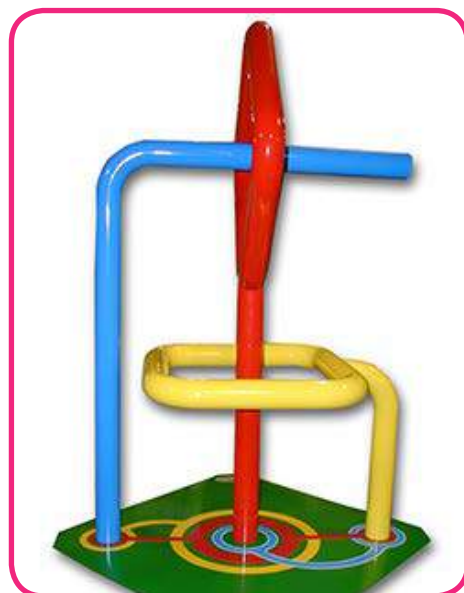
*Exhibit concepts: problem solving.*



## Linked Links

Two loops of stainless steel attached to chromed chains. The visitor tries to unlink the loops without breaking the chain, then re-link the loops. This is achieved by crossing the loops and chains.

*Exhibit concepts: problem solving, spatial awareness.*



## Loop the Loop

Three metal frames with different shapes and colours. The visitor loops the rope around one frame, then transfers the rope to the next frame, then the last frame without untying the knot.

*Exhibit concepts: problem solving, knot theory.*



## Mirror Writer

A mirror above a ledge covering three shapes - a circle, star and square - and a pointer for tracing. While looking in the mirror, the visitor attempts to trace the shapes. The mirror reverses the visitor's actions, making the task quite difficult.

*Exhibit concepts: problem solving, mirror images.*





### Nice Dice

The six faces of a dice made up of nine separate pieces. The puzzle sits on a mirror so all sides can be viewed. The aim is to complete the dice by positioning all the pieces in the correct places, with opposing sides adding up to 7.

*Exhibit concepts: problem solving, spatial awareness, mathematical calculations.*



### Optical Spinners

Three different spinning optical illusions, independently operated.

*Exhibit concepts: optical illusions, perception.*



### Packing Parcels

Nine different-sized "parcels" and a container. The visitor attempts to fit all nine parcels in the container.

*Exhibit concepts: problem solving, spatial awareness, how things fit together in three dimensions.*



### Pepper's Ghost

The visitor places their hand through the hole and curls their fingers forward. Pushing a button turns on a light in the Pepper's Ghost box. Through the viewing hole, the visitor sees an illusion of their fingers chopped off with a knife.

*Exhibit concepts: light and illusions, reflective and transparent properties of glass.*







### Pyramid Piles

Six different arrangements of connected balls, a rectangular and a triangular base. The visitor arranges the balls to form pyramids on the bases.

*Exhibit concepts: problem solving, spatial awareness, how things fit together in three dimensions.*



### Rotating Ames Window

A large rotating trapezoidal window. The visitor views the window close up and from a distance and notices that the window seems only to oscillate when seen from a distance.

*Exhibit concepts: optical illusions and perception.*



### Sheep Pen

A puzzle consisting of six different fences with long/short slots and four sheep blocks. The visitor forms separate pens for the sheep by slotting the fences together. By changing the position of the fences they then build two pens, for one sheep and three sheep.

*Exhibit concepts: problem solving by trial and error, spatial awareness.*



### Soma Cube

A puzzle comprising seven pieces. The visitor builds a three by three cube by interlocking the pieces, there are 240 ways to do this. The seven pieces represent all the ways that three or four cubes can be joined, except in a straight line.

*Exhibit concepts: problem solving by trial and error, spatial awareness, geometry.*





### Squirming Hand

A patterned disk mounted on a turntable. The visitor spins the disk slowly and stares at it. After watching the spinning disk for about 20 seconds they then look at their hand. For a short time, the visitor notices that the middle of their hand appears to be moving, but in the opposite direction to the disk.

*Exhibit concepts: vision and perception, motion after-effect.*



### Thread the Needle

The visitor attempts to thread a chain through a needle, while keeping one eye closed.

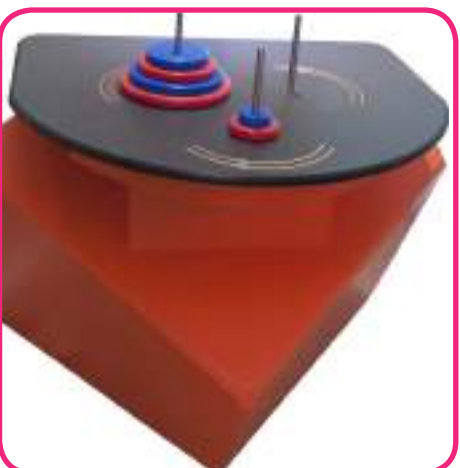
*Exhibit concepts: depth perception, hand-eye coordination, binocular vision.*



### T or Tree

A tangram puzzle consisting of four different-shaped pieces. The visitor arranges the pieces to make a "T" or "tree" shape.

*Exhibit concepts: problem solving.*



### Tower of Hanoi

Six disks and three poles. By transferring the disks from one pole to another, one at a time, the visitor attempts to rebuild the tower on one of the other two pegs.

*Exhibit concepts: problem solving, logic.*







### Unlucky Seven

A tangram consisting of seven pieces which can be pieced together to make many different shapes. The pieces are placed in templates, however one piece will not fit. The visitor is challenged to discover which is the odd shape.

*Exhibit concepts: problem solving, logic.*



### Vertical Nail Picture

A vertical frame with thousands of tiny metal rods. The visitor presses their hand into the rods. On the other side of the frame they will see a three-dimensional outline of their hand.

*Exhibit concepts: three dimensional images, pixels.*



### Zoetrope

A rotating slotted cylinder and cartoon strips. Visitors spin the cylinder and see how the images appear to move while the cylinder rotates.

*Exhibit concepts: perception, moving images and cinema.*







## sound exhibits

Bongo Pipes  
Bottled Music  
Data Storage  
How a Cell Phone Works  
How a CD Works  
Infra-red Stringless Harp  
Longitudinal & Transverse  
Waves  
Pipes of Pan  
Seeing Sounds  
Slap-a-phone  
Sound in Solids  
Sound Tubes Long  
Sound Tubes Wide  
Speaker Induced Wave  
Speed of Sound in Air  
Telephants  
Telephone Tubes  
Whisper Dishes

## Key

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free-standing floor exhibit



wall-mounted exhibit



tabletop exhibit



whole body experience



power supply required



no power required



push button



augmented reality



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Earth's Fury exhibition

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### Bongo Pipes

Eight PVC pipes of different lengths and a paddle. The visitor strikes the pipes and notices that each pipe produces a different sound, long pipes making lower sounds and short pipes making higher sounds. The eight pipes approximate a musical octave and the visitor can play a simple tune.

*Exhibit concepts: sound and vibrations, pitch.*



### Bottled Music

Eight glass bottles containing different amounts of coloured water and a striker. The visitor gently taps the bottles or blows across the open tops. Each bottle produces a sound of different pitch depending on the volume of water in the bottle.

*Exhibit concepts: sound and vibrations, pitch, music.*



### Data Storage

The visitor can explore how communications technology has evolved over time, from written to Morse code, CD and silicon chip. Includes data storage and retrieval.

*Exhibit concepts: sound and communications technology, data storage, electronic components.*



### How a Cell Phone Works

Find out how a cell phone works and how the signal is transmitted through a network to the receiver. The visitor can follow the progress of signals from one base station to the next, interconnected by switching centres.

*Exhibit concepts: cellular networks, sound transmission.*





### How CD works

A model CD, sensor and press button. The visitor spins the disk and holds down the button. When the disk turns to areas marked with dots and dashes, they are read by a sensor and a beeping sound is heard.

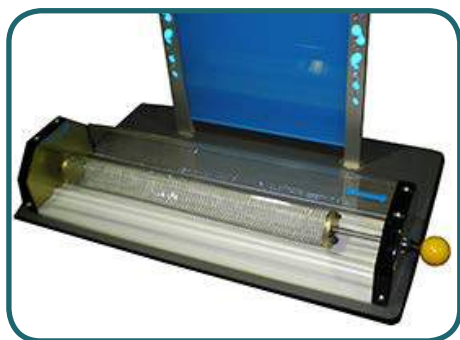
*Exhibit concepts: digital signals, sound transmission.*



### Infra-red Stringless Harp

Visitors choose from over 100 sounds or instruments and enter the code on the key pad. Pluck the 'invisible strings' (beams of infrared light directed at sensors) to play the corresponding note or sound on a electronic music synthesiser.

*Exhibit concepts: sensors, sound and music.*



### Longitudinal and Transverse Waves

An enclosed moveable slinky with a knob at each end. The visitor pushes and pulls one knob to set up longitudinal waves and the other knob to make transverse waves, which move through the spring's coils.

*Exhibit concepts: sound waves, energy, transverse and longitudinal waves.*



### Pipes of Pan

The visitor places an ear against the end of each pipe and listens. The pipes act as filters, picking up sounds in the room that correspond with the natural frequencies of the pipes. Through the longer pipes they will hear low sounds and high pitch sounds through the short pipes.

*Exhibit concepts: ambient sounds, natural frequency, sound waves, pitch.*



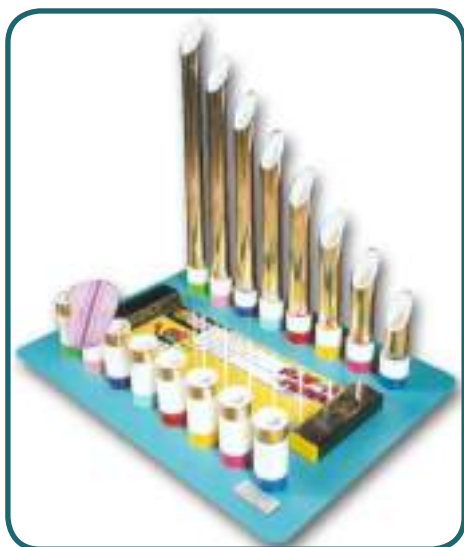




### Seeing Sounds

The visitor speaks into the microphone and makes sounds of differing pitch and volume. Wave patterns from the sounds are displayed on the oscilloscope screen. They can then compare the patterns with those from a tuning fork.

*Exhibit concepts: properties of sound waves, pitch and frequency, volume and amplitude, musical notes and noise.*



### Slap-a-phone

Open pipes of different lengths and a rubber striker. The visitor hits the pipes with the striker to produce sounds of different pitch.

*Exhibit concepts: pitch, vibrations, sound production.*

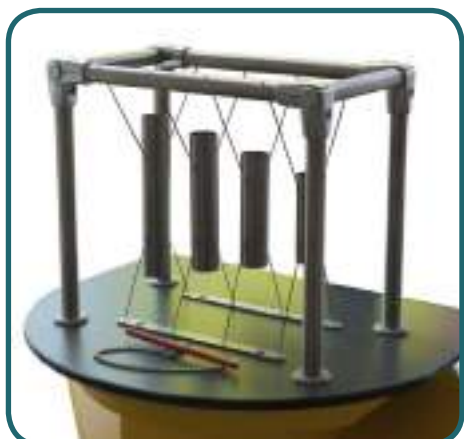


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### Sound in Solids

Three blocks -aluminium, wood and concrete, and a pull-back striker. When the striker hits the block, a timer measures the time taken for sound waves to travel through the block in metres per second and kilometres per hour. The visitor compares the speed of sound through each solid.

*Exhibit concepts: speed of sound through different solids.*



### Sound Tubes Long

Four suspended metal tubes with the same width but differing lengths. When tapped by the visitor using the striker, each tube produces a different pitched sound depending on its length.

*Exhibit concepts: sounds and vibrations, pitch.*





### Sound Tubes Wide

Four metals tubes of the same length, but with differing diameters. When tapped by the visitor using the striker, each tube produces a different pitched sound depending on its diameter.

*Exhibit concepts: sounds and vibrations, pitch.*



### Speaker Induced Wave

Visitors can experiment with a sound modulated speaker producing standing waves at different pitches.

*Exhibit concepts: sound and vibrations, pitch, standing waves.*



### Speed of Sound in Air (Wall-mounted)

100 metres of flexible tubing with open ends mounted on the wall. The visitor speaks into one end of the tube and listens through the other end. It takes time for the sounds to travel through the air in the tube and the visitor will notice a short delay between speaking and hearing the sounds.

*Exhibit concepts: speed of sound in air, sound waves.*





### Speed of Sound in Air (Table top)

A telephone style earpiece and mouthpiece connected by a 60 metre long flexible hose contained in the exhibit base. The visitor talks into the mouthpiece and will hear their voice through the earpiece after a short delay.

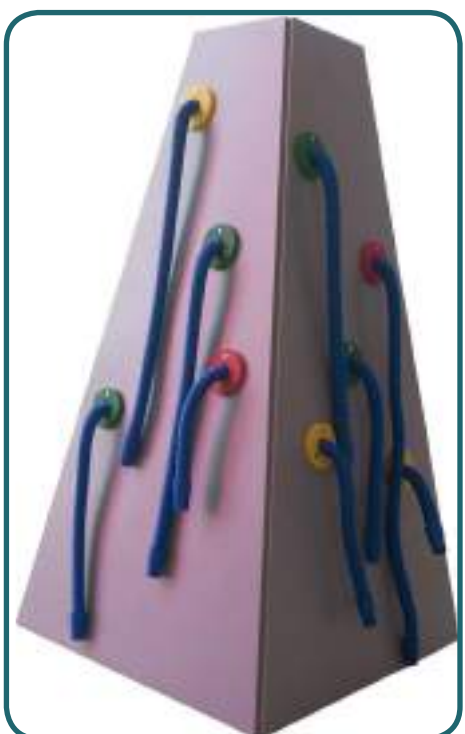
*Exhibit concepts: speed of sound in air, how sound travels.*



### Telephants

Two telephants connected by a large flexible tube. Visitors can talk to a friend at the other telephant through a hole in the back of the telephant's head. Extra telephants can be connected to the 'telephant exchange'.

*Exhibit concepts: how sounds travel.*

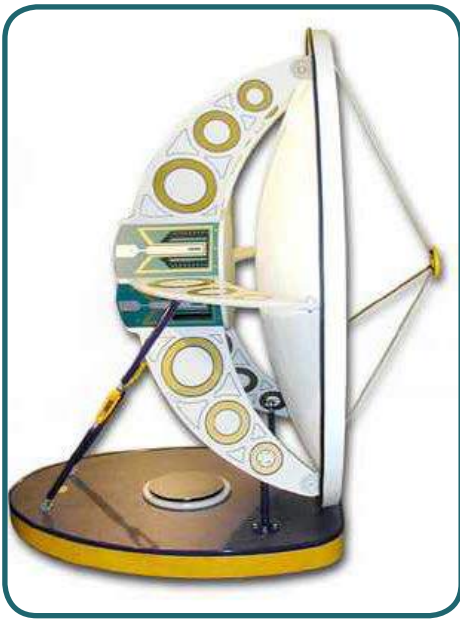


### Telephone Tubes

A large free-standing exhibit containing colour-coded tubes on each side. One person talks through a tube while others attempt to find, through listening, which tube they are using. Visitors can converse through the tubes.

*Exhibit concepts: sounds in tubes.*





### Whisper Dishes (free-standing)

Two large whisper dishes face each other. One visitor speaks into the centre ring. The sounds from their voice travel across the room and are easily heard by another visitor listening at the ring of the opposite dish.

*Exhibit concepts: how sounds travel, reflection and focussing of sound.*



### Whisper Dishes (wall-mounted)

Two large parabolic dishes mounted opposite each other. Two visitors can have a long distance conversation with each other across the room by speaking and listening at the centre ring (the focus). The dishes collect and reflect sound waves which travel in a straight line from one dish to the other.

*Exhibit concepts: how sounds travel, reflection and focussing of sound waves.*

