Physicists in Primary Schools project

Examples from presentations

at www.iop.org/pips

Ann Marks

The first slide from the sound presentation with an interesting title.

SOUNDS GOOD!

From musical boxes to iPods

Space Walk

Aug 2005

Stephen Robinson

outside Discovery

NASA picture

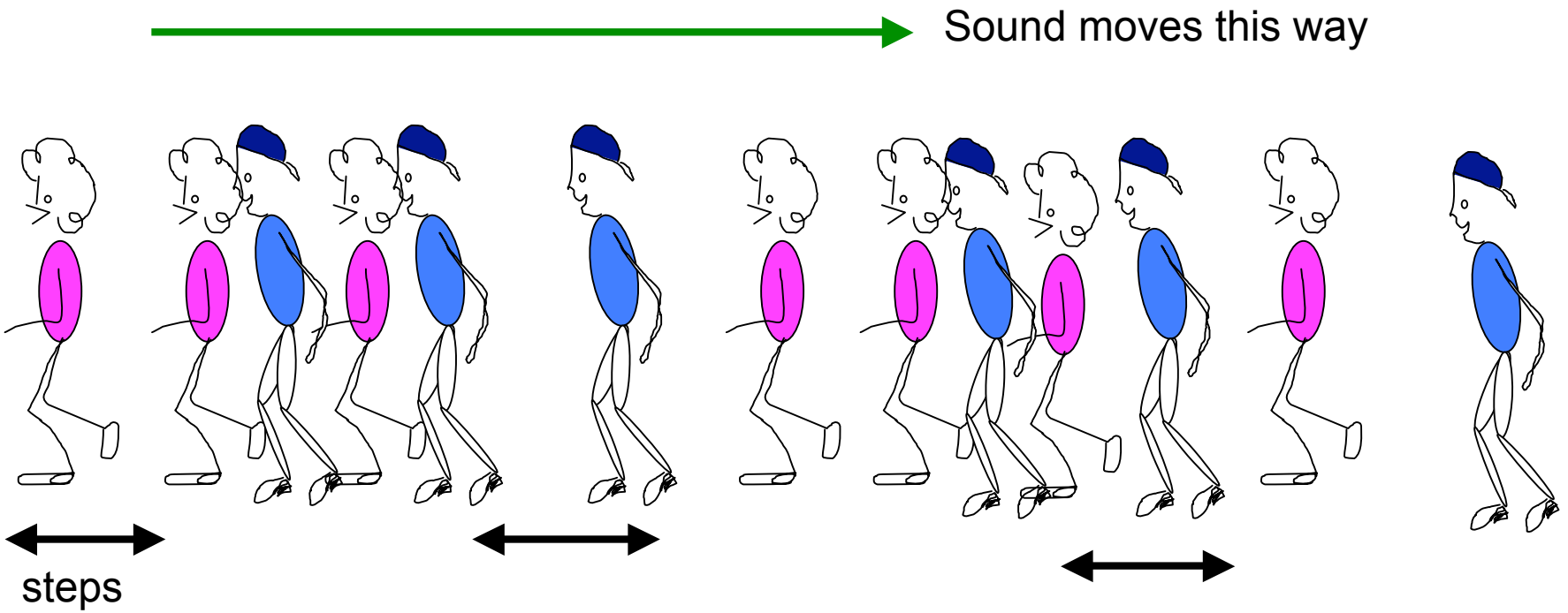
How to use the Space Walk slide to explain why sound needs a medium through which to travel.

- Point out that if someone shouts loudly outside a house, the sound can be heard inside the house. Space ships have very thin outer skins. Ask whether, during a space walk, an astronaut could be heard by those inside the space craft. If they are not sure, point out that some of the pictures show the astronaut attached to a line. Ask what it is for. (For Communications and to prevent the astronaut moving away from the space ship and being lost.)
- The astronaut is well above the Earth's atmosphere which is seen as the bright blue band round the distant horizon. Therefore there is no air outside the space craft so the astronaut's calls would not be heard by those inside the space craft.
- Sound needs something to travel through (e.g. air).

Let's play some games!

A useful slide to show when the class is busy doing an activity.

Sound dance



- The bunches move along the line.
- The children do not move along!

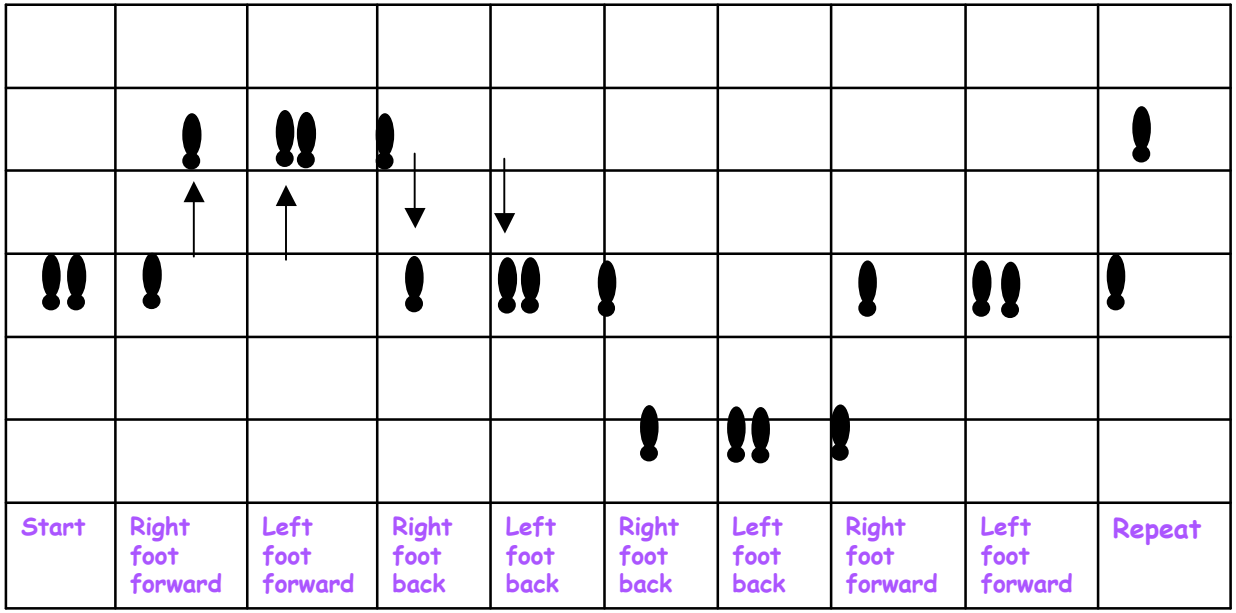
Sound dance - instructions (for presenter)

Activity	Discussion	Aims/facts
5. Class activity: 'dance' Ask about 10 volunteers to line up across the classroom all facing towards one end of the line. Child 1 should start to step. The as soon as child 2 sees child 1 move, 2 should start to step. As soon as child 3 sees child 2 move, 3 should start to step. A second group could dance, if there is time. Show **Powerpoint Slide 6** See Apparatus List See Safety Notes	The remainder of the class should watch and explain what they see. The line should automatically form bunches which move along the line to represent the sound travelling. Point out that the children do not move along the line. Only the bunches move along: the individuals just vibrate. Ask them how the dance could represent quiet sounds and loud sounds.	As the sound travels, the individual particles vibrate and do NOT travel with the sound. Sound travels like a wave. A sound wave.

Sound Dance - from Apparatus list

Steps explained for presenter

5. Activity Dance steps



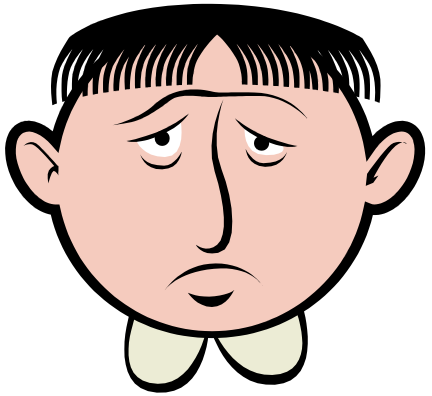
About 10 children should be in line one behind another, spaced across the classroom.

Child 1 starts to step as shown in the diagram.
Child 2 starts to step after child 1 has taken the first step.
Child 3 moves once child 2 has started etc

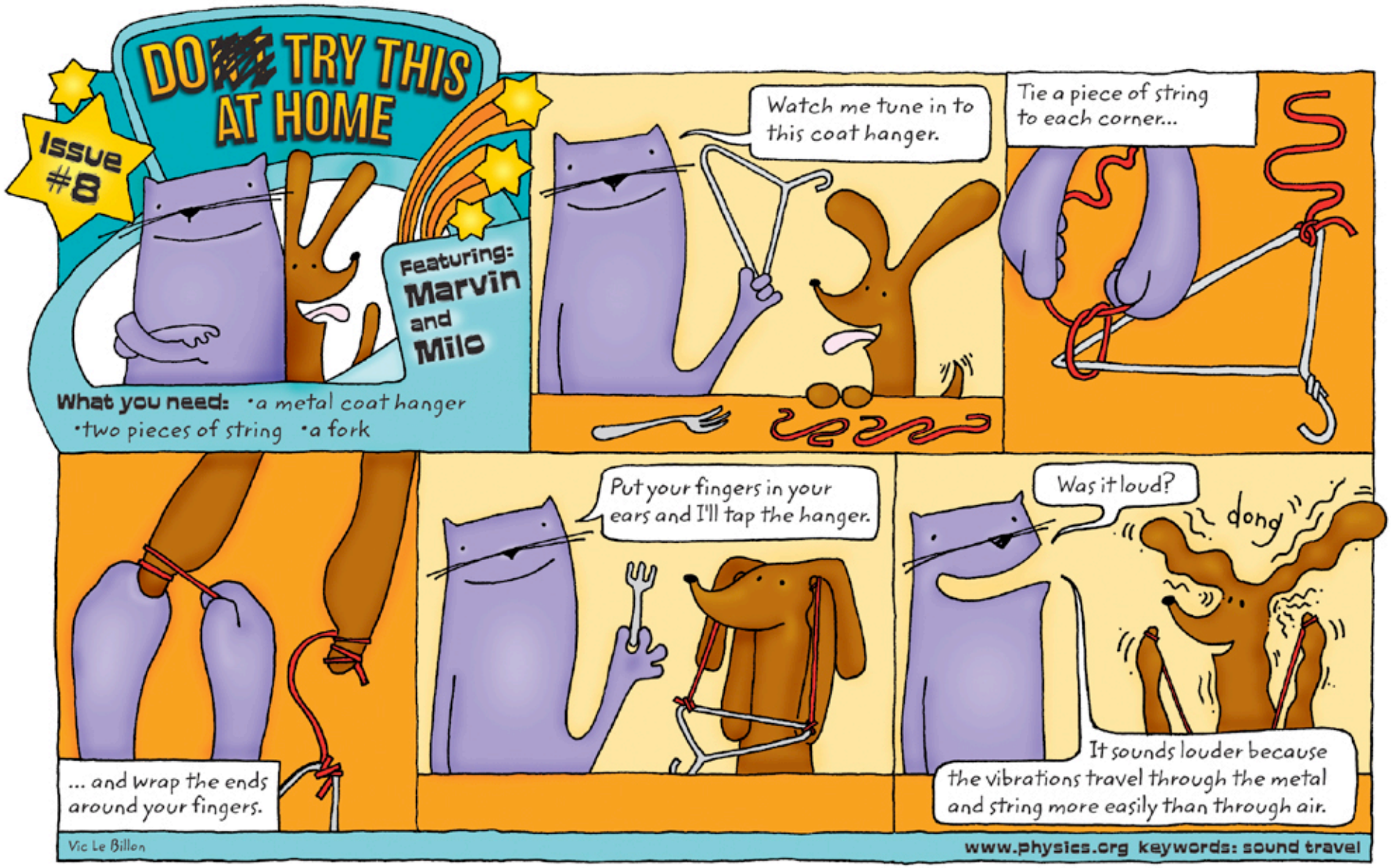
Safety Notes

During the dance, children should be warned to take small steps so they do not tread on each other's feet. Good behaviour is essential. Any child who is uncooperative should be sent from the line.

Large ears to collect sound



- Our ears are on the side of our heads.
- We can play a game to find out why.


DO TRY THIS AT HOME
Issue #8
Featuring: Marvin and Milo
What you need: •a metal coat hanger •two pieces of string •a fork
Watch me tune in to this coat hanger.
Tie a piece of string to each corner...
... and wrap the ends around your fingers.
Put your fingers in your ears and I'll tap the hanger.
Was it loud?
dong
It sounds louder because the vibrations travel through the metal and string more easily than through air.
Vic Le Billon
www.physics.org keywords: sound travel

Bells

- What sounds will they make?

This slide follows explanations explaining that large objects make low frequency sounds and small objects make high frequency sounds.

Can you spot the baby?

Ultra sound is used as an example of the use of sound.

Sound has lots of uses

Physics is everywhere

- From kitten's ears to mobile phones

The final slide in the 'Sound' presentation to reinforce the message that 'physics is everywhere'.

ELECTRICITY: To explain that particles move through the wire when a current flows: When seen from an aeroplane the forest appears like an almost smooth surface.

A forest

At a lower level monkeys and other animals can be seen moving between the trees. This provides an analogy with the tiny particles (electrons) moving between atoms in a conductor when a current flows.

What can you see?

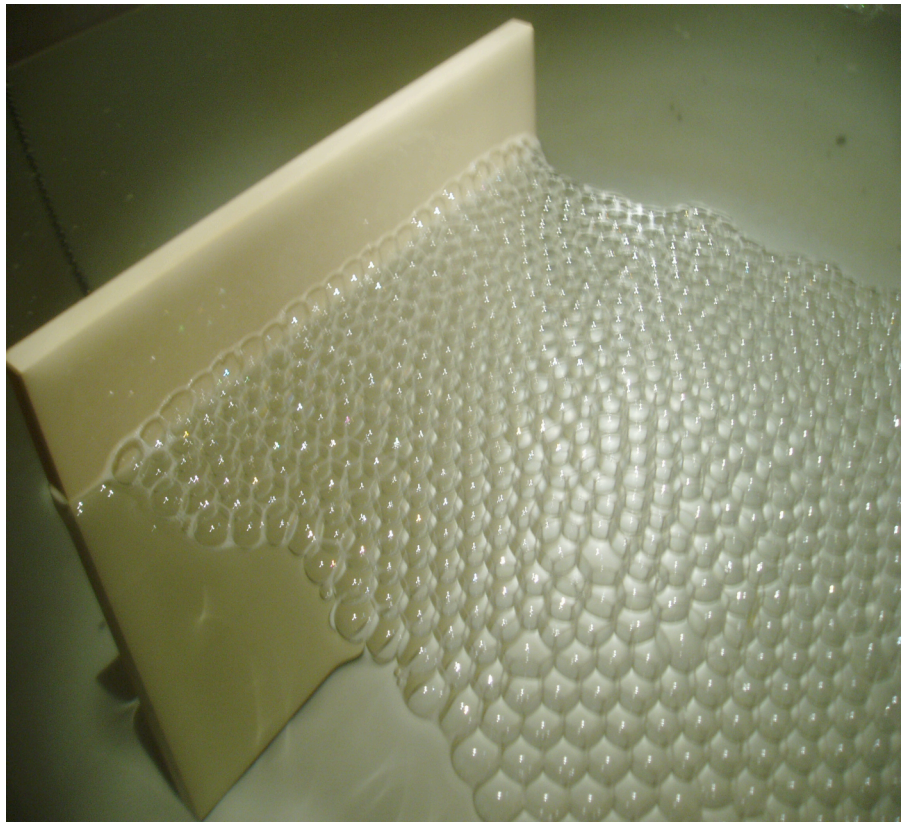
Now
a game ----

A bubble raft is a 'solid' layer on the surface of the water

Simple instructions are provided so the children can make bubble rafts to learn about crystal structure.

A bubble raft grown quickly.

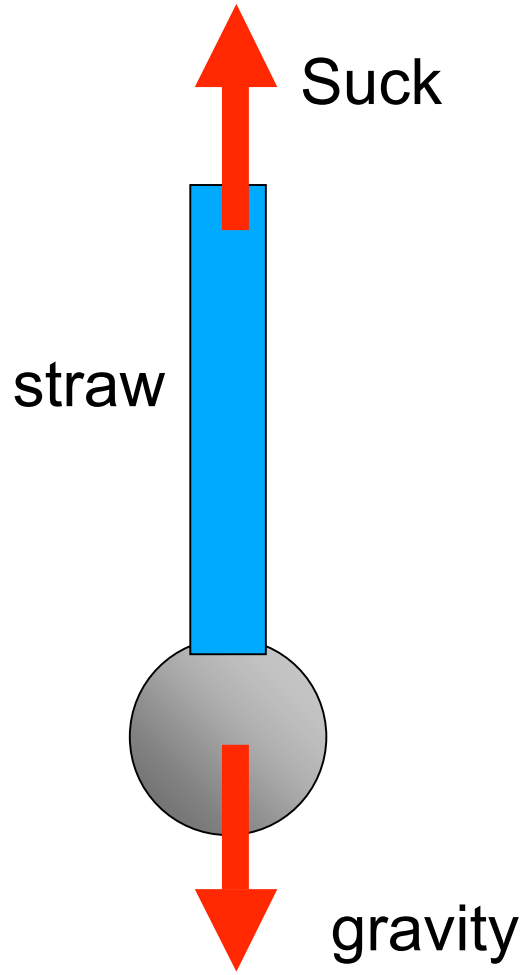
Solids topic



The ball does not fall when your upward force = force of gravity

Forces and Gravity topic

A game to learn about balanced forces in a very simple way.



Day and night

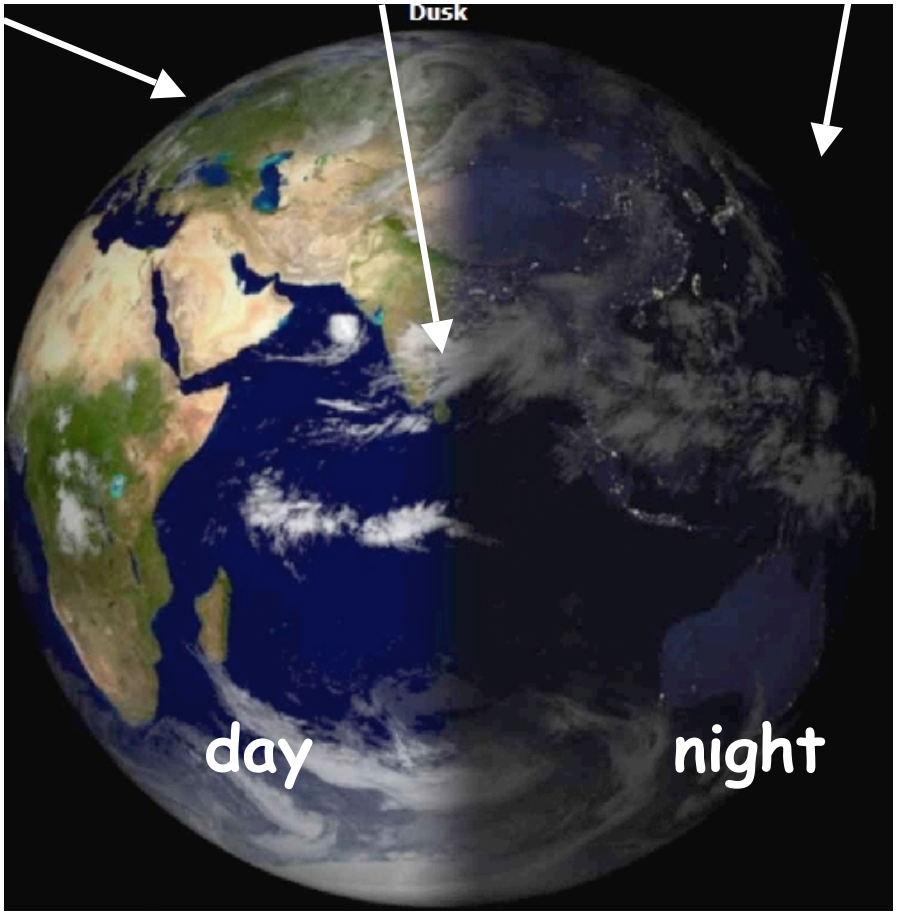
Sunlight and space travel topic

Dusk in India

Dark in China

Daylight in the UK

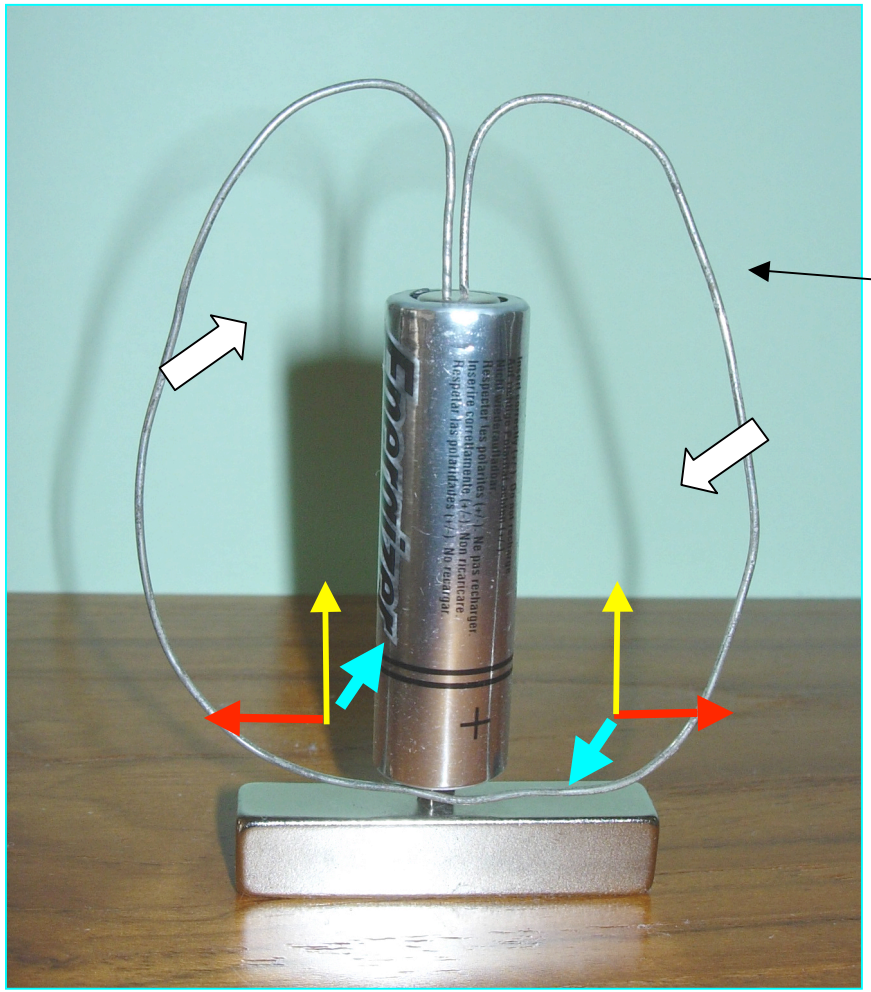
Light from the Sun



Simple motor

Forces and magnetism topic

The wire rotates about a vertical axis showing that a magnet + an electric current can cause movement. (explanation for the presenter.)



Using a

- neodymium magnet
- battery
- wire

Bare non-magnetic wire. Copper works well but should not be lacquered.

Current →

Magnetic field →

The force → on each part of wire causes a horizontal couple perpendicular to the currents so the wire rotates.

EPSRC
Engineering and Physical Sciences Research Council

IOP Institute of Physics

The University Of Sheffield.

Physicists in Primary Schools Project

Website: www.iop.org/pips

(or www.iop.org/ and select popular link at foot of the home page)

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