Echo Activity

1 1/2 hours

Objectives

- To investigate how sound is used by industry to identify rock layers
- To understand that sound bounces off different surfaces but some of the sound can be absorbed
- To use ICT to measure the amount of sound

Resources

Per group of four children unless otherwise stated

Selection of different materials, e.g. cotton wool sheet, metal sheet, plastic tray, thin fabric, expanded polystyrene sheet

2 poster tubes or other cardboard cylinders

Tray or surface to use as a 'wall'

Small ball of blue-tac

Sound source, e.g. simple circuit containing a buzzer

Data logger for sound measuring

Activity sheet

Email

Enlarge the activity sheet to A3

Advance preparation

Remind the children about the information about echoes they have been learning about on www.roughguidetogas.org.uk . Ask How do we hear echoes?

Introducing the activity

The teacher explains the idea that sound bounces off surfaces and travels back to us. Depending on how far away the surface is and the type of surface determines if we hear a clear echo or a blurred hard to distinguish sound.

This difference between echoes can help us to identify different materials and shapes within the rocks. We can use this information to find out which materials absorb or reflect sound.

The children, working in small groups, plan how they can test different materials and check for an echo being reflected off different surfaces.

The following is a suggested way of carrying out the activity but the children should be encouraged to test out their own methods.

Main activity

Position the activity sheet against a wall or vertical surface (could be a tray held on position on a table).

Line up the poster tubes on the marks on the activity sheet and place the sound source either just inside or at the end furthest away from the vertical surface. A small piece of blue-tac can be used to hold it in position. Place the data logger at the end of the other tube, again furthest away from the vertical surface. Switch on the sound source and record the volume of sound shown on the data logger.

Change the surface the sound is bouncing off and repeat the activity. The second tube can be moved to different positions to show the sound changes at different positions.

Once all the surfaces have been tested, the results are collected together and the class decides the best way of presenting them. This could be as separate bar charts or as combined scatter graphs for each surface.

Plenary

An object produces sound when it vibrates. These vibrations move the particles around the object whether the particles are solids, liquids or gases.

Background information

Good information on sound travels & we hear sounds at http://health.howstuffworks.com/human-body/systems/ear/hearing.htm