

Learn to Light:



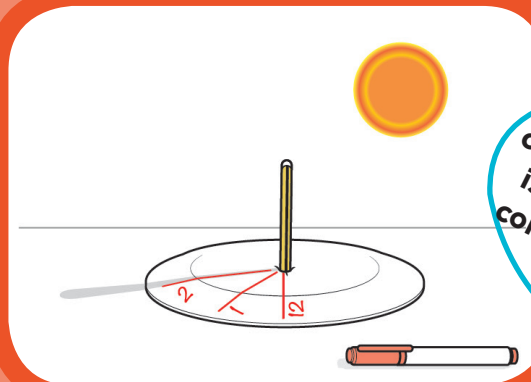
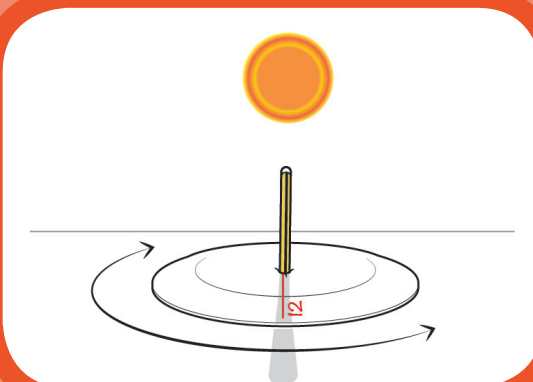
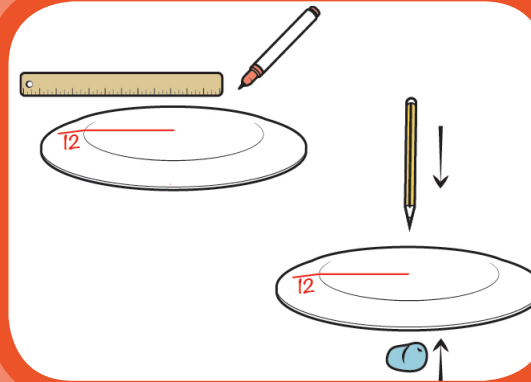
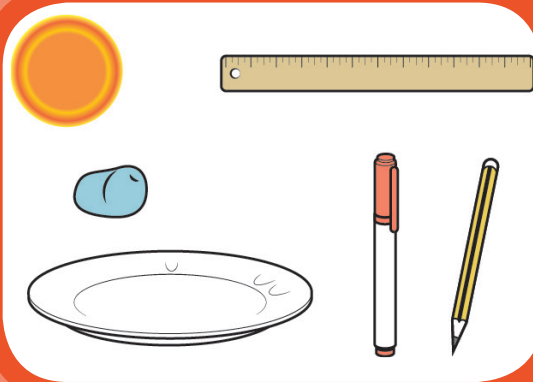
Shadows Shadows are formed when the light from a light source is blocked by an opaque object. Light rays travel from a source in straight lines. If an opaque object gets in the way, it stops some of the light rays travelling through it, and an area of darkness appears behind the object. The dark area is called a shadow. Shadows are not totally black. If you look closely at a shadow, you will see a dark area in the centre (the umbra) and a lighter area around it (the penumbra).

Experiment

Make a sundial

You will need: A paper plate, sharp pencil, pen, ruler, sunlight, blu tack

1. Make a hole in the centre of the plate. Write the number 12 on the edge of the plate and draw a straight line to the hole. Put the pencil through the hole and secure with blu tack.
2. Place your plate in the sun and at 12pm turn so the shadow lines up with the line to the number 12.
3. An hour later draw a line where the shadow is now and write the number 1, repeat every daylight hour until you have a complete sundial to tell the time by.



FUN FACTS

The sundial was the first time keeping device and is one of the world's oldest scientific instruments.

Shadow play, also known as shadow puppetry, is an ancient form of storytelling. Chinese legends state that the first shadow puppet was made more than 2,000 years ago.



A gnomon is the pointer on a sundial that casts the shadow (your gnomon is the pencil). It is a word that comes from ancient Greek and means 'indicator'.

A solar eclipse occurs when the Moon passes in front of the Sun casting a huge shadow across the earth.

Findings

Is the shadow always the same shape and size ?

At what time is the shadow longest ?

Do all things have a shadow ?



Riddle: I follow you around in the light, I say goodbye to you in the night? What am I?

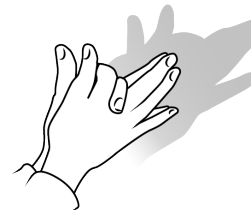
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Conclusion The size and shape of a shadow depends on the position and size of the light source compared to the object. Moving an object nearer a light source will make the shadow bigger and moving it further away will make it smaller. Changing the angle between the object and the light source will change the length of the shadow.

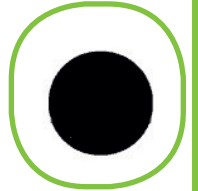
Shadow Play

CAN YOU MAKE AN OWL SHADOW USING YOUR HANDS?

As far back as prehistoric times people have used their hands to help tell stories creating simple shadows reflected on the walls of fire-lit caves.



CAN YOU MATCH THE OBJECT TO ITS SHADOW?



CAN YOU PUT ON A SHADOW PUPPET PLAY?

Choose a favourite book, create puppets for each of the characters by cutting out paper shapes and attaching them to the end of a pencil/straw with some sticky tape. You can also make pieces of scenery and props in the same way, then you're ready to act out the story.

CAN YOU GUESS WHAT THE SHADOW IS?

Each person finds an object from around the house, making sure no one else sees what it is. When it's your turn you place your object behind the screen and everyone else has to guess what it is from the shadow it creates. The person to get the most correct is the winner.

Create a screen by putting a white bed sheet/large piece of white paper in front of a window or light source. Make sure the rest of the room is dark. Place objects behind the screen but in front of the light source to create shadows on your screen.

Grown-ups: It doesn't take very long to set up a screen and once it's done kids can have hours of fun playing different games and learning a lot. For best results, make sure the sheet is as taut as possible. Filming a shadow puppet play to send to grandparents is also a lovely way of keeping in touch.