

DAY 11

TOPIC: LIGHT

How Light Travels

Aim: Describe how light travels

Explain how shadows are formed.

Activity :

- Read p.27 attached below.
- Watch video 8.L.21
- Answer the questions 1, 2,3,4 on p.27
- Answer questions on Light 1

11.1 Mostly about light

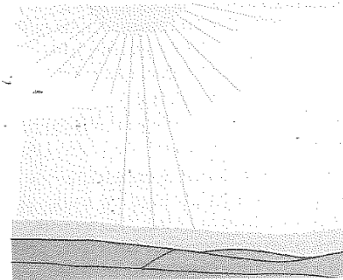
Starting
off

No one can see anything in a completely darkened room. There has to be light before you can see! You see when light enters your eye. And so you have to know something about light to understand how the eye works.

What is light?

Light is a kind of energy. It's a type of radiation (like heat radiation). Light energy is given off by the Sun, by electric light bulbs, by candles, and other **light sources**.

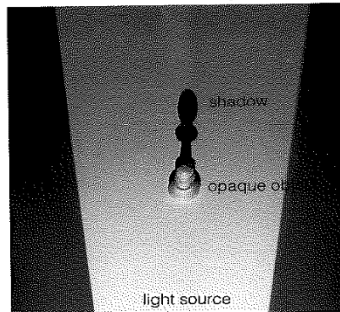
Light energy travels from one place to another. The light travels in straight lines. (You can see that from the pictures of the Sun.) It's often useful to think of the light travelling as light rays. These rays are like tiny beams of light, travelling through the air at 300 000 km each second.



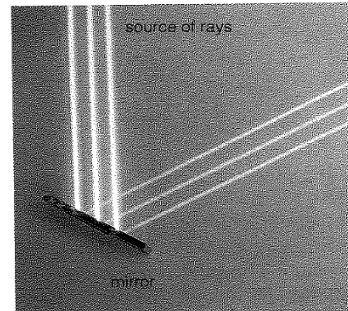
Shadows and reflections

Because light travels in straight lines, shadows form. A **shadow** is an area behind an object where no light from a light source reaches. When the Sun shines on an object, like a tree, the Sun's rays cannot bend round corners to reach the area behind it. That's why the area behind the tree is dark, and that's what makes the shadow.

Light rays can be bounced off, or **reflected** off, an object. You see this page because rays of light are being reflected from it into your eye. Shiny surfaces, like mirrors, reflect light best. You can see from the photo how a mirror reflects the rays.



How shadows are formed
The rays from the torch can't bend round the object... and so a shadow forms behind it.



Did you know?

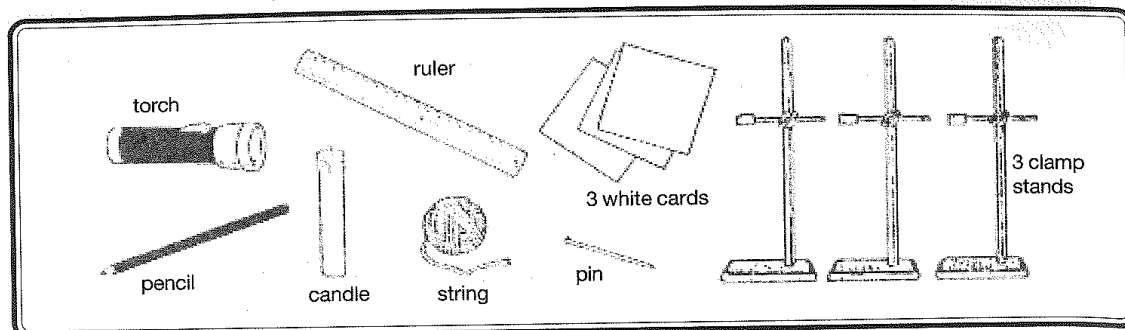
- Pin-hole cameras took the earliest photographs. The film was fixed to the back of the camera.
- The Arabs and Chinese knew about lenses around 800 AD. 500 years after that, the first spectacles were made in Italy.

- 1 What is a light source? Give some examples.
- 2 Write down two facts about light rays.
- 3 What is meant by: a) a shadow b) reflecting light?
- 4 Why does a shadow form behind you when the Sun shines?
- 5 Mirrors and polished cars reflect light well. Walls don't. Why?
- 6 Try to find out: does the Moon give off light or reflect it?

Light 1

How light travels

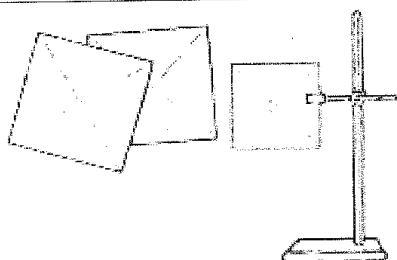
You will need:



How does light travel?

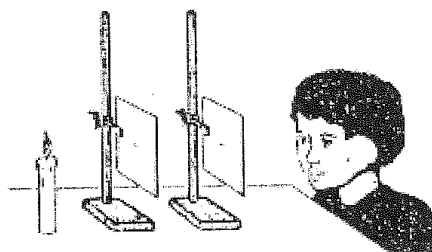
Work in darkened area.

1



Draw two lines from corner to corner on each card, as shown. The centre is where the two lines cross. Make a small pinhole at the centre of the three cards. Clamp each card in a clamp stand.

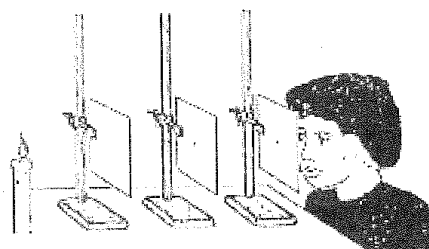
2



Arrange two cards as shown so that you can see a candle flame through the holes.

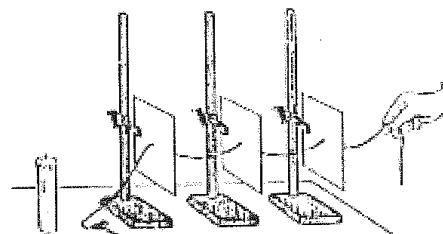
3

Place the third card in position so the flame can be seen through the three holes.



4

Blow out the candle. Don't move the stands. Thread a piece of string through the three holes, and pull it tight.



Q1 What do you notice about the string when it is pulled tight through the holes?

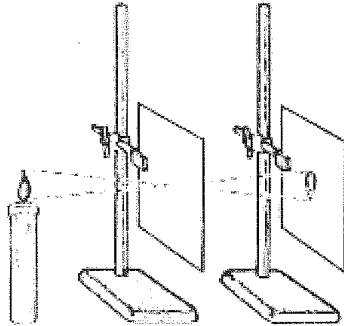
Q2 How must the holes be arranged for light to travel from the candle to the eye?

Q3 Draw a diagram of the cards in this position.

Q4 What does this activity show about the way light travels?

YEAR 8

- 5 Put a lighted candle in front of a card with a pin hole. Look at the image on a second card.



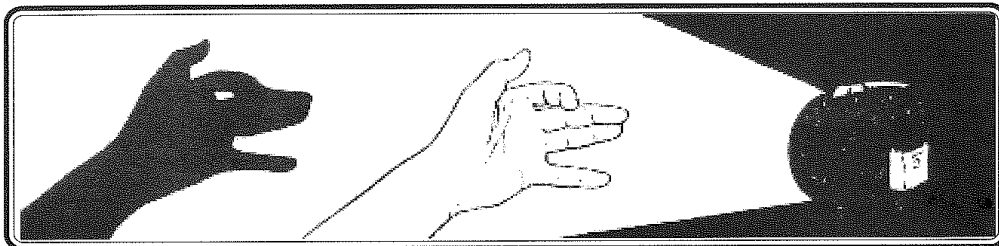
Q5 What do you notice about the image?

Q6 Draw a diagram.

Q7 Copy this information.

These activities show that light travels in a straight line. This is why we cannot see around the corner, or behind ourselves.

Shadows

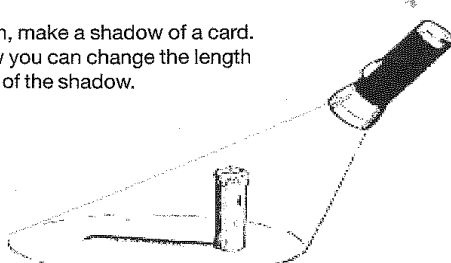


You have probably tried making shadow pictures on the walls at home. You only need a bright lamp or candle and a dark room.

Q8 Copy this information.

Shadows are due to light travelling in straight lines. When light falls on an **opaque** object (one which will not allow light through) a **shadow** is formed on the opposite side of the object.

- 1 Using a torch, make a shadow of a card. Find out how you can change the length and position of the shadow.



Q9 Explain how you were able to make a candle have a long or a short shadow.

Draw a diagram to help you.

Q10 In ancient times shadow clocks were used for telling the time. Explain how a shadow clock works.

Q11 A shadow clock is called sundial. Make a sundial as a class project.

NEW WORDS: opaque, shadow