

DAY 12

TOPIC: LIGHT

Pinhole camera

Aim: Describe image formed in a pinhole camera

Explain how this image can be made clearer

Activity :

- Read p.28 attached below.
- Answer questions on Light 2

11.1 Making pictures

Going
further

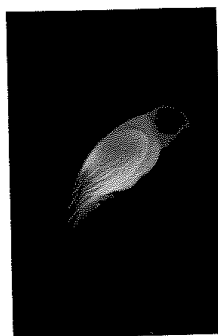
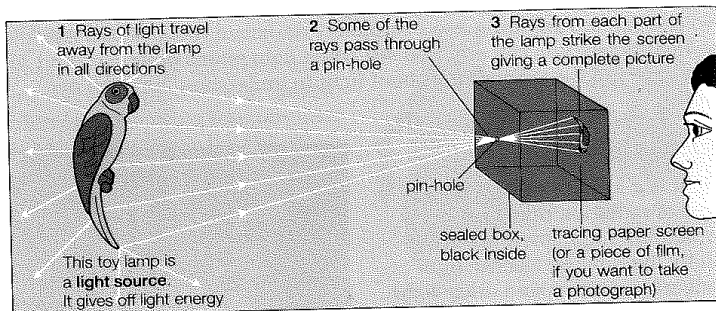
Light can be used to make a picture on a screen. An easy way to do this is by using a pin-hole camera.

You can see a model pin-hole camera in the diagram. Light rays enter the box through the tiny pin hole at the front to make a picture on the screen at the back. The hole is too small to let much light in.

You might think it would be easy to get a bright picture by making the hole bigger. This works but the picture becomes blurred. The big hole lets rays of light from one part of the lamp strike the screen at different places. **If you want to get a clear picture, all the rays from one part of the lamp must strike the screen at the same place.**

To get a bright, clear picture, you must use a wide hole and a **convex lens**. A lens is a specially shaped piece of glass which bends light rays. A convex lens bends light rays so that they come together. If you put the lens between the lamp and the hole, the picture becomes clearer. By moving the lens backwards and forwards, you can find a position which gives you a very clear picture. The picture is then **in focus**. The lens bends the rays of light which enter the camera from one part of the lamp so that they all strike the screen at the same place.

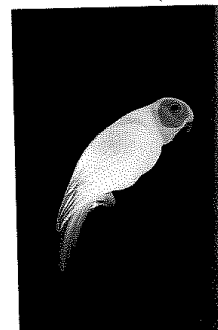
- 1 a) Explain how you can make a picture using a pin-hole camera. ▲
- b) Why is the picture not very bright? ▲
- 2 What does a convex lens do to light rays? ▲
- 3 **Try to find out:** how lenses are made.



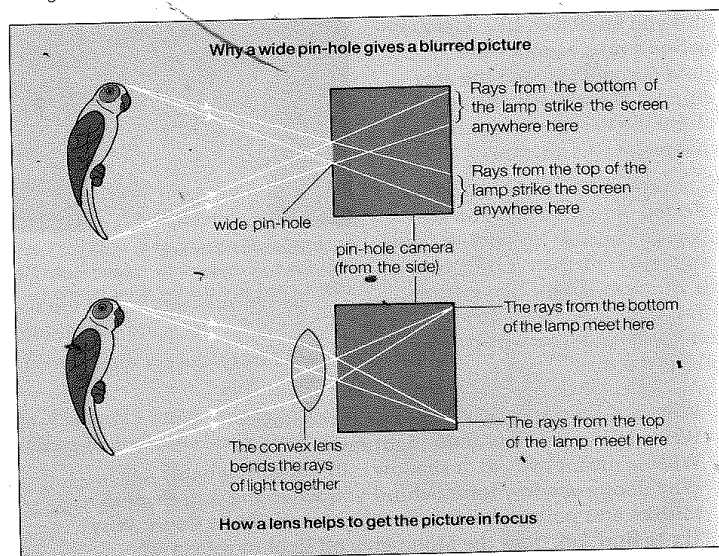
a small pin-hole
sharp, but not bright
enough



a large pin-hole
bright, but blurred



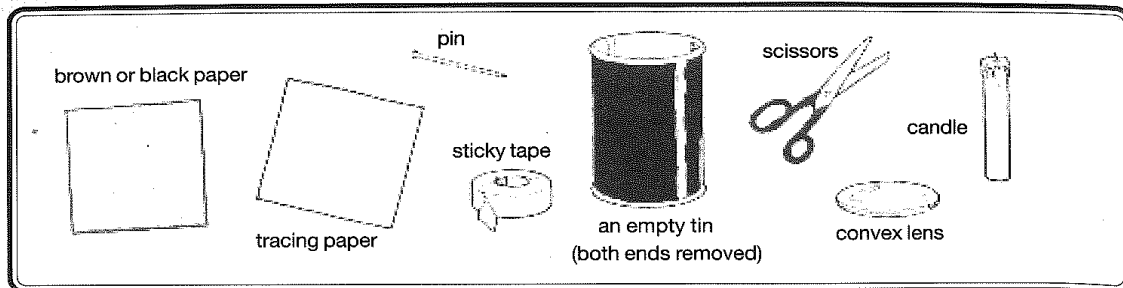
a large pin-hole with a
camera lens
bright and sharp



Light 2

Making a pinhole camera

You will need:

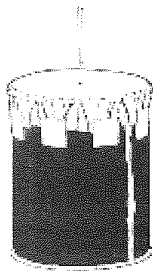


Making the camera

Work in a darkened area.

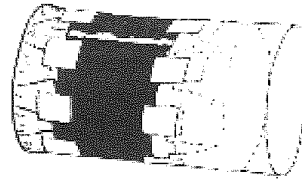
1

Cover one end of a tin with brown paper. Then make a very small pinhole in the middle.



2

Cover the other end of the tin with greaseproof paper. Add the shade of brown paper as shown.



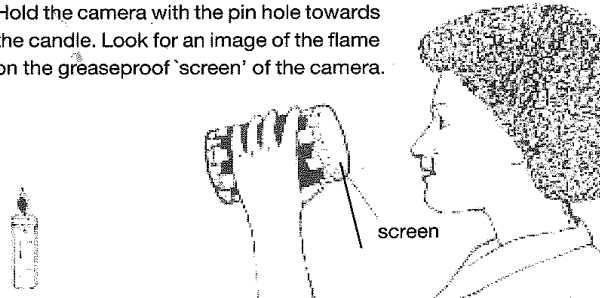
3

Light a candle.



4

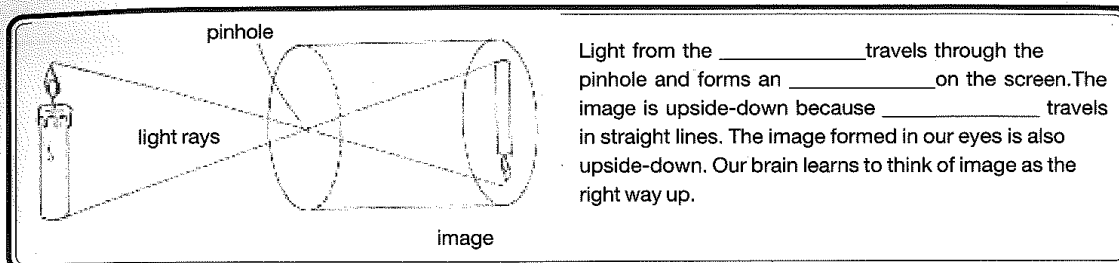
Hold the camera with the pin hole towards the candle. Look for an image of the flame on the greaseproof 'screen' of the camera.



Q1 Draw a picture of the **image**.

Q2 Is the image upright or upside-down?

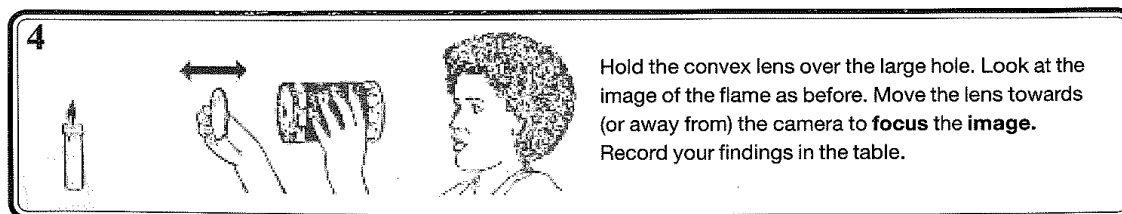
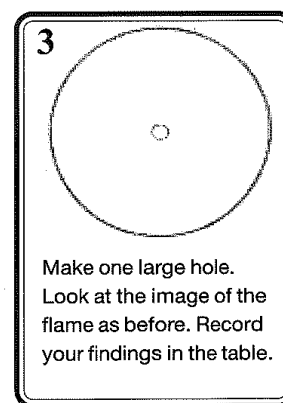
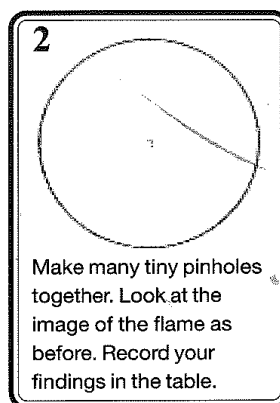
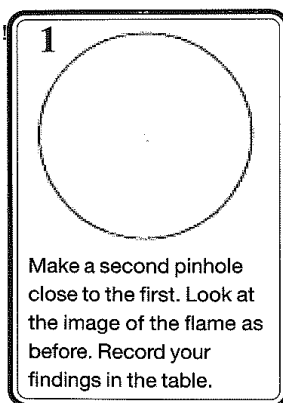
Q3 Copy this diagram. Then copy and complete the information..



Improving the camera

Q4 Copy this table

Type of hole	Image clear or blurred
1 pinhole	clear
2 pinholes	
many pinholes	
large hole	
large hole and lens	



Q5 Which gives a brighter image, one or many pinholes?

Q6 Which gives a clearer image, one pinhole or a larger hole?

Q7 What effect does the lens have on the image?

NEW WORDS: image, focus