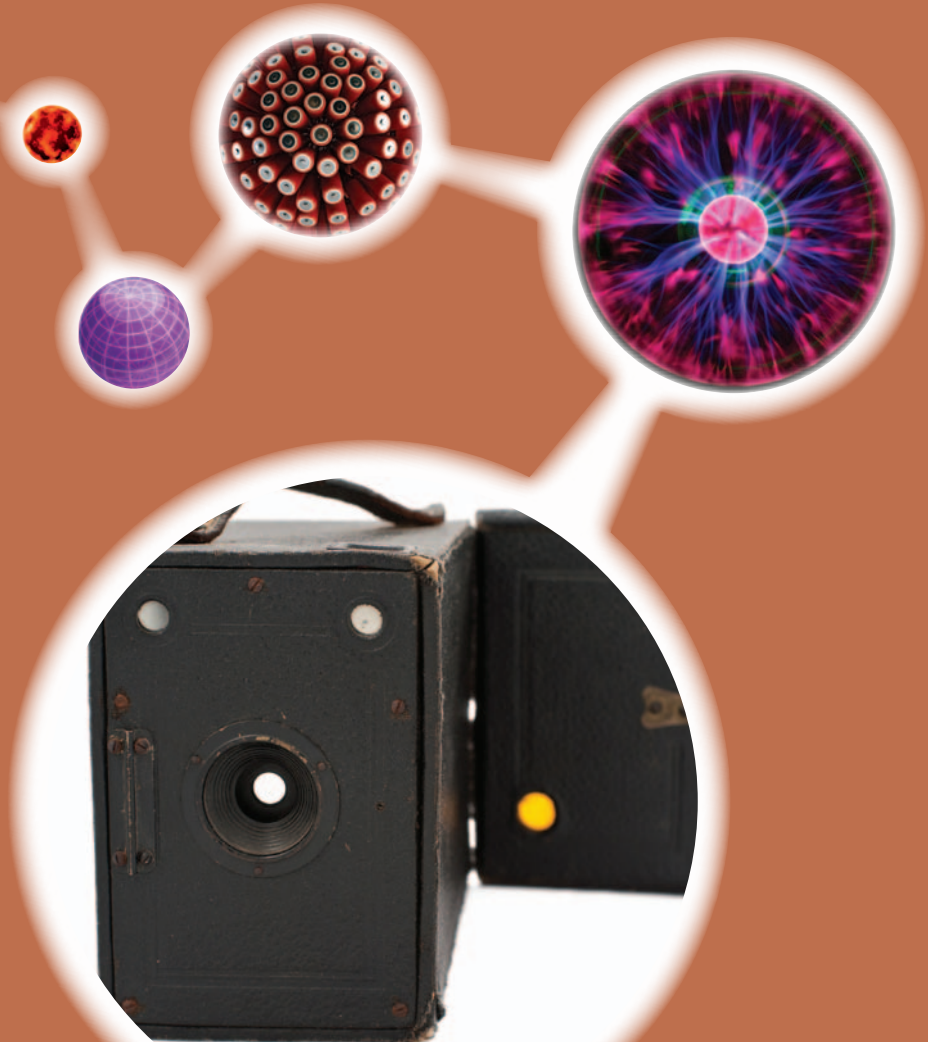


A Classic Pin-Hole Camera



Apparatus

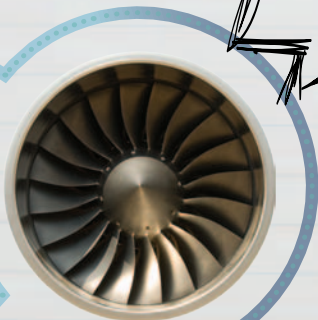
Empty crisps tube, cylindrical cardboard type
Marker pen and sharp knife
Ruler
Map pin or drawing pin
Masking tape
Aluminium foil
Foam polystyrene drinking cup
Bright sunny day!

Reference: Gateway Science Suite Physics P5h

Twenty First Century Science Suite Physics
P7.2

Procedure

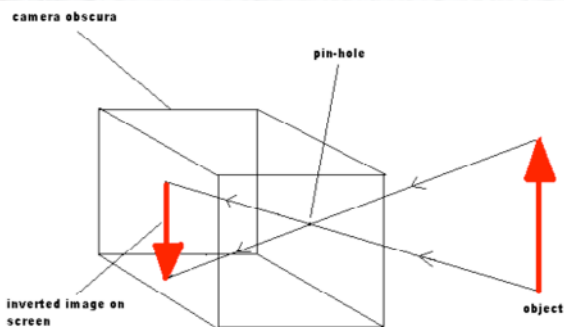
- 1 Take the lid off the cardboard tube, and give it a clean.
- 2 Carefully draw a line all round the tube, about 5cm from the bottom [with the metal base], and then cut the tube along the line into two pieces.
- 3 Use the pin to make a "pin-hole" in the centre of this metal disc.
- 4 The plastic lid is going to be the screen, so put this back on top of the shorter piece of tube. Put the longer piece back on top and tape all the pieces together.



Remember
Ruler
Aluminium foil
Crisp tube



- 5 Now we need to make the tube light-proof, so wrap it with aluminium kitchen foil and tape all the edges down neatly.
- 6 As a finishing touch, and to make using the camera easier if you wear glasses, make an eye piece from a foam polystyrene drinking cup. Cut off the bottom as close to the bottom as possible, and wedge the thinner end of the cone that is produced into the open end of the camera. The wider end can then be shaped with a pair of scissors to make a snug-fitting eye piece. It helps keep stray light out as well!

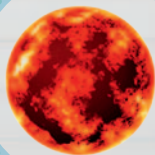


- 7 Go outside on a bright day and look at the world through the camera. The lid makes a screen on which you can observe an up-side-down world!

What's going on?

You have made a 'camera obscura' which is Latin for "dark chamber". The first camera obscura were small rooms that were completely dark except for a tiny hole in one wall which let in a narrow beam of sunlight. People in the room saw an image of the trees and sky on the wall opposite the hole.

Some artists used this projection technique to trace images of the view which they then painted in. An early "painting-by-numbers" trick!



I Love science

Questions and extensions

- 1 As a group several cameras could be made, with different sized holes to investigate the clarity of image. What happens if two holes are used close together, or far apart?
- 2 Make several cameras with screens at different distances from similar sized holes, and investigate the clarity of the image.
- 3 What would be the effect if three or more holes were made all close together?