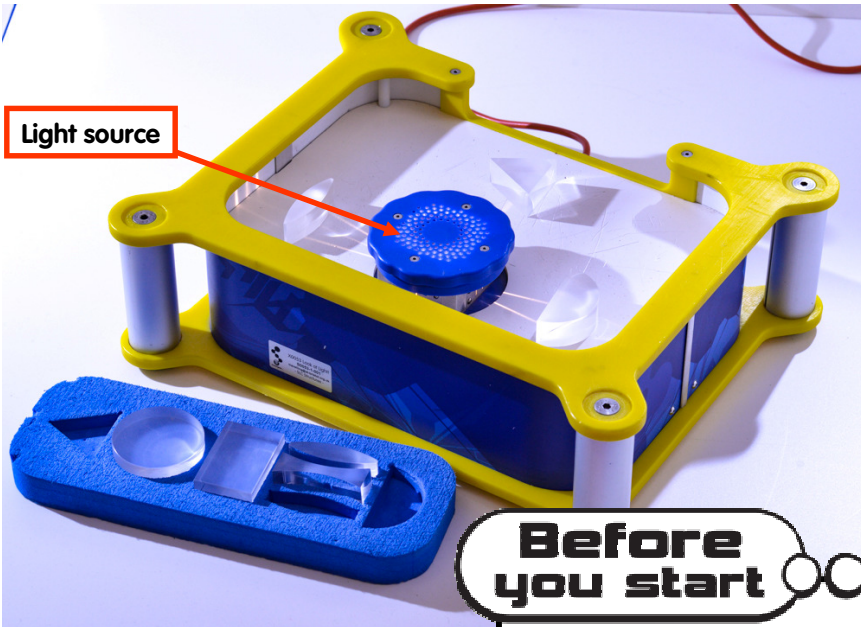


LOOK AT LIGHT

Challenge



Before you start

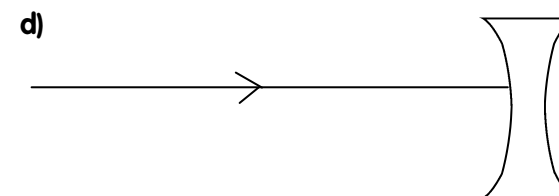
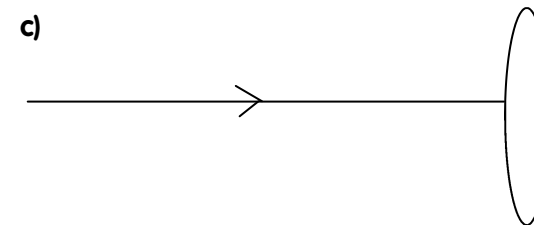
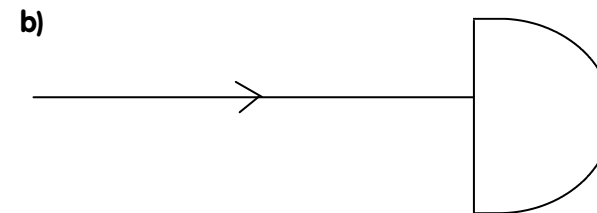
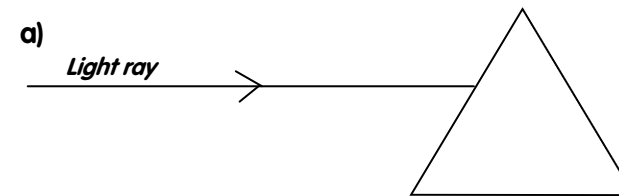
Turn the blue dial and look closely at the different beams coming from the light source

Investigate how light behaves as it passes through transparent materials of different shapes

LOOK AT LIGHT

1. Place the Perspex blocks in front of a single beam of light coming from the light source.

Draw the path the light beams take when they pass through the blocks



LOOK AT LIGHT

2. Fill in the missing words in the paragraph below. Select words from the word box

energy	electrical
transferred	light bulb

Light is a form of _____. The light source is powered by _____ energy. The electrical energy is _____ into light energy in the _____.

3. A triangular prism can be used to break up (disperse) white light into lots of different colours.

Place the triangular block (prism) in front of a beam light. Adjust the position of the prism until you see the white light separate into different colours.

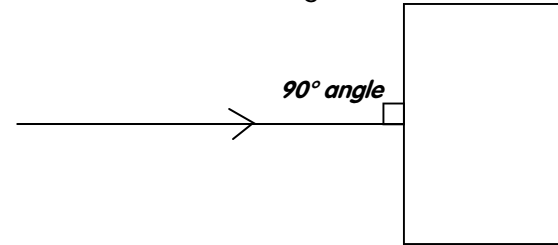
What colours do you see?

Raindrops work as thousands of tiny prisms breaking up the light. Can you list the six 'colours of the rainbow' below? Use the colours from the prism to help you.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

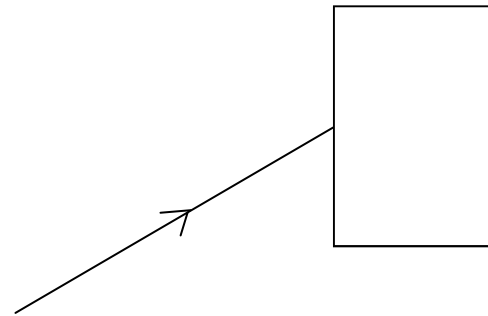
LOOK AT LIGHT

4 a) Place the rectangular shape in front of the light source as shown below so that it meets the block at a 90° angle



Sketch the light beam as it enters and emerges from the block.

b) Now position the block so the beam of light enters at a different angle, as below.



Sketch the light beam as it enters and passes through the block. Be careful to make your observation from directly above the block.

c) As the beam enters and leaves the block, does the angle change or stay the same?

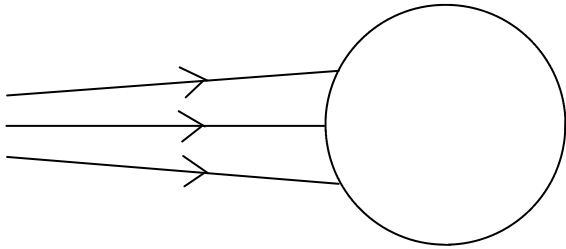
Entering _____

Leaving _____

When light passes from one medium to another it can change direction. This is called **REFRACTION**. It happens because the speed of the light changes.

LOOK AT LIGHT

6 a) Find the circular block and place it in the path of the three beams of light.



Sketch the light beams as they enter and emerge from the block.

b) Describe what is happening to the light beams as they pass through the circular block.

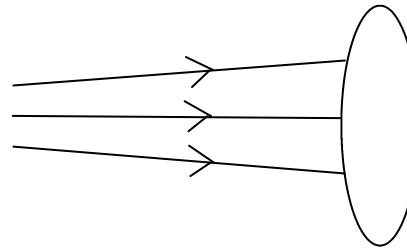
Locate the point where the three emerging beams come together. This is called the **FOCAL POINT**. Label this on your diagram above.

LOOK AT LIGHT

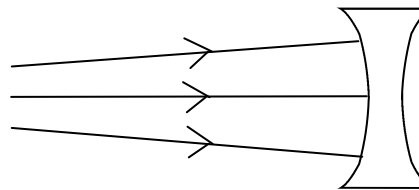
7. Replace the circular block with the biconvex, biconcave and semi-circular blocks, in turn.

Make sketches of the light beams.

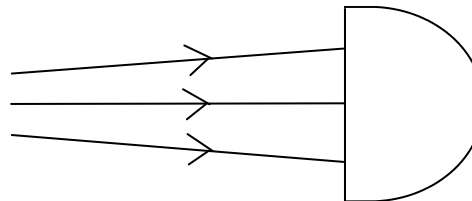
a) Biconvex block



b) Biconcave block



c) Semi-circular (*plano-convex*) block



LOOK AT LIGHT

Biconvex, biconcave and plano-convex shapes can be used as lens. Lenses are transparent objects that focus or disperse light by means of refraction.

Inside the eye is a biconvex lens that helps refract light so it is focused on the retina*.

Lenses in glasses and contact lenses are used for vision correction.

8. In the boxes match each description to a diagram. One has been completed for you.

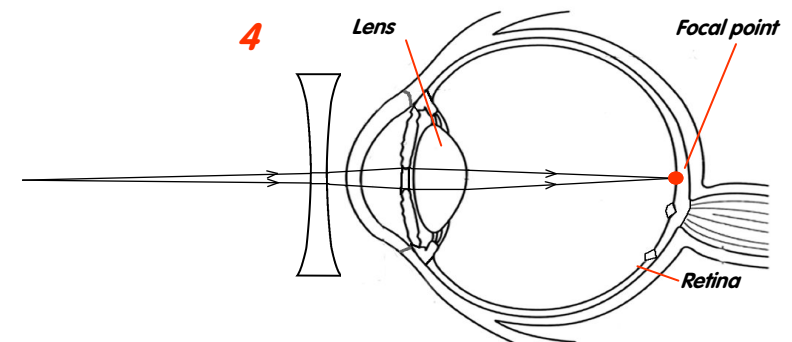
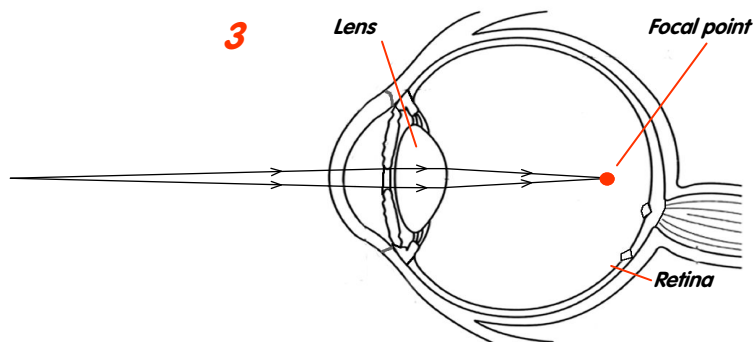
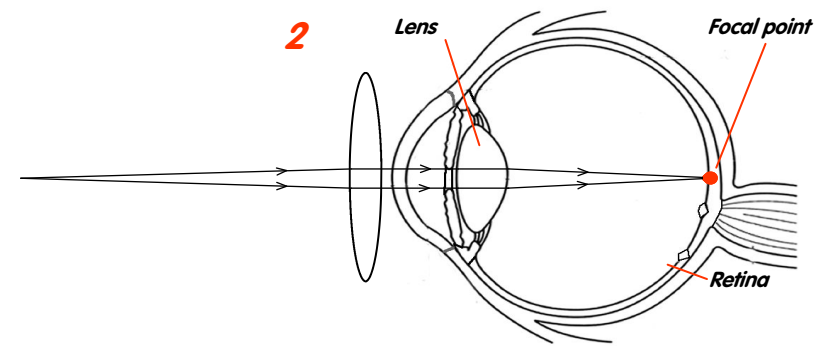
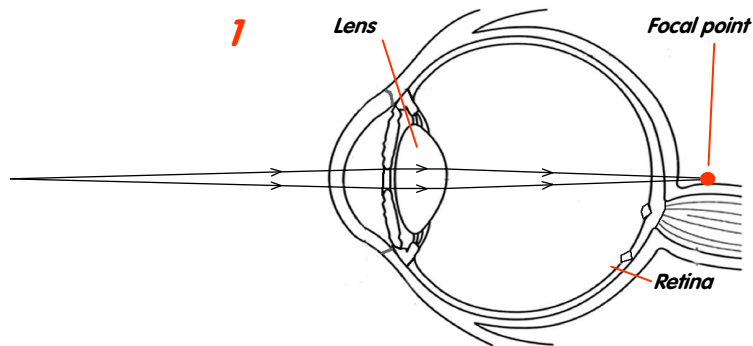
Biconvex lenses can refract the light so it focuses on the retina, making close objects sharper.

2

Biconcave lenses are used to refract the light so it focuses on the retina, making distant objects sharper.

Long-sightedness is where the focus is past the retina. This causes near object to appear blurry.

Short-sightedness is where the focus is before the retina, causing far objects to be blurry.



* The lens is not the only part of the eye to refract and focus the light. The cornea also helps focus the light. For the purpose of this exercise, only the lens is considered in regards to refraction in the eye.