

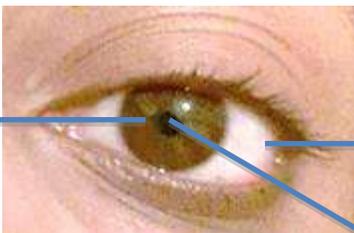
# How Do We See Things?

Topics covered: Light travels in straight lines, reflection, the eye, light can damage our eyes

Before you get started, make sure you watch this video ‘Seeing The Invisible’

<https://vimeo.com/163255189> (copy onto google search and you will see the video)

We see things when light enters our eyes. The pupils in our eyes change size to let more light in when it’s dark or less light in when it’s bright and this is important because too much light can damage our eyes. Not all objects give off light and so we see some objects because light reflects off their surface and into our eyes.



Iris

Sclera

Pupil

## Activity 1: Light and

- Get a mirror and close into a dark room. (You can do this with a member of your family)

## Pupil Size

all the curtains/ blinds in the room or go

into a dark room. (You can do this with a member of your family)

- Start with the lights on and look at the size of your pupils with your mirror.
- Then turn the lights off for 15 to 30 seconds and turn them back on again. Now look at how your pupils change size in your mirror as the lights are turned back on. Repeat several times if needed.

Questions:

1. What did you notice happened to the size of your pupils when the lights were turned off and you were in darkness? [L] [SEP]

A: pupils were larger in the dark and smaller in brighter light. [L] [SEP]

2. Why do you think the pupils in your eyes change size? [L] [SEP]

A: Light enters our eyes and hits the retina (inside surface / back of the eye). If the light is too intense it can damage the cells on the retina. The pupils get larger in the dark to allow more light in so that we can try and see objects around us. The pupils get smaller when it's brighter to reduce the amount of light hitting the retina and therefore protect the cells from damage. [L] [SEP] Extra info: The size of the pupils is controlled by muscles in the iris (coloured part of the eye). These muscles contract (tense up) in the dark to make the pupils bigger and relax in bright light to make the pupils smaller. [L] [SEP]

## Activity 2: Light and Reflection

Before you carry out the next activity, let's recap on some facts learnt so far.

1. How can you see the person sitting next to you? [L] [SEP]

A: A light source gives out light which travels in straight lines and reflects off the person beside you before entering your eyes allowing you to see them. [L] [SEP]

2. Why can't you see that person in the dark? [SEP]

A: Not all objects (e.g. people) give out their own light. Light needs to reflect off an object for us to see it and in the dark, there is no source of light. [SEP]

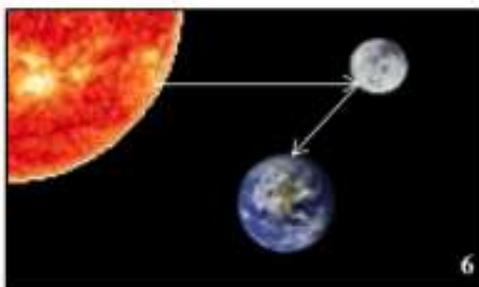
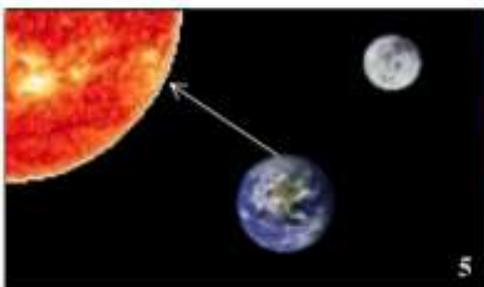
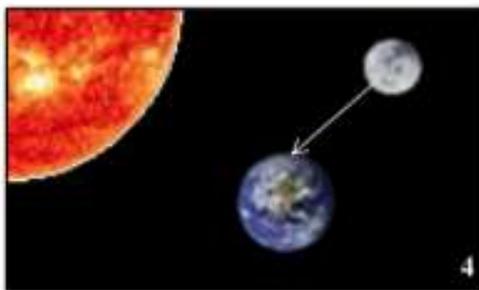
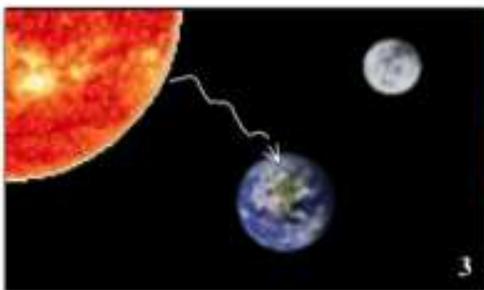
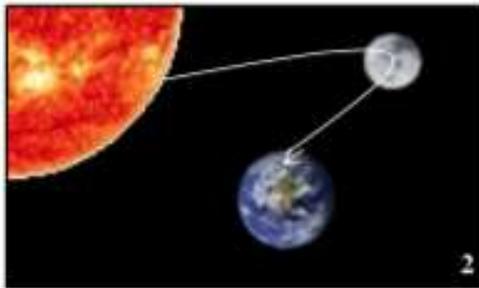
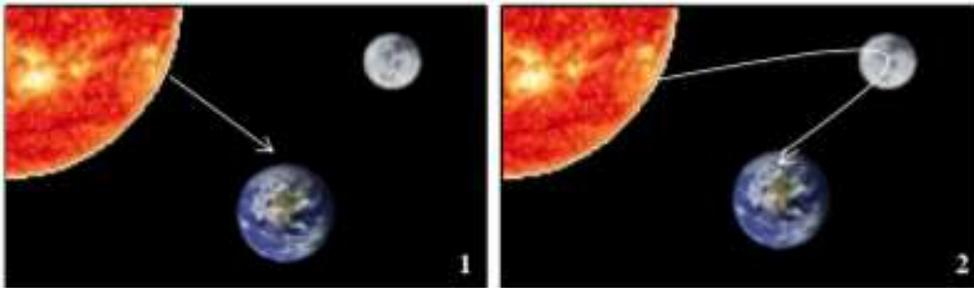
### Activity 2 for you:

Pick out one image which correctly shows how we see the Sun and one image which correctly shows how we see the Moon.

### How do we see things?

Which one of these images correctly shows how we see the Sun? Which one of these images correctly shows how we see the Moon?

Why are the other images wrong?



Challenge – Can you explain why the other four images are incorrect in terms of what you know about light?

## ANSWERS

### Activity 2: Light and Reflection

Correct images<sup>[1][1]</sup><sub>[SEP]</sub> are: **1** – How we see the Sun and **6** – How we see the Moon.

Incorrect images and reasons:

**2** – Light travels in straight lines (not in curved lines)<sup>[1][1]</sup><sub>[SEP]</sub>

**3** – Light travels in straight lines (not as a zig-zag)<sup>[1][1]</sup><sub>[SEP]</sub>

**4** – The Moon does not make its own light. Light needs to be reflected off its surface and into our eyes for us to see it.

**5** – Light must enter our eyes for us to see it.