

# Science, Year 3 - Light and Shadows



## Learning Objectives -

- ◆ Recognise that they need light in order to see things and that dark is the absence of light.
- ◆ Notice that light is reflected from surfaces.
- ◆ Recognise that light from the sun can be dangerous and that there are ways to protect their eyes.
- ◆ Recognise that shadows are formed when the light from a light source is blocked by an opaque object.
- ◆ Find patterns in the way that the size of shadows change.

## Working Scientifically Skills -

- ◆ Set up simple practical enquiries, comparative and fair tests.
- ◆ Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment including thermometers and data loggers.
- ◆ Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.
- ◆ Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.

## What should I already know?

- ◆ Certain things produce light, usually by burning (the Sun) or by electricity (street lights).
- ◆ Shiny materials do not make light, they reflect it.
- ◆ Shadows are caused when materials block light.

## Scientific Vocabulary -

- Convex:** rounded like the outside of a ball or circle.
- Concave:** rounded inward like the inside of a bowl.
- Description:** a statement that says what you see.
- Dull:** a surface that scatters light and does not look shiny.
- Emit:** to emit a light means to produce it.
- Explanation:** a sentence (or sentences) giving a reason for something happening.
- Light source:** the place where light originates from.
- Mirror:** a shiny polished surface.
- Observation:** what we see happening in a scientific test.
- Opaque:** not letting light pass through.
- Reflect:** to change the direction of light using a shiny surface.
- Shadow:** darkness caused by light being blocked.
- Shiny:** surfaces that reflect lots of light.
- Translucent:** letting some light through.
- Transparent:** letting most or all light through.

## Equality and diversity -

- Mo Ti is the first recorded person to have exploited this phenomenon to trace the inverted image to create a picture.
- Ibn al-Haytham, mathematician and astronomer who made significant contributions to the principles of optics and the use of scientific experiments
- On October 18th 2019, the first all female spacewalk was conducted by Jessica Meir and Christina Koch.

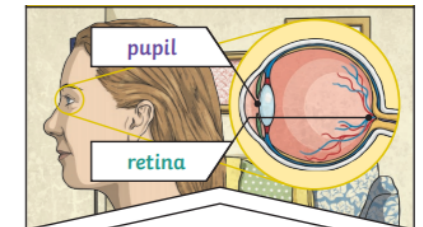
## What will I know by the end of this unit?

### What is a light source?

- ◆ A light source is anything that produces light.
- ◆ It can be a burning light source like the sun or an electrical light source like a torch.
- ◆ Light can also be the result of a chemical reaction like a glow stick.
- ◆ The Sun and Stars are examples of light sources. The moon is not - this is a reflective light source.

### Why do we need light?

- ◆ We need light to be able to see in the dark.
- ◆ Dark is the absence of light.



**The pupils**  
control the amount of light entering the eyes. If too much light enters, then it can damage the retina. To help protect the eyes, you can wear a hat with a wide brim and sunglasses with a UV rating.

### How does light travel?

- ◆ Light travels in straight lines, called beams.
- ◆ When light is blocked by an opaque object, a shadow is formed.
- ◆ When light hits an object it is reflected off. Some objects/surfaces are more reflective than others.
- ◆ Smooth shiny surfaces are the best for reflecting light.

### How are shadows formed?

- ◆ When light is blocked a dark shadow forms.
- ◆ When light shines on a transparent object it shines through. A very faint shadow is produced.
- ◆ When light shines on a translucent object some of the light travels through it. We can see a bright light and a dark shadow.
- ◆ A shadow's size changes as the light source moves closer/further away. The further away, the smaller the shadow. The closer, the bigger the shadow.

