

What should I already know?

- The **moon** is **NOT** a source of light because it **reflects light** from the **sun** (the same way a mirror can't be a source of light)
- Some surfaces/objects are **more reflective** than others
- **Reflective surfaces** can be very **useful**
- When the **light** from a **light source** is **blocked** by an **opaque** (*not see-through*) object a **shadow** is **formed**
- Some objects allow **more light through** than others
- You can **change** the **shape** of a **shadow** by **moving** the **light source** or the **object further away** from, or **closer to**, each other

Scientific Learning

How Light Travels

Light is a type of **energy** (*electromagnetic radiation*). Unlike **sound**, it **doesn't need matter to travel through** – it can travel through **empty space** (a *vacuum*) – which is how **sunlight** is able to reach us **from outer space**

Light travels in **straight lines** (*rays or beams of light*) from a **source** and in **all directions**

It can't bend around objects and if it hits an **opaque** (*not see-through*) object it is **blocked**

2. Rays of light **bounce** (*reflect*) off an object and **travel** into our **eyes** – we **see** the object

1. Rays of light travel from a source and **hit objects** around us

Reflections

Reflections occur when rays of light **hit a surface and bounce off**. The **angle** the rays hit the surface is **equal** to the **angle** at which they **bounce off**. If the surface is **smooth and shiny** (like a *mirror*), **ALL** the rays of light will be **reflected** (unlike a *dull or dark surface*)

A **periscope** enables you to see around a corner or over a barrier

The Eye

The **iris** (*coloured part of the eye*) **widens or narrows** to **change** the size of the **pupil** (*the black opening in the centre*). It does this to either let in **more/less light** depending on how **dark/bright** it is. **REMEMBER:** Very **bright light** can **damage** your **eyesite**

Filters

You can change the **perceived colour** of an **object** by looking at it through **optical filters**

Funny Reflections

Reflections on **rippling water** or **curved metal** (like a *spoon*) can look **distorted**. That is because the **light reflects off them at different angles**

Shadows

A **shadow** is formed when an **object blocks light**. An object must be **opaque** (*dark shadow*) or **translucent** (*faint shadow*), but **not transparent** (*lets all light through*), to make a **shadow**. The **shape** of a **shadow** can be **changed** by altering the **angle** of the **light source** **OR** by **moving** the **light source closer** or **further away** from the object

high angle → short shadow
low angle → long shadow
close to object → big shadow
far from object → small shadow

What should I know by the end of the unit?

- recognise that light appears to travel in straight lines
- use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye
- explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes
- use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them

Vocabulary

refraction	This is when light bends as it passes from one medium to another. E.g. Light bends when it moves from air into water.	shadow	An area of darkness where light has been blocked.
visible spectrum	Light that is visible to the human eye. It is made up of a colour spectrum .	transparent	Describes objects that let light travel through them easily, meaning you can see through the object.
prism	A prism is a solid 3D shape with flat sides. The two ends are an equal shape and size. A transparent prism separates out visible light into all the colours of the spectrum .	translucent	Describes objects that things let some light through, but scatters the light so we can't see through them properly.
light	A form of energy that travels in a wave from a source.	opaque	Describes objects that do not let any light pass through them.
light source	An object that makes its own light .		
reflection	Reflection is when light bounces off a surface, changing the direction of a ray of light .		

