



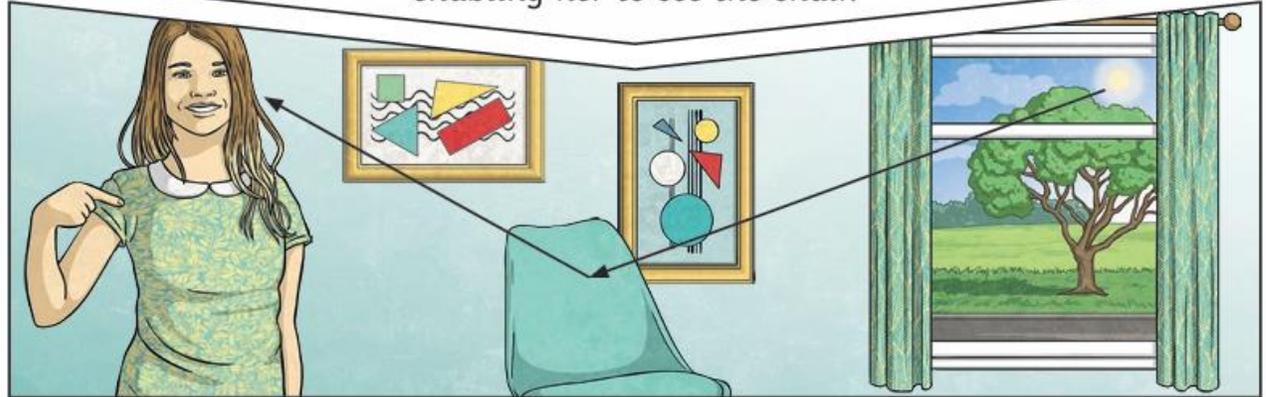
As a Scientist...

Key Vocabulary	
light	A form of energy that travels in a wave from a source.
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 .
incident ray	A ray of light that hits a surface.
reflected ray	A ray of light that has bounced back after hitting a surface.
the law of reflection	The law states that the angle of the incident ray is equal to the angle of the reflected ray .

Key Knowledge

We need **light** to be able to see things. **Light** waves travel out from sources of **light** in straight lines. These lines are often called rays or beams of **light**.

Light from the sun travels in a straight line and hits the chair. The **light** ray is then **reflected** off the chair and travels in a straight line to the girl's eye, enabling her to see the chair.



The **law of reflection** states that the angle of **incidence** is equal to the angle of **reflection**. Whenever **light** is **reflected** from a surface, it obeys this law.

The angle of **reflection** is the angle between the normal line and the **reflected ray** of **light**.

The angle of **incidence** is the angle between the normal line and the **incident ray** of **light**.

angle of **reflection**

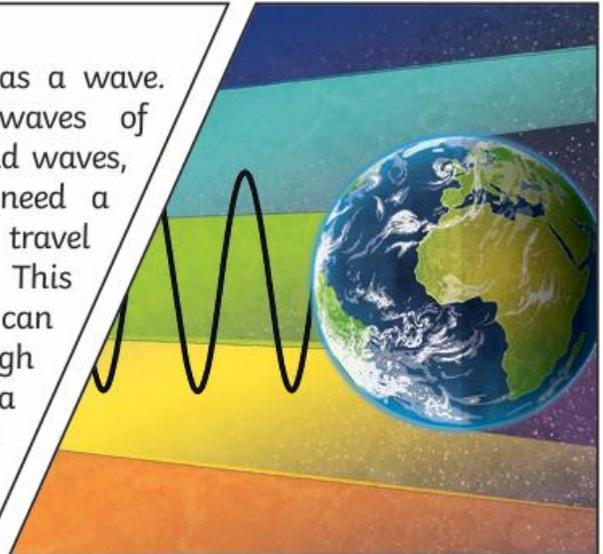
reflected ray

normal line

incident ray

angle of **incidence**

Light travels as a wave. But unlike waves of water or sound waves, it does not need a medium to travel through. This means **light** can travel through a vacuum - a completely airless space.





As a Scientist...

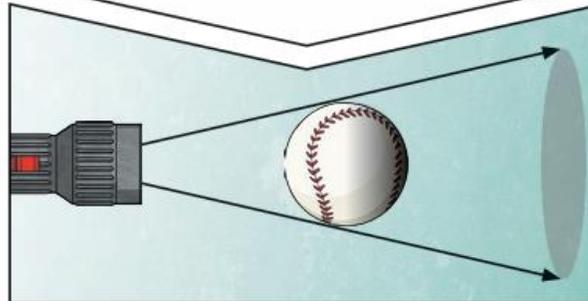
Key Vocabulary	
refraction	This is when light bends as it passes from one medium to another. E.g. Light bends when it moves from air into water.
visible spectrum	Light that is visible to the human eye. It is made up of a colour spectrum .
prism	A prism is a solid 3D shape with flat sides. The two ends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

Key Knowledge

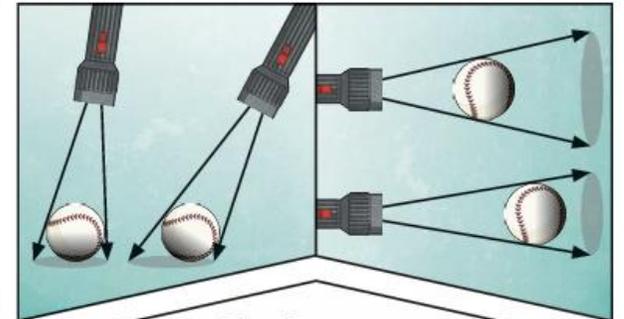


The spoon in this water looks as if it is bent. This is because **light** bends when it moves from air to water. When **light** bends in this way, it is called **refraction**.

A **shadow** is always the same shape as the object that casts it. This is because when an **opaque** object is in the path of **light** travelling from a **light source**, it will block the **light** rays that hit it, while the rest of the **light** can continue travelling.



Isaac Newton shone a **light** through a **transparent prism**, separating out **light** into the colours of the rainbow (red, orange, yellow, green, blue, indigo and violet) - the colours of the **spectrum**. All the colours together merge and make visible **light**.



Shadows can also be elongated or shortened depending on the angle of the **light source**. A **shadow** is also larger when the object is closer to the **light source**. This is because it blocks more of the **light**.



As a Scientist...

In year 3 I learnt to:

- recognise that 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 a solid object.
- find patterns in the way that the sizes of shadows change.

In year 6 I will learn to:

- 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.

In Keystage 3 I will learn:

- the similarities and differences between light waves and waves in matter.
- light waves travelling through a vacuum; speed of light.
- the transmission of light through materials: absorption, diffuse scattering and specular reflection at a surface Science.
- use of ray model to explain imaging in mirrors, the pinhole camera, the refraction of light and action of convex lens in focusing (qualitative); the human eye.
- light transferring energy from source to absorber leading to chemical and electrical effects; photo-sensitive material in the retina and in cameras.
- colours and the different frequencies of light, white light and prisms (qualitative only); differential colour effects in absorption and diffuse reflection.