

Science Knowledge Organiser

Year 3

Summer (i)

How are shadows formed?

Portable Knowledge - We need light to see things. Darkness is the absence of light. Shadows are formed when light is blocked by an opaque object

To know that we need light in order to see things; To know that darkness is the absence of light

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.



Darkness, the direct opposite of lightness, is defined as **a lack of illumination, an absence of visible light, or a surface that absorbs light, such as black.**



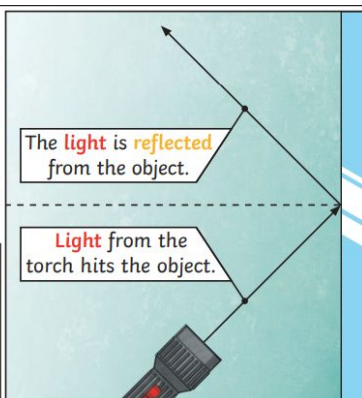
Light travels in a straight line and hits the apple.



The ray of light is reflected off the apple and travels in a straight line to the eye allowing it to see the apple.

To know that light is reflected from surfaces

We need **light** to be able to see things. **Light** travels in a straight line. When **light** hits an object, it is **reflected** (bounces off). If the **reflected light** hits our eyes, we can see the object. Some surfaces and materials **reflect light** well. Other materials do not **reflect light** well. **Reflective** surfaces and materials can be very useful...



The surfaces that reflect **light** best are smooth, shiny and flat.

A smooth, shiny, flat surface.

A rough and uneven surface.

Mirrors **reflect light** very well, so they create a clear image. An image in a mirror appears to be reversed. For example, if you look in a mirror and raise your right hand, the mirror image appears to raise its left hand.

A photograph of a boy looking into a mirror. The mirror shows a clear reflection of the boy, demonstrating the concept of reflection.

To know that light from the Sun can be dangerous and there are ways to protect the eyes

The Eye

If too much light comes through the pupil, it can damage the retina.

It causes pain, so that you instantly close your eyes, or turn away from a bright light.

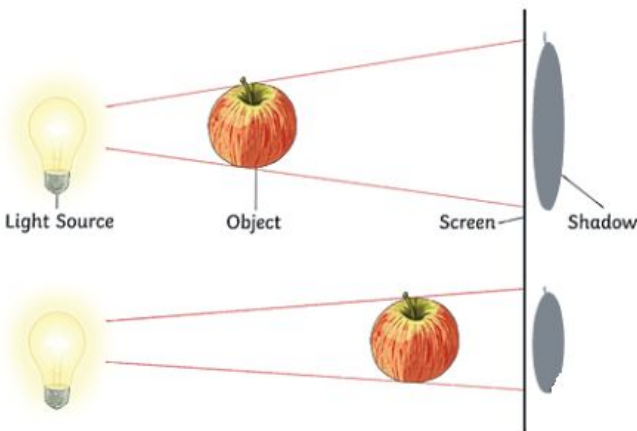
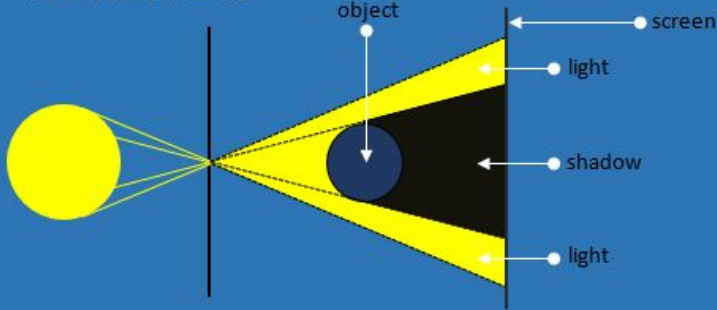
It is very important that you never look directly at the sun, as the light can damage your eyes very quickly.

Bright lights indoors can also damage your eyes, so you should never look at them, or shine lights into anyone's eyes.



To know that shadows are formed when the light from a light source is blocked by an opaque object

How a shadow is formed



Core vocabulary

shadow - a dark shape made when light is stopped or blocked by an object or a person

opaque - no light can pass through the object

reflected - When light from an object is reflected by a surface, it changes direction. It bounces off the surface at the same angle as it hits it

PROTECT YOUR EYES FROM THE SUN



Wear UV-blocking sunglasses and broad-brimmed hats whenever you're outside.

Check that your glasses block both UV-A and UV-B rays and that are labeled either UV400 or 100 percent UV protection.



THE CLOUDS DON'T PROTECT YOU FROM UV LIGHT.

The sun's rays can pass through haze and thin clouds.



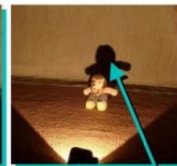
NEVER LOOK DIRECTLY AT THE SUN



Looking directly at the sun at any time, including during an eclipse, can lead to solar retinopathy, which is damage to the eye's retina from solar radiation.



LARGE SHADOW
when the toy is close to the light

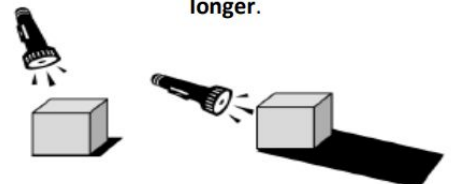


SMALLER SHADOW
when the toy is further from the light



TINY SHADOW
when the toy is a long way from the light

As the **light source** moves **higher** in relation to the **object**, the **shadow** gets **shorter**. As the **light source** moves **lower**, the **shadow** gets **longer**.



How do you make a shadow smaller or larger? What pattern do you notice?