

## Key Learning

Year 3

Recognise that light is needed to see things and that dark is the absence of light.

Recognise that shadows are formed when light from a light source is blocked by a solid object.

Notice that light is reflected from surfaces.

Recognise that light from the sun is dangerous and that there are ways to protect the eyes.

Year 4

Describe what happens to a light source in the dark.

Find patterns that determine the size of shadows.

Describe the way in which light is reflected from surfaces.

Describe in simple terms how light travels and what happens.

## ROSES Year 3/4 Science: LIGHT AUTUMN 1<sup>st</sup> half


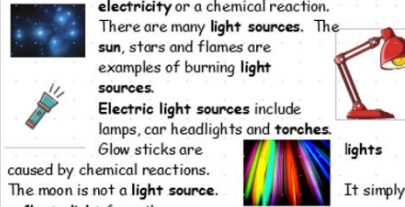


Morda CE Primary School

### Key Knowledge

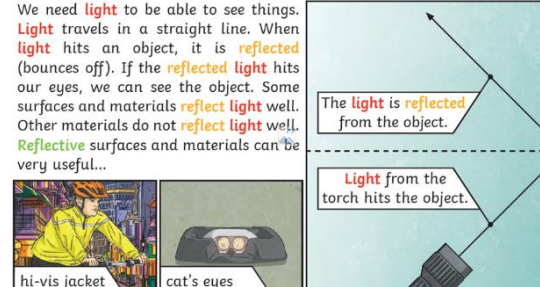
What is light?

What is dark?

|   |   |
|---|---|
| We need <b>light</b> to be able to see things |  <p>We are able to see things because our eyes sense <b>light</b>. We need <b>light</b> so that we are able to see in the <b>dark</b>, this is because <b>dark</b> is the absence of <b>light</b>. The <b>sun</b> and stars give us <b>light</b>. We must never look directly at the <b>sun</b> as it is dangerous and can damage our eyes.</p>  |
| What a <b>light source</b> is                 | <p>A <b>light source</b> is something that <b>emits light</b> by burning, <b>electricity</b> or a chemical reaction. There are many <b>light sources</b>. The <b>sun</b>, stars and flames are examples of burning <b>light sources</b>.</p> <p><b>Electric light sources</b> include lamps, car headlights and <b>torches</b>. <b>Glow sticks</b> are caused by chemical reactions. The moon is not a <b>light source</b>. <b>reflects light</b> from the sun.</p>  <p>It simply <b>lights</b></p> |

What is reflective light? What are reflective materials?

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...



What are

reflective surfaces? How does a mirror work?

### Key Scientific Vocabulary

| Key Vocabulary      |  |
|---------------------|--|
| <b>light</b>        | A form of energy that travels in a wave from a source.                                       |
| <b>light source</b> | An object that makes its own <b>light</b> .  |
| <b>dark</b>         | <b>Dark</b> is the absence of <b>light</b> .   |
| <b>reflection</b>   | The process where <b>light</b> hits the surface of an object and bounces back into our eyes. |
| <b>reflect</b>      | To bounce off.   |
| <b>reflective</b>   | A word to describe something which <b>reflects light</b> well.                               |
| <b>ray</b>          | Waves of <b>light</b> are called <b>light rays</b> . They can also be called beams.          |

| Key Vocabulary     |   |
|--------------------|---|
| <b>pupil</b>       | The black part of the eye which lets <b>light</b> in.   |
| <b>retina</b>      | A layer at the very back of the eye. The <b>retina</b> takes the <b>light</b> the eye receives. It then changes it into nerve signals to send to the brain. |
| <b>shadow</b>      | An area of darkness where <b>light</b> has been blocked.  |
| <b>opaque</b>      | Describes objects that do not let any <b>light</b> pass through them.   |
| <b>translucent</b> | Describes objects that let some <b>light</b> through, but scatter the <b>light</b> so we can't see through them properly.                                   |
| <b>transparent</b> | Describes objects that let <b>light</b> travel through them easily, meaning that you can see through the object.  |

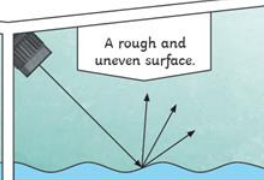
Mirrors **reflect light** very well, so they create a clear image. An image in a mirror appears to be reversed. For example, if you look in a mirror and raise your right hand, the mirror image appears to raise its left hand.



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



A smooth, shiny, flat surface.



A rough and uneven surface.

What is a shadow? What do you know about their shape and size?

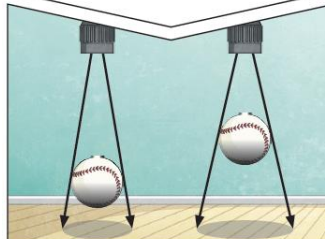
When the **light** source is directly above the object, the **shadow** will be directly underneath.



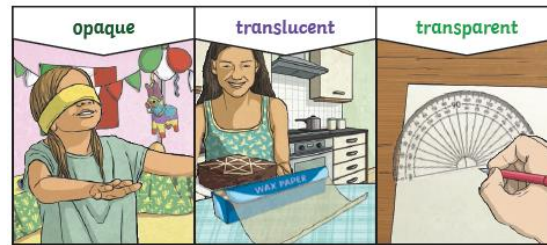
When a **light** source is to one side of an object, the **shadow** will appear on the opposite side. The **shadow** will also be longer.



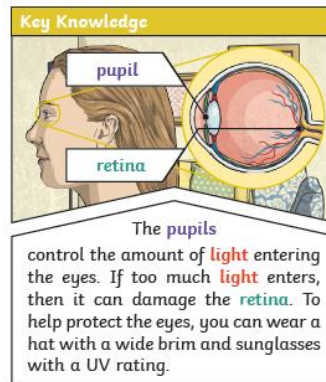
A **shadow** is caused when **light** is blocked by an **opaque** object. A **shadow** is larger when an object is closer to the **light** source. This is because it blocks more of the **light**.



Which materials are the best for blocking light?



How does an eye work?



## Enquiry types

To recognise that we need light in order to see things and that dark is the absence of light.

To notice that light is reflected from surfaces.

To investigate which surfaces reflect light.

To recognise that light from the sun can be dangerous and that there are ways to protect our eyes.

To recognise that shadows are formed when the light from a light source is blocked by a

## Common Misconceptions

Some children may think:

- we can still see even where there is an absence of any light
- our eyes 'get used to' the dark
- the moon and reflective surfaces are light sources
- a transparent object is a light source
- shadows contain details of the object, such as facial features on their own shadow
- shadows result from objects giving off darkness.

solid object by investigating the best material for curtains for a baby's bedroom.

To find patterns in the way that the size of shadows change by investigating what happens when you change the distance between the object and the light source.

