Sholing Junior School - Science

Topic: Light	Year: 3	Strand: Physics

What should I already know?

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

What will I know by the end of the unit?

I will:
- 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.

Why do we need **light**?	• We need light so that we are able to see in the dark. • **This is because the dark is the absence of light**. The Sun and stars always give us light but we can only see the stars when it is dark. At night time we cannot see the Sun's light as the Earth turns and our part of the Earth is not lit up by the Sun at night. • When we are driving, we need car headlights or street lights to help us. • If we are walking or out in the dark, we would need torches to help us see. You should not look directly into the torch as this is dangerous.
What are not **sources** of **light**?	• The Moon is not a source of light even though we can see it in the dark. • **This is because the Sun's light reflects on the surface of the Moon making it appear as though the Moon emits light.** • Shiny things are not light sources - they appear to be sources of light as they are bright.
Shadows	• **When light is blocked by an opaque object, a dark shadow is formed.**

Investigate

We will explore what happens when light reflects off a mirror or other reflective surfaces, including playing mirror games to help us to answer questions about how light behaves.

We will think about why it is important to protect our eyes from bright lights.
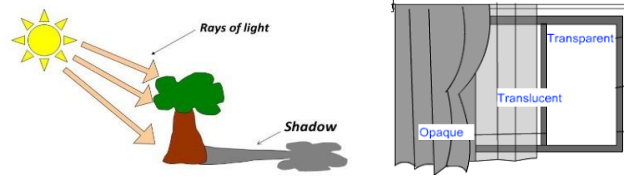
We will look for and measures shadows and find out how they are formed and what might cause the shadows to change.

We might work scientifically by: looking for patterns in what happens to shadows when the light source moves or the distance between the light source and the object changes.
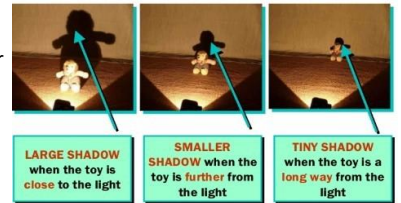
Diagrams

How are **shadows** formed?

- When **light** is blocked by an **opaque** object, a **dark shadow** is formed. An **opaque** material blocks **light** so we can't see through it and we cannot shine a **light** through it.
- When **light** is shone onto a **transparent** object, the **light** travels through it, we can see through it and it makes a very faint **shadow**.
- When **light** is shone onto a **translucent** object, some of the **light** travels through it, we can see **bright light sources** through it and it makes a fairly **dark shadow**.
- The size of a **shadow** changes as the **light source** moves. The further away the **light source** is, the smaller the **shadow** is. The closer the **source** of the light, the bigger the shadow.

Vocabulary

angle	the direction from which you look at something
bright	a colour that is strong and noticeable, and not **dark**
chemical reactions	a process that involves changes in the structure of something
dark	the absence of **light**
dim	**light** that is not **bright**
electricity	a form of energy that can be carried by wires and is used for heating and lighting, and to provide power for machines
emits	to **emit** a sound or **light** means to produce it
light	a **brightness** that lets you see things.
mirror	a flat piece of glass which **reflects light**, so that when you look at it you can see yourself **reflected** in it
opaque	if an object or substance is **opaque**, you cannot see through it
product	something that is produced
reflects	sent back from the **surface** and not pass through it
shadows	a dark shape on a **surface** that is made when something stands between a **light** and the **surface**
source	where something comes from
sunglasses	glasses with **dark** lenses which you wear to protect your eyes from **bright** sunlight
surface	the flat top part of something or the outside of it
torches	a small **electric light** which is powered by batteries and which you can carry
translucent	if a material is **translucent**, some **light** can pass through it
transparent	If an object or substance is **transparent**, you can see through it