Light ~ Year 3/4 subject knowledge organiser

KEY CONCEPTS

Physics, scientific enquiry, science for the future and vocabulary.

What I will have learnt by the end of the unit

I can recognise that they need light in order to see things and that dark is the absence of light.
I can notice that light is reflected from surfaces.
I can recognise that light from the Sun can be dangerous and that there are ways to protect their eyes.
I can recognise that shadows are formed when the light from a light source is blocked by a solid object.
I can find patterns in the way that the size of shadows changes.

What I should already know

To be able to find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.

Observe and describe weather associated with the seasons, and how day length varies.

What I will have learnt at the end of the key stage

I will understand that light travels in a straight line.
I will know that light travels in a straight line to explain that objects are seen because they reflect light into the eye.
I will be able to use the journey light takes to explain how we see things.
I will be able to use the idea that light travels in a straight line to explain how shadows are formed. Predict how a shadow will look based on the changing position of a light source.

Key skills I will learn/use

- Ask relevant questions and using different types of scientific enquiries to answer them.
- Set up sample practical enquiries, comparative and fair tests.
- Make systematic and careful observation and, where appropriate, taking measurements using standard units, using a range of equipment, including thermometers and data loggers.
- Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.
- Using results draw simple conclusions, make predictions, suggest improvements and raise further questions.

Opportunities for teaching diversity, equality (including protected characteristics and expanding cultural capital)
I'm a Scientist, Get me out of here! – A super-curricular science outreach education & engagement activity (imascientist.org.uk) Science for Everyone (science4everyone.org).

Skills I may use for other subjects
Literacy – I can use my literacy knowledge to write about my findings.
Mathematics – I can use my knowledge to carry out simple tests and record my findings using diagrams and graphs.

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

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

Recall & Remember Add information to your knowledge mind map regularly, to help you reflect on, and remember what you have learnt throughout the unit. At the end of the unit, work in a small group to create a fun quiz on purple mash about light for your friends to complete.

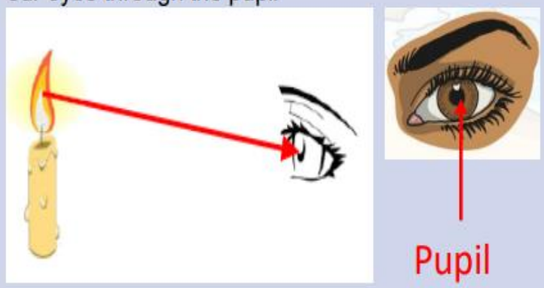
KEY KNOWLEDGE

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.

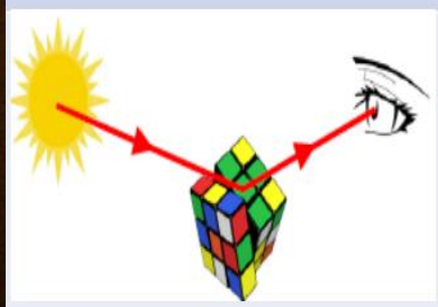
Mirrors reflect light very well, so they create a clear image. An image in a mirror appears to be reversed. For example, if you look in a mirror and raise your hand, the mirror image appears to raise its left hand.

How we see things

We see things when light from a light source enters our eyes through the pupil



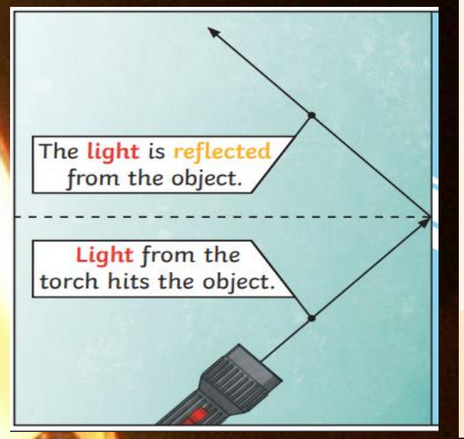
Light travels from the light source and into the eye



The light travels from the light source, bounces off the object and into the eye

Shadows

A **shadow** is formed when an object does not allow the light to pass through it.



Things you need to know about light

What is a light **source**?	*Something that makes its own light*

Common sources of light

The sun

The stars

Flames

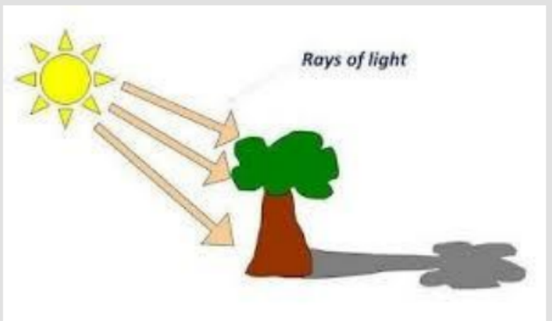
Electric lights

Some animals (fireflies and glow worms make their own light)

Things you may think are light sources but aren't	*The moon* *A mirror* *Shiny objects*

How a shadow is made

Shadows are made when there is an object blocking the light from hitting the surface. This means that the shadow will always be on the opposite side of an object to the sun or light.



*The object needs to be an **opaque** object. If it is **transparent** then the light will pass through it, whereas a solid object will block it.*
*Some light passes through **translucent** objects. Although some light is blocked, some gets through and so a shadow is formed. These shadows are not as dark.*