

Year 5 – Knowledge Organiser

Autumn Term Topic – Light, Earth & Space

What should I already know?

Certain things produce light, usually by burning (e.g. the Sun) or electricity (e.g. street lights)

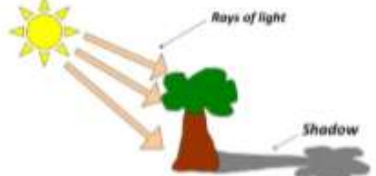
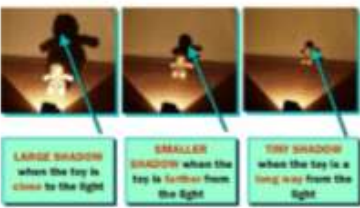
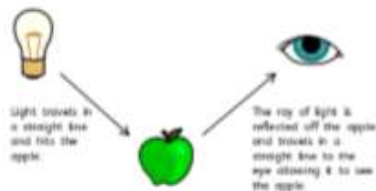
Shiny materials do not make light but do reflect it.

Shadows are caused when certain materials block light.

Light travels in straight lines. When light is blocked by an opaque object, a dark shadow is formed.

The further away the light source is, the smaller the shadow is. The closer the source of the light, the bigger the shadow.

Diagrams

What will I know by the end of the unit?	
How does light travel?	<ul style="list-style-type: none"> • Light travels in a straight line. • When you place a torch on a table in a dark room, the beam travels in a straight line. • Reflection is when light bounces off a surface - this changes the direction in which the light travels.
What is the relationship between light sources and shadows?	<ul style="list-style-type: none"> • Because light travels in straight lines, when there is an opaque object blocking the light, a shadow is formed. • These shadows have the same shape as the objects that cast them. <div style="text-align: center;">  </div> <ul style="list-style-type: none"> • The size of a shadow changes as the light source moves. <div style="text-align: center;">  </div>
How do we see?	<div style="text-align: center;">  </div>

Vocabulary

Angle - the direction from which you look at 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 give a sound or a light off

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

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

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

Scientific enquiry

- What happens when light is reflected from different surfaces? What happens when light is reflected from a mirror? What happens when the angle of the mirror (or light source changes?)
- Draw diagrams to show how light travels and what happens when light is reflected from a mirror.
- Draw diagrams to show how we see.
- Design an experiment to measure shadow length by changing a variable. Show your results in a line graph to show the relationship between distance of light source and shadow length. Explain your findings using scientific vocabulary.
- Create shadow puppets to show how light travels and to demonstrate that a shadow has the same shape as the object that casts them.
- Make a periscope and explain how it works using diagrams and scientific vocabulary. Use the idea that light appears to travel in straight lines to explain how it works.
- Research how mirrors are used in different contexts (e.g. rear view mirrors, on a dangerous bend) and explain why and how they work.
- Explain why objects look bent in water.
- Explore different contexts in which light travels including rainbows, colours on soap bubbles and coloured filters.

What will I know by the end of the unit?

- 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



<u>Key Word</u>	<u>Information</u>
Axis	An imaginary line about which a body rotates
Asteroid	A small rocky body orbiting the sun
British summer time – (BST)	Time as advanced one hour ahead of Greenwich mean time for daylight saving in the uk between march and October.
Galaxy	A system of millions or billions of stars, together with gas and dust, held together by gravitational attraction
Crescent	The curved sickle shape of the waxing or waning moon
Moon	The natural satellite of the earth, visible (chiefly at night) by reflected light from the sun
Lunar moon	A lunar eclipse occurs when the Moon passes directly behind the Earth into its umbra (shadow)
Nebula	A cloud of gas and dust in outer space.
Solar system	The collection of eight planets and their moons in orbit round the sun, together with smaller bodies in the form of asteroids, meteoroids, and comets.
Star	A fixed luminous point in the night sky which is a large, remote incandescent body like the sun.
Sun	The star round which the earth orbits.
Year	The period of 365 days (or 366 days in leap years) starting from the first of January.

Unit Summary	
<ul style="list-style-type: none"> Describe the movement of the Earth and other planets relative to the sun in the solar system. Describe the movement of the moon relative to the Earth. Describe the sun, Earth and moon as approximately spherical bodies. Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky. 	

WORKING SCIENTIFICALLY

- Evaluate their observations and suggest a further test, offer another question or make a **prediction**.

Observe (including changes over time) and suggest a reason for what they notice.

- Use secondary sources of information to identify and classify.

Decide which sources of information (and / or equipment and / or test) to help identify and classify.

- Refine a scientific question so that it can be tested e.g. 'What would happen to... if we changed...?'

Independently ask their own scientific questions taking some ownership for finding out the answers.

Find out how scientific ideas have changed / developed over time

Perform / create simple models to exemplify scientific ideas using scientific terminology

- Propose their own ideas and make decisions with agreement in a group.
- Support, listen to and acknowledge others in the group *e.g. Yes. I prefer that one too.*
- Check the clarity of each other's suggestions *e.g. are you saying you think this one is a herbivore?*
- Build on / add to someone else's idea to improve a plan or suggestion.

Understand that it is okay to disagree with their peers and offer a reasons for their opinion.