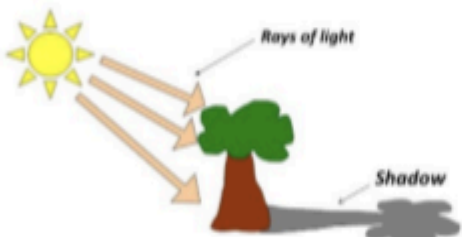
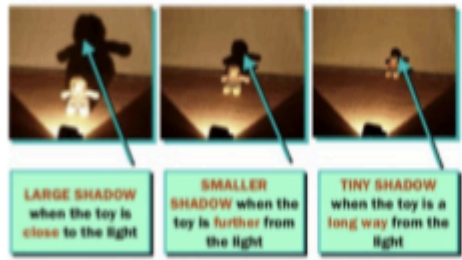
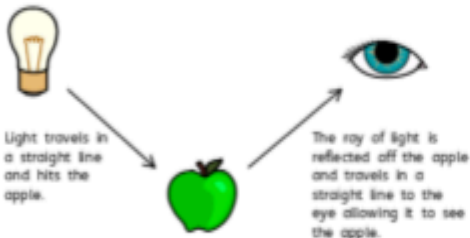


# Caroline Haslett Primary School - Science Topic: Light

What should I already know?	
<ul style="list-style-type: none"> <li>• Certain things produce <b>light</b>, usually by burning (e.g. the Sun) or <b>electricity</b> (e.g. street lights)</li> <li>• Shiny materials do not make <b>light</b> but do reflect it.</li> <li>• <b>Shadows</b> are caused when certain materials block <b>light</b>.</li> <li>• <b>Light</b> travels in straight lines. When <b>light</b> is blocked by an <b>opaque</b> object, a <b>dark shadow</b> is formed.</li> <li>• The further away the <b>light source</b> is, the smaller the <b>shadow</b> is. The closer the <b>source</b> of the light, the bigger the shadow.</li> </ul>	

What will I know by the end of the unit?	
How does <b>light</b> travel?	<ul style="list-style-type: none"> <li>• <b>Light</b> travels in a straight line.</li> <li>• When you place a torch on a table in a <b>dark</b> room, the beam travels in a straight line.</li> <li>• <b>Reflection</b> is when <b>light</b> bounces off a surface - this changes the direction in which the <b>light</b> travels.</li> </ul>

What is the relationship between <b>light sources</b> and <b>shadows</b> ?	<ul style="list-style-type: none"> <li>• Because <b>light</b> travels in straight lines, when there is an <b>opaque</b> object blocking the <b>light</b>, a <b>shadow</b> is formed.</li> <li>• These <b>shadows</b> have the same shape as the objects that cast them.</li> </ul>  <ul style="list-style-type: none"> <li>• The size of a <b>shadow</b> changes as the <b>light source</b> moves.</li> </ul> 
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How do we see?	 <p>Light travels in a straight line and hits the apple.</p> <p>The ray of light is reflected off the apple and travels in a straight line to the eye allowing it to see the apple.</p>
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Vocabulary	
angle	the direction from which you look at something
dark	the absence of <b>light</b>
dim	<b>light</b> that is not <b>bright</b>
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 <b>emit</b> a sound or <b>light</b> means to produce it
light	a <b>brightness</b> that lets you see things.
mirror	a flat piece of glass which <b>reflects light</b> , so that when you look at it you can see yourself <b>reflected</b> in it
opaque	if an object or substance is <b>opaque</b> , you cannot see through it
reflects	sent back from the <b>surface</b> and not pass through it
shadows	a dark shape on a <b>surface</b> that is made when something stands between a <b>light</b> and the <b>surface</b>
source	where something comes from
surface	the flat top part of something or the outside of it
torches	a small <b>electric light</b> which is powered by batteries and which you can carry
translucent	if a material is <b>translucent</b> , some <b>light</b> can pass through it
transparent	If an object or substance is <b>transparent</b> , you can see through it

Investigate!	
<ul style="list-style-type: none"> <li>• What happens when light is <b>reflected</b> from different <b>surfaces</b>? What happens when light is <b>reflected</b> from a <b>mirror</b>? What happens when the <b>angle</b> of the <b>mirror</b> (or <b>light source</b> changes?)</li> <li>• Draw diagrams to show how <b>light</b> travels and what happens when <b>light</b> is <b>reflected</b> from a <b>mirror</b>.</li> <li>• Draw diagrams to show how we see.</li> <li>• Design an experiment to measure <b>shadow</b> length by changing a variable. Show your results in a line graph to show the relationship between distance of <b>light source</b> and <b>shadow</b> length. Explain your findings using scientific vocabulary.</li> <li>• Create <b>shadow</b> puppets to show how <b>light</b> travels and to demonstrate that a <b>shadow</b> has the same shape as the object that casts them.</li> <li>• Make a periscope and explain how it works using diagrams and scientific vocabulary. Use the idea that <b>light</b> appears to travel in straight lines to explain how it works.</li> <li>• Research how <b>mirrors</b> are used in different contexts (e.g. rear view mirrors, on a dangerous bend) and explain why and how they work.</li> <li>• Explain why objects look bent in water.</li> <li>• Explore different contexts in which <b>light</b> travels including rainbows, colours on soap bubbles and coloured filters.</li> </ul>	

## Caroline Haslett Primary School - Science Topic: Light

<p><b>Working scientifically</b></p>	<p>Questions can help us find out about the world and can be answered using a range of scientific enquiries, including fair tests, research and observation. Ask and answer deeper and broader scientific questions about the local and wider world that build on and extend their own and others' experiences and knowledge.</p> <p>A method is a set of clear instructions for how to carry out a scientific investigation, including what equipment to use and observations to make. A variable is something that can be changed during a fair test. A prediction is a statement about what might happen in an investigation based on some prior knowledge or understanding. Plan and carry out a range of enquiries, including writing methods, identifying and controlling variables, deciding on equipment and data to collect and make predictions based on prior knowledge and understanding.</p> <p>An observation involves looking closely at objects, materials and living things. Accurate observations can be made repeatedly or at regular intervals to identify changes over time, identify processes and make comparisons. Specialised equipment is used to take accurate measurements in standard units eg. data loggers plus sensors, such as light (lux), sound (dB) and temperature (°C); timers (seconds, minutes and hours); thermometers (°C) and measuring tapes (millimetres, centimetres, metres). Take accurate, precise and repeated measurements in standard units, using a range of chosen equipment. Independently decide which observations to make, when and for how long and make systematic and careful observations. Use them to make comparisons, identify changes, classify and make links between cause and effect.</p> <p>The results are information, such as measurements or observations, that have been collected during an investigation. Data can be recorded and displayed in different ways, including tables, bar and line charts, scatter graphs, classification keys and labelled diagrams. Choose an appropriate approach to recording accurate results, including scientific diagrams, labels, timelines, classification keys, tables, models and graphs (bar, line and scatter), linking to mathematical knowledge. A conclusion is an explanation of what has been discovered, using correct, precise terminology and collected evidence. Report on and validate their findings, answer questions and justify their methods, opinions and conclusions, and use their results to suggest improvements to their methodology/ predictions, separate facts from opinions, pose further questions and make predictions for what they might observe.</p>
<p><b>Light</b></p>	<p>Identify that light travels in straight lines. Light sources give out light. They can be natural or artificial. When light hits an object, it is absorbed, scattered, reflected or a combination of all three. Light from a source, or reflected light, enters the eye.</p> <p>Vertebrates, such as mammals, birds and reptiles, have a cornea and lens that refracts light that enters the eye and focuses it on the nerve tissue at the back of the eye, which is called the retina. Once light reaches the retina, it is transmitted to the brain via the optic nerve. Explain that, due to how light travels, we can see things because they give out or reflect light into the eye.</p> <p>A shadow appears when an object blocks the passage of light. Apart from some distortion or fuzziness at the edges, shadows are the same shape as the object. The distortion or fuzziness depends on the position or type of light source. Explain, using words, diagrams or a model, why shadows have the same shape as the objects that cast them and how shadows can be changed.</p>