

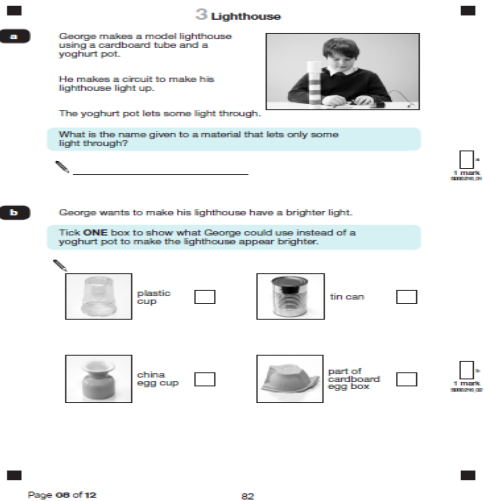
<p><b>Scientific Model (KS2):</b>  <b>Energy Transfer Model</b></p> <ul style="list-style-type: none"> <li>- Ensure the children understand that light is a type of energy by referring to it as light energy throughout the unit.</li> <li>- Start to introduce the idea that energy is not created from scratch but is instead transferred from one form to another (energy from the sun and electricity is transferred into light energy).</li> </ul>	<p><b>Scientific Skills Taught:</b></p> <p>ASK</p> <ul style="list-style-type: none"> <li>- To ask relevant questions</li> <li>- To decide when to use secondary sources to find answers</li> <li>- To make simple predictions based on knowledge of science</li> </ul> <p>BREAKDOWN</p> <ul style="list-style-type: none"> <li>- To set up simple tests</li> <li>- To decide what equipment to use</li> <li>- To learn how to use new equipment</li> <li>- To make decisions about the type of enquiry</li> <li>- To use different enquiry types to test questions</li> </ul> <p>CAPTURE</p> <ul style="list-style-type: none"> <li>- To observe carefully</li> <li>- To measure accurately using standard units</li> <li>- To measure using a range of equipment</li> <li>- To gather data and record in different ways</li> <li>- To make systematic observations</li> <li>- To identify differences, similarities and changes</li> <li>- To group, sort and classify using different criteria</li> </ul> <p>DESCRIBE</p> <ul style="list-style-type: none"> <li>- To draw simple conclusions</li> <li>- To present data in different ways</li> <li>- To explain what they have found out using correct scientific language</li> <li>- To record finding using correct language in varied ways</li> <li>- To answer questions based on evidence orally and in writing</li> <li>- To suggest improvements to tests</li> </ul>
<p><b>Scientific Investigations:</b></p> <ul style="list-style-type: none"> <li>- Observing Changes over Time</li> <li>- Looking for Naturally- Occurring Patterns and Relationships</li> <li>- Identifying and Classifying Things</li> <li>- Researching Using Secondary Sources</li> <li>- Comparative and Fair Testing</li> </ul>	
<p><b>Scientists:</b></p> <ul style="list-style-type: none"> <li>- Arthur James Wilson – invented the car wing mirror.</li> </ul>	

<p><b>Prior Learning:</b></p> <ul style="list-style-type: none"> <li>- Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. (Y1 - Animals, including humans) i.e., reference to seeing.</li> </ul>
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Curriculum	Learning Intention	Knowledge and Key Vocabulary
<p><b><u>Making links to learning and discuss the model (if needed)</u></b></p> <ul style="list-style-type: none"> <li>- Ensure the children understand that light is a type of energy by referring to it as light energy throughout the unit.</li> </ul>	<p><b>What do I know about Light and Shadow?</b></p> <p>Discuss what is already known about light and shadow using leading questions:</p> <p>Where does light come from?            How are shadows made?            How do we protect ourselves from light?            What is light used for?            What are shadows like?            How can light change?            What is dark?</p>	

<p><b><u>Knowledge and skills through investigations</u></b> Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>- recognise that they need light in order to see things and that dark is the absence of light</li> <li>- notice that light is reflected from surfaces</li> <li>- recognise that light from the sun can be dangerous and that there are ways to protect their eyes</li> <li>- recognise that shadows are formed when the light from a light source is blocked by an opaque object</li> <li>- find patterns in the way that the size of shadows change.</li> </ul> <p>Notes and guidance (non-statutory):</p> <ul style="list-style-type: none"> <li>- Pupils should explore what happens when light reflects off a mirror or other reflective surfaces, including playing mirror games to help them to answer questions about how light behaves.</li> <li>- They should think about why it is important to protect their eyes from bright lights.</li> <li>- They should look for, and measure, shadows, and find out how they are formed and what might cause the shadows to change.</li> <li>- Note: Pupils should be warned that it is not safe to look directly at the Sun, even when wearing dark glasses.</li> </ul> <p>Pupils might work scientifically by:</p> <ul style="list-style-type: none"> <li>- looking for patterns in what happens to shadows when the light source moves or the distance between the light source and the object changes.</li> </ul>	<p><b>What is light energy?</b> <b>Energy Transfer Model</b> <b>Start to introduce the idea that energy is not created from scratch but is instead transferred from one form to another (energy from the sun and electricity is transferred into light energy).</b> <b>Ensure the children understand that light is a type of energy by referring to it as light energy throughout the unit.</b></p> <ul style="list-style-type: none"> <li>• identify a range of light sources</li> <li>• explain that dark is caused by the absence of light</li> <li>• explain that I need light to see things</li> </ul> <p><b>Which material is most reflective?</b></p> <ul style="list-style-type: none"> <li>• explain reflection</li> <li>• identify reflective materials</li> <li>• select the most reflective material for a purpose</li> </ul> <p><b>How do mirrors show and change reflections?</b></p> <ul style="list-style-type: none"> <li>• explain why mirrors are good reflectors</li> <li>• use mirrors to reflect light onto different objects</li> <li>• identify concave and convex mirrors</li> <li>• ask questions about the size of images in concave and convex mirrors</li> <li>• carry out an investigation and record data to answer my question</li> <li>• explain how concave and convex mirrors change images</li> <li>• identify who invented wing mirrors</li> </ul> <p><b>How can we protect ourselves from the sun</b></p> <ul style="list-style-type: none"> <li>• use scientific model of energy transfer</li> <li>• explain the benefits and dangers of the sun</li> <li>• explain about UV light and its dangers</li> <li>• describe ways to protect our eyes from the sun</li> </ul> <p><b>Which materials successfully block light?</b></p> <ul style="list-style-type: none"> <li>• explain how light travels</li> <li>• sort different materials according to whether they are opaque, transparent or translucent</li> </ul>	<p><b>Knowledge:</b></p> <ul style="list-style-type: none"> <li>- Explain how we see objects</li> <li>- Know that the dark is the absence of light energy</li> <li>- Name 4 light sources</li> <li>- Objects are easier to see if there is more light energy.</li> <li>- Some surfaces reflect light energy.</li> <li>- Objects are easier to see when there is less light energy if they are reflective.</li> <li>- Know that the light energy from the sun can damage our eyes and how to stay safe.</li> <li>- Explain how shadows are formed</li> <li>- Explain 3 things which have an impact on the size of a shadow</li> </ul> <p><b>Vocabulary:</b> Light, light energy, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight. Reflect, reflective, shadow, dark, darker, darkness, surface, smooth, shiny, flat, plain mirror, scattered, angle, light rays, surface, direction, rough, transparent, translucent, opaque, light; light energy, travel; direction; straight; line; reflection; surface; sun; source; protect; damage; eyes; shadow; object; dangerous; absence; artificial; natural; patterns; shape; torch; candle; lamp; solid; block; visibility.</p>
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	<ul style="list-style-type: none"> <li>• use these materials in an investigation into different shadows</li> </ul> <p>How can we change shadows?</p> <ul style="list-style-type: none"> <li>• explain how a shadow is formed</li> <li>• plan and set up an investigation about the way shadows change size</li> <li>• observe patterns in the way shadows change size</li> <li>• explain the patterns I find</li> </ul>	
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<p><b>Application and Assessment Activity</b></p>	 <p>The screenshot shows a digital assessment activity titled "Lighthouse". It contains two questions:</p> <p><b>a</b> George makes a model lighthouse using a cardboard tube and a yoghurt pot. He makes a circuit to make his lighthouse light up. The yoghurt pot lets some light through. What is the name given to a material that lets only some light through?</p> <p><b>b</b> George wants to make his lighthouse have a brighter light. Tick <b>ONE</b> box to show what George could use instead of a yoghurt pot to make the lighthouse appear brighter.</p> <p>Options for question b:</p> <ul style="list-style-type: none"> <li>plastic cup <input type="checkbox"/></li> <li>tin can <input type="checkbox"/></li> <li>china egg cup <input type="checkbox"/></li> <li>part of cardboard egg box <input type="checkbox"/></li> </ul> <p>Page 06 of 12 82</p>
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**Thinking Deeper:**

- Children use a mirror to create a symmetrical pattern. Position the mirror on the centre line and ensure the pattern is the same on both sides of this mirror line.

<p><b>Links to other subjects:</b></p> <ul style="list-style-type: none"> <li>• Subject Specific links – <ul style="list-style-type: none"> <li>- Literacy - use of the dictionary in defining words and use of alphabetical order.</li> <li>- Persuasive language in writing advertisement for their design for a protective product.</li> </ul> </li> <li>• Personal Development – to be aware of the safety aspect of the sun and looking at it directly</li> </ul>
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| <ul style="list-style-type: none"><li>• SMSC – sense of wonder in using mirrors to change shapes</li></ul>   |
| <ul style="list-style-type: none"><li>• Cultural Capital – Learning about scientists from different eras and countries connected to the subject.</li></ul> |
| <ul style="list-style-type: none"><li>• Careers – Physical sciences, environmental science.</li></ul>  |
| <ul style="list-style-type: none"><li>• British Values – to learn the law about how light travels</li></ul>  |
| <ul style="list-style-type: none"><li>• Equality – The sun universally shines down on us all; we are all at risk of damaging rays.</li></ul>               |