

Learning Journey	Science	Light	Year 6 Spring 2	
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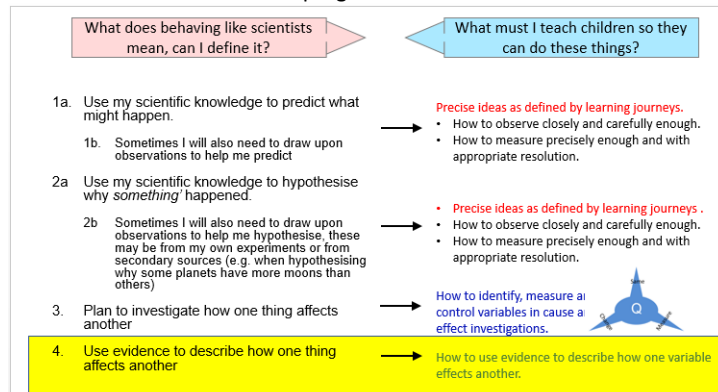
Building on prior learning	Theme overview	Preparing for future learning	Vocabulary
<p>In Y3 the children will have learnt that light has to come from a source and that we can only see if we have light.</p> <p>They will also have learnt about objects being transparent, opaque and reflective. When learning about opacity, they will have learnt that the light is blocked and a shadow is formed.</p> <p>Following on from this they will have begun to explore the concept of translucency.</p>	<ul style="list-style-type: none"> <li>• How light travels.</li> <li>• How light behaves when it hits an object.</li> <li>• How we see.</li> </ul>	<p>In KS3 children will learn more about ♣the similarities and differences between light waves and waves in matter</p> <ul style="list-style-type: none"> <li>♣ light waves travelling through a vacuum; speed of light</li> <li>♣ the transmission of light through materials: absorption, diffuse scattering and specular reflection at a surface</li> <li>♣ use of ray model to explain imaging in mirrors, the pinhole camera, the refraction of light and action of convex lens in focusing (qualitative); the human eye</li> <li>♣ light transferring energy from source to absorber leading to chemical and electrical effects; photo-sensitive material in the retina and in cameras</li> <li>♣ colours and the different frequencies of light, white light and prisms (qualitative only); differential colour effects in absorption and diffuse reflection.</li> </ul>	<ul style="list-style-type: none"> <li>• Transparent, translucent, opaque, reflective, absorbent.</li> <li>• Angle if measuring how light reflects)</li> <li>• Nocturnal</li> <li>• Anatomy of eye vocabulary: pupil, retina, lens, iris.</li> </ul>

NC coverage and HWJS skills development	Knowledge organisers
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<p><b>National Curriculum:</b></p> <ul style="list-style-type: none"> <li>• recognise that light appears to travel in straight lines</li> <li>• 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</li> <li>• 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</li> <li>• Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.</li> </ul>	<p><b>Chapter 1: How light travels</b></p> <ul style="list-style-type: none"> <li>• When light is emitted from a light source it travels in straight lines until it hits an object. This can be represented by an arrow.</li> </ul>
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### HWJS skills development

Details of the skills that will be taught within the unit. These should match up with the skills progression documentation



#### A Model of Skills Progression.

1. Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations
2. Identifying scientific evidence that has been used to support or refute ideas or arguments
3. Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations

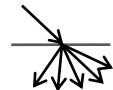
In Year 5 &6, using evidence to describe how one thing affects another is key. Children should be taught how to describe patterns and give a **judgement** on how sure they are. Key features of this are:

- Recognise that conclusions may be uncertain due to difficulties controlling and measuring variables accurately.
- That measurement always introduces some error. Understand that repeating experiments helps to identify what the true value is and that data points far from the mean are likely to be inaccurate and should be discounted.

- Shadows form when light hits an opaque object, the area behind is in darkness because light can only travel in straight lines

#### Chapter 2: How light behaves when it hits objects


- When light hits a transparent object it goes through it in a straight line so we can see a clear image through it.
- When light hits a translucent material it goes through it but is scattered, this means light can pass through but we can't see an image through it.
- When light hits a mirrored surface it reflects off it in straight lines, so we can see an image in the reflective material
- Some times when light hits a material it reflects off it in many different directions (it is scattered). In this case light will be reflected but no image will be seen in the material
- Shiny surfaces are better reflectors and rough surfaces scatter light more. Opaque objects don't allow any light to pass through them.



#### Chapter 3: How we see.

- Animals see objects when light is reflected off the object and enters the eye through the pupil. The pupil changes its size to allow enough, but not too much light into the eye. Too much light damages the eye and too little results in poor quality images.

<ul style="list-style-type: none"> <li>Adapting experiments to produce more precise conclusions when the question requires it, especially when seeking to find maximum, minimum or specific values</li> </ul>							
<p style="text-align: center;"><b><u>Connections / deepening understanding</u></b></p> <p>How is the understanding of this area deepened in other areas of the curriculum? What links are there in the other subjects in the curriculum?</p>		<p style="text-align: center;"><b><u>RADE</u></b></p> <p>Are the rights of the child relevant in this area of study - do they get referred to in the work?</p>		<p style="text-align: center;"><b><u>Assessment</u></b></p> <p style="text-align: center;">By the end of the unit the children will be able to ...</p> <p>Details of the objectives that they will have covered within this unit of work</p>			
<p>English – Report writing. Geography- How sunlight and angle of sun’s rays varies over seasons as the earth rotates.</p>		<p>Brief mention of the health benefits of light – Vitamin D.</p>		<p>Light travels in straight lines and shadows are formed when light hits an opaque surface.</p>	<p>Light reflects off all objects (unless they are black). Light behaves differently when it hits transparent, translucent, opaque and mirrored surfaces. Non-shiny and rough surfaces scatter the light so we do not see a single beam.</p>	<p>Animals see objects when light travels from a source, is reflected off an object and enters the eye through the pupil.</p>	
<p><b>Assessment recording for the unit - checking the level of pitch of the work</b></p>							
<p style="text-align: center;"><b><u>Key skill(s)/ knowledge to be assessed by the end of the unit</u></b></p>		<p style="text-align: center;"><b><u>Lower attaining</u></b></p>		<p style="text-align: center;"><b><u>Middle attaining</u></b></p>		<p style="text-align: center;"><b><u>Higher attaining</u></b></p>	
<ul style="list-style-type: none"> <li>When light is emitted from a light source, it travels in straight lines until it hits an object. This can be represented by an arrow.</li> <li><b>Shadows</b> form when light hits an <b>opaque</b> object, the area behind is in darkness because light can only travel in straight lines</li> <li>When light hits a <b>transparent</b> object, it goes through it in a straight line so we can see a clear image through it.</li> </ul>		<p>Light comes from a light source.</p> <p>When light hits an object that you can’t see through (opaque) a shadow forms. They don’t let light through them.</p> <p>Some materials are transparent and light will travel through them.</p>		<p>Light comes from a light source It travels in straight lines until it hits an object. They can draw arrow diagrams to show this. .</p> <p>When light hits an object that you can’t see through (opaque) a shadow forms. The area behind is in darkness because light can only travel in straight lines. They can draw arrow diagrams to show this.</p> <p>Some materials are transparent and light will travel through them. Children can explain that a clear image is seen. They can draw arrow diagrams to show this.</p>		<p>Light comes from a light source It travels in straight lines until it hits an object. They can draw arrow diagrams to show this and describe accurately what is happening . .</p> <p>When light hits an object that you can’t see through (opaque) a shadow forms. The area behind is in darkness because light can only travel in straight lines. They can draw arrow diagrams to show this and write accurate descriptions of what is happening.</p> <p>Some materials are transparent and light will travel through them. Children can explain that a clear image is seen. They can draw arrow diagrams to show this and write accurate descriptions of what is happening.</p>	

<ul style="list-style-type: none"> <li>When light hits a <b>translucent</b> material, it goes through it but is scattered, this means light can pass through, but we can't see an image through it.</li> <li>When light hits a mirrored surface, it reflects off it in straight lines, so we can see an image in the reflective material.</li> <li>Sometimes when light hits a material it <b>reflects</b> off it in many different directions (it is scattered). In this case light will be reflected but no image will be seen in the material.</li> <li>Shiny surfaces are better reflectors and rough surfaces scatter light more. Opaque objects don't allow any light to pass through them.</li> </ul>	 <p>Some materials are translucent and some light can pass through them.</p> <p>Some materials are mirrored and the light reflects back from them. In some cases an image can be seen but not always. Shiny surfaces are better reflectors than rough ones</p>	<p>Some materials are translucent and some light can pass through them. The light is scattered. They can draw arrow diagrams to show this.</p> <p>Some materials are mirrored and the light reflects back from them. It reflects off it in straight lines, so we can see an image in the reflective material.</p> <p>Sometimes when light hits a material it <b>reflects</b> off it in many different directions (it is scattered). In this case light will be reflected but no image will be seen in the material. They can draw arrow diagrams to show this.</p>	<p>Some materials are translucent and some light can pass through them. The light is scattered. They can draw arrow diagrams to show this and write accurate descriptions of what is happening. They can describe instances when transparent and translucent materials may be of benefit.</p> <p>Some materials are mirrored and the light reflects back from them. It reflects off it in straight lines, so we can see an image in the reflective material. They can draw arrow diagrams to show this and write accurate descriptions of what is happening.</p> <p>Sometimes when light hits a material it <b>reflects</b> off it in many different directions (it is scattered). In this case light will be reflected but no image will be seen in the material. They can draw arrow diagrams to show this and write a description of what is happening.</p>
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NB: The assessments are completed for two reasons – to enable the class teacher and in turn the subject leader to evaluate the pitch of the learning within the unit in order to consider any necessary updates and for the class teacher to report to parents on the attainment of pupils in the end of year reports