



The Canons CE Primary School



Year 6 – Light		
Prior Learning	In Year 6	Future Learning
In Year 3 children will be taught to: - find patterns in the way that the size of shadows change - investigate how the size of shadows change - recognise how shadows are formed when a solid object blocks the light - describe how light from the sun can be dangerous and the ways they can protect their eyes - describe what happens when light hits a reflective surface - describe what happens when there is an absence of light - recognise that we need light in order to see things. In Year 5 children will be taught to: - compare and group everyday materials on the basis of their properties e.g. hardness, solubility, transparency, conductivity (electrical and thermal) and response to magnets. (<i>Properties and changes of materials</i>)	In Year 6 children will be taught to: - use their knowledge of the way light travels to describe how shadows are formed - discuss how objects are seen using scientific vocabulary e.g. light source and reflection - demonstrate that light travels in straight lines to explain how objects are seen - use examples to show that light appears to travel in straight lines.	In KS3 children will be taught about: - the similarities and differences between light waves and waves in matter - light waves travelling through a vacuum; speed of light - the transmission of light through materials: absorption, diffuse scattering and specular reflection at a surface - 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 - light transferring energy from source to absorber leading to chemical and electrical effects; photo-sensitive material in the retina and in cameras - colours and the different frequencies of light, white light and prisms (qualitative only); differential colour effects in absorption and diffuse reflection.
	Key Vocabulary	
	light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous, filter, colour, absorb, refract, spectrum, wavelength, prism, visible, lens, angle, incidence, straight, ray, beam, wave	
Famous Scientists	Common Misconceptions	Possible Evidence to be Secure
- Nikola Telsa – founder of AC Electric system (<i>links to electricity topic too</i>) - Thomas Young (1773 – 1829) – wave theory of light. Double-slit experiment. - Sir David Brewster (1781 – 1868) - deduced ‘Brewster’s law’ giving the angle of incidence that produces reflected light which is completely polarized; invented the kaleidoscope and the stereoscope, and improved the spectroscope - Jean-Bernard-Leon Foucault (1819 – 1868) – accurately measured the speed of light	Some children may think: we see objects because light travels from our eyes to the object.	Children can: - describe, with diagrams or models as appropriate, how light travels in straight lines either from sources or reflected from other objects into our eyes - describe, with diagrams or models as appropriate, how light travels in straight lines past translucent or opaque objects to form a shadow of the same shape.



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Working Scientifically

National Curriculum Statutory Requirements

1. Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.
2. Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings where appropriate.
3. Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.
4. Use test results to make predictions to set up further comparative and fair tests.
5. Report and present findings from enquiries, including conclusions, casual relationships and explanations of result, in oral and written forms such as displays and other presentations.
6. Identifying scientific evidence that has been used to support or refute ideas or arguments.

Highlighted = main focus during this topic

Teaching Ideas – Different Types of Scientific Enquiry

Comparative and Fair Testing	Identifying and Classifying	Observation Over Time	Pattern Seeking	Research
Which material is most reflective? How does the angle that a light ray hits a plane mirror affect the angle at which it reflects off the surface?	Can you identify all the colours of light that make white light when mixed together? What colours do you get if you mix different colours of light together?	How does my shadow change over the day?	Is there a pattern to how bright it is in school over the day? And, if there is a pattern, is it the same in every classroom?	How do astronomers know what stars are made of?

Teaching Ideas – How Pupils Could Work Scientifically

Teaching Ideas – Possible Evidence to be Secure

(Bracketed Number = National Curriculum Statutory Requirement Link)

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| <ul style="list-style-type: none"> Explore different ways to demonstrate that light travels in straight lines e.g. shining a torch down a bent and straight hose pipe, shining a torch through different shaped holes in card. (1, 4) Explore the uses of the behaviour of light, reflection and shadows, such as in periscope design, rear view mirrors and shadow puppets. (1) | <p>Children can:</p> <ul style="list-style-type: none"> explain how evidence from enquiries shows that light travels in straight lines (5) predict and explain, with diagrams or models as appropriate, how the path of light rays can be directed by reflection to be seen, e.g. the reflection in car rear view mirrors or in a periscope (4, 5) predict and explain, with diagrams or models as appropriate, how the shape of shadows can be varied. (4, 5) |
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