

Science Project Overview Year 6 Light

<p>Subject Knowledge (PoS) Substantive Knowledge</p> <ul style="list-style-type: none"> • Light appears to travel in straight lines. • Objects are seen because they give out or reflect light into the eye. • We see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes. • Light travels in straight lines. • Shadows have the same shape as the objects that cast them. 	<p>Working Scientifically (PoS+Overview) Disciplinary Knowledge</p> <p>During years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:</p> <ul style="list-style-type: none"> • Asking their own questions about scientific phenomena • Select the most appropriate ways to answer science questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests and finding things out using a wide range of secondary sources. • planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary • taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate • recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs • using test results to make predictions to set up further comparative and fair tests • 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 • identifying scientific evidence that has been used to support or refute ideas or arguments. • Draw conclusions based on their data and observations, use evidence to justify their ideas, and use their scientific knowledge and understanding to explain their findings 	<p>Working Scientifically Methods</p> <p>Using different types of scientific enquiry to answer their own questions, including:</p> <ul style="list-style-type: none"> • observing changes over different periods of time, • noticing patterns, • grouping and classifying things, • carrying out comparative and fair tests • and finding things out using a wide range of secondary sources
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<p>Previous learning:</p> <ul style="list-style-type: none"> • Recognise that they need light in order to see things and that dark is the absence of light. (Y3 - Light) • Notice that light is reflected from surfaces. (Y3 - Light) • Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. (Y3 - Light) • Recognise that shadows are formed when the light from a light source is blocked by an opaque object. (Y3 - Light) • Find patterns in the way that the size of shadows change. (Y3 - Light) • Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets. (Y5 - Properties and changes of materials) 	<p>Preparing learning:</p> <ul style="list-style-type: none"> • The similarities and differences between light waves and waves in matter. (KS3) • Light waves travelling through a vacuum; speed of light. (KS3) • The transmission of light through materials: absorption, diffuse scattering and specular reflection at a surface. (KS3) • 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. (KS3) • Light transferring energy from source to absorber leading to chemical and electrical effects; photo-sensitive material in the retina and in cameras. (KS3) • Colours and the different frequencies of light, white light and prisms (qualitative only); differential colour effects in absorption and diffuse reflection. (KS3) 	<p>Bespoke to our school:</p> <p>Children are explicitly taught the Tier 2 and Tier 3 vocabulary and this is revisited at the start of every Science lesson.</p>
<p>Vocabulary:</p> <p>Light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous ,reflective surface straight lines, light rays,periscope</p>		

Misconceptions:

- We see objects because light travels from our eyes to the object

English Links:

The Gruffalo's child

Maths links:

Measurement: When solving problems that require the calculation and conversion of units of measures, use decimal notation up to three decimal places- using datalogger to measure light (lux) levels

Statistics: Know how to construct a pie chart and line graph- creating graphs from results table

Use pie charts and line graphs to solve problems- use results data to write/ discuss conclusions

Understand the term mean as an average and be able to calculate it- calculate averages of readings from investigations

Famous Scientists to possibly study:

Patricia Bath (BP website)- saving sight Started community outreach eye-care programmes and invented a tool that removes cataracts. <http://bpes.bp.com/primary-resources/science/ages-7-to-9/light/super-scientists-patricia-bath/>

Alhazen, the 'father of optics', on observation and how the eye sees using light.BBC http://www.bbc.co.uk/programmes/articles/2bnTHtTcyLfdKk7BtCtjbhf/scitube-scientists-and-scientific-method?dm_i=3YNL,BHOK,2VWQKN,16RVJ,1

Jean-Bernard-Leon Foucault (1819-1868) – Accurately measured the speed of light

History/ Geography links: What is local business doing to help tackle climate change?-Links to solar panels

Explorify links:

[Light and time](#)

[Find your focus](#)

[Now you see me...](#)

[See round the bend](#)

[What if there were two suns?](#)

Possible careers/jobs:

Architect (designs buildings), Astronomer (studies space), Astrophysicist (studies the physics of space and objects in space), Ophthalmologist (a doctor specialising in vision and eye health), Optician (a doctor specialising in vision and eye health)