

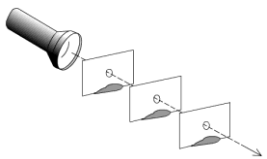
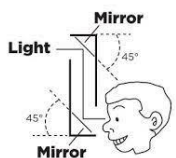
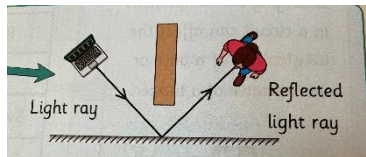


Knowledge and Skills Map – Science at Estcots School

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|-----------------------|---|---------------------------------|
| Year 6 – Light | Main Outcomes: <ul style="list-style-type: none"> • Recognise that light appears to travel in straight lines. • 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. • 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. • Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. | Focus: Science – physics |
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| What should I already know? |
| <ul style="list-style-type: none"> • Light is needed in order to see things. • Dark is the absence of light. • Light is reflected from surfaces. • Light from the Sun can be dangerous: there are ways to protect our eyes. • Shadows are formed when the light from a light source is blocked by a solid object. • Shadows change size depending on the distance and position of the light source to the object blocking it. |
| What I will do |
| <p>I will have weekly or blocked science lessons. In lessons, I will be taught a skill and I will gain knowledge and understanding through the process of scientific enquiry (observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing (controlled investigations); and researching using secondary sources).</p> <p><u>Possible lines of enquiry</u></p> <ul style="list-style-type: none"> • Building on the work on light in year 3, explore the way that light behaves, including light sources, reflection and shadows: talk about what happens and make predictions. • Decide where to place rear-view mirrors on cars. • Design and make a periscope, using the idea that light appears to travel in straight lines to explain how it works. • Investigate the relationship between light sources, objects and shadows by using shadow puppets. • Extend their experience of light by looking at a range of phenomena including rainbows, colours on soap bubbles, objects looking bent in water and coloured filters (they do not need to explain why these phenomena occur). <p>Note: Pupils should be warned that it is not safe to look directly at the Sun, even when wearing dark glasses.</p> |

| Vocabulary | Meaning |
|-------------------------------|--|
| absorb | to take in something |
| colour | a way that we describe an object based on the way that it reflects or emits light |
| dark/darkness | the absence of light |
| direct/direction | the line or course along which something moves, lies, or points |
| emit | to send or give out |
| light | a form of energy |
| light ray | a beam of light |
| light source | something which emits its own light |
| magnify | to enlarge in fact or in appearance |
| mirror | any glass or other smooth, polished surface that forms an image by reflection |
| opaque | a material that doesn't let light through it |
| rainbow | multi-coloured arcs that form in the sky and are created when sunlight shines through the water |
| reflect/reflective/reflection | when light bounces off something |
| reflector | an object that reflects light |
| refraction | the bending of light rays |
| scatter | to separate and go in various directions (disperse) |
| shadow | the dark area behind an object where light is blocked out |
| translucent | a material that light travels through |
| transparent | a material that some light passes through, but the light is scattered, so you can't see clearly through it |

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| Resources |
| <p>Hamilton Science planning: light https://www.hamilton-trust.org.uk/science/year-6-science/crime-lab-investigation/ (all planning also saved on SharePoint).</p> |

| Knowledge to understand | | Skills to learn | |
|---|--|---|--|
| <p>Light travels in straight lines from a light source.</p>  | <ul style="list-style-type: none"> • We see things when light enters our eyes. • This light may be reflected off objects before it enters our eyes. • Light can also come directly from the light source. • It is not safe to look directly at the Sun, even when wearing dark glasses. | <ul style="list-style-type: none"> ➤ 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 | <p>Cross-curricular (maths)</p> <ul style="list-style-type: none"> ➤ recognise angles where they meet at a point or are on a straight line ➤ convert between standard units of measure (feet and inches to cm) |
| <p>Mirrors reflect light rays back at the same angle.</p>  | <p>This can be useful if you want to see around objects.</p>  | <p>Equipment to become familiar with</p> <p>Torches</p> <p>Rulers</p> <p>Light meters (can use data loggers)</p> <p>Prisms</p> <p>Magnifying glasses of different strengths</p> <p>Periscopes</p> <p>Telescopes</p> <p>Binoculars</p> <p>Mirrors</p> | |
| <p>Shadows have the same shape as the objects that cast them. This is because light travels in straight lines.</p>  |  | | |

| Evidence of Learning | How will I know what I've learnt? |
|---|---|
| <p>Science books</p> <p>Photos</p> <p>Videos</p> <p>Pupil conferencing</p> <p>Teaching and learning observations</p> <p>Learning walks</p> <p>Data analysis</p> | <p>See KS2 teacher assessment exemplification for science</p> <p>https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/763065/2018_key_stage_2_teacher_assessment_exemplification_science.pdf</p> <p>See also Hamilton Science_Assessment_Y6 (saved in planning folder on Sharepoint).</p> <p>KS2 quizzes:</p> <p>https://gcequiz.com/quiz/ks2-science-quizzes</p> <p>https://churchfieldsjunior.com/test-your-skills-science/</p> |