

Year Group	6
Term	Spring 2
Subject	Science

Topic	Light
Curriculum Intent	Children will investigate light travelling in straight lines and be able to explain how objects are seen. Children will use this knowledge to explain why shadows have the same shape as the objects.

Key Vocabulary	Straight lines, light rays, Light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous, travel, waves, beam, photon, energy, vacuum, Reflection, angle, incidence, normal, periscope, Refraction, bend, lens, focus, focal point, spectrum, wavelength, colour, prism, visible, rainbow.
Skills	<p>Record and present findings, identifying patterns and drawing conclusions – lesson 1</p> <p>Use relevant scientific language and illustrations to discuss, communicate and justify their ideas – lesson 2/3</p> <p>Make their own decisions about what observations to make, what measurements to use and how long to make them for – lesson 4.</p> <p>Select and plan the most appropriate type of scientific enquiry to use to answer scientific questions & – lesson 6</p>

Knowledge	<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. <p>Common Misconceptions: Some children may think: we see objects because light travels from our eyes to the object. See Teacher's background notes here</p>
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Week	Learning Objective	Activities	Outcome
1	Assess: Record and present findings, identifying patterns and drawing conclusions	Assess what children remember from Year 3 (and year 5): Recognise that they need light in order to see things, and that dark is the absence of light. Notice that light is reflected from surfaces. Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. Recognise that shadows are formed when the light from a light source is blocked by an opaque object. Find patterns in the way that the size of shadows change.	Children will: Plan and carry out 5 light investigations in response to given enquiry questions Record and present findings, identifying patterns and drawing conclusions.
2	LO: I can demonstrate that light travels in a straight line.	For this challenge, the children should work in groups to produce an educational programme for children all about how light enables us to see. They may want to use pictures or diagrams, or even props to support their explanations in the programme. Encourage them to get into character as scientists!	Plan and film a short video to explain how the hose pipe and torch can be used to support the idea that light travels in a straight line.
3	I can understand how mirrors reflect light, and how they can help us see objects.	How Is Light Reflected? Show four "Reflection Explanations" and ask chn to vote on paper for correct one. Explain what the angles of incidence and reflection are, and that they are always equal. Explain what a periscope.	I can explain how light is reflected. I can measure the angles of incidence and reflection.
4	I can investigate how refraction changes the direction in which light travels	Show children the photo of a straw in a glass of water. Ask them to discuss what is happening, then introduce the concept cartoon showing a group of children talking about their ideas. Ask the children to speak to their partner about which explanation they agree with and why.	I can understand how light is refracted. I can investigate the effects of refraction. I can understand the way refraction alters the direction of light.
5	LO: To learn about the properties of light by splitting it with a prism.	What colour is light? Light may appear white but is made up of lots of different colours. Revise colours of the rainbow. When we use a glass prism to refract the light, it splits the different colours up because they travel at different frequencies. Newton discovered this and devised his Theory of Light. Children to complete light splitting experiment in pairs. Explain a prism refracts light, causing it to bend. Children use a torch to shine a ray of light through a prism, holding a piece of white card in front of the refracted ray of	I can understand how a prism affects a ray of light. I can explain what this tells us about the visible spectrum. I can describe what Isaac Newton discovered about light.

		<p>light as it leaves the prism. They should see the light ray split into the colours of the spectrum.</p> <p>NB: This worked best last year in a very dark room e.g. cupboard or cloakroom. Some children needed a lot of help to see the rainbow of colours.</p> <p>A prism is a triangular block of glass or perspex which splits light into its constituent colours.</p> <p>https://www.science-sparks.com/rainbow-with-a-prism/</p> <p>Challenge: Create a colour wheel spinner and when spun describe what happens. Instructions on Twinkle activity sheet.</p> <p>Cardboard, pens and string needed.</p> <p>See end of Twinkle PowerPoint</p>	I can make my own colour wheel and explain what it shows about light
6	What factors affect the size of a shadow in a shadow theatre?	<p>Children use their own shadow puppets to investigate how the shadow size changes as they change the distance between light source and screen.</p> <p>This is an ideal enquiry for children to plan their own method to explore the factors that affect the size of shadows. They can share their ideas by drawing a diagram of their simple test and writing a simple method to describe how to carry out their test, step by step.</p> <p>Children can design their own results table to record their measurements, remembering to include column headings with units for the variable they are changing and the variable they are measuring.</p> <p>Children answer the big question in the form of a conclusion, clearly explaining how their data helped them come up with this conclusion.</p> <p>Children can plot their data on (pre-prepared) axes to help them identify trends in their measurements.</p> <p>STEnvestigation here</p> <p>https://www.bbc.co.uk/bitesize/topics/z3nnb9q/articles/z9wm7yc</p> <p>Skills: Select and plan the most appropriate type of scientific enquiry to use to answer scientific questions.</p> <p>Make own decisions about what observations to make , measurements to use and how long to make them for.</p> <p>Decide how to record data and results.</p>	Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.

