

Physics

Strand: Light

Working Scientifically Drives All of the Knowledge & Understanding

NC Objectives	Key Scientific Knowledge	Key Vocabulary	Working Scientifically
Year 3			
To recognise that they need light in order to see things and that dark is the absence of light	<p><i>What is light? Light is ENERGY</i></p> <p>To recognise that we need light (light needs to enter the eye) in order to see things</p> <p>To be able to describe darkness as the absence of light.</p>	<p>Light, energy</p> <p>Light, dark, eye, bright, darkness</p>	<p>Chn should be able to explain that light is a form of energy (orally)</p> <p>Teacher to ask questions e.g. What organ do we use to see? The eye. How do we see? We need light to see (vs. Yr 6= light <i>enters</i> the eye)</p> <p>Make simple observations about how we see (brightness/ darkness)</p>
To notice that light is reflected from surfaces	To explain a reflection as light bouncing off something e.g. something shiny/ with reflective qualities.	Reflect, reflection, bounce, light, shiny, dull,	<p>Support chn in raising questions: what happens to light when a mirror is put in the way?</p> <p>Chn make observations about the direction of the light (using torches) and explore what happens when light hits curved surfaces. Chn raise further questions; ask what else they would be interested in exploring e.g. What happens to light on bumpy/ foil/ bubbled/ surface?</p>
To recognise that light from the sun can be dangerous and that there are ways to protect their eyes	To understand that looking directly at the sun is dangerous; light is energy which can damage our eyes.	Danger, sunlight, protect, energy, damage, squinting, cover	Make observations & suggest explanations about why people wear sun-glasses/ what happens when we go outside and it is bright (squinting)/ possible eye-watering.

	To understand how to protect their eyes in bright weather e.g. tinted glasses/sun-glasses		Teacher to ask question: how can we protect our eyes from bright lights? What experiences have you had/ seen? Chn explore the use of glasses/ eclipse glasses to protect eyes
To recognise that shadows are formed when the light from a light source is blocked by an opaque object	To understand what opaque, translucent and transparent mean. To be able to explain why shadows form when opaque objects block light.	Opaque, transparent , translucent, shadow, light source	Chn observe how and when shadows are formed; make observations and record findings e.g. which objects (opaque / transparent/ translucent) will form shadows; present findings orally to class/ group Chn consider further questions that this raises e.g. Now we know how shadows are formed, how can we <i>change</i> shadows? What else affects shadow shape/ formation (Potential fair testing opportunity or pattern finding – see below)
To find patterns in the way that the size of shadows change.	Through experimentation and testing to discover that shadow formation depends on a number of factors including: a) how opaque/ translucent an object is; b) the distance of the object from the light source c) the position of the light source in relation to the object e.g. Earth's position in relation to the sun, forming shadows of different lengths/ positions at different times of day/ seasons.	Pattern/ link, longer/ shorter, shadow, time of day, measure, cm, m, change, position, light source,	Chn should be asked what equipment would help them in measuring shadows. Skill: using rulers/ metre sticks/ tape measures to measure shadow length/ height. Chn should take accurate measurements using standard units e.g. mm, cm, m Chn measure shadow length/ height at different times of day (specified intervals); draw shadow shapes and make observations/ record notes; find patterns e.g. between position of sun and shadow

length and make conclusions/ present ideas.

Year 6

To recognise that light appears to travel in straight lines	<i>Revise Yr 3 lights/ shadows vocabulary and content.</i> To identify that light travels in straight lines.	Light, travel, direction	Explore direction of light travel; draw diagrams with torches/ paper; make observations & share findings orally
To 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	To understand that light travels in straight lines and can be reflected off surfaces; this light enters our eyes so we can see. To identify light sources e.g fire, sun, light, lamp, star, LED, (not moon-reflected light).	Reflection, light source, enter, periscope,	Create periscope to use the understanding of light travelling in straight lines/ entering eye, enabling us to see; written explanation or oral presentation of how periscope works. Explore positioning of mirrors (e.g. rear view mirrors/ security mirrors/ road mirrors for black spots) and apply understanding of light behaviour (chn should be able to make causal links between the position/ orientation of the mirror and the direction of the light)
To 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	To be able explain that in order for us to see, light needs to enter the eye from a reflection/ light source.	light source, reflection,	Draw diagrams of light bouncing off items and entering eye/ light source giving off light and light entering eye. Written explanation of how we see (because light enters the eye from objects that give out light or reflected light e.g. moon/ light bouncing off object)
To use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.	To be able to explain why a shadow (usually) has the same shape as the object that casts it (due to light travelling in straight lines)	Shadow, cast, light source	Chn make predictions and draw shadows cast by objects given the light source and position. To present findings & make conclusions using their data/ shadow drawings (oral).

			Explore shadow puppets and projecting shadows onto wall/ board.
<i>Possible extension: chn can explore range of phenomena (do not need to explain) rainbows/ colour filters/ objects looking bent in water; colours on soap bubbles / which liquids create rainbow of colours with light?</i>			