

Science

Light Year 3

Remember when

Sun protection is necessary to keep us healthy. Humans need to wear sunglasses, hat and wear sun cream. (Y2)

Sticky knowledge

- Light from the sun can be dangerous to our eyes and we should protect our eyes with sunglasses or hats
- It is dark when there is no light and we need light to see
- Surfaces reflect light
- Shadows are formed when light is blocked
- Shadows get bigger when they are closer to the light source
- Solid objects make the darkest shadow. Translucent objects produce a feint shadow. Coloured translucent materials produce a coloured shadow



Key vocabulary

Light source
bright
dark
dim
light
mirror
opaque
reflect
shadow
source
surface
translucent
transparent
absences of light
shiny
matt
sunlight
dangerous

National Curriculum

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 a solid object

Find patterns in the way that the size of shadows change.

Working Scientifically

- Setting up simple practical enquiries, comparative and fair tests.
- Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
- Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers
- Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
- Using straightforward scientific evidence to answer questions or to support their findings

Common Misconceptions

Some children may think:

- we can still see even where there is an absence of any light
- our eyes 'get used to' the dark
- the moon and reflective surfaces are light sources
- a transparent object is a light source
- shadows contain details of the object, such as facial features on their own shadow
- shadows result from objects giving off darkness.

LO	Knowledge and Skills	Lesson outline
<p>Lesson 1</p> <p>LO: To know that we need light in order to see</p> <p>Enquiry Type:</p> <p>Observation</p>	<p>Why do we need light? What is a light source?</p> <p>Sticky Knowledge: It is dark when there is no light and we need light to see</p> <p>Skill: Setting up simple practical enquiries, comparative and fair tests.</p>	<p>What is light? Why do we need it to see things? What is a light source? Sort cards in groups according to whether or not they are light sources.</p> <p>Children look at light using a box with a small hole in one side. Place objects into the box and look through the hole. What can you see? Does the colour of the object affect how well it can be seen (not a light source) It should be dark so they shouldn't be able to see much. They can only see light sources.</p> <p>Children to sort these into a table whether or not it is a light source.</p> <p>LA – Use sentence starters to explain what happened when they looked into the box (shared task)</p> <p>MA – Use sentence starters to explain what happened when they looked into the box (independent task). Why is yellow seen more easily than purple?</p> <p>GD – Explain what happens when they look into the box, and why certain colours can be seen better than others.</p>

<p>Lesson 2</p> <p>LO: To know how we can protect our eyes from the sun</p> <p>Enquiry type: Comparative</p>	<p>How can we protect our eyes from the sun?</p> <p>Sticky Knowledge: Light from the sun can be dangerous to our eyes and we should protect our eyes with sunglasses or hats</p> <p>Skill: Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</p>	<p>Children will use UV beads and a range of glasses/sunglasses to test their effectiveness (including prescription glasses, prescription sunglasses, fashion glasses, novelty sunglasses and UV-protective sunglasses).</p> <p>Make a prediction as to which glasses will have the least impact on the beads (highest level of UV protection)</p> <p>Leave the glasses and beads in a sunny space for a period of time, then check the beads periodically.</p> <p>LA: Use investigation template.</p> <p>GD: Explain the pattern between the level of protection and the effect on the beads.</p> <p>Write results and a simple conclusion.</p>
<p>Lesson 3</p> <p>LO: To know that light is reflected from surfaces</p> <p>Enquiry Type: Comparative and fair testing</p>	<p>How much light is reflected from different surfaces?</p> <p>Sticky Knowledge: Surfaces reflect light</p> <p>Skills: Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers</p>	<p>How much light can be reflected from different surfaces? Cover tables in different materials (cardboard, plastic, aluminum foil). Shine a torch onto the surface and use data loggers to record the amount of light reflected from each surface.</p> <p>Mixed ability groups. All children should have the opportunity to read the data loggers.</p> <p>Create a table of results in books. Then transfer data into a bar chart. (CC Maths)</p>
<p>Lesson 4</p> <p>LO: To know how shadows are formed</p> <p>Enquiry type: Observation</p>	<p>How are shadows created?</p> <p>Sticky Knowledge: Shadows are formed when light is blocked</p> <p>Skill: Recording findings using simple scientific language, drawings,</p>	<p>Recap opaque objects. What happens when an opaque object blocks light? Explain that an absence of light is a shadow. Children create shadows of different objects using torches. Predict and test which objects create the best shadows. Why is this?</p> <p>Recap transparent and introduce translucent.</p> <p>Use the investigation framework to design an investigation to see who can make the best shadows as a class. To be carried out in mixed ability groups.</p> <p>LA – Framework given to complete</p> <p>GD – Spot a pattern in the clarity of the shadows.</p>
<p>Lesson 5</p> <p>LO: To find patterns in the way that the size of shadows change</p> <p>Enquiry type: Pattern seeking</p>	<p>How can shadows change?</p> <p>Sticky Knowledge: Shadows get bigger when they are closer to the light source</p> <p>Skill: Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers</p>	<p>Children predict and investigate what happens when a torch is moved closer/further away from an object.</p> <p>Blu-tac a piece of A3 paper to the wall, mark a line on the paper to mark the top of the shadow for each distance. This will make it easier to measure the size of the shadow.</p> <p>LA – Complete cloze sentences using a word bank to explain how the size of the shadows changed.</p> <p>MA – Use sentences starters and word bank to describe change in size.</p> <p>GD – Write an explanation using key words to describe how the shadows changed. Do shadows change when the object is moved closer and further away, rather than the light source?</p>
<p>Lesson 6</p> <p>LO: To know which materials make the best shadow puppet.</p>	<p>Which materials make the best shadow puppets?</p> <p>Sticky Knowledge: Solid objects make the darkest shadow. Translucent objects produce a feint shadow. Coloured translucent materials</p>	<p>Using the information we discovered last week about the way different materials create different shadows, children will design a shadow puppet that they think will create the most effective shadows.</p> <p>LA – templates given – compare the shadows.</p> <p>MA – Explain decisions in design – how can it be improved?</p> <p>GD – add translucent acetate into shadow puppet (sweet wrappers) which colours work best?</p>

Enquiry type: Observation	produce a coloured shadow Skill: using straightforward scientific evidence to answer questions or to support their findings Sticky Knowledge Quiz	Send materials home to make puppet (Give Thorpetons)	
Working towards	End of unit assessment Working at Age related expectations		Working at a greater depth