

KS2: MEDIUM TERM PLANNER**Light Y3**

Pupils should be taught to:

- recognise that they need light 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


The principal focus of science teaching in lower key stage 2 is to enable pupils to broaden their scientific view of the world around them. They should do this through exploring, talking about, testing, and developing ideas about everyday phenomena and the relationships between living things and familiar environments, and by beginning to develop their ideas about functions, relationships and interactions. They should ask their own questions about what they observe and make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, including observing changes over time, noticing patterns, grouping, and classifying things, carrying out simple comparative and fair tests and finding things out using secondary sources of information. They should draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out.


'Working scientifically' is described separately at the beginning of the programme of study but must always be taught through and clearly related to substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content. Pupils should read and spell scientific vocabulary correctly and with confidence, using their growing word-reading and spelling knowledge.





During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:


- asking relevant questions and using different types of scientific enquiries to answer them
- setting up simple practical enquiries, comparative and fair tests
- making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers
- gathering, recording, classifying, and presenting data in a variety of ways to help in answering questions
- recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
- reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
- using results to draw simple conclusions, make predictions for new values, suggest improvements, and raise further questions
- identifying differences, similarities or changes related to simple scientific ideas and processes
- using straightforward scientific evidence to answer questions or to support their findings.


<p>Prior Learning:</p> <ul style="list-style-type: none"> • Explore how things work. (Nursery – Light) • Talk about the differences in materials and changes they notice. (Nursery – Light) • Describe what they see, hear, and feel whilst outside. (Reception – Light) • Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. (Y1 - Animals, including humans) • Describe the simple physical properties of a variety of everyday materials. (Y1 - Materials) 		<p>Future learning:</p> <ul style="list-style-type: none"> • Recognise that light appears to travel in straight lines. (Y6 - Light) • 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. (Y6 - Light) • 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. (Y6 - Light) • Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. (Y6 - Light) 	
Key Questions <i>(show how content and concepts link)</i> Differentiated Learning Objectives	Teaching and learning activities <i>(linked directly to objectives)</i>	Resources <i>(to help pupils reach the learning objectives)</i>	Written and non -written outcomes <i>(assessment including homework's)</i>
<p>1) What is light?</p> <p>SCIENCE CAPITAL: <i>How does this lesson connect with children in my class? Why is light important to you? How does it affect your everyday life?</i></p> <p>Science Working scientifically Skills:</p>  <p>Science Enquiry Type</p> <p>Classify</p> <p><i>We see objects because our eyes can sense light. Dark is the absence of light. We cannot see anything in complete darkness. Some objects, for example, the sun, light bulbs and candles are sources of light. Objects are easier to see if there is more light. Some surfaces reflect light. Objects are easier to see when there is less light if they are reflective. The light from the sun can damage our eyes</i></p>	<p>Science reasoning task: explorify: In the shade - Explorify</p> <p>Activity 1: Read the book, shadow and pupils to come up with questions linked to book and topic light.</p> <p>Activity 2: complete reading comprehension linked to book.</p> <p>Activity 3: identify light sources and use Venn diagram to classify them.</p> <p>Misconception: Some children may think:</p> <ul style="list-style-type: none"> • 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. 	<p>Activity 1: Shadow book by Robert Stevenson.</p> <p>Activity 2: reading comprehensions</p> <p>Activity 3- classify- table for pictures/ objects of light sources to classify</p>	<p>Assessment: can pupils identify the various light sources.</p> <p>Homework: note down all the light sources they use on a day to day basis.</p>

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<p>2) LO: How well do different colours reflect light?</p> <p>SCIENCE CAPITAL: <i>How does this lesson connect with children in my class? When might you need reflecting light in your life? Do you own anything that reflects light?</i></p> <p>Science Working scientifically Skills:</p>  <p>Science Enquiry Type</p> <p>Comparative</p> <p><i>We see objects because our eyes can sense light. Dark is the absence of light. We cannot see anything in complete darkness. Some objects, for example, the sun, light bulbs, and candles are sources of light. Objects are easier to see if there is more light. Some surfaces reflect light. Objects are easier to see when there is less light if they are reflective. The light from the sun can damage our eyes</i></p>	<p>Science reasoning task: explorify: In the shadows - Explorify</p> <p>Activity 1: PowerPoint – what reflective light is and why it is useful.</p> <p>Activity 2: plan and carry out mini experiment of which material and colour is most reflective.</p> <p>Activity 3: carry out the experiment and conclude. Create a book bag label which materials or colours you recommend.</p> <p>Misconception: Some children may think:</p> <ul style="list-style-type: none"> • 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. 	<p>Activity 1: PowerPoint-</p> <p>Activity 2: planning template-different materials/ colours to test out.</p> <p>Activity 3: Template of a bookbag to label with the most reflective colour and material.</p>	<p>Assessment: Are pupils able to explain which materials or colours are most reflective of light?</p>

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<p>3) LO: What happens when light is reflected on different surfaces?</p> <p>SCIENCE CAPITAL: <i>How does this lesson connect with children in my class? What fabric materials around you use magnets? Why do you think that is?</i></p> <p>Science Working scientifically Skills:</p>  <p>Science Enquiry Type</p> <p>Comparative</p> <p><i>We see objects because our eyes can sense light. Dark is the absence of light. We cannot see anything in complete darkness. Some objects, for example, the sun, light bulbs and candles are sources of light. Objects are easier to see if there is more light. Some surfaces reflect light. Objects are easier to see when there is less light if they are reflective. The light from the sun can damage our eyes</i></p>	<p>Science reasoning task: explorify: You had magnets for fingers? - Explorify</p> <p>Activity 1: Discuss concept cartoon about reflective off surfaces- who do pupils agree with most and why?</p> <p>Activity 2: write a mirror message and create a mirror maze and discuss what they noticed.</p> <p>Activity 3: look at car mirrors/ wing mirror and discuss the different purposes of the mirrors.</p> <p>Misconception: Some children may think:</p> <ul style="list-style-type: none"> • 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. 	<p>Activity 1: talk partner</p> <p>Activity 2: mirrors and paper</p> <p>Activity 3: table of the different mirror types- concave, plane, convex.</p>	<p>Assessment: Are ch able to set up a scientific experiment to answer a question?</p>

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<p>4) LO: Why is it important to stay safe in the sun?</p> <p>SCIENCE CAPITAL: <i>How does this lesson connect with children in my class? What do you notice about the sun? Is it a light source? How does the sun affect our lives? Our health?</i></p> <p>Science Working scientifically Skills:</p>  <p>Science Enquiry Type Research</p> <p><i>We see objects because our eyes can sense light. Dark is the absence of light. We cannot see anything in complete darkness. Some objects, for example, the sun, light bulbs and candles are sources of light. Objects are easier to see if there is more light. Some surfaces reflect light. Objects are easier to see when there is less light if they are reflective. The light from the sun can damage our eyes</i></p>	<p>Science reasoning task: Reflections On Mars - Explorify</p> <p>Activity 1: PowerPoint go through is the sun a hero or a villain?</p> <p>Activity 2: read about sun safety and complete comprehension</p> <p>Activity 3: Using the research to create an information leaflet for year 2 about how to keep safe in the sun.</p> <p>Misconception: Some children may think:</p> <ul style="list-style-type: none"> • 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. 	<p>Activity 1: PowerPoint – write why they think the sun is a hero or a villain.</p> <p>Activity 2: sun safety comprehensions</p> <p>Activity 3: leaflet template</p>	<p>Assessment: Able to come up with enquiry questions and use secondary resources to find the answers to them?</p> <p>Homework: write an experience of being at the beach, on holiday and it has been hot- how have you been sun safe?</p>

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<p>5) How do different objects cast shadows?</p> <p>SCIENCE CAPITAL: <i>How does this lesson connect with children in my class? Where do you see shadows? When? What time of day? Why are they useful in our everyday lives?</i></p> <p>Science Working scientifically Skills:</p>  <p>Science Enquiry Type</p> <p>Comparative</p> <p><i>We see objects because our eyes can sense light. Dark is the absence of light. We cannot see anything in complete darkness. Some objects, for example, the sun, light bulbs, and candles are sources of light. Objects are easier to see if there is more light. Some surfaces reflect light. Objects are easier to see when there is less light if they are reflective. The light from the sun can damage our eyes</i></p>	<p>Science reasoning task: explorify: Sources of light - Explorify</p> <p>Activity 1: Play -guess the object from its shadow.</p> <p>Activity 2: PowerPoint to go over the different shadows and how they are created. Identify, transparent, opaque and translucent objects.</p> <p>Activity 3: Set up an experiment to find out which material is the best to block out light.</p> <p>Misconception: Some children may think:</p> <ul style="list-style-type: none"> • 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. 	<p>Activity 1: guess the shadow worksheet.</p> <p>Activity 2: PowerPoint and to sort and identify transparent, opaque and translucent objects.</p> <p>Activity 3: Planning template.</p>	<p>Assessment: Are pupils able to plan a scientific enquiry and answer their enquiry question?</p>

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<p>6) How does the distance of the light affect the size of the shadow?</p> <p>SCIENCE CAPITAL: <i>How does this lesson connect with children in my class? What happens to your shadow when your walking in the dark?</i></p> <p>Science Working scientifically Skills:</p>  <p>Science Enquiry Type</p> <p><i>We see objects because our eyes can sense light. Dark is the absence of light. We cannot see anything in complete darkness. Some objects, for example, the sun, light bulbs and candles are sources of light. Objects are easier to see if there is more light. Some surfaces reflect light. Objects are easier to see when there is less light if they are reflective. The light from the sun can damage our eyes and therefore we should not look</i></p>	<p>Science reasoning task: explorify: Exploding lights - Explorify</p> <p>Activity 1: Concept cartoons about shadows.</p> <p>Activity 2: plan an experiment that finds out if distance of the object affects the size of the shadow.</p> <p>Activity 3: To carry out and record results.</p> <p>Misconception: Some children may think:</p> <ul style="list-style-type: none"> • 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. 	<p>Activity 1: PowerPoint / concept cartoons</p> <p>Activity 2: use planning sheet, with prompt questions.</p> <p>Activity 3: carry out experiment and record results.</p>	<p>Assessment: Are pupils able set up an experiment?</p>

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