

Year 3 Science Planning – Light

<p><u>Light</u></p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>♣ recognise that they need light in order to see things and that dark is the absence of light</li> <li>♣ notice that light is reflected from surfaces</li> <li>♣ recognise that light from the sun can be dangerous and that there are ways to protect their eyes</li> <li>♣ recognise that shadows are formed when the light from a light source is blocked by an opaque object</li> <li>♣ find patterns in the way that the size of shadows change.</li> </ul>		<p><u>Working scientifically</u></p> <ul style="list-style-type: none"> <li>• asking relevant questions and using different types of scientific enquiries to answer them</li> <li>• setting up simple practical enquiries, comparative and fair tests</li> <li>• making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers</li> <li>• gathering, recording, classifying and presenting data in a variety of ways to help in answering questions</li> <li>• recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables</li> <li>• reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</li> <li>• using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions</li> <li>• identifying differences, similarities or changes related to simple scientific ideas and processes</li> <li>• using straightforward scientific evidence to answer questions or to support their findings.</li> </ul>	
<p><u>Key words:</u></p> <p>description, dull, explanation, light source, mirror, observation, opaque, reflect, shadow, shiny, translucent, transparent</p>			
<p>Session Number</p>	<p>Focus and Success Criteria:</p>	<p>Lesson Plan</p>	<p>Resources</p>

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<p>1</p>	<p>Focus: To recognise that we need light in order to see things and that dark is the absence of light</p> <p>Success Criteria:          I can name light sources.          I know why we need light.          I can explain what darkness is.</p>	<p>Emerging: Children require support to suggest different light sources. Expected: Children name different light sources and can describe what darkness is. Exceeding: Children use scientific language to explain darkness.</p> <p>Ask children to name some light sources e.g. torch, tv screen, light bulb, sun etc. Can they sort these in to man made and natural light sources? Misconception may be the moon, mirrors etc. Explain that these reflects light but is not a source of light.</p> <p>Children to write on their boards what they think darkness is. Then to use a dictionary to define: darkness. Keep this on their wbs until the end of the lesson.</p> <p>Show children a dark box with an object inside. Can they see what is inside it? What is making it difficult to see? What will make it easier to see? Then their partner gradually opens the box lid at the other end to the object, peeking inside to see if they can see and name the object. The other person could measure how high the lid is raised before their partner says what the object is.</p> <p>Children to write their own definition of what darkness is.</p>	<p>Light sources worksheets.</p>
<p>2</p>	<p>Focus: To notice that light is reflected from surfaces.</p> <ul style="list-style-type: none"> <li>• I know the difference between shiny and dull.</li> <li>• I know that smooth, shiny objects can reflect light.</li> <li>• I can test objects to find the most reflective object.</li> </ul>	<p><b>Subject Knowledge</b> Emerging: Children sort according to shiny and dull. Expected: Children can say that smooth and shiny surfaces reflect light. Exceeding: Children link properties of materials in explanations, e.g. materials reflect light and they can see their reflection in them.</p> <p><b>Working Scientifically</b> Emerging: Children need support to describe how they are sorting materials. Expected: Children can write sentences or use a video to show which materials reflect. Exceeding: Children choose how they explain how different materials reflect light.</p> <p>Give children a collection of shiny and dull surfaces, e.g. mirrors, polished metals, Perspex, paper, painted surfaces and polished wood. Ask them to find out which ones they can see themselves in and which ones reflect a torch light.</p> <p>Challenge them to record and make sense of their results. Use PowerPoint Slide 5 as an example. Children should come up with the idea that shiny surfaces reflect light better than dull surfaces. They can record their results using Activity Resource 3.1.</p> <p>Bring the class together to discuss the words dull and shiny and what they notice about the materials. Ask them what they notice about material that reflects light. What conclusions can they make? Why do some surfaces reflect light better than others? The aim is for children to recognise that dull surfaces do not reflect</p>	

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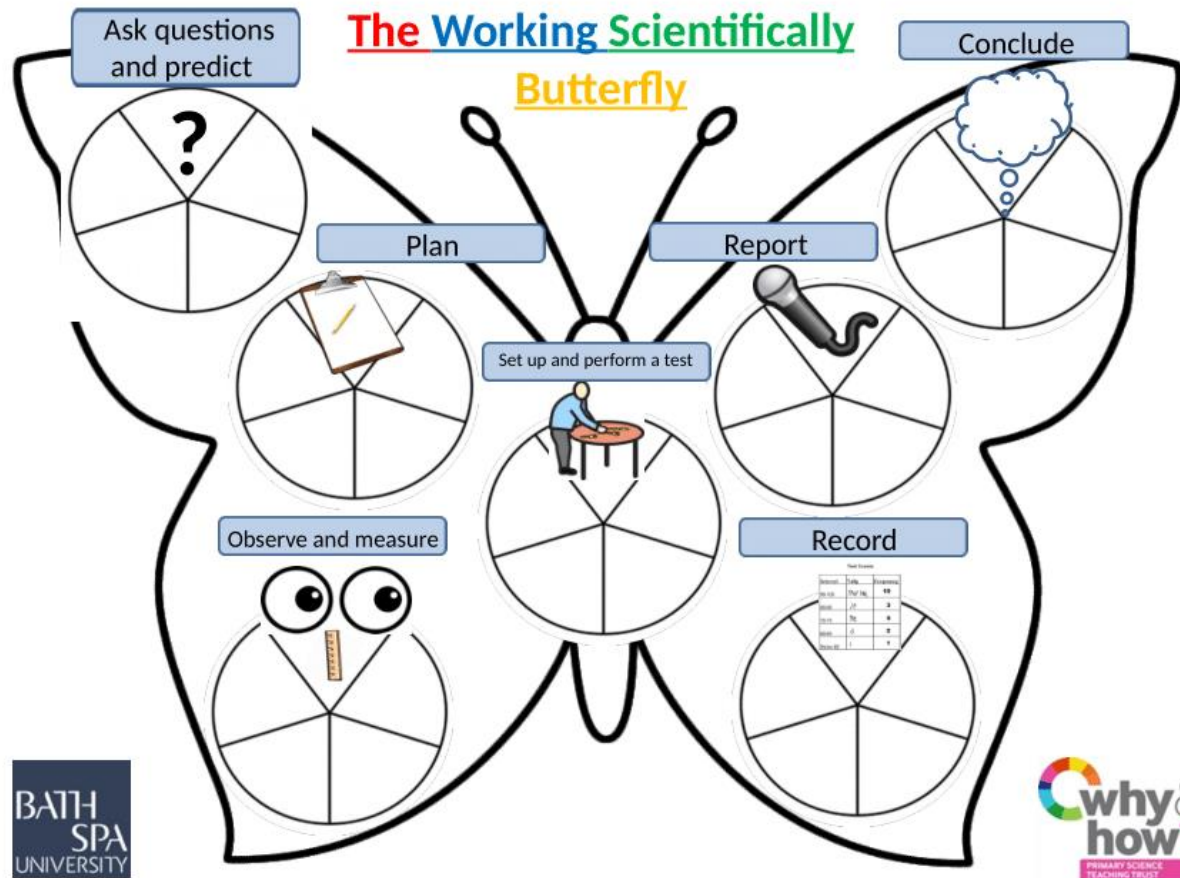
		<p>the torchlight and they cannot see their reflection in them. They should know that surfaces that are smooth and shiny reflect light (light bounces off it) and they can see their reflection.</p> <p>Watch the following video: <a href="https://www.bbc.com/bitesize/clips/ztcg9j6">https://www.bbc.com/bitesize/clips/ztcg9j6</a> to see how reflective surfaces and materials can be useful, especially when outside at night.</p> <p>Part Two Give children a collection of different mirrors as well as objects that reflect, e.g. make-up mirrors, shaving mirrors and spoons. Ask them to describe what they see and to note any differences. Discuss the fact that some reflections look the same size as the object being reflected while others look bigger or smaller. Use Activity Resource 3.2.</p> <p>Ask children to look at their reflection in a plane mirror and observe closely when they do the following: smile close one eye (wink) close the other eye hold up one hand then hold up the other scratch their nose with one hand then the other. They should notice that the reflection is the wrong way around; this can be difficult for some children to understand because it requires children to understand left and right and be able to recognise left and right in their reflection. Ask children to say why they can see themselves in the mirror and not in, e.g. a carpet or their school jumper. Listen for explanations that show that they know that the surfaces of shiny objects are good at reflecting light and therefore we can see the object in the mirror. Dull surfaces do not reflect light like a mirror and therefore we cannot see our reflection.</p> <p>Use PowerPoint Slide 10 to show children the photograph of the word AMBULANCE written on a vehicle and ask what they notice. Why is it back to front? What do they know about mirrors and images? Challenge them to write their name, famous scientists, the words mirror, reflect, reflection so that it can be read when a mirror is used.</p>	
3	<p>Focus: To recognise that light from the sun can be dangerous and that there are ways to protect their eyes</p> <ul style="list-style-type: none"> <li>• I know that the sun is a light source.</li> <li>• I can explain the benefits and dangers of the sun</li> </ul>	<p>Ask the children to stand while reading the statements about the sun on the Lesson Presentation. Children sort the statements according to whether they are beneficial or dangerous by moving around the classroom to stand under either the 'Hero' sign or the 'Villain' sign. Address any misconceptions or interesting issues when discussing children's ideas.</p> <p>Using the lesson presentation, discuss UV light and its effects.</p> <p>Children work in groups to set up a simple investigation into the effects of UV light. They should place card shapes onto coloured paper, then position the paper in sunlight for a week. When they come back to it, the paper around the shapes will have lightened, showing the effects of UV (if the British weather allows!!!!)</p>	

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	<ul style="list-style-type: none"> <li>I know about UV light and the dangers.</li> <li>I can suggest how to protect my eyes in the sun.</li> </ul>	<p>Explain the function of the pupil and the retina using the Lesson Presentation. Ask children to look at their pupil in a mirror, then to close their eyes for 30 seconds. They should then open their eyes to see that the light quickly makes their pupil smaller.</p> <p>Discuss the damaging effect of bright lights. Emphasise the importance of never looking directly at the sun, or other bright lights.</p> <p>Ask children how they think we can protect our eyes from damage from the Sun. Explain ways to keep our eyes safe using the Lesson Presentation</p> <p>Design a poster to explain to people how to be safe in the sun. Explain why the sun is dangerous and what you can do to protect yourself.</p>	
4	<p>Focus: To recognise that shadows are formed when the light from a light source is blocked by a solid object</p> <ul style="list-style-type: none"> <li>To know what the words transparent, translucent and opaque mean.</li> <li>To be able to sort materials according to these properties.</li> <li>To choose the most suitable material to make a shadow.</li> </ul>	<p>Emerging: Children classify materials with support. Expected: Children classify materials and predict which materials will make the darkest shadow. Exceeding: Children apply their knowledge about the properties of the materials to explain why some materials will make dark shadows.</p> <p>Give children a range of materials that are transparent, translucent and opaque, remind them that these are words that they learned in Key Stage 1. Ask them to hold each material up to the light shining from a window. Encourage them to sort the materials into those that let no light through (opaque), some light through (translucent) and all of the light through (transparent).</p> <p>Ask them to record their findings in the table on Activity Resource 3.4. This could be done by cutting swatches of the materials and gluing them onto their table. Finally, challenge them to make predictions about each of the fabrics and write them in another column on their table in Activity Resource 3.4</p> <p>Children to choose a material to make a shadow puppet from. Ask them to explain why they chose that material. Can they use scientific words?</p>	
5	<p>Focus: Find patterns in the way that the sizes of shadows change.</p> <ul style="list-style-type: none"> <li>I can explain how a shadow is formed.</li> <li>I can make predictions about</li> </ul>	<p>Children use Activity Resource 3.5 to make another rabbit. Challenge children to make ‘Black Rabbit’ (the shadow in the starter story) and use it to find out how they can use their torch and rabbit shadow puppet to change the Black Rabbit. As they work, ask them to think about what they have to do to make the shadow bigger and smaller. Where do they put the torch and shadow puppet and how does it change the Black Rabbit shadow? Children should note that shadows get bigger when an object is close to the light source and get smaller when an object is far away from the light source.</p>	

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	<p>how the size will change.</p> <ul style="list-style-type: none"> <li>I can carry out an experiment to see how the size of a shadow changes.</li> </ul>	<p>Encourage children to test what happens when they move the light source (torch) or change the position of the torch, e.g. to the side, above. Bring children together and support them in explaining how shadows are made and changed. Using literacy approaches for scaffolding writing, ask children to talk in pairs and orally explain to each other how a shadow is made. Then ask them to write down all of the scientific words they need in their explanation. Follow this by asking children to use those words to draft and redraft their explanation on their whiteboard. Their explanation is ready to write into their book when they are confident they have written a good explanation and have checked grammar and spellings</p> <p>IF A SUNNY DAY, THIS COULD BE CARRIED OUT OUTSIDE AT DIFFERENT TIMES OF THE DAY.</p>	
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Working scientifically butterfly.