

Pioneer Federation
Medium term plan
Cycle 1, Term 2
Science



Subject: Science

Key Concept/ Theme: Light

Prior Learning links: Taught in Year 3/ 4 cycle 2 t2.

- 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 sizes of shadows change.

Vocabulary:

Light- a form of energy that travels in a wave from a source.

Light Source – an object that emits its own light

Ray- waves of light are called light rays. They can also be called light beams.

Emits – to emit light means to produce it

Opaque – you cannot see through it, block

Reflects / reflective – when a light ray hits a surface and bounces off

Shadow - a dark shape that appears on a surface when something stands between the light source and the surface, the absence of light.

Transparent- Light can pass through and there is a clear view of objects on the other side.

Translucent- Some light can travel through but objects on the other side are not clear.

Absence of light- If light cannot get through.

Surface/ dark

Absorb- Sometimes, not all of the light is reflected by an object. Some of it is absorbed. Absorption is when the object soaks up some of the light waves

Direction- where the light travels

Straight line- Light travels in a straight line

Visible- an object you can see

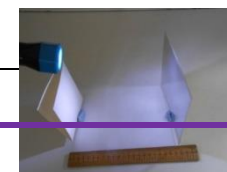
Position- where an object is placed

School specific areas to cover (where applicable):

1.	Deeper learning question: ow does light travel?
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	<p>Prior learning reconnection (year group, cycle & term): light year 3 cycle 2 term 2. Knowledge about how shadows are created and what a light source is. Give children picture from http://geology.com/articles/satellite-photo-earth-at-night.shtml for the children to reflect on what Earth would be like without light/where are our light sources? Use the concept cartoons in folder to write down what they know before session as an pre assessment tool.</p> <p>LO: Let's learn that light travels in straight lines and to use scientific evidence to support or refute an idea.</p> <p>Activity: Watch video clip about light traveling in straight lines. https://www.bbc.co.uk/programmes/p0119rsp Children to then make their own model to prove that light travels in straight lines. (see instructions on Kent planning document). Children to record their understanding through labelled diagrams. SEND to have comm in print vocab cards and diagram drawn without lines for them to add lines on and adult to record what they say about the prepared diagram using the vocab cards.</p> <p>Future learning links: <i>In science week (In March) they will extend their knowledge by looking at a range of different light phenomena's including rainbows, colours soap bubbles and how light makes an object in water look bent.</i></p>
2.	<p>Deeper learning question: Can we always see objects all of the time? Reconnection: How does light travel? Concept map for them to agree/disagree with. LO: Let's learn that light travels in straight lines and that objects are seen because they give out or reflect light into the eye. Enquiry focus: observing Activity: The children should already know that light is required in order for us to see. The piece of conceptual understanding that they now need to begin developing is an understanding of the journey of the light in relationship to our ability to see things. Challenge the children to make the inside of a shoe box as dark as possible. They then must devise a viewing hole in one end that will let through hardly any light. They must invent some form of slit into the box so they can vary the amount of light that can travel inside when opened. Once children have explored viewing objects in their boxes with varying amounts of light, encourage them to use cut out arrows to show the direction and journey of the light. Get the children to reflect at the end of the lesson about how this knowledge might have helped people in ww2 to avoid being seen from above when moving at night. Record understanding through labelled diagrams and photo of experiment.</p>
3	<p>Deeper learning question: Do shadows ever change? Reconnection: How do we see objects? LO: Let's explain why shadows have the same shape as the objects that cast them. Enquiry focus: questioning Activity: Investigation using umbrellas to show the shadow changing as the sun moves from East to West. Where would we need to place the umbrellas so that the people have the most shade? Record by taking photos of models and then diagrams or arrows on their pictures to show their understanding and explaining. Children to think of a question to investigate about the shape of the shadow.</p>
4	<p>Deeper learning question: How can we show how we see things in a mirror? Which material is best to reflect light? Reconnection: How do shadows change throughout the day?</p>



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	<p>LO: Lets learn about and that objects are seen because they give out or reflect light into the eye. Let's plan a fair test and identify the variables to control.</p> <p>Enquiry focus: fair test, method and equipment</p> <p>Activity: Use different materials to test which ones reflect. Start with card opposite each other then change to different materials. Keep moving the material back until you no longer see the light being reflected. Measure and record.</p> <p>Talk about how to make this a fair test, what variable are they changing? What are they keeping the same? SEND: children to circle the variable changing form a list and tick what is staying the same from a list provided. Coloured stickers for distance to move it for guidance might be needed for some.</p>
5	<p>Deeper learning question: Does the amount of light change in different places?</p> <p>Reconnection: Do all materials reflect light? Recap investigation last week.</p> <p>LO: Let's compare the light around our school using a data logger.</p> <p>Enquiry focus: <i>Presenting results and conclusions</i></p> <p>Activity: Using a data logger, can they find out where the brightest and darkest places around school are? Predict and then use equipment to answer their questions. Present their results and draw conclusions as what they found out and why this might be. SEND: When writing a conclusion, children to have key words on vocab mat and a recipe for a conclusion as a tick list for scaffolding. Produce results on 2graph for support or use table on 2simple.</p>
6	<p>Deeper learning question: Does light reflect and how is this used in the wider world?</p> <p>Reconnection: Does the amount of light change around school and why? Compare lit areas form last week backing with scientific ideas/vocabulary.</p> <p>LO: Let's apply our knowledge about how light travels and how objects are seen by planning a scientific enquiry to answer a question.</p> <p>Enquiry focus: <i>question, conclusion</i></p> <p>Activity: Set the children the challenge of making a periscope. They will need to place two mirrors in the correct place within some tubes. Link to ww2- tanks or submarines. Get the children to generate a question they could answer by making a periscope. Children to write a conclusion. SEND children to use stem sentences for modelling the question. When writing a conclusion, children to have key words on vocab mat and a recipe for a conclusion as a tick list for scaffolding.</p>
7	<p>End of unit quiz</p>
<p>End points: Children will be able to describe how light travels, objects are seen and light is reflected and that shadows cast are the same shape as the objects but changes position throughout the day. They will be able to apply scientific enquiry skills when investigating and use scientific vocabulary accurately to describe their understanding.</p>	