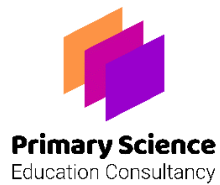




## Examples of Work


Muharem


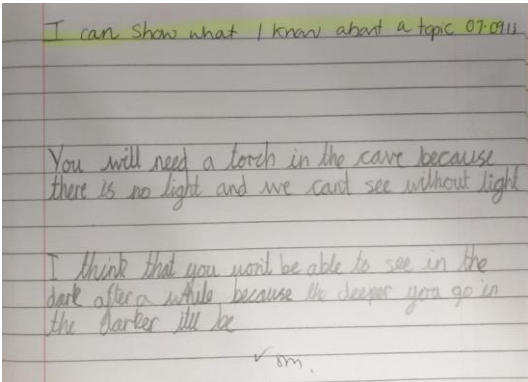
Light - Year 6




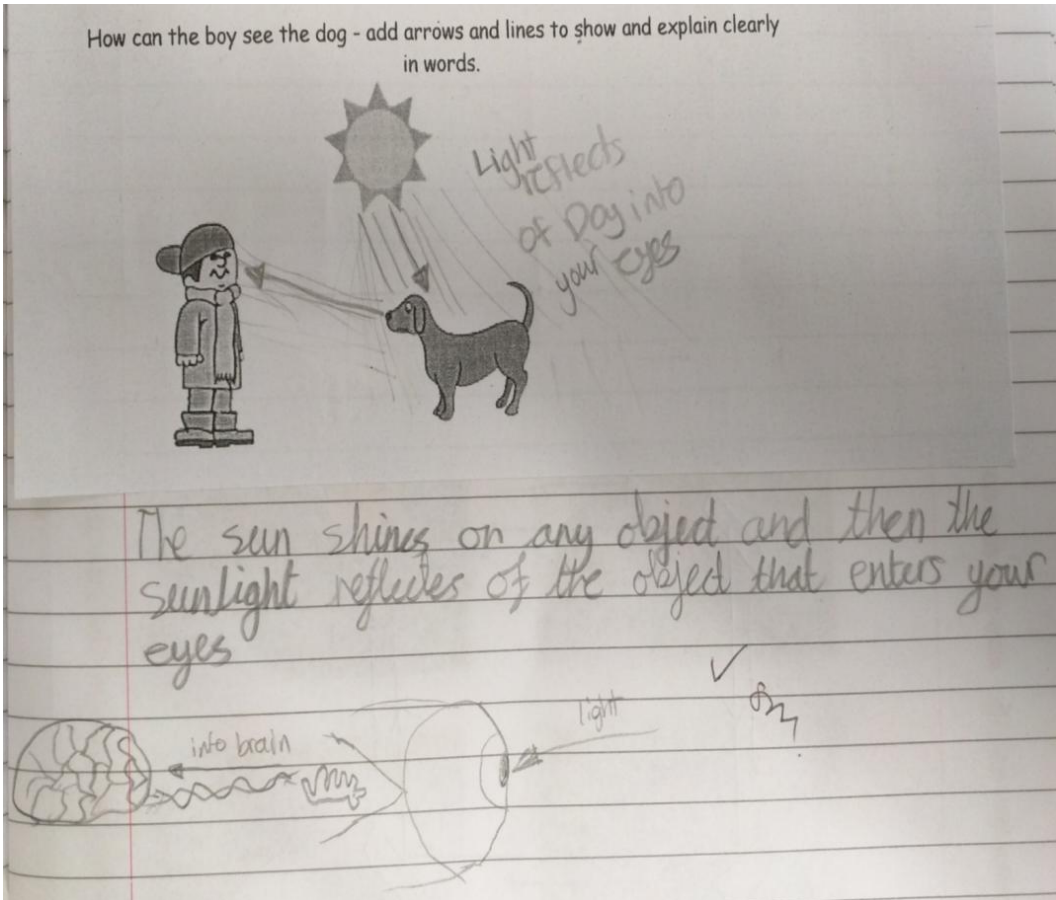
	Year	6	Topic	Light
	Focus of assessment (National Curriculum statements)			
	<ul style="list-style-type: none"> <li>Recognise that shadows are formed when the light from a light source is blocked by an opaque object. (Y3)</li> <li>Find patterns in the way that the size of shadows change. (Y3)</li> </ul>			
	Description of activity			
	<p>Before starting the initial assessment activity to find out what the children already knew about light, they were given an opportunity to explore using torches to make shadows. The children were given a range of different materials and encouraged to make and change shadows.</p>			


EVIDENCE OF LEARNING		ASSESSMENT
Oral evidence	Examples of work	Knowledge
Teacher observations		Muharem is secure on the Year 3 statements.
Muharem showed his understanding of shadow by choosing suitable materials and making different sized shadows using the same puppet.		Working scientifically

	Year	6	Topic	Light
	Focus of assessment (National Curriculum statements)			
	<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. (Y3)</li> </ul>			
	Description of activity			
<p>The children discussed this concept cartoon. The teacher asked Muharem to record in writing what he had shared during the discussion, as he had demonstrated a good understanding verbally.</p>				


EVIDENCE OF LEARNING		ASSESSMENT
Oral evidence	Examples of work	Knowledge
Teacher observations	 <p style="text-align: center;">71</p> 	<p>This writing shows that Muharem is secure on the Year 3 statement.</p>
		Working scientifically

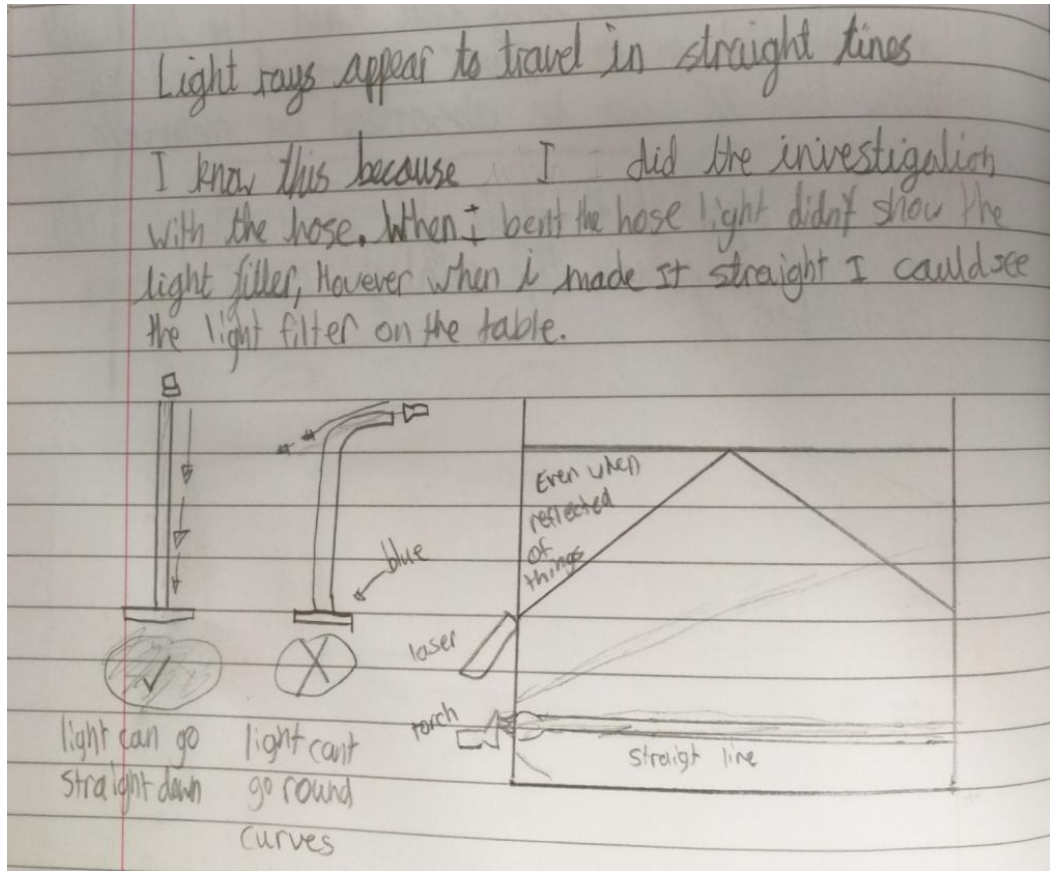
	Year	6	Topic	Light
	Focus of assessment (National Curriculum statements)			
	<ul style="list-style-type: none"> <li>Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes.</li> </ul>			
	Description of activity			
	The children were asked to annotate a diagram to show how a boy sees a dog.			


EVIDENCE OF LEARNING		ASSESSMENT
Oral evidence	Examples of work	Knowledge
		<p>This evidence shows that Muharem has some understanding of light travelling in straight lines and how we see objects. He is drawing straight lines to represent the light but, at the moment, they do not show the path of the light clearly. This needs further work. At present, his understanding is not secure.</p>
<p>Teacher observations</p> <p>Straight line arrows are drawn to show light.</p> <p>This shows an understanding that light is reflected off objects and then into our eyes which is how we see them. However, reflection is not shown accurately because the arrows do not touch the object.</p> <p>The bottom drawing shows an understanding that there is a link between our eyes and our brain (beyond Year 6 curriculum).</p>		<p>Working scientifically</p>

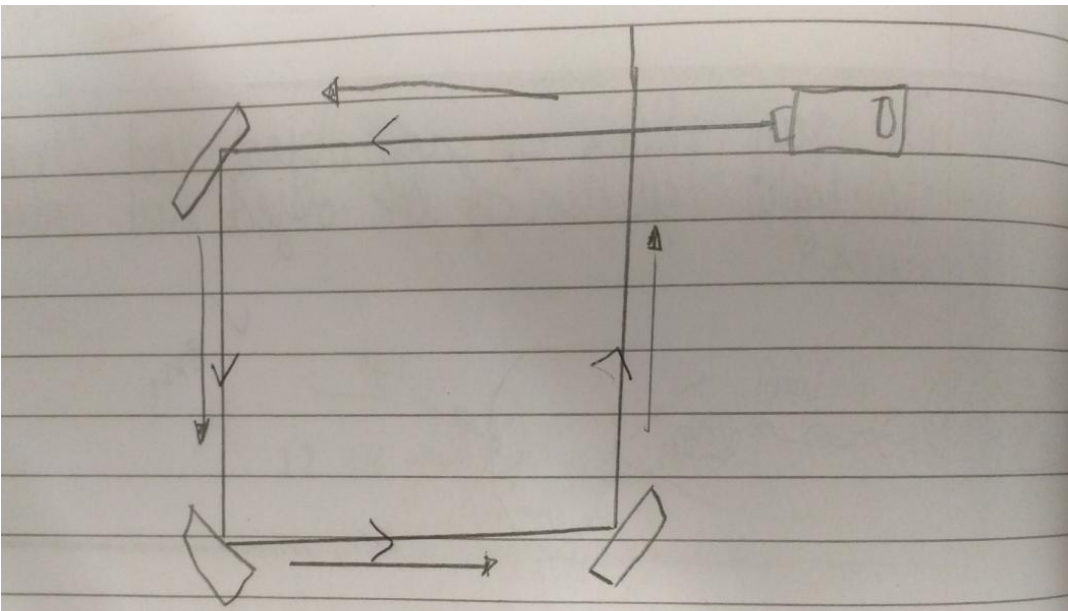
	Year	6	Topic	Light
	Focus of assessment (National Curriculum statements)			
	<ul style="list-style-type: none"> <li>Recognise that light appears to travel in straight lines.</li> </ul>			
	Description of activity			
	The children use a torch and hose pipe to explore how they can be used to show that light travels in a straight line. The children then create a short video to explain their observations.			


EVIDENCE OF LEARNING		ASSESSMENT
Oral evidence	Examples of work	Knowledge
<p>“A length of hose pipe has a piece of coloured acetate over one end acting as a filter. Light from a torch is shone down the hose pipe onto a table.</p> <p>“When the hose pipe is bent no coloured light comes out of the end of the hose pipe.</p> <p>“When the hose pipe is straight, coloured light is seen on the table which has travelled through the hose pipe.”</p>	 <p>Watch the video <a href="#">here</a>.</p>	
Teacher observations		Working scientifically
		Muharem plans and films a short video to explain how the hose pipe and torch can be used to support the idea that light travels in a straight line.

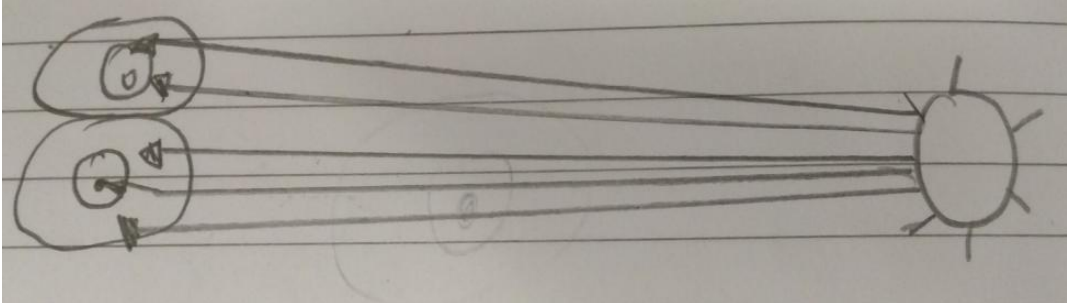
	Year	6	Topic	Light
	Focus of assessment (National Curriculum statements)			
	<ul style="list-style-type: none"> <li>Recognise that light appears to travel in straight lines.</li> </ul>			
	Description of activity			
The children explore using lasers and mirrors. This allows them to see clearly that light travels in straight lines and is reflected off the mirror.				


EVIDENCE OF LEARNING		ASSESSMENT
Oral evidence	Examples of work	Knowledge
		<p>The diagram on the right is the first time Muharem has drawn the light as a continuous line. It also shows clearly how it is reflected off the surface at a single point.</p>
<p>Teacher observations</p> <p>The two diagrams on the left show what he means in the text above, but the light is drawn outside of the hose and is not a continuous line.</p>		<p>Working scientifically</p> <p>Through practical enquiry, Muharem uses his observations as evidence for light travelling in a straight line.</p>

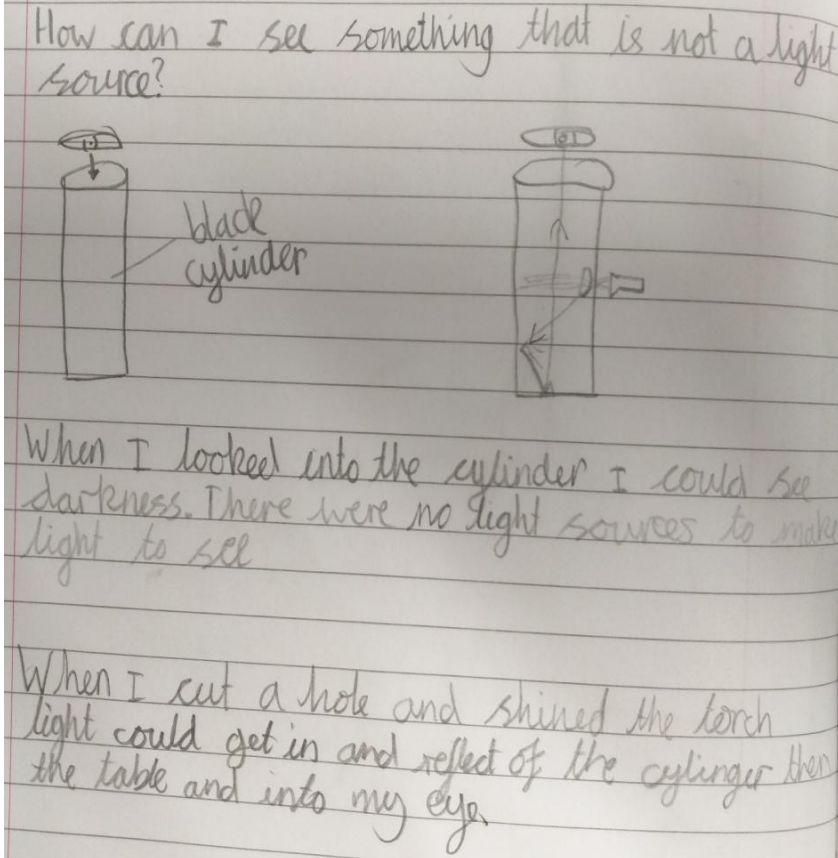
	Year	6	Topic	Light
	Focus of assessment (National Curriculum statements)			
	<ul style="list-style-type: none"> <li>Recognise that light appears to travel in straight lines.</li> </ul>			
	Description of activity			
The children were then given multiple mirrors to reflect the light a number of times.				


EVIDENCE OF LEARNING		ASSESSMENT
Oral evidence	Examples of work	Knowledge
		Muharem knows that, because light travels in a straight line, he can reflect light in a predictable direction using mirrors. He is demonstrating securely that light travels in straight lines.
<b>Teacher observations</b> Muharem draws the light as a continuous straight line reflecting off the surface at a single point, now with an arrow to indicate direction.  He still feels the need to add additional arrows around the outside.	<p><i>Light can be changed in direction using mirrors that reflect the light in another direction.</i></p>	<b>Working scientifically</b> Muharem records his observations using a diagram and writing.

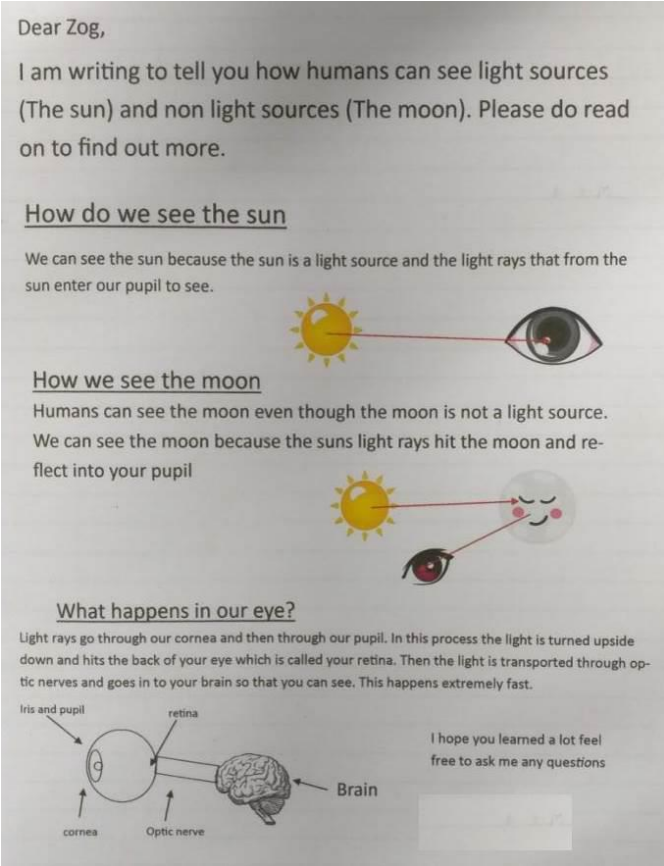
	Year	6	Topic	Light
	Focus of assessment (National Curriculum statements)			
	<ul style="list-style-type: none"> <li>Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye.</li> </ul>			
	Description of activity			
	The children were shown a light source (a candle) and asked to draw how they think they see light sources, using their learning about light and how it travels.			


EVIDENCE OF LEARNING		ASSESSMENT
Oral evidence	Examples of work	Knowledge
		This shows that Muharem understands that we see a light source because light travels from it in a straight line into our eyes.
Teacher observations		Working scientifically
Muharem chose to use the Sun as his light source.  Rays of light are drawn coming from the light source to the eye.		

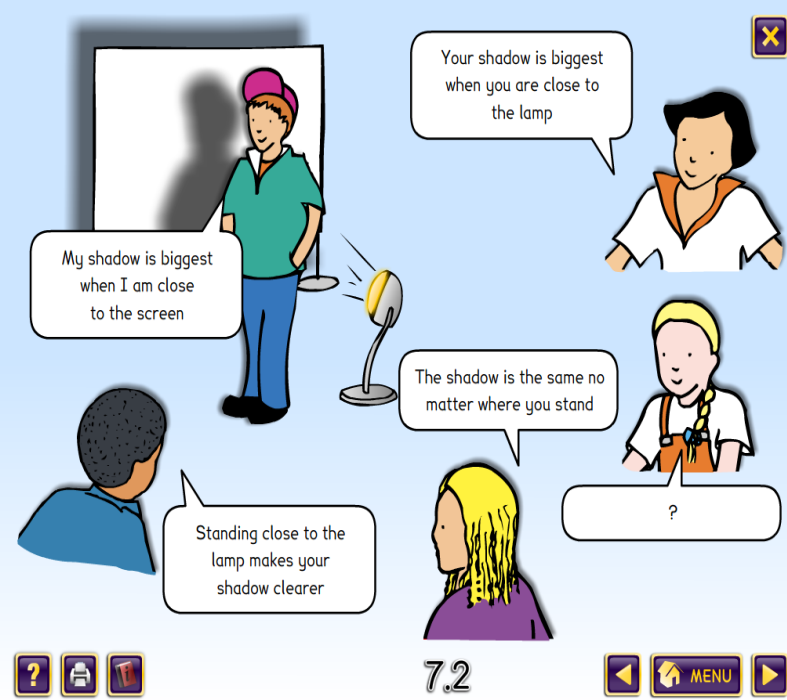
	Year	6	Topic	Light
	Focus of assessment (National Curriculum statements)			
	<ul style="list-style-type: none"> <li>Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye.</li> </ul>			
	Description of activity			
	The children were given a black cylinder to look into. With the base on the table, they could see nothing inside. When they shone a torch in a small hole on the side, they could see the table.			

EVIDENCE OF LEARNING		ASSESSMENT
Oral evidence	Examples of work	Knowledge
		<p>The right-hand diagram demonstrates that Muharem understands that light travels in a straight line and is reflected from surfaces into the eye so he can see them.</p>
<p><b>Teacher observations</b></p> <p>When asked about the arrow on the left-hand picture, Muharem explained that this was to show that he was looking into the cylinder.</p>		<p><b>Working scientifically</b></p> <p>Muharem uses diagrams to support his written recording of his observations.</p>

	Year	6	Topic	Light
	Focus of assessment (National Curriculum statements)			
	<ul style="list-style-type: none"> <li>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</li> <li>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.</li> </ul>			
	Description of activity			
	The children were asked to write a letter to an alien (Zog) to explain how humans see.			

EVIDENCE OF LEARNING		ASSESSMENT
Oral evidence	Examples of work	Knowledge
Teacher observations		Muharem expresses clearly in words and diagrams how we see light sources and non-light sources.
<p>Muharem uses the key vocabulary, 'light source', 'light rays', 'reflect'.</p> <p>In the diagram showing how we see the Moon, the lines are not continuous but, when asked, he stated that he couldn't join them on the computer. He has, however, demonstrated this more than once in his own drawings.</p> <p>The information under 'What happens in our eye?' is beyond the Key Stage 2 curriculum.</p>		Working scientifically

	Year	6	Topic	Light
	Focus of assessment (National Curriculum statements)			
	<ul style="list-style-type: none"> <li>Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.</li> </ul>			
	Description of activity			
The children discussed the concept cartoon.				

EVIDENCE OF LEARNING		ASSESSMENT
Oral evidence	Examples of work	Knowledge
<p>“The boy by the screen is wrong. We did this in Year 3! When the object is close to the light source, the shadow is bigger.</p> <p>“To prove this, I will keep the light source in the same place and move the object. I will measure the length and width of the shadow to check that I am right.</p> <p>“My question is, ‘How does the position of the object change the size of the shadow?’”</p>		<p>Muharem remembers what he has learnt in Year 3 about the size of shadows. He does not comment on the shape of the shadow.</p>
Teacher observations		Working scientifically
		Muharem plans how to control variables to gather data to confirm his prediction.



Year

6

Topic

Light

Focus of assessment (National Curriculum statements)

- Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.

Description of activity

The children carried out the investigation they planned and chose how to record their evidence.

EVIDENCE OF LEARNING

ASSESSMENT

Oral evidence

Examples of work

Knowledge

How far from wall	How far from LS	Length	width
25 cm	5 cm	40cm	6.7cm
20 cm	10 cm	26.5cm	4.7cm
15 cm	15 cm	20.5cm	4.3cm
10 cm	20 cm	19.5cm	3.5cm
5 cm	25 cm	15.5cm	3.2cm
2 cm	28 cm	13.2cm	3cm

Teacher observations

Working scientifically

Muharem chooses to use a table to record his evidence.

L.O. To record our results. // Accurate measuring

Distance between object and light source	Length of shadow
15cm	6cm
12cm	<del>7</del> 6.6cm
9cm	8cm
6cm	9.5cm
3cm	15.2cm

SP

Another child's table



Year

6

Topic

Light

Focus of assessment (National Curriculum statements)

- Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.

Description of activity

The children chose how to present their evidence.

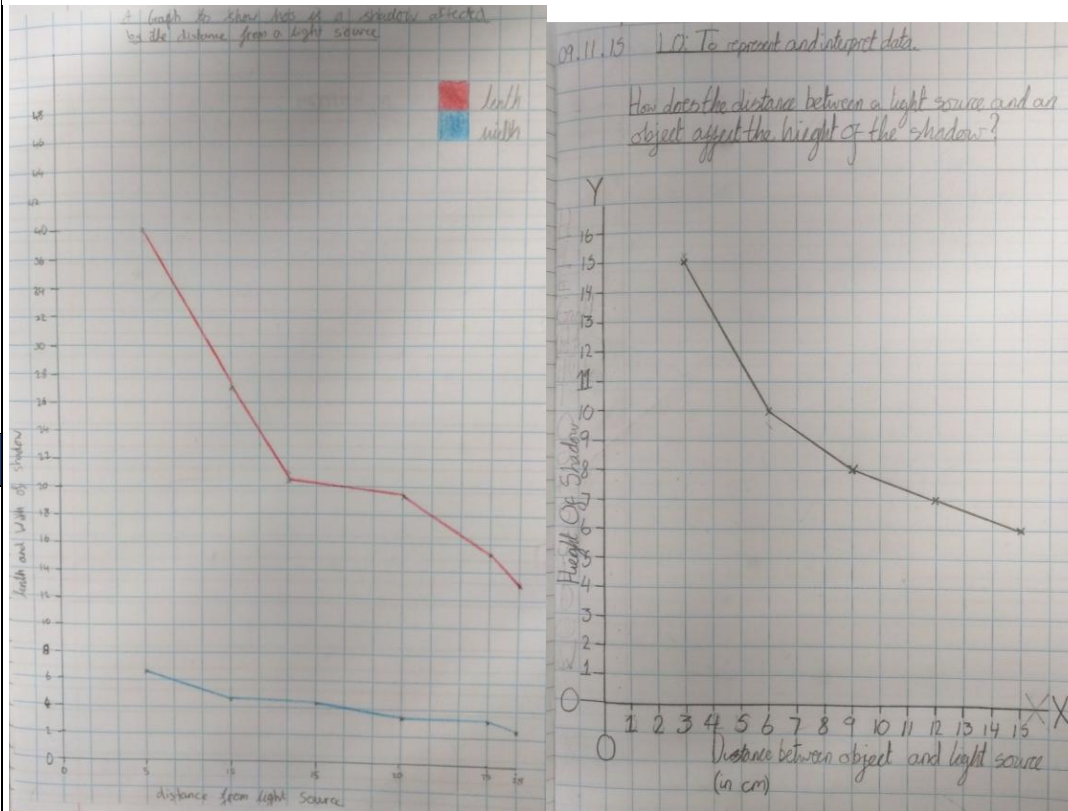
EVIDENCE OF LEARNING

ASSESSMENT

Oral evidence

Examples of work

Knowledge




Another child's graph

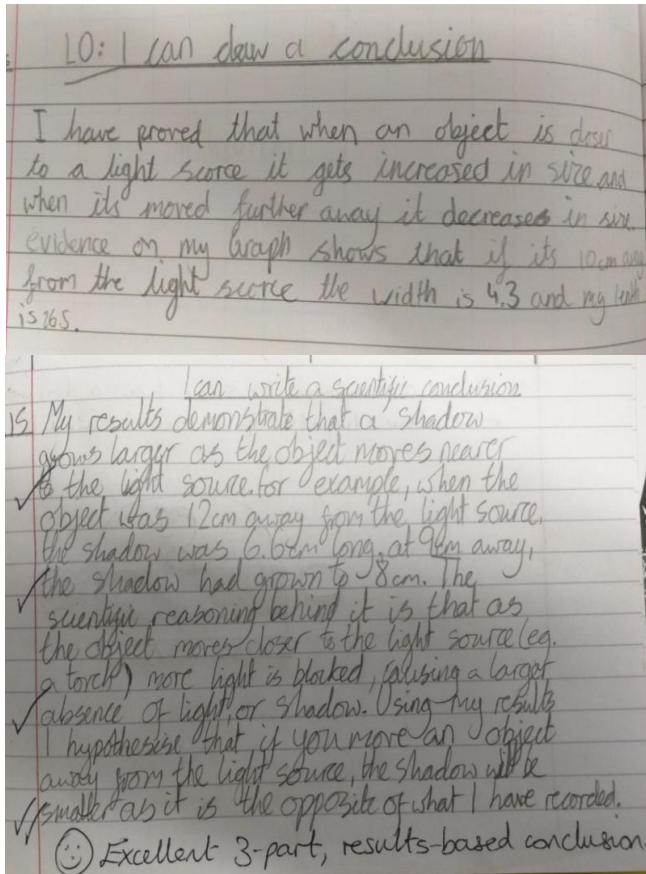
Working scientifically

Muharem independently presents his evidence as a line graph.


Teacher observations

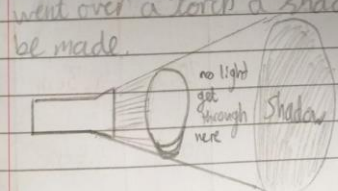
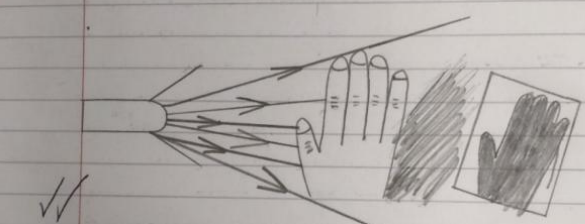
Muharem independently chose to use a line graph to present his data.


	Year	6	Topic	Light
	Focus of assessment (National Curriculum statements)			
	<ul style="list-style-type: none"> <li>Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.</li> </ul>			
	Description of activity			
	The children wrote conclusions based on the evidence they gathered.			

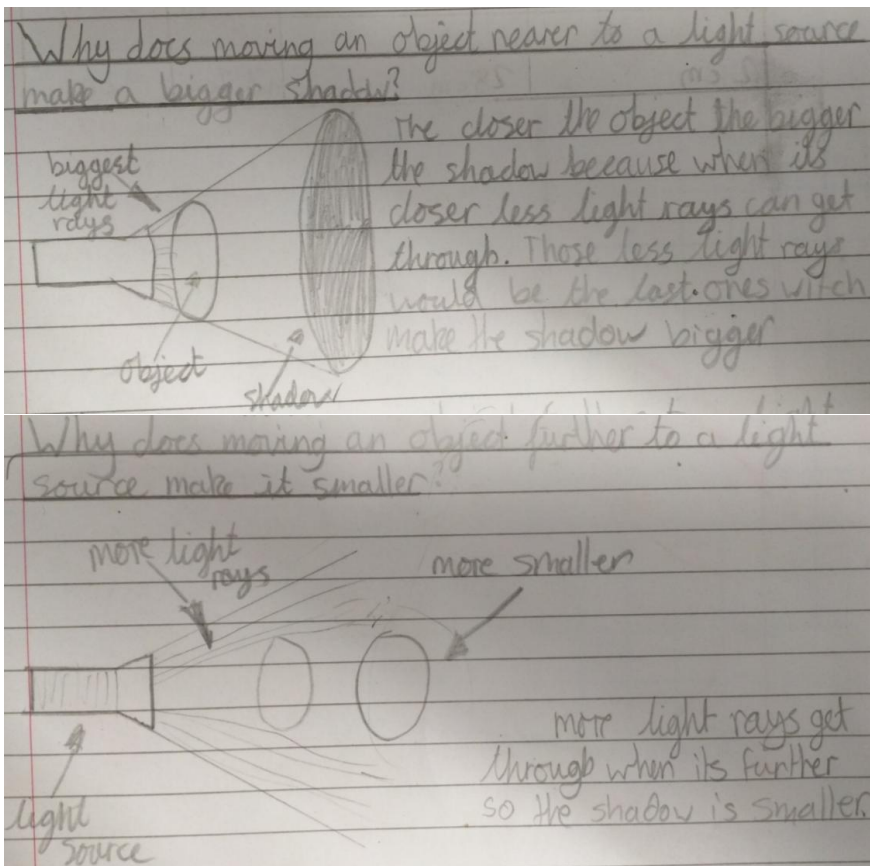
EVIDENCE OF LEARNING		ASSESSMENT
Oral evidence	Examples of work	Knowledge
Teacher observations		Working scientifically
<p>Muharem's conclusion is incomplete. The other child gives two pieces of data as evidence for the pattern. This also goes on to give the scientific reason. This is a good conclusion.</p>		<p>Muharem does not comment on the shape of the shadow, only the size.</p> <p>Muharem comments on the main pattern in the data, but only explicitly gives one set of results which does not completely back the statement up with data. This is only a partial conclusion, as no scientific explanation is given.</p>

Another child's conclusion

	Year	6	Topic	Light
	Focus of assessment (National Curriculum statements)			
	<ul style="list-style-type: none"> <li>Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.</li> </ul>			
	Description of activity			
	The children explored making shadows using their hands and other objects and were asked to draw diagrams to explain their observations using their knowledge of light and how it travels.			

EVIDENCE OF LEARNING		ASSESSMENT
Oral evidence	Examples of work	Knowledge
Teacher observations	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p>How are shadows made?</p> <p>Shadows are made when light rays are blocked by opaque objects. For example if your hand went over a torch a shadow of your hand would be made.</p>  </div> <div style="border: 1px solid black; padding: 5px;"> <p>Since light travels in straight lines, a shadow is formed when a light source produces light rays that are blocked by an opaque object. Behind this, since there is no light there is an absence of light, or a shadow.</p>  </div> <div style="border: 1px solid black; padding: 5px; margin-top: 10px; width: fit-content;"> <p>Another child's explanation</p> </div>	<p>This shows a good understanding of how shadows are formed, which was developed in Year 3, but now the key vocabulary, 'light ray', is included and the diagram shows light travelling in straight lines.</p> <p>The diagram also shows how the shape of the shadow depends on the shape of the object.</p> <div style="background-color: #FF0000; color: white; text-align: center; padding: 5px; margin-top: 10px;"> <b>Working scientifically</b> </div> <p>Muharem uses a labelled diagram to support his explanation.</p>

	Year	6	Topic	Light
	Focus of assessment (National Curriculum statements)			
	<ul style="list-style-type: none"> <li>Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.</li> </ul>			
	Description of activity			
Children explored making shadows using their hands and other objects, and were asked to draw diagrams to explain their observations using their knowledge of light and how it travels.				

EVIDENCE OF LEARNING		ASSESSMENT
Oral evidence	Examples of work	Knowledge
		<p>Muharem's text is confused, but the diagrams clearly show that he is able to use the idea of light rays to explain why a shadow changes size when the object is moved. This is beyond the Key Stage 2 curriculum, which only expects children to link this to the shape of the object, but confirms understanding of light traveling in straight lines.</p>
Teacher observations		<p><b>Working scientifically</b></p> <p>Muharem uses labelled diagrams to support his explanations.</p>



## Overall summary

Secure

Through a range of practical explorations, Muharem demonstrates that light travels in a straight line and talks about this confidently. He shows in his diagrams that he understands that light travels from a light source, and reflects off objects, into our eyes enabling us to see things. He explores shadows on several occasions and each time links the formation of shadows back to the fact that light travels in a straight line.



# Acknowledgements

- Pages 3 & 10, *Concept Cartoons*, Millgate House Education