


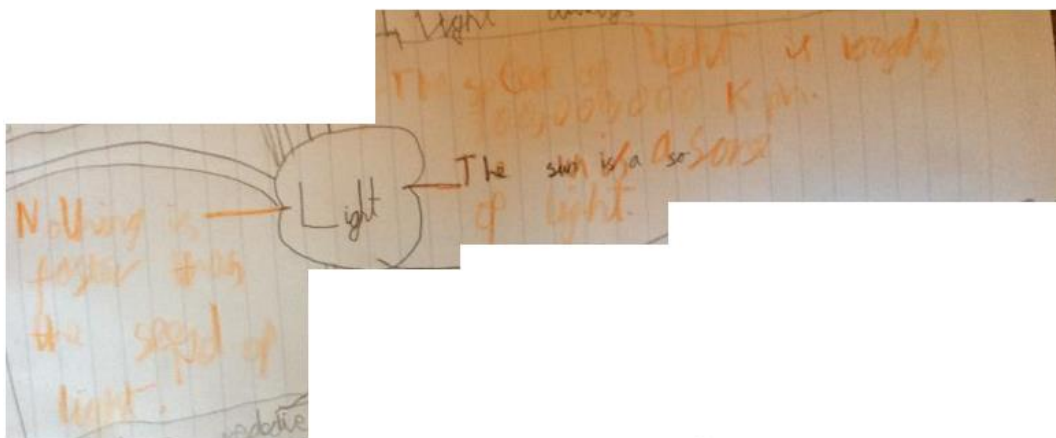



Examples of Work


Max


Light - Year 3

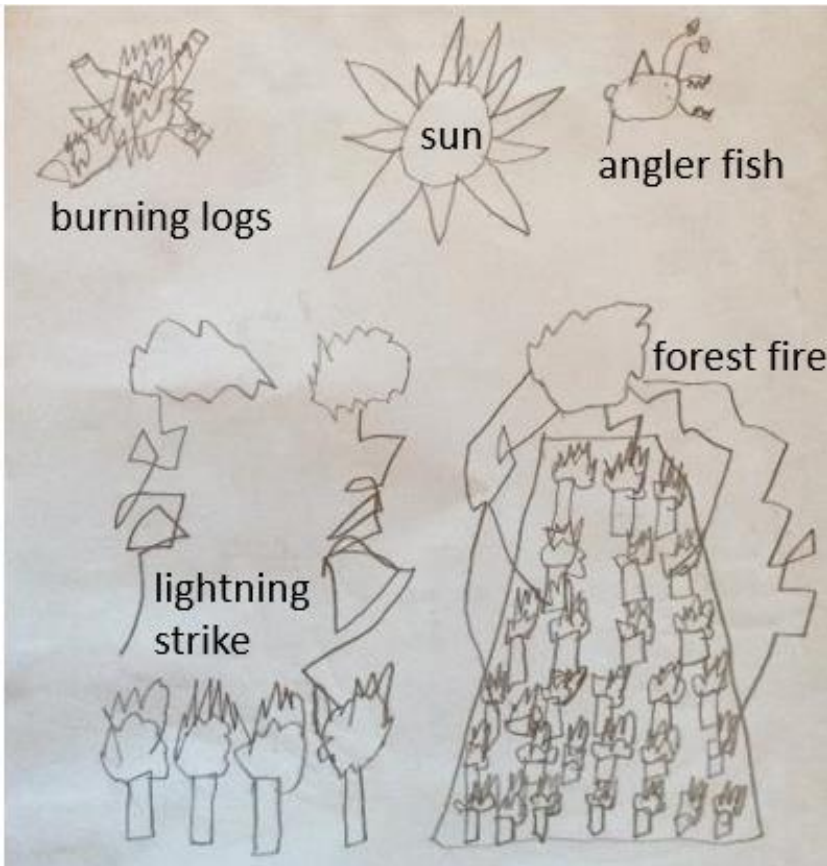
|  | Year | 3 | Topic | Light |
|---|--|---|-------|-------|
| | | | | |
| | Focus of assessment (National Curriculum statements) | | | |
| | <ul style="list-style-type: none">Recognise that they need light in order to see things and that dark is the absence of light. | | | |
| | Description of activity | | | |
| | The pupils were asked to think about what they already knew about light and shadow and given some key words to prompt them – ‘see’, ‘dark’, ‘light’, ‘reflection’, ‘shadow’. | | | |


| EVIDENCE OF LEARNING | | ASSESSMENT |
|----------------------|---|--|
| Oral evidence | Examples of work | Knowledge |
| |  | Max identifies the Sun as a source of light. He does not choose to write anything about shadows or reflection but shares some facts about the speed of light that he knows from his own reading. |
| Teacher observations | | Working scientifically |
| | | |

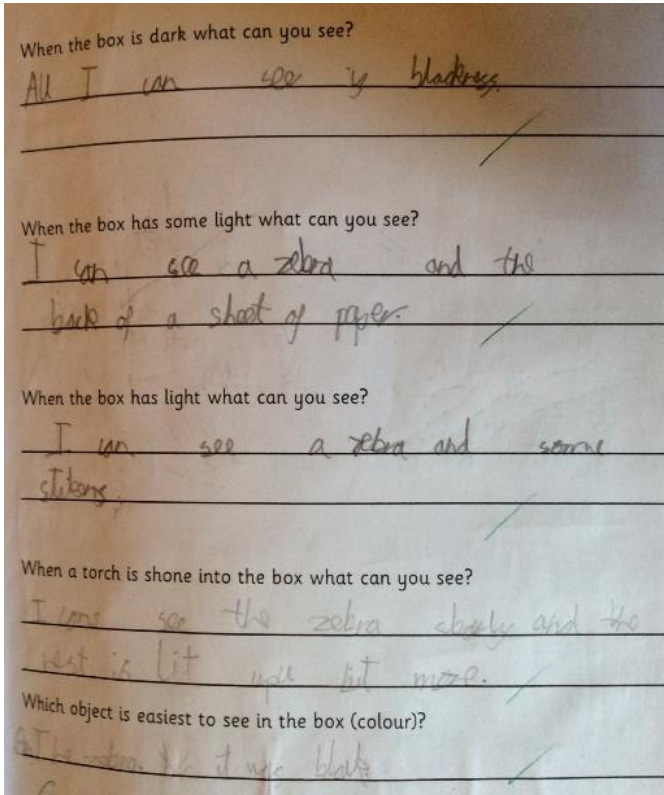
|  | Year | 3 | Topic | Light |
|---|--|---|-------|-------|
| | | | | |
| | Focus of assessment (National Curriculum statements) | | | |
| | <ul style="list-style-type: none">Recognise that they need light in order to see things and that dark is the absence of light. | | | |
| | Description of activity | | | |
| | The pupils were shown three light sources and asked to talk about which one they thought was the odd one out. | | | |


| EVIDENCE OF LEARNING | | ASSESSMENT |
|--|---|--|
| Oral evidence | Examples of work | Knowledge |
| <p>"I thought it was the candle because it's the only natural light. The others use electricity. Actually, I think all of them because the candle is natural, the lightbulb is not portable, the torch has a powerful beam to help you see in the dark."</p> |  | <p>Max talks about the differences between light sources and shows an understanding that they help you to see in the dark.</p> |
| Teacher observations | | Working scientifically |
| | | |


| | | | | |
|---|--|---|-------|-------|
|  | Year | 3 | Topic | Light |
| | Focus of assessment (National Curriculum statements) | | | |
| | <ul style="list-style-type: none"> Recognise that they need light in order to see things and that dark is the absence of light. | | | |
| | Description of activity | | | |
| | The pupils were asked to name as many light sources as they could with their partner and to then draw those that were natural sources of light. The teacher then asked them to discuss the statement, 'What if there were no light sources?' | | | |


| EVIDENCE OF LEARNING | | ASSESSMENT |
|--|---|---|
| Oral evidence | Examples of work | Knowledge |
| <p>"It would be dark all the time, everywhere. We wouldn't know if it was day or night because there would be no Sun."</p> |  | <p>Max identifies fire (burning logs and huge forest fire), the Sun, an anglerfish (the fish that makes their own light as they live so deep in the ocean) and lightning as natural light sources.</p> <p>Max knows that the Sun is a light source and that without it, it would be dark all the time. He does not link this with not being able to see things at this point.</p> |
| Teacher observations | | Working scientifically |
| | | |

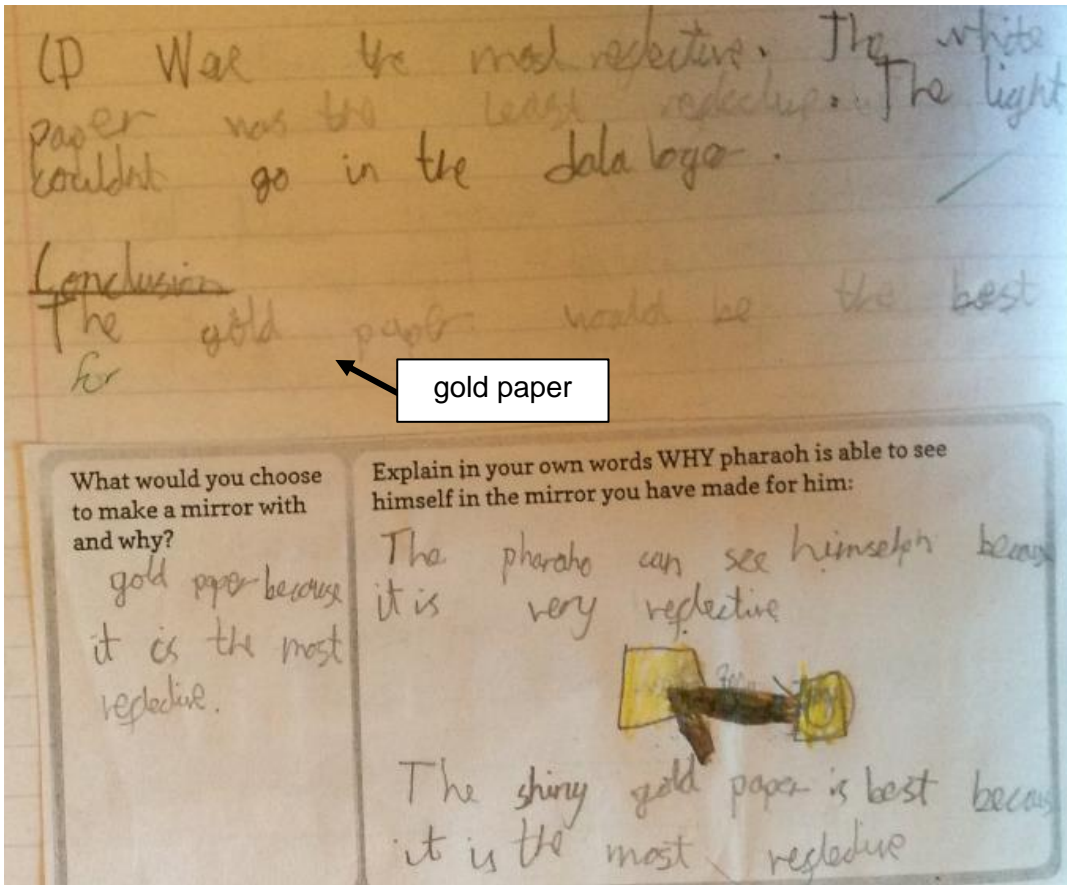
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|---|---|---|-------|-------|
|  | Year | 3 | Topic | Light |
| | Focus of assessment (National Curriculum statements) | | | |
| | <ul style="list-style-type: none"> Recognise that they need light in order to see things and that dark is the absence of light. | | | |
| | | | | |
| | <p>The pupils were given a large box that had some objects inside it. There was a small hole in the side of the box into which they could look. There were other holes in the top of the box which were covered by flaps which they could lift to let in more light. They also used a torch to shine more light into the box. Whenever the pupils were using torches, the teacher reminded them about not shining the light in each other's eyes.</p> | | | |


| EVIDENCE OF LEARNING | | ASSESSMENT |
|---|---|---|
| Oral evidence | Examples of work | Knowledge |
| <p>"When there was no light in the box, I couldn't see anything at all. It was just blackness."</p> |  | <p>Max recognises that without light we cannot see.</p> |
| Teacher observations | | Working scientifically |
| | | <p>Max observes that, as there is more light going into the box, he can see more objects. He identifies the zebra as the easiest object to see.</p> |



|  | Year | 3 | Topic | Light |
|---|---|---|-------|-------|
| | | | | |
| | Focus of assessment (National Curriculum statements) | | | |
| | <ul style="list-style-type: none"> Notice that light is reflected from surfaces. | | | |
| | <p>The pupils were studying the Ancient Egyptians and were asked to make a mirror for the Pharaoh. The teacher explained that for a material to make a good mirror it needed to be reflective and that light bounces off a reflective material causing it to look shiny. The pupils were given some materials and asked to sort them in order of reflectiveness. Different groups put them in different orders, so the teacher showed them how a datalogger can be used to measure light. They were then left to work out how to measure the light reflected from the surface of each material.</p> | | | |


| EVIDENCE OF LEARNING | | ASSESSMENT |
|----------------------|---|---|
| Oral evidence | Examples of work | Knowledge |
| Teacher observations |  | |
| | | <p>Working scientifically</p> <p>Max and his group used a torch to shine light onto each material and then measured the amount of light being reflected.</p> |

|  | Year | 3 | Topic | Light |
|---|--|---|-------|-------|
| | Focus of assessment (National Curriculum statements) | | | |
| | <ul style="list-style-type: none"> Notice that light is reflected from surfaces. | | | |
| | | | | |
| | The pupils were then asked to use their evidence to select the best material for the Pharaoh's mirror. | | | |


| EVIDENCE OF LEARNING | | ASSESSMENT |
|---|---|---|
| Oral evidence | Examples of work | Knowledge |
| <p>Teacher: "How do you know the gold paper was the most reflective?"</p> <p>Max: "Because the number on the datalogger was higher so more light was reflecting off the gold paper into it."</p> <p>Teacher: "What do you mean by the light couldn't go into the datalogger?"</p> <p>Max: "The number on the datalogger was the same whether we shone the light on the paper or not."</p> |  | |
| Teacher observations | | Working scientifically |
| | | Max interprets the readings from the datalogger taking into account the background reading of the light in the room. He uses his readings to make suggestions for the Pharaoh's mirror. |

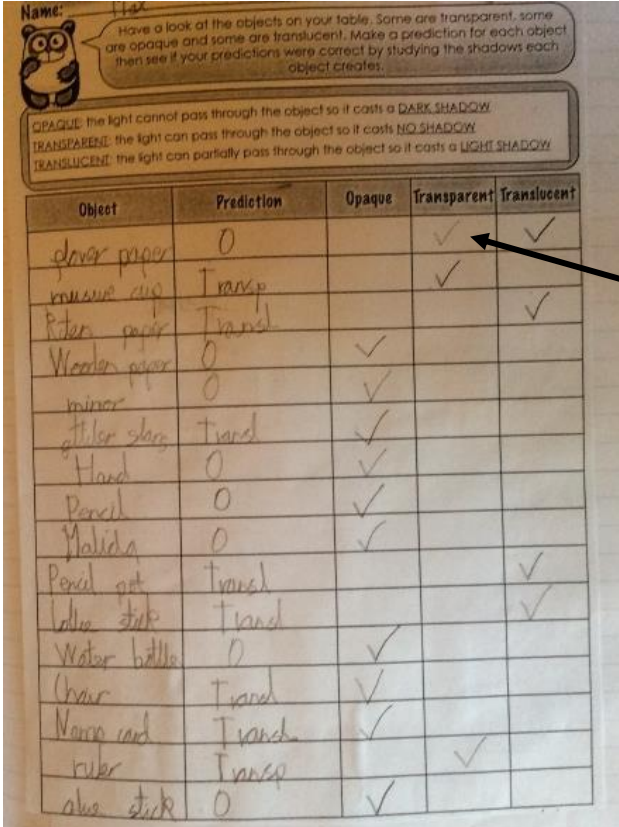
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|---|--|---|-------|-------|
|  | Year | 3 | Topic | Light |
| | Focus of assessment (National Curriculum statements) | | | |
| | <ul style="list-style-type: none"> Recognise that shadows are formed when the light from a light source is blocked by an opaque object. | | | |
| | Description of activity | | | |
| | The pupils were given a collection of objects to explore making shadows with. | | | |


| EVIDENCE OF LEARNING | | ASSESSMENT |
|--|--|---|
| Oral evidence | Examples of work | Knowledge |
| <p>"Ah, the cone has a lumpy shadow because of all the bits sticking out here.</p> <p>"The shadow of the pyramid is pointy like the object. There is only one side of the object - it's showing one face of the object.</p> <p>"The jam jar is transparent. Actually, it does make a kind of fuzzy shadow and lots of lines. It's showing light through but it's in long stripes. On top, it makes a circle. [There is a lid on the top.] The top is circular and opaque, but the sides are transparent.</p> <p>"[Looking at the plastic ball] I can see holes where the light shines through." [Max is talking about the circles of light he can see on the table.]</p> |    | <p>Max recognises that opaque objects make dark shadows, whereas transparent objects make very light shadows. He notices that light passes through the holes in an opaque object.</p> |
| Teacher observations | | Working scientifically |


|  | Year | 3 | Topic | Light |
|---|--|---|-------|-------|
| | Focus of assessment (National Curriculum statements) | | | |
| | <ul style="list-style-type: none"> Recognise that shadows are formed when the light from a light source is blocked by an opaque object. | | | |
| | | | | |
| | The pupils were given a torch and objects made of different materials and asked to explore the different shadows that they could make. | | | |


| EVIDENCE OF LEARNING | | ASSESSMENT |
|--|---|--|
| Oral evidence | Examples of work | Knowledge |
| <p>"The cork is a cylinder shape. The shadow is like the cork itself and yet it can be longer. [Max moves the torch to make a longer shadow.]</p> <p>"On top, it's just a mini shadow... semi-circle. Oh! Lying on the table, it's very long. [Max moves the torch to different positions as he talks.]</p> <p>"Around here is the best shadow... about 45 degrees. It's the same shape and the same length as the actual cork itself."</p> <p><u>Yellow plastic folder</u></p> <p>"It's translucent. It makes a shadow - the same shape... a rectangle. It's not such a deep shadow. Not as deep as the pyramid or the cork."</p> |  | <p>Max observes that the darkness of the shadow depends on whether the object casting the shadow is transparent, translucent or opaque. He also observes that the shape of the shadow and the size of the shadow change according to the position of the light source.</p> |
| Teacher observations | | Working scientifically |
| | | Max makes careful observations about the changes to the shadows. |

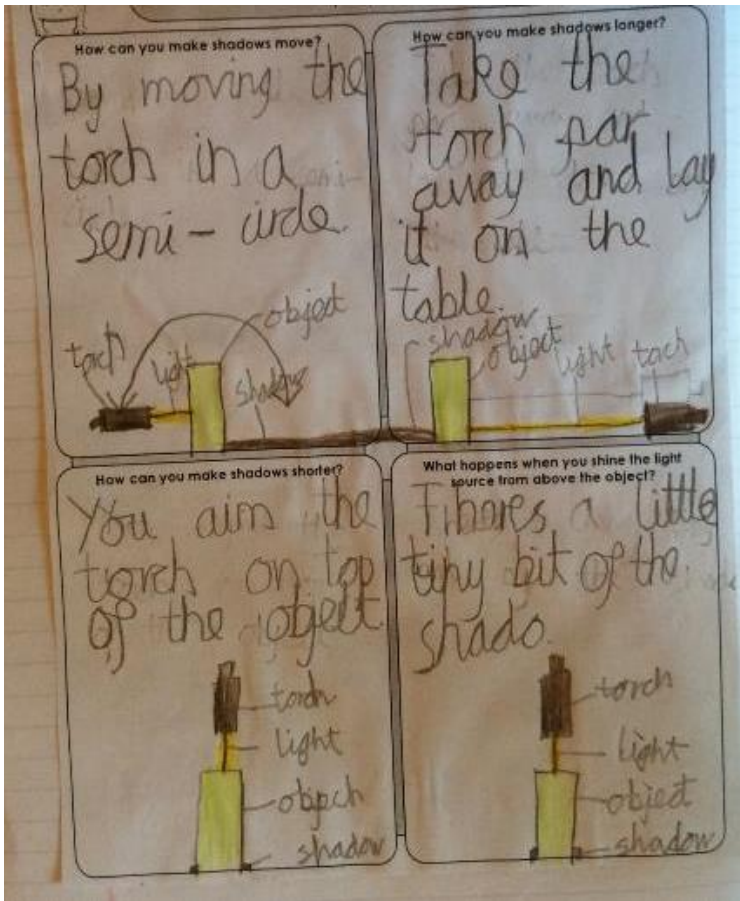
|  | Year | 3 | Topic | Light |
|---|---|---|-------|-------|
| | Focus of assessment (National Curriculum statements) | | | |
| | <ul style="list-style-type: none"> Recognise that shadows are formed when the light from a light source is blocked by an opaque object. | | | |
| | | | | |
| | <p>The pupils used their knowledge from a previous activity, about the type of shadows formed by transparent, translucent and opaque objects blocking the light, to make predictions about the shadows formed by other materials/objects in the classroom identifying each as transparent, translucent or opaque.</p> | | | |


| EVIDENCE OF LEARNING | | ASSESSMENT |
|--|---|--|
| Oral evidence | Examples of work | Knowledge |
| <p>"I was quite surprised by the flower paper because it was quite thick, but then it was translucent.</p> <p>"The glitter stone was actually opaque. Because there were glittery bits, I thought they would let the light through."</p> |  <p>This tick is rubbed out.</p> | |
| Teacher observations | | Working scientifically |
| | | <p>Max uses his knowledge from the previous activity to make predictions. He records his observations on a prepared table.</p> |


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|---|---|---|-------|-------|
|  | Year | 3 | Topic | Light |
| | | | | |
| | Focus of assessment (National Curriculum statements) | | | |
| | <ul style="list-style-type: none"> Find patterns in the way that the size of shadows change. | | | |
| | <p>The Pupils were given a torch and asked to explore the following four questions.</p> <ul style="list-style-type: none"> How can you make shadows move? How can you make shadows longer? How can you make a shadow shorter? What happens when you shine the light source from above the object? | | | |


| EVIDENCE OF LEARNING | | ASSESSMENT |
|--|---|---|
| Oral evidence | Examples of work | Knowledge |
| <p>"The shadow changes if you put the torch in a different place."</p> |  | <p>Max changes the shadow by altering the position of the light source.</p> |
| Teacher observations | | Working scientifically |
| | | <p>Max makes observations to answer questions.</p> |


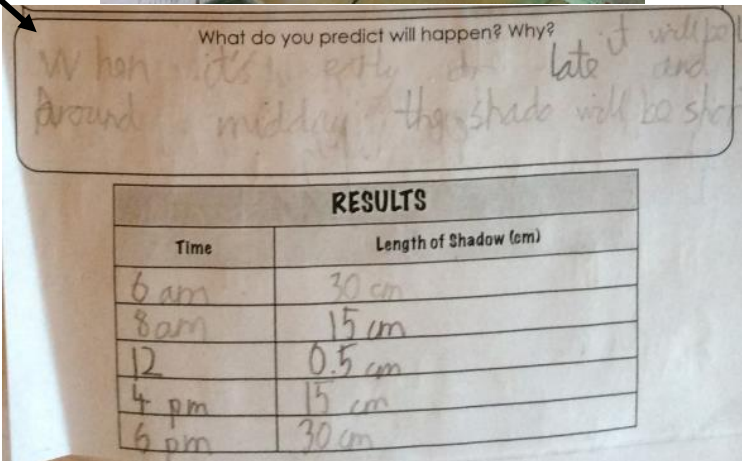
|  | Year | 3 | Topic | Light |
|---|---|---|-------|-------|
| | Focus of assessment (National Curriculum statements) | | | |
| | <ul style="list-style-type: none"> Find patterns in the way that the size of shadows change. | | | |
| | | | | |
| | The pupils record their findings to answer the questions about shadows. | | | |


| EVIDENCE OF LEARNING | | ASSESSMENT |
|----------------------|---|---|
| Oral evidence | Examples of work | Knowledge |
| |  | <p>Max recognises that he can change the position or length of the shadow by moving the torch in relation to the object casting the shadow. He does not explicitly talk about the patterns at this stage.</p> |
| Teacher observations | | Working scientifically |
| | | <p>Max records his observations using text and diagrams.</p> |

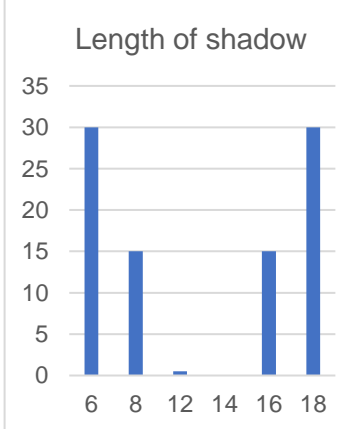
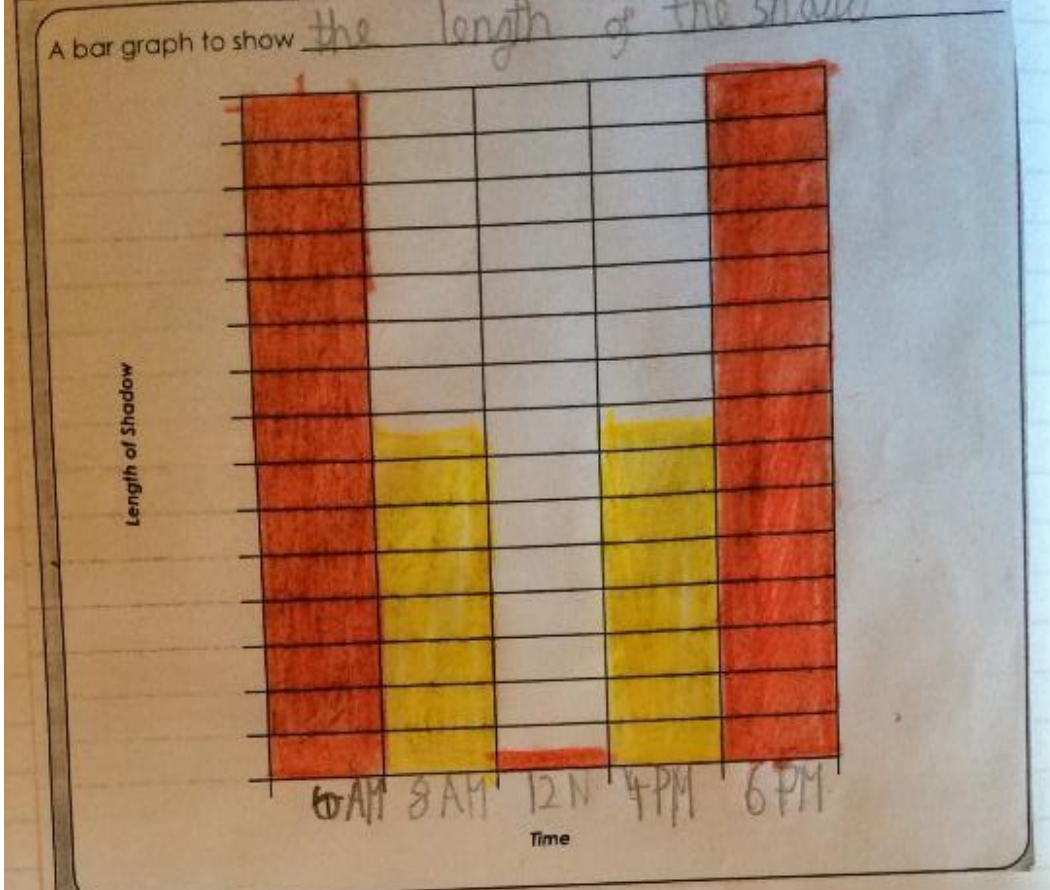
|  | Year | 3 | Topic | Light |
|---|---|---|-------|-------|
| | | | | |
| | Focus of assessment (National Curriculum statements) | | | |
| | <ul style="list-style-type: none">• Recognise that light from the Sun can be dangerous and that there are ways to protect their eyes.• Find patterns in the way that the size of shadows change. | | | |
| | Description of activity | | | |
| | The pupils went outside at different times during the day and stood on the same spot, facing the same direction and made the same shape with their bodies. A friend drew around their shadow each time. Before going outside, the teacher talked to them about not looking directly at the Sun. | | | |


| EVIDENCE OF LEARNING | | ASSESSMENT |
|--|--|---|
| Oral evidence | Examples of work | Knowledge |
| <p>"We used special glasses when we watched the eclipse. Sunglasses make it safer, but you still shouldn't look right at the Sun."</p> <p>"Each time we came out, the shadow had moved round on the floor. It also got smaller and then bigger."</p> |  <p>(Illustrative image only)</p> | Max suggests ways to protect his eyes when outside in the Sun. |
| <p>Teacher observations</p> <p>NB Looking at how shadows caused by the Sun change through the day can be left until Year 5 when they are learning about how the Sun appears to move across the sky.</p> | | <p>Working scientifically</p> <p>Max observes how the shadow changes in position and size.</p> |

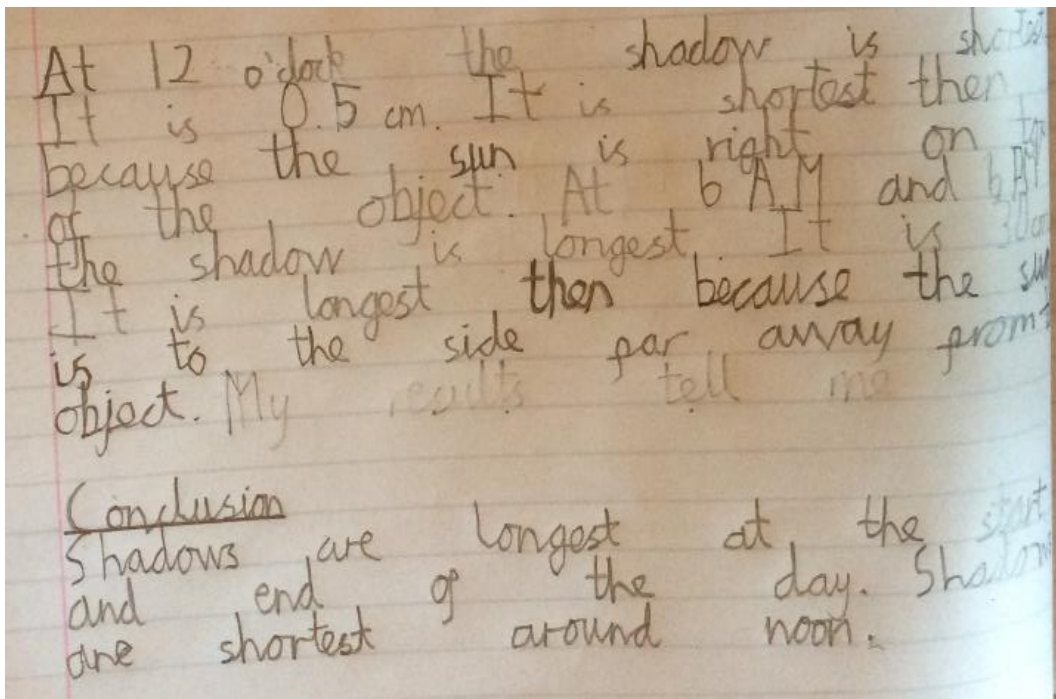
|  | Year | 3 | Topic | Light |
|---|---|---|-------|-------|
| | Focus of assessment (National Curriculum statements) | | | |
| | <ul style="list-style-type: none"> Find patterns in the way that the size of shadows change. | | | |
| | | | | |
| | <p>The pupils were given different equipment to gather better data about how the length of a shadow changed with the position of the Sun during the course of the day. The torch represents the Sun and the arch is labelled with the Sun's position at different times of the day.</p> | | | |


| EVIDENCE OF LEARNING | | ASSESSMENT |
|----------------------|--|--|
| Oral evidence | Examples of work | Knowledge |
| |  <p>When it's early or late, it will be long and, when it is midday, it will be short.</p> | |
| Teacher observations | | Working scientifically |
| |  | <p>Max uses his learning from the previous activities to predict how the shadow will change, which is then confirmed by the results.</p> |

|  | Year | 3 | Topic | Light |
|---|---|---|-------|-------|
| | Focus of assessment (National Curriculum statements) | | | |
| | <ul style="list-style-type: none"> Find patterns in the way that the size of shadows change. | | | |
| | | | | |
| | The pupils were asked to present their data using a graph. | | | |


| EVIDENCE OF LEARNING | | ASSESSMENT |
|---|---|---|
| Oral evidence | Examples of work | Knowledge |
| <p>Teacher observations</p> <p>NB Continuous data of this sort should be plotted as a line graph. However, in Year 3, this is not appropriate so would be better presented as a series of lines.</p>  |  | <p>Working scientifically</p> <p>Max chooses a suitable scale to fit the measurements. However, he has not put the scale on the y axis.</p> |

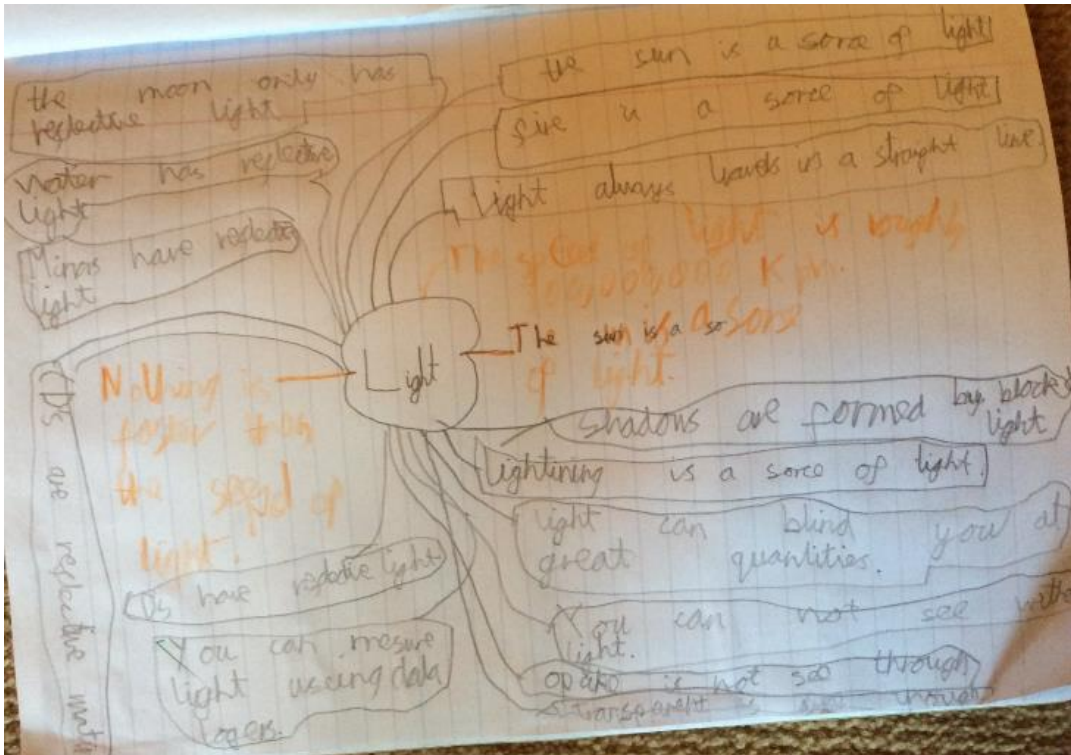
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|---|---|---|-------|-------|
|  | Year | 3 | Topic | Light |
| | | | | |
| | Focus of assessment (National Curriculum statements) | | | |
| | <ul style="list-style-type: none"> Find patterns in the way that the size of shadows change. | | | |
| | The pupils wrote about what their data showed. | | | |

| EVIDENCE OF LEARNING | | ASSESSMENT |
|----------------------|---|--|
| Oral evidence | Examples of work | Knowledge |
| |  | Max identifies patterns in the data that he has gathered and can explain this by linking back to the position of the light source. He is secure on this objective. |
| Teacher observations | | Working scientifically |
| | | Max talks about a range of results and explains why the length changes based on the position of the Sun. |

|  | Year | 3 | Topic | Light |
|---|---|---|-------|-------|
| | | | | |
| | Focus of assessment (National Curriculum statements) | | | |
| | <ul style="list-style-type: none"> Find patterns in the way that the size of shadows change. | | | |
| | Description of activity | | | |
| | The teacher talked to Max and his partner about the investigation and how this knowledge could be used. | | | |

| EVIDENCE OF LEARNING | | ASSESSMENT |
|--|--|---|
| Oral evidence | Examples of work | Knowledge |
| <p>Teacher: "Can we use what we know about the movement of shadows to tell the time?"</p> <p>Max: "You could use a big metal pole with numbers around. The shadow would move around so, if it was small, it would be between 11 and 12 o'clock. It would tell you roughly the time."</p> <p>Teacher: "That's a good idea. How does that work?"</p> <p>Max: "Well, what happens is the Sun would be there and it would be the perfect spot at 5 o'clock. The Sun is here and the shadow is here. [Points with hands and using one hand as the Sun and the other on the table to make a shadow.] You would need to use something to block the light like a pole."</p> <p>Teacher: "How would you know if it was morning or afternoon?"</p> <p>Max: "Well, on that side it would be morning and that side it would be the afternoon."</p> <p>Teacher: "And what about the night?"</p> <p>Max: "It's night so there couldn't be a shadow because there is no Sun!"</p> <p>Another child: "I've seen a clock with a semi-circle and a big stick. You can tell the time by looking at the shadow."</p> <p>Teacher: "Oh yes, it's a sundial-that's what I was thinking of."</p> |  <p>(Illustrative image only)</p> | <p>Max applies his knowledge of how shadows change during the day when talking about a sundial.</p> |
| Teacher observations | | Working scientifically |

|  | Year | 3 | Topic | Light |
|---|--|---|-------|-------|
| | Focus of assessment (National Curriculum statements) | | | |
| | <ul style="list-style-type: none"> 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. | | | |
| | Description of activity | | | |
| | The pupils revisited their mind map from the first lesson and added their new learning. | | | |

| EVIDENCE OF LEARNING | | ASSESSMENT |
|--|---|---|
| Oral evidence | Examples of work | Knowledge |
| |  | <p>Max names a number of objects that reflect light – water, the Moon and mirrors.</p> <p>Max knows that the Sun can be dangerous to the eyes and that without light we cannot see.</p> |
| Teacher observations | | Working scientifically |
| Max knows that light always travels in straight lines. This is beyond the Year 3 curriculum. | | |



Overall summary

Secure

By exploring how the amount of light entering a box affects what can be seen, Max developed the understanding that without light you cannot see. He measures the light reflected by different materials using a datalogger and, from this, understands that shiny objects reflect light and that some materials reflect light better than others. He shows understanding of how to protect his eyes from being damaged by the Sun. He shows a good understanding of the difference between opaque, transparent and translucent materials and how these affect the quality of a shadow produced. He is able to demonstrate how to change the size and shape of a shadow and can talk generally about the pattern he observed, linking shadow size and shape to relative positions of light source and object.



Acknowledgements

- *PlanBee worksheet pages 10, 12, 14 & 15*