

**Elsecar Holy Trinity - Science**



Topic: Light

Year: 6

Strand: Physics

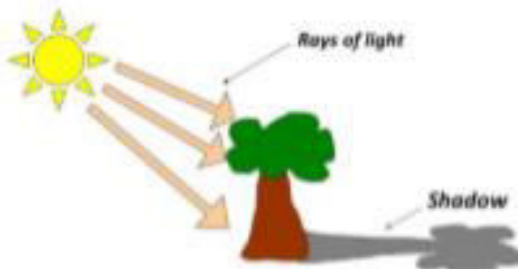
### What should I already know?

- Certain things produce **light**, usually by burning (e.g. the Sun) or **electricity** (e.g. street lights)
- Shiny materials do not make **light** but do reflect it.
- **Shadows** are caused when certain materials block **light**.
- **Light** travels in straight lines. When **light** is blocked by an **opaque** object, a **dark shadow** is formed.
- The further away the **light source** is, the smaller the **shadow** is. The closer the **source** of the light, the bigger the shadow.

### What will I know by the end of the unit?

- How does light travel?
- **Light** travels in a straight line.
  - When you place a torch on a table in a dark room, the beam travels in a straight line.
  - **Reflection** is when **light** bounces off a surface - this changes the direction in which the **light** travels.

- What is the relationship between light sources and shadows?
- Because **light** travels in straight lines, when there is an **opaque** object blocking the **light**, a **shadow** is formed.
  - These **shadows** have the same shape as the objects that cast them.



- The size of a **shadow** changes as the **light source** moves.

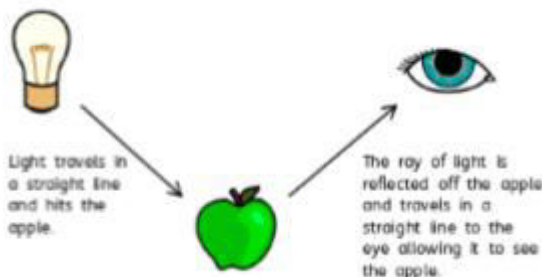


**LARGE SHADOW**  
when the toy is close to the light

**SMALLER SHADOW**  
when the toy is further from the light

**TINY SHADOW**  
when the toy is a long way from the light

How do we see?



### Investigate!

- What happens when light is **reflected** from different **surfaces**? What happens when light is **reflected** from a **mirror**? What happens when the **angle** of the **mirror** (or **light source** changes?)
- Draw diagrams to show how **light** travels and what happens when **light** is **reflected** from a **mirror**.
- Draw diagrams to show how we see.
- Design an experiment to measure **shadow** length by changing a variable. Show your results in a line graph to show the relationship between distance of **light source** and **shadow** length. Explain your findings using scientific vocabulary.
- Create **shadow** puppets to show how **light** travels and to demonstrate that a **shadow** has the same shape as the object that casts them.
- Make a periscope and explain how it works using diagrams and scientific vocabulary. Use the idea that **light** appears to travel in straight lines to explain how it works.
- Research how **mirrors** are used in different contexts (e.g. rear view mirrors, on a dangerous bend) and explain why and how they work.
- Explain why objects look bent in water.
- Explore different contexts in which **light** travels including rainbows, colours on soap bubbles and coloured filters.

### Vocabulary

angle	the direction from which you look at something
dark	the absence of <b>light</b>
dim	<b>light</b> that is not <b>bright</b>
electricity	a form of energy that can be carried by wires and is used for heating and lighting, and to provide power for machines
emits	to <b>emit</b> a sound or <b>light</b> means to produce it
light	a <b>brightness</b> that lets you see things.
mirror	a flat piece of glass which <b>reflects light</b> , so that when you look at it you can see yourself <b>reflected</b> in it
opaque	if an object or substance is <b>opaque</b> , you cannot see through it
reflects	sent back from the <b>surface</b> and not pass through it
shadows	a dark shape on a <b>surface</b> that is made when something stands between a <b>light</b> and the <b>surface</b>
source	where something comes from
surface	the flat top part of something or the outside of it
torches	a small <b>electric light</b> which is powered by <b>batteries</b> and which you can carry
translucent	if a material is <b>translucent</b> , some <b>light</b> can pass through it
transparent	If an object or substance is <b>transparent</b> , you can see through it

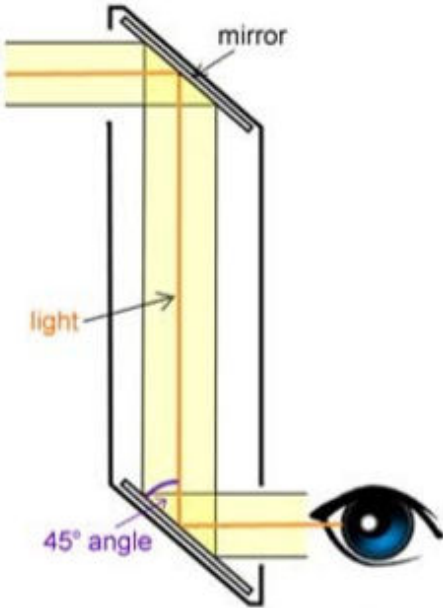
Question 1: When light bounces off a surface, it is..	Start of unit:	End of unit:
absorbed		
dissolved		
reflected		
bounced		

Question 3: The word that best describes an object that does not allow light to travel through it is....	Start of unit:	End of unit:
transparent		
translucent		
opaque		

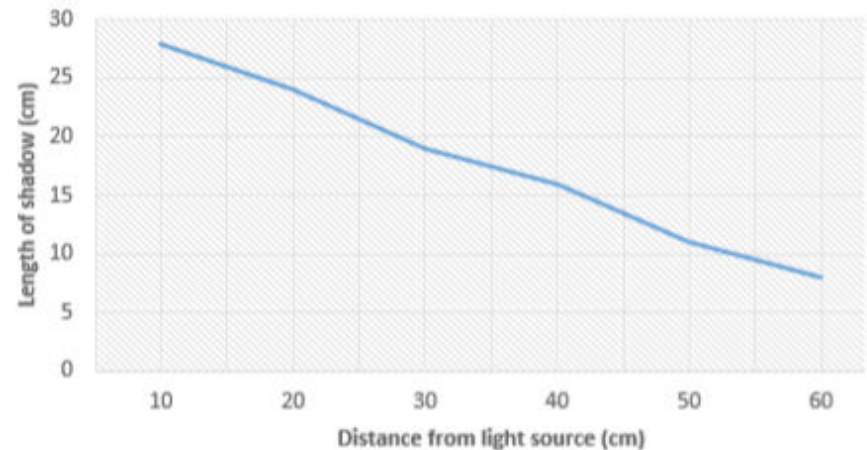
Question 2: Shadows are formed when...	Start of unit:	End of unit:
light is let through an object		
light reflects off an object		
it is dark		
light cannot travel through an object		

Question 4: How do we see an object?	Start of unit:	End of unit:
Light reflects off the object and enters our eyes		
Light travels from our eyes and reflects off the object		
Light reflects off our eyes and enters the object		

Question 5: A child says that a shadow takes the shape of the light source. Is this true or false? Explain your reasoning.	Start of unit:	End of unit:

Question 6: Describe how the mirrors in a periscope allow us to see.	Start of unit:	End of unit:
		

<p>Question 7: You design an experiment to test the size of a shadow that is cast by a light source. Name one thing you will keep the same. Name one thing you will change.</p>	<p>Start of unit:</p>	<p>End of unit:</p>

<p style="text-align: center;"><b>Shadow Investigation</b></p>  <table border="1" style="display: none;"> <caption>Data points from the Shadow Investigation graph</caption> <thead> <tr> <th>Distance from light source (cm)</th> <th>Length of shadow (cm)</th> </tr> </thead> <tbody> <tr><td>10</td><td>28</td></tr> <tr><td>20</td><td>24</td></tr> <tr><td>30</td><td>19</td></tr> <tr><td>40</td><td>16</td></tr> <tr><td>50</td><td>11</td></tr> <tr><td>60</td><td>8</td></tr> </tbody> </table>	Distance from light source (cm)	Length of shadow (cm)	10	28	20	24	30	19	40	16	50	11	60	8	<p>Start of unit:</p>	<p>End of unit:</p>
Distance from light source (cm)	Length of shadow (cm)															
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<p>Question 8: Look at the graph above. What was the approximate length of the shadow when the object was 35cm away from the light source?</p>		
<p>Question 9: Look at the graph above. Approximately, how far away from the light source was the object when the length of the shadow was 25cm long?</p>		
<p>Question 10: Write a conclusion about what the line graph is showing using scientific vocabulary.</p>		