



# SS John Fisher & Thomas More Catholic Primary School

A Voluntary Academy



Year Group: Year 6	Term: Spring 2	Topic: Electricity
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### National Curriculum Links

Pupils in Key Stage Two should be taught to:

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

### Working Scientifically

- plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
- use test results to make predictions to set up further comparative and fair tests
- report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations
- identify scientific evidence that has been used to support or refute ideas or arguments.

Prior Learning	Future Learning
<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 - Light)</li> <li>• Notice that light is reflected from surfaces. (Y3 - Light)</li> <li>• Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. (Y3 - Light)</li> <li>• Recognise that shadows are formed when the light from a light source is blocked by an opaque object. (Y3 - Light)</li> <li>• Find patterns in the way that the size of shadows change. (Y3 - Light)</li> <li>• Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency,</li> </ul>	<ul style="list-style-type: none"> <li>• The similarities and differences between light waves and waves in matter. (KS3)</li> <li>• Light waves travelling through a vacuum; speed of light. (KS3)</li> <li>• The transmission of light through materials: absorption, diffuse scattering and specular reflection at a surface. (KS3)</li> <li>• Use of ray model to explain imaging in mirrors, the pinhole camera, the refraction of light and action of convex lens in focusing (qualitative); the human eye. (KS3)</li> <li>• Light transferring energy from source to absorber leading to chemical and electrical effects; photo-sensitive material in the retina and in cameras. (KS3)</li> </ul>

conductivity (electrical and thermal), and response to magnets. (Y5 - Properties and changes of materials)

- Colours and the different frequencies of light, white light and prisms (qualitative only); differential colour effects in absorption and diffuse reflection. (KS3)

### Common Misconceptions

Some children may think:

- we see objects because light travels from our eyes to the object.

### Sustainable Development Goals & Catholic Social Teaching

Global Goals

This global goal would be perfect to fit with this unit of learning:

- Add your activities here



Catholic Social Teaching

- Add your activities here

### Applied Write Opportunities

- Humphry Davy – biography on Davy who invented the light bulb.
- Instructional text on how to create a circuit.

### Enrichment Opportunities

### Assessment Opportunities

- Can explain how evidence from enquiries shows that light travels in straight lines
- Can predict and explain, with diagrams or models as appropriate, how the path of light rays can be directed by reflection to be seen, e.g. the reflection in car rear view mirrors or in a periscope
- Can predict and explain, with diagrams or models as appropriate, how the shape of shadows can be varied

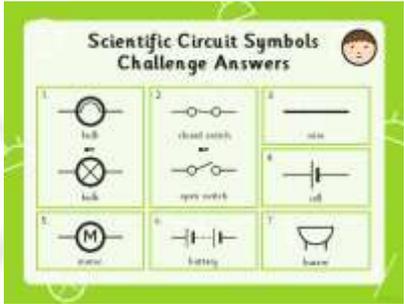
## Key Vocabulary

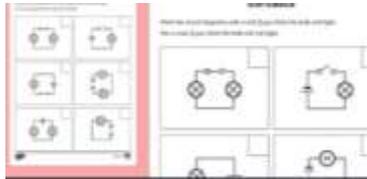
Tier Two:

bulbs, cell, battery, buzzers, investigation, plan, fair test, wire, length, wires, switch, scientific,

Tier Three:

motor, informal, circuit, comparative test

Knowledge and Skills Objectives	Activity	Differentiation
<p><u>Lesson 1:</u> I can use recognised symbols when representing a simple circuit in a diagram.</p> <p>Add w/s here</p>	<p>Circuits: What is a circuit? What parts do all circuits contain? Can you draw a circuit which includes a bulb? All children draw a circuit containing a bulb on a whiteboard.</p> <p>Circuit Diagram: Reveal a correct circuit diagram. How close is your drawing to this one? What did you miss out? Is there anything about this <b>circuit diagram you don't remember or understand?</b></p> <p>Address misconceptions and issues that arise. Battery or Cell? State that they will be learning the scientific symbols for parts of a circuit in this lesson.</p> <p><b>Explain that there are different drawings for 'battery' and 'cell' and highlight the differences between them.</b> Scientific Circuit Symbols: Show children the symbols they would have used in Year 4 and explain that these were informal rather than scientific symbols.</p> <p>On the presentation, children match the informal and scientific symbols used to draw circuit diagrams. Show children the correct symbols.</p> <p>Circuit Symbols Memory Test: Children work in pairs. All circuit symbols are shown on the Lesson Presentation.</p>	<p>Add clear differentiation and outline of activity</p> <p>Complete the following sheet:</p>  <p>The image shows a worksheet titled 'Scientific Circuit Symbols Challenge Answers' with a grid of seven numbered boxes. Each box contains a scientific circuit symbol and its name: 1. Bulb, 2. Closed switch, 3. Wire, 4. Cell, 5. Motor, 6. Battery, 7. Buzzer.</p>

	Children to be given a minute to memorise them. Their partner will select one of the physical Circuit Symbols Memory Cards and ask their partner to draw it. Children take it in turns to test each other.	
Knowledge and Skills Objectives	Activity	Differentiation
<p><u>Lesson 2</u> I can understand key vocabulary.</p> <p>Is this an LO?</p> <p>Add w/s here</p>	<p>Chn to learn the key vocabulary they will need for this topic. At the back of CLJ book there is a key vocab sheet. Children should be able to tick this off by the end of lesson.</p> <p>Chn to define each part of an electrically circuit and understand its purpose within a circuit.</p> <p>They will be able to identify the symbols and link the symbols to the definitions using sheet provided. See powerpoint</p>	<p>Key voab: Cell, switch, bulb, motor, buzzer, wire, conductor, insulator, circuit</p>  <p><a href="https://www.bbc.co.uk/bitesize/topics/z2882hv/articles/zcwnv9g">https://www.bbc.co.uk/bitesize/topics/z2882hv/articles/zcwnv9g</a>  <a href="https://www.bbc.co.uk/bitesize/topics/zq99q6f/articles/zt8vg82">https://www.bbc.co.uk/bitesize/topics/zq99q6f/articles/zt8vg82</a>  <a href="https://www.bbc.co.uk/bitesize/topics/z2882hv/articles/zxv482p">https://www.bbc.co.uk/bitesize/topics/z2882hv/articles/zxv482p</a></p> <p>What is the task and what is the differentiation?</p>
Knowledge and Skills Objectives	Activity	Differentiation
<p><u>Lesson 3</u> I can give reason and compare why circuits do and do not work.</p> <p>Add w/s here</p>	<p>Chn to compare pictures of circuits, each of the 6 circuits has a different amount of functions.</p> <p>Why might one circuit work better than another?  Will the circuit work or not? Why?  What about the Cells within the circuit does this influence the loudness of motor, movement or light?  If the circuit is incomplete will this have an effect?</p> <p>Is this substantial for a 2 hour lesson?</p>	<p>Key vocab:</p>  <p>Components, function, Cell, switch, bulb, motor, buzzer, wire, conductor, insulator, circuit</p> <p>Are all children expected to do this?  How do you challenge the HA?</p>

Knowledge and Skills Objectives	Activity	Differentiation																																				
<p><u>Lesson 4</u> I can identify hazards within my home.</p> <p>Add w/s here</p> <p>PSHE – UIP</p>	<p>Chn to identify the risks of electricity within their homes. Show chn picture of rooms within a house and ask them to identify the risks which they might come across associated with electricity. Eg. Water bottle on the tele. Straighteners plugged in. Get chn to TTYP about their own home. Then identify risks on sheet. Under sheet get children to write how they could prevent risks in their home.</p>	<p>Add differentiation here</p>																																				
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<p><u>Lesson 5</u> I can associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells.</p>	<p>Current and Voltage: Watch this BBC video about current and voltage. State the main points related to current and voltage.</p> <p>How Many Volts? Allow children to examine a range of different batteries and check the number of volts each one supplies.</p> <p>Labelling Volts: Show children a circuit diagram with the volts labelled. Discuss the location of the label and how to label a battery containing multiple cells, as opposed to a single cell.</p> <p>What Difference Do the Volts Make? Make predictions together about what will happen to a bulb, motor or buzzer depending on the voltage of the cell or battery. Discuss what difference they would expect (e.g. bulb will get brighter, it will increase in brightness, the brightness will stay the same). Model one example using a bulb, including how to draw the circuit diagram of each step with volts labelled accurately.</p> <p>Observing the Effect of Volts: In mixed ability pairs, children obtain the appropriate equipment and record their observations and circuit drawings on the Volts Activity Sheet.</p>	<p>Add differentiation here</p> <table border="1" data-bbox="1563 818 2080 1102"> <tbody> <tr> <td>Sub</td> <td>0V</td> <td>1.5V</td> <td>3.0V</td> </tr> <tr> <td>Prediction</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Result</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Sub</td> <td>0V</td> <td>1.5V</td> <td>3.0V</td> </tr> <tr> <td>Prediction</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Result</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Sub</td> <td>0V</td> <td>1.5V</td> <td>3.0V</td> </tr> <tr> <td>Prediction</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Result</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Sub	0V	1.5V	3.0V	Prediction				Result				Sub	0V	1.5V	3.0V	Prediction				Result				Sub	0V	1.5V	3.0V	Prediction				Result			
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	<p>Appropriate Volts: What would happen to an electrical appliance that requires 3V if it were powered by 5V cell or battery? Discuss as a whole class.</p>							
<p><u>Lesson 6 - Investigation Part 1</u></p> <p>I can understand variations in how components function.</p> <p>Add all w/s here</p> <p>I can plan an investigation.</p>	<p>Length: Does wire length affect how components in a circuit work?</p> <p>Children discuss the question with their talk partners and feed back.</p> <p>Planning Your Investigation: Outline the three different types of scientific enquiries they can choose from. <b>Which are?</b> Address any misconceptions or errors.</p> <p>Investigation: All children select a type of enquiry and plan their investigation using the differentiated Electricity Investigation Activity Sheets.</p> <p>More detail required</p>	<p>Are all children doing this? How? Mixed pairs? Groups?</p> <p>I can plan an investigation to understand variations in how components function.</p> <p><b>Practical Enquiry</b></p> <p>Key Words bulb, cell, battery, buzzer, wire, length, junction, components, variation</p> <p>Question: Does wire length affect how components in a circuit work?</p> <p>Prediction: _____</p> <p>Equipment: Tick the equipment you will need</p> <table border="0"> <tr> <td><input type="checkbox"/> bulb</td> <td><input type="checkbox"/> battery</td> </tr> <tr> <td><input type="checkbox"/> buzzer</td> <td><input type="checkbox"/> switch</td> </tr> <tr> <td><input type="checkbox"/> wires (short)</td> <td><input type="checkbox"/> wires (long)</td> </tr> </table> <p>Method: _____</p>	<input type="checkbox"/> bulb	<input type="checkbox"/> battery	<input type="checkbox"/> buzzer	<input type="checkbox"/> switch	<input type="checkbox"/> wires (short)	<input type="checkbox"/> wires (long)
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<p>Knowledge and Skills Objectives</p>	<p>Activity</p>	<p>Differentiation</p>						

Lesson 7 - Investigation Part  
2

What is the LO?

Add all the w/s here

I can record my data and  
report my findings

Investigation: Children given their Electricity Investigation Activity Sheet and given time to read and edit if necessary.

Degree of Trust: Define what degrees of trust are. Discuss the different criteria. Which of these should you bear in mind while conducting your investigation? What will you do to ensure you can have a high degree of trust in your results?

Conducting the Investigation: Discuss the important points relating to how the investigation should be conducted. Children to create a table to record their results before conducting the investigation.

Reporting Findings: Children use the Electricity Reporting Activity Structure to report their findings - no sheet needed.

Are all children able to access this?  
How do you plan to challenge the HA?



The form is titled "Electricity Reporting" and includes a header for the student's name. It contains several sections with horizontal lines for writing: "Who your prediction correct?", "Conclusion:", "In what way did you establish a high degree of trust in your results? Explain", "What else can you do to establish a high degree of trust in your results?", and "What would you do differently next time?".