

## Y4 Science – Electricity

### Targets to be covered:

- identify common appliances that run on electricity.
- construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.
- identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery.
- recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit.
- recognise some common conductors and insulators, and associate metals with being good conductors.

### Learning Ladders:

- I can describe how to work safely with electricity.
- I can identify metals that are good conductors.
- I can recognise and describe some common insulators.
- I can recognise and describe some common conductors.
- I can describe the impact of an open and/or closed switch on a simple series circuit.
- I can describe what will happen if the circuit isn't complete.
- I can create a simple series electrical circuit using basic parts.
- I can identify the basic parts of a simple series electrical circuit e.g. cells, wires, bulbs, switches and buzzers.
- I can identify common appliances that run on electricity.

### Working Scientifically

- Ask relevant questions and use different types of scientific enquiries to answer them.
- Set up simple practical enquiries, comparative and fair tests.
- Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables.
- Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.
- Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.
- Identify differences, similarities or changes related to simple scientific ideas and processes.

### Key Vocabulary

electricity, electrical appliance/device, mains, plug, electrical circuit, complete circuit, cell, battery, positive, negative, connect/connections, loose connection, short circuit, crocodile clip, bulb, switch, buzzer, motor, conductor, insulator, metal, non-metal, symbol, voltage

| Week | Order of Study                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
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| 1    | <p><b>Pre-assessment quiz</b></p> <p><b><u>LI: I can describe how to work safely with electricity.</u></b></p> <p><b>Type of Scientific Enquiry – Research</b></p> <p><b>Starter</b> – Discussion: What is electricity? What do we use it for? What can it do to us?</p> <p><b>Teach</b> – Go through PowerPoint slides. Look at BBC bitesize website, <a href="#">Mains power and the dangers of electricity - KS2 Science - BBC Bitesize</a>. Then look at the info on the other twinkl PowerPoint 'Electricity Safety'.</p> <p><b>Task</b> – Children to look at an image showing different dangers around electricity and to spot five dangers. After, discuss with the children what 'voltage' is. Then present children with the questions around voltage to find the answers to – research as a class or individually on iPads.</p> <p><b>Qs:</b></p> <ol style="list-style-type: none"> <li>1. Why are overhead cables dangerous?</li> <li>2. What is the voltage of electricity in your home?</li> <li>3. What voltage does an electric train set use?</li> <li>4. Write down five things that are dangerous to do near electricity.</li> </ol> |

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|     | <p><b>Plenary</b> – Discuss what electricity is and what we use it for. Ask for 3 possible dangers around electricity. Discuss voltage means and share answers to the above questions.</p> <p><b>Resources needed:</b> <a href="#">Mains power and the dangers of electricity - KS2 Science - BBC Bitesize</a><br/>Twinkl PowerPoint – Electricity safety<br/>Image of electricity dangers<br/>Possibly iPads</p> <p><b>Key terminology</b> – voltage, electricity, electrical appliance/device, mains, plug, metal, non-metal</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 2/3 | <p><b>LI: I can identify common appliances that run on electricity.</b></p> <p>Think about the appliances around home and school, which ones need electricity to work? Give children images of appliances to sort in pairs whether they think they need electricity to work or not. Use some classroom appliances. Discussion. Children to then make two columns in their book. Cut and stick appliances or write them in the correct column.</p> <p><b>LI: I can recognise and describe some common conductors and insulators.</b><br/><b>LI: I can identify metals that are good conductors.</b></p> <p><b>Type of Scientific Enquiry – identifying and classifying</b></p> <p><b>Starter</b> – Look at the BBC bitesize information about conductors and insulators.<br/><a href="#">What are conductors and insulators? - BBC Bitesize</a> - children to then write a definition for conductors and insulators.</p> <p><b>Main lesson</b> – Look at what materials conduct electricity. Sort the materials on the PowerPoint slide into the correct columns on a table (conductors and insulators).</p> <p><b>Plenary</b> – Quiz on appliances that need/don't need electricity to work.</p> <p><b>Resources needed:</b> <a href="#">What are conductors and insulators? - BBC Bitesize</a><br/>Images of appliances<br/>Appliances quiz</p> <p><b>Key terminology</b> – appliances, conductors, insulators, metal, non-metal</p>                                                                                                                                                                                                                                                                        |
| 4   | <p><b>LI: I can create a simple series electrical circuit and identify the basic parts.</b><br/><b>LI: I can describe what will happen if the circuit isn't complete and explain the impact of an open or closed switch.</b></p> <p><b>Type of Scientific Enquiry –</b></p> <p><b>Starter</b> – Children to have a look at the equipment that they are given. What do they think they need to do to make the bulb light up or buzzer sound?</p> <p><b>Main lesson</b> – Look at PowerPoint on circuits and this website:<br/><a href="https://www.bbc.co.uk/bitesize/topics/zj44jxs/articles/zqgfp4j">https://www.bbc.co.uk/bitesize/topics/zj44jxs/articles/zqgfp4j</a></p> <p>Encourage the children to think 'What is a circuit? Where does the electricity come from in a circuit? How does it travel around the circuit?' Their task is to make a circuit that will light up a bulb or sound the buzzer when a switch is pressed. After, they will draw and label that circuit in their books.</p> <p><b>NB children will learn the symbols in year 6 electricity unit – they can be shown the symbols but when drawing circuits, use pictures and not symbols.</b></p> <p><b>NB make sure children are aware the positive/negative end of the cell need to be connected to the wires and not both wires to the positive end etc. Their circuits should reflect this too.</b></p> <p><b>Plenary</b> – Peer assess each other's drawings of the circuits in books. Refer back to the positive/negative end of the cells.</p> <p><b>Resources needed:</b> <a href="https://www.bbc.co.uk/bitesize/topics/zj44jxs/articles/zqgfp4j">https://www.bbc.co.uk/bitesize/topics/zj44jxs/articles/zqgfp4j</a></p> |



## The Canons CE Primary School



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|   | <p>PowerPoint on circuits</p> <p>Resources to make a circuit – crocodile clip wires, cell, buzzer, bulb between pairs</p> <p>Extra resources that could be used:</p> <p><a href="#">How an electric circuit works - KS2 Science - BBC Bitesize</a></p> <p><a href="#">Using circuits to make games and activities - KS2 Science - BBC Bitesize</a></p> <p><b>Key terminology – simple series circuit, complete, switch, buzzer, bulb, cell, battery, wire, crocodile clips, positive, negative</b></p> |
| 5 | <b>Assessment time</b> – Children complete the quiz to review understanding.                                                                                                                                                                                                                                                                                                                                                                                                                           |