# Brough Primary School – Curriculum Intention Plan 2022 - 2023

<table>
<tr><td colspan="2">Subject: Science<br>Year Group: Year 5/6</td><td colspan="2">Area of learning: Electricity (Year B)</td></tr>
<tr><td>Links to previous work/Remember when</td><td colspan="3">• Being able to identify common appliances that run on electricity<br>• Being able to construct simple series circuits, identifying and naming the basic parts: cells, wires, bulbs, switches and buzzers.<br>• Being able to identify if a bulb will light in a simple series circuit based on whether the circuit is complete or not.<br>• Knowing that a switch opens or closes and thus completes or interrupts a circuit.<br>• Knowing that some common materials conduct electricity and that some insulate electricity.<br><br><u>Working Scientifically</u><br>• being able to ask and investigate relevant scientific questions;<br>• setting up simple scientific enquiries;<br>• making systematic and careful observations;<br>• gathering, recording and presenting data;<br>• reporting on findings both oral and written;<br>• using results to draw simple conclusions<br>• using straight forward scientific evidence to support what they have found out.</td></tr>
<tr><td>Term</td><td>Year 5/6</td><td colspan="2">Key Skills to be taught</td></tr>
<tr><td>Autumn 2 2023<br><br>What the children should know at the end of this series of lessons</td><td colspan="3">• associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit<br>• compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches<br>• use recognised symbols when representing a simple circuit in a diagram<br><br>• <u>Working Scientifically</u><br>• plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary<br>• take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate<br>• record results using scientific diagrams and labels<br>• use test results to make predictions to set up further comparative and fair tests<br>• 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<br>• vi. identify scientific evidence that has been used to support or refute ideas or arguments</td></tr>
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**Vocabulary**
Electricity, Thomas Edison, Nikola Tesla, Alessandro Volta, Michael Faraday, home, alternating current, direct current, battery, cell, bulb, wires, switch, motor, buzzer, scientific, informal, circuit, circuit diagram, brightness, volume, increase, decrease.

| Sequence of learning | Learning Objectives/Outcomes | Objectives and suggested details provided by subject leader. |
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| 1 | **Learning Objective:** To learn about the major discoveries made by scientists in the field of electricity.<br><br>**Key Knowledge:** Benjamin Franklin was the first person to study electricity in detail. Alessandro Volta invented the first battery. Michael Faraday was able to make electrical current move. Thomas Edison invented the modern lightbulb. Lewis Latimer invented the 'filament' in light bulbs.<br><br>**Enquiry Type** Identifying scientific evidence that has been used to support or refute ideas or arguments. | **Recap** – What appliances can you remember that run on electricity? What components of a simple circuit can you remember? What does a switch in a simple circuit do? Can you remember any insulators or conductors of electricity?<br><br>For this lesson, start by using a quiz or questions of your own to gauge what the children can remember about the work done in lower KS2. Make sure the children understand that this new learning in electricity will build on what they know already. Move on to a reading comprehension exercise so the children can learn about the key knowledge. Finally, for a number of humanities tools, identify how electricity has impacted our lives – for example compare a Victorian washing tub and board with a modern washing machine.<br><br>**How electricity was discovered**<br>● Ben Franklin found lightening was electrical.<br>● Alessandro Volta invented batteries.<br>● Michael Faraday was able to make electrical current move.<br>● Thomas Edison invented modern lightbulbs.<br>● Lewis Latimer invented the filament in lightbulbs.<br><br>*Children record how our understanding of electricity has changed over time.*<br>*Children answer comprehension questions about how major discoveries affected our understanding and use of electricity.* |
| 2 | **Learning Objective:** To use recognised symbols when representing a circuit diagram by representing and | **Recap** – What did Ben Frankin discover? Who found out how to make electrical current move using magnets? Why should we be really thankful to Thomas Eddison and Lewis Latimer? |

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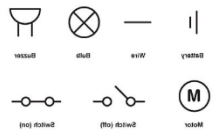
| | drawing circuit symbols accurately.<br><br>**Key Knowledge:**<br>Knowing what a circuit is and the difference between complete and not complete. Knowing the difference between a cell and a battery. Knowing the symbols for bulb, cell, battery, wire, motor, buzzer, open switch, closed switch.<br><br>**Enquiry Type**<br>N/A | In this lesson, the children revise what makes a complete circuit and learn how simple circuits can be represented using circuit diagrams and symbols. They learn the symbols for well-known components. You could introduce a practical element to this lesson or just cover the theory before doing it practically next week.<br><br>**Circuits, circuit diagrams and symbols**<br>● Use and name common symbols.<br>● A battery has more than one cell. (e.g. a car battery)<br>● A single cell is not a battery (AA used in remote controls).<br>● A circuit diagram is a formal representation of a circuit so has to be drawn formally, with a ruler etc.<br><br>  <br><br>*Children challenge each other to draw and label the correct symbol from the memory card in their books.*<br>*Children practice labelling and drawing different circuit diagrams for a given list of components.*<br>*Children take part in a revision quiz of the symbols – how many can they remember?* |
| 3 | **Learning Objective:**<br>To compare and give reasons for the brightness of a bulb or the volume of a buzzer based on the number or voltage of cells.<br><br>**Key Knowledge:**<br>Different batteries have different voltages and there is a relationship between voltage and brightness of a bulb or the volume of a buzzer.<br><br>**Enquiry Type**<br>Using text results to make predictions to set up further comparative tests. Reporting and presenting findings from enquiries. | **Recap** – Carry out a symbol quiz – what can the children remember? Who first discovered that electricity could move? Who first made the modern lightbulb?<br><br>In this lesson the children experiment with single cells of different voltages and different batteries and record the affect each change has on the brightness of a bulb or the volume of a buzzer. This is largely a practical lesson.<br><br>**Relationship between voltage and Current or power**<br><br>● The higher the voltage, the higher the current or power in a circuit.<br>● With higher voltage bulbs will be brighter and buzzers will be louder.<br>● Remind safety aspect that actually if the current is too high the component will ‘blow’. |

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| | | *Children record their observations of the lightbulb and the motor when a given range of voltages are run through the circuit. They refine their predictions based on early results.*<br><br>*Children draw written conclusions based on their observations about the relationship between voltage and the brightness of the bulb and the volume of a buzzer.* |
| 4 | **Learning Objective:**<br>To plan an investigation to answer the question – "Does wire length affect how components in a circuit work?<br><br>**Key Knowledge:**<br>Independent variable is the one thing I will change in my investigation. Dependent variables are the things we are measuring. Controlled variables are the things that I will keep the same. I need a question to investigate and I should make a prediction based on what I know at the start of the investigation.<br><br>**Enquiry Type**<br>Planning different types of scientific enquiry to answer questions, including recognising and controlling variable where necessary. | **Recap** – How does voltage affect the brightness of a bulb? What is this symbol for? What is the name we give a circuit which has power and a lit lightbulb? (Complete)<br><br>In this lesson the children will plan an investigation to answer the given question. They will go through the various stages of an investigation plan with their teacher guiding/adapting as appropriate.<br><br>**Investigation Planning**<br>Stages are<br>● Question.<br>● Prediction.<br>● Identifying the various variables.<br>● Listing equipment.<br>● Writing a 'method' or set of instructions.<br>● Identifying how their results will be recorded.<br><br>*Children write an investigation plan adapted as appropriate.* |
| 5 | **Learning Objective:**<br>To undertake an investigation to answer the question – "Does wire length affect how components in a circuit work?<br><br>**Key Knowledge:** | **Recap** – What question are we investigating? What is the independent variable for our investigation?<br><br>In this lesson, the children will cut and use different lengths of wire to investigate if the length of wire affects the brightness of a bulb. They should record their results in the most effective way. A discussion should take place about whether the observations should be repeated to |

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| | Understanding of the investigation process and the need to change only one thing. The longer the wire, the dimmer the bulb. The shorter the wire, the dimmer the bulb.<br><br>**Enquiry Type**<br>Reporting and presenting findings from enquiries, including conclusions, casual relationships and explanations of results. | ensure accuracy or whether one observation is sufficient.<br><br>**Investigation Process**<br>● Carry out the investigation in a controlled accurate way.<br>● Be aware that judgements of 'bulb brightness' are subjective and therefore open to interpretation.<br>● How will they try to ensure their results are valid?<br>● What do their results tell them? Ensure they draw conclusions using the scientific term of relationships between variables. (See key knowledge)<br><br>*Children carry out the investigation and record their results. Children record their own conclusions and then discuss with the wider class. Purple pen additions could be made to the conclusions following whole class discussion.* |
| 6 | **Learning Objective:**<br>To demonstrate what has been learnt about electricity. | ASSESSMENT LESSON<br><br>Take part in a quiz on sound that will assess children's learning of all the concepts and vocabulary covered in this block. |

| **Learning Outcome/product** |
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| Children will have learnt what a circuit diagram is and what the key symbols mean. They will know what effect that changing the voltage has on a lightbulb and buzzer and how the length of wire can affect the brightness of a lightbulb. |

| **Assessment records** | **List only those children who have not achieved the expected outcomes.** |
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