



'An ambitious curriculum that meets the needs of all'

## Medium Term Planning - Topic: Electricity

Curriculum Intent	
Skills/National Curriculum Links	<p>In addition to working further on objectives from Year __, pupils will be taught, following National Curriculum guidelines, the following this topic:</p> <ul style="list-style-type: none"><li>- Current electricity</li><li>- electric current, measured in amperes, in circuits, series and parallel circuits, currents add where branches meet and current as flow of charge</li><li>- potential difference, measured in volts, battery and bulb ratings; resistance, measured in ohms, as the ratio of potential difference (p.d.) to current</li><li>- differences in resistance between conducting and insulating components (quantitative).</li></ul>
Spiritual, moral, social, and cultural development	<p><b>SMSC:</b> Safe working. The importance of energy in real life. Students will reflect on their experiences and apply their understanding to a range of issues. Students will be encouraged to be reflective about their own beliefs and those of others and compare different people's faiths, feelings and values in order to develop their own perspective on life. Students will explore how Science influences the next stage of their education and/or employment.</p> <p><b>PSHE/British Values:</b> learn about everyday stores of energy and apply this to generating electricity</p> <p><b>Skills Builder:</b> Listening (Receiving, retaining and processing info), Speaking (The oral transmission of info and ideas), Problem solving (Find a solution to a situation or challenge), Creativity (imagination and generation of new ideas), Staying positive (The ability to use tactics and strategies to overcome setbacks), aiming high (Set clear and tangible goals), Leadership and teamwork</p>
Numeracy	drawing and interpreting graphs, using a formula.
Literacy	<p><b>Vocabulary Tier 2:</b> construct, varies, overall (net), explain, pattern, measure, drawing conclusions, difference, interact, suggest, predict, interact,</p> <p><b>Vocabulary Tier 3:</b> circuit symbols, components, series circuit, parallel circuit, potential difference, resistance, current, ammeter, battery, bulb, conductors, insulators, variables, charge, sketch, electrical field, electrostatic shocks,</p> <p><b>Reading:</b> Following a written method and read risk assessments. Students may be directed to the textbook; this could be in lesson or at home on Kerboodle.</p> <p><b>Writing:</b> Describing and explaining scientific phenomenon, free response writing for describing precautions taken, use of word mat to promote sentence formation.</p> <p><b>Oracy:</b> inclusion of BEST resources which are research evidence on common misunderstandings in science, effective diagnostic questioning and formative assessment, constructivist approaches to building understanding, and effective sequencing of key concepts that promote metacognitive talk and dialogue.</p>
Becoming future ready	<p><b>Careers/Employability:</b></p> <ul style="list-style-type: none"><li>- <i>Electrician</i></li><li>- <i>Electrical engineer</i></li><li>- <i>Sound engineer</i></li><li>- <i>Set designer</i></li></ul>
Adaptation	Throughout this topic, quality first teaching will provide differentiation:

<b>QFT/SEND Provision</b>	<p><b>By product:</b> Linear assessments and differentiated practical work.</p> <p><b>By resource:</b> Lessons are differentiated per class and students, worksheets are coloured blue if support and assessments are linear.</p> <p><b>By Intervention:</b> by providing different levels of supervision and support</p> <p><b>By Progressive Questioning:</b> exploring pupils' understanding through interactive dialogue.</p> <p><b>By Grouping:</b> according to prior attainment, gender, social preference, preferred learning style.</p> <p><b>By Task:</b> Pupils should be involved in the identification of targets which are meaningful to them and in the selection of an appropriate task from the given range.</p> <p><b>By Offering Optional Activities:</b> In class or as homework, to extend learning.</p> <p>This QFT/SEND provision will be explicit within the lesson-by-lesson schemes of work.</p>
<b>Implementation Curriculum Delivery</b>	<p>To be able to:</p> <p><i>Recognise circuit symbols for electrical components.</i></p> <p><i>Describe the function of different components</i></p> <p><i>Draw simple circuit diagrams.</i></p> <p><i>Safely construct circuits from diagrams.</i></p> <p><i>Describe the difference between series and parallel circuits.</i></p>
<b>Learning Outcomes (Core Knowledge)</b>	<p><i>Know</i></p> <ul style="list-style-type: none"> <li>- <i>State one difference between series and parallel circuits.</i></li> <li>- <i>State how potential difference varies in series and parallel circuits.</i></li> </ul> <p><i>Apply</i></p> <ul style="list-style-type: none"> <li>- <i>Describe the difference between series and parallel circuits.</i></li> <li>- <i>Describe how potential difference varies in series and parallel circuits</i></li> <li>- <i>Identify the pattern of potential difference in series and parallel circuits.</i></li> </ul> <p><i>Extend</i></p> <ul style="list-style-type: none"> <li>- <i>Predict the effect of changing the resistance of a circuit component on the overall (net) resistance of the circuit.</i></li> <li>- <i>Explain why p.d. varies in series and parallel circuits.</i></li> <li>- <i>Explain the pattern in potential difference readings for series and parallel circuits, drawing conclusions.</i></li> </ul>
	<p><i>Know</i></p> <ul style="list-style-type: none"> <li>- <i>State what current is.</i></li> <li>- <i>Use an ammeter to measure current.</i></li> <li>- <i>Identify the pattern of current in series and parallel circuits.</i></li> </ul> <p><i>Apply</i></p> <ul style="list-style-type: none"> <li>- <i>Describe how current changes in series and parallel circuits when components are changed.</i></li> <li>- <i>Describe how to measure current.</i></li> <li>- <i>Set up a circuit including an ammeter to measure current.</i></li> </ul> <p><i>Extend</i></p> <ul style="list-style-type: none"> <li>- <i>Use a model to explain how current flows in a circuit.</i></li> <li>- <i>Predict the current in different circuits.</i></li> <li>- <i>Measure current accurately in a number of places in a series circuit.</i></li> <li>- <i>Explain the pattern in current readings for series and parallel circuits, drawing conclusions.</i></li> </ul>
	<p><i>Know</i></p> <ul style="list-style-type: none"> <li>- <i>State the unit of potential difference.</i></li> <li>- <i>Name the equipment used to measure potential difference.</i></li> <li>- <i>Describe the effect of a larger potential difference.</i></li> <li>- <i>Use appropriate equipment to measure potential difference.</i></li> </ul> <p><i>Apply</i></p> <ul style="list-style-type: none"> <li>- <i>Describe what is meant by potential difference.</i></li> <li>- <i>Describe how to measure potential difference.</i></li> <li>- <i>Describe what is meant by the rating of a battery or bulb.</i></li> <li>- <i>Set up a simple circuit and use appropriate equipment to measure potential difference.</i></li> </ul> <p><i>Extend</i></p> <ul style="list-style-type: none"> <li>- <i>Explain why potential difference is measured in parallel.</i></li> <li>- <i>Predict the effect of changing the rating of a battery or bulb in a circuit.</i></li> <li>- <i>Set up and measure potential difference across various components in a circuit.</i></li> <li>- <i>Explain the difference between potential difference and current.</i></li> </ul>
	<p><i>Know</i></p> <ul style="list-style-type: none"> <li>- <i>Calculate the resistance from values of p.d. and current with support.</i></li> <li>- <i>Compare simply the resistance of conductors and insulators.</i></li> <li>- <i>List examples of conductors and insulators.</i></li> <li>- <i>Identify some of the variables in the investigation.</i></li> </ul> <p><i>Apply</i></p> <ul style="list-style-type: none"> <li>- <i>Describe what is meant by resistance.</i></li> </ul>



- Calculate resistance of a circuit.
  - Describe the difference between conductors and insulators in terms of resistance.
  - Identify independent, dependent, and control variables.
- Extend*
- Explain the causes of resistance.
  - Explain what factors affect the resistance of a resistor.
  - Compare the effect of resistance in different materials.
  - Independently select and control all the variables in the investigation, considering accuracy and precision.

- Know*
- Describe how to charge insulators.
  - State the two types of charge.
  - State what surrounds charged objects.
  - Describe what happens when you bring similarly charged objects together, and when you bring differently charged objects together.
- Apply*
- Use a sketch to explain how objects can become charged.
  - Describe how charged objects interact.
  - Describe what is meant by an electric field.
  - Interpret observations, identifying patterns linked to charge.
- Extend*
- Explain, in terms of electrons, why something becomes charged.
  - Predict how charged objects will interact.
  - Suggest ways to reduce the risk of getting electrostatic shocks.
  - Use observations to make predictions.

**Current learning  
to be developed in  
the future within:**

***Before:*** At KS2 you will have covered series circuits, but not parallel circuits. You should know the necessary precautions for working safely with electricity..

***Future:*** At GCSE you learn in more detail about series and parallel circuits. Resistance in circuits and how to investigate this.

**Assessment**

Refer to assessment maps for formative and summative assessment opportunities.

**Impact**

Attainment and Progress – Refer to assessment results / data review documentation.