DOWN AMPNEY PRIMARY SCHOOL

Term 1

Unit Overview: UKS2 Science

Electricity

National Curriculum Objectives

- Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.
- 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.
- Use recognised symbols when representing a simple circuit in a diagram.

Working Scientifically Skills

- planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.
- taking 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.
- reporting and presenting 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.

Possible misconceptions

Some children may think:

- larger-sized batteries make bulbs brighter
- a complete circuit uses up electricity
- components in a circuit that are closer to the battery get more electricity.

Substantive knowledge

- Know that adding more cells to a complete circuit will make a bulb brighter, a motor spin faster or a buzzer make a louder sound.
- Know that if you use a battery with a higher voltage, the same thing happens.
- Know that adding more bulbs to a circuit will make each bulb less bright; using more motors or buzzers, each motor will spin more slowly and each buzzer will be quieter.
- Know that turning a switch off (open) breaks a circuit so the circuit is not complete and electricity cannot flow. Any bulbs, motors or buzzers will then turn off as well.
- Recognise circuit symbols to draw simple circuit diagrams.

Disciplinary knowledge

- Incorporate a switch into a circuit to turn it on and off.
- Change cells and components in a circuit to achieve a specific effect.
- Communicate structures of circuits using circuit diagrams with recognised symbols.
- Devise ways to measure brightness of bulbs, speed of motors, volume of a buzzer during a fair test.
- Predict results and answer questions by drawing on evidence gathered.

Vocabulary

Circuit, complete circuit, circuit diagram, circuit symbol, cell, battery, bulb, buzzer, motor, switch, voltage

Phonics / polysyllabic words

Electricity (c/y)
circuit (ui)
connection (tion)
conductor (or)

Reading support

- Word mats
- Scaffolded recording / choice of recording
- Pre teaching of vocab

Extension: deeper thinking

- Describe what a fuse wire does and why it is useful.
- Interpret more complex circuit diagrams.
- Investigate how differences in voltage affect the performance of components in a circuit, taking into account external aspects that may affect results.
- Plan and carry out an investigation with a high degree of independence, considering and controlling variables.

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<table>
<tr>
<td rowspan="2">Prior learning: Yr 4 Electricity / Making Connections
❖ 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.

Future learning: KS3
❖ Electric current, measured in amperes, in circuits, series and parallel circuits, currents add where branches meet and current as flow of charge.
❖ Potential difference, measured in volts, battery and bulb ratings;
❖ resistance, measured in ohms, as the ratio of potential difference (p.d.) to current.
❖ Differences in resistance between conducting and insulating components (quantitative).
❖ Static electricity.</td>
<td></td>
<td>❖ Understand that in a series circuit the flow of electricity (current) is shared between the different loops.
❖ Suggest extensions to the games they and others build or devise alternative games.

Key People
❖ Mildred S Dresselhaus
❖ Lewis Howard Latimer</td>
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<tr>
<td>British Values
❖ Democracy: Teamwork during science investigations
❖ The rule of law Understand the importance of safety rules when working scientifically make choices when planning an investigation as others may have different points of view as to where to start.
❖ Individual Liberty: Choice to join a club- science club/ Justifying conclusion from experiments, respecting other people's results / Devising own ways to present ideas and solutions / Allow children to develop their independence, offering them opportunities to follow their own ideas and interests / Ensure that all children engage in a wide range of activities and are not limited by by gender or other stereotypes. gender or other stereotypes.
❖ Tolerance Scientific discoveries have come from other cultures and religious beliefs</td>
<td>Christian Values

❖ Courage
Asking our own questions and investigating new ideas.

❖ Respect
Supporting other's ideas, even if they differ to our own.

❖ Trust
Celebrating everyone's unique ideas and working together collaboratively.</td>
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	often compete with scientific understanding. ❖ Mutual respect Work as a team, discuss findings and 0ffer support and advice to others.	