



Year 6: Electricity



Kindness Enjoyment Achievement

Key Concepts:

If electricity is used wrongly, it can be hazardous. Be careful with leads to avoid tripping hazards; don't use electricity near any water. Keep your hands dry when using switches. Don't use electrical items with damaged leads. Don't overload plugs. The only things that go in sockets are plugs- never your fingers!

Batteries are a store of energy. This energy pushes electricity around a circuit. When the battery's energy is gone, it stops pushing. Voltage measures the "push".

The greater the current flowing through a device, the harder it works. When more batteries are included in a circuit, lamps will light up more brightly and motors work faster.

When more lamps (or other components) are added without increasing the number of batteries, they will be less bright.

Current is how much electricity is flowing round a circuit.

When current flows through wires, heat is released. The greater the current, the more heat is released.

Types of Enquiry:

Sorting and classifying:

How could you group components and appliances based on what electricity makes them do?

Fair/ comparative test:

Do all batteries push as hard as each other?

How does the voltage of batteries in a circuit

affect the brightness of the lamp?

How does the thickness of the conducting material

affect the brightness of the lamp?

Which make of battery lasts the longest?

Use of secondary sources:

How has our understanding of electricity changed over time?

Change over time:

How does the length of time I leave the current

flowing for affect the brightness of the bulb?

Does the temperature of the light bulb go up the longer it is on?

Pattern seeking:

How does the number of batteries I use affect the current that flows (ie how hard components work in a circuit)?

How does the length of wire affect how bright a bulb is?

Vocabulary:

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



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This can be useful in electrical heaters but can also be hazardous and cause fires.

Electrical symbols:



Battery



Wire



Bulb



Buzzer



Motor



Switch (off)



Switch (on)

When drawing circuit diagrams, it is usual to make them a rectangular shape for clarity. Children should be able to draw circuit diagrams from the series circuits they make. They should also be able to construct a series circuit from a diagram.

How does the number of lamps in a circuit affect how long a battery lasts?
How does the length of a wire affect how hot it becomes when it conducts? **(This is short circuiting the battery: the wire and battery will become VERY HOT- you could rest the wire on chocolate to test the heating effect- warn the children not to touch the wire OR the battery during this test)**

Working scientifically skills:

Questioning:

Observing:

Identify and classify:

Testing:

Recording:

Record using: annotated photos, labelled diagrams, observational drawings, labelled scientific diagrams or writing.

Communicating:

Use oral and written forms such as displays and other presentations to report conclusions, causal relationships and explanations of degree of trust in results.

Concluding:

How it fits in with the rest of the curriculum:

EYFS: some objects need electricity to work. A switch will turn things on and off.

Y3: (Hazard Alley trip): Know some simple safety rules when using electricity.

Y4: Identify common appliances that run on electricity.

Construct a simple series circuit., identifying and naming its basic parts including cells, wires, bulbs, switches and buzzers.

Identify whether or not a bulb will light in a simple series circuit, based on whether it is part of a complete circuit.

Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple circuit.

Recognise some common conductors and insulators, and associate metals with being good conductors.



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	<p>Discuss whether evidence from other groups and their own understanding supports or refutes their answer.</p>	<p>Know some simple safety rules when using electricity. Know how to avoid short circuiting a battery.</p> <p>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 ration of potential difference to current. Differences in resistance between conducting and insulating components (quantitative). Separation of positive or negative charges when objects are rubbed together; transfer of electrons, forces between charged objects. The idea of electric field, forces acting across the space between objects not in contact.</p> <p><u>Cross curricular links:</u> DT: Making quiz cards or traffic lights PSHE: Keeping safe Maths: measuring, length of wires.</p>
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