

Topic:	Year group	Term
Electricity	6	Autumn

Background knowledge

In year 4, the children looked at simple series circuits and drew pictorial diagrams of circuits labelling and naming the function of the components. They investigated and made simple switches explaining how they worked using their knowledge of conductors and insulators. They also covered basic electrical safety rules. A useful resource for background knowledge: Reach out CPD, Upper Primary, Electricity. When the children are recording their investigations, they should draw circuit diagrams using the new symbols they have learnt. Data loggers are available to get accurate readings to compare the brightness of the bulbs/ volume of the buzzer.

Adding more cells to a complete circuit will make a bulb brighter, a motor spin faster or a buzzer make a louder sound. If you use a battery with higher voltage the same thing happens. Adding more bulbs to a circuit will make the bulbs less bright. Using more motors or buzzers, each motor will spin more slowly and each buzzer will be quieter. Turning a switch (open) breaks a circuit so the circuit is not complete and the electricity cannot flow. Any bulb, motors or buzzers will turn off as well.

Misconceptions

When adding several components to a circuit, children may think that the bulb is the brightest or the first buzzer makes the most noise. This misconception often arises from the idea that electricity comes out of the battery so the first is the brightest and the last is the dimmest. In fact, all the bulbs would be the same level of brightness (the electricity is 'shared' between the components).

When making a circuit with different coloured wires, the children may 'wrongly' assume that the different coloured wires have different properties.

Children may think that the bigger the battery, the more electricity is contained in it and will make a bulb shine brighter. Although it is true to say a battery's voltage does affect the brightness of a bulb, the size of the battery isn't always related to the voltage e.g. a 1.5V battery can come in 4 different sizes.

What should I already know?

- I can identify and name appliances that need electricity to function.
- I can construct a series circuit.
- I can identify and name the components in a series circuit (including cells, wires, bulbs, switches and buzzers).
- I can draw a circuit diagram (as a pictorial representation).
- I can predict and test whether a lamp will light within a circuit.
- I can describe the function of a switch in a circuit.
- I can describe the difference between a conductor and insulator giving examples of each.
- I can observe patterns

National Curriculum Objectives / Key Skills	The Journey
Use recognised symbols when representing a simple circuit in a diagram. 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. Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. <u>Working scientifically</u> Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. Planning different types of scientific enquiries to answer questions, including	1. Construct and draw series circuits using symbols 2. Complete and incomplete circuits 3. Variations within circuits 4. Plan - voltage experiment 5. Investigate - voltage experiment 6. Evaluate - voltage experiment

recognising and controlling variables where necessary.

Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.

Using test results to make predictions to set up further comparative and fair tests.

Scientific enquiry

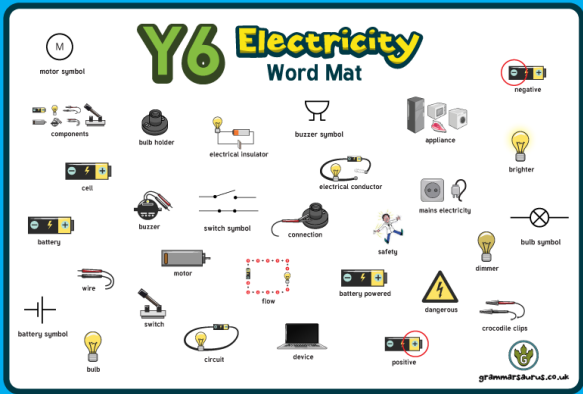


Outcomes

Working towards: With support I can use recognised symbols when representing a simple circuit in a diagram. With support I can 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. With support I can associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.

Expected: I can use recognised symbols when representing a simple circuit in a diagram. I can 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. I can associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.

Exceeding: I can use recognised symbols when representing a simple circuit in a diagram and explain the uses of each component. I can 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. I can associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit and create an investigation to show this.

Key Vocabulary	Timeline / Diagrams												
Appliance - a device or piece of equipment that has been made to perform a specific task Battery - a small item used to power small appliances Circuit - a route through which electricity flows Components - the parts of a circuit Conductor - allows electricity to flow through Electrical - something that uses electricity to work Insulator - doesn't allow electricity to flow through it Mains power - electricity provided by power stations Pylon - a tower used for keeping electrical wires above the ground Renewable energy - energy from a source that is not depleted when used, such as wind or solar power Non-renewable energy - energy from a source that is depleted when used, such as coal, gas and oil.	<table><tr><td>Light bulb</td><td></td><td>Buzzer/ Speaker</td><td></td></tr><tr><td>Cell/ Battery</td><td></td><td>Switch (open)</td><td></td></tr><tr><td>Switch (closed)</td><td></td><td>Electric motor</td><td></td></tr></table> 	Light bulb		Buzzer/ Speaker		Cell/ Battery		Switch (open)		Switch (closed)		Electric motor	
Light bulb		Buzzer/ Speaker											
Cell/ Battery		Switch (open)											
Switch (closed)		Electric motor											

Key people / places
STEM job; electrical technician, Jack Day - Electronics technician Alessandro Volta

Question of the week

Question of the Week



Sam and Ron are talking about circuits.

Why?

You must draw the components in a certain order, starting with the cell.



Sam

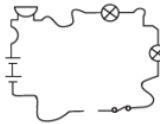
The order that you draw the components is not important if the circuit is complete.



Ron

Who do you agree with? _____

Diddy has drawn a series circuit.



a) Identify two of Diddy's mistakes.

1. _____
2. _____

Question of the Week



Diddy has been looking at series circuits.



In an incomplete circuit, the current disappears and escapes from the circuit.

Do you agree with Diddy? _____

Why? _____

Question of the Week



Diddy has been looking at variations within circuits.



If I make a circuit with one cell and keep adding bulbs, the bulbs will get brighter.

Do you agree with Diddy? _____

Why? _____
