



# Year 4: Electricity

## Kindness Enjoyment Achievement



<p><b>Key Concepts:</b> Lots of devices are powered by electricity; they need a source of electricity to work, which could be mains or battery.</p> <p><b>Health and safety:</b> NEVER put anything other than a plug in a socket, which should be switched off before you plug in. NEVER fly a kite near a pylon or climb a pylon. NEVER short circuit batteries (wire directly from one end to the other of the battery): the battery will become <b>hot enough to burn skin very quickly</b>.</p> <p><b>Complete circuits:</b> The battery/ cell's job is to push electricity to the device but it needs something to carry the electricity all the way from the supply to the device. This is called a circuit. You need a complete circuit for objects to work. Construct simple series circuits, identifying the basic parts including cells, wires, bulbs, switches and buzzers/ motors. <b>There is no need to teach</b></p>	<p><b>Types of Enquiry:</b> <u>Identify, sort and classify:</u> Sort between electrical conductors and insulators. Sort electrical devices by where their energy comes from.</p> <p><u>Fair/ comparative test:</u> Which materials conduct electricity? Which metal is the best conductor of electricity?</p> <p><u>Use of secondary sources:</u> Who invented the lightbulb: Thomas Edison or Joseph Swan? How has electricity changed the way we live? (There are links back to sustainability)</p> <p><u>Change over time:</u> How long does a battery light a torch for?</p> <p><u>Pattern seeking:</u> What happens as you add more cells to a circuit? What kinds of materials make good conductors? Which room has the most electrical sockets in a house?</p>	<p><b>Vocabulary:</b> Electricity Electric current Appliances Mains Pylon, overhead cables Crocodile clips Wires Bulb Battery/ cell Battery holder Motor Buzzer Pressure, slide and swivel switches Insulator/ conductor connection</p>
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<p><b>electrical symbols: this is covered in Y6.No need to teach parallel circuits.</b></p> <p>Identify whether or not a bulb will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery.</p> <p>If there are more batteries, they push harder and so the device will work harder (brighter/ faster/ louder)</p> <p>Switches open and close circuits; know how the bulb is affected in each case.</p> <p>Know that the poles must be aligned when using multiple batteries to allow the flow of electricity.</p>	<p><b><u>Working scientifically skills:</u></b></p> <p><b><u>Questioning:</u></b></p> <p>Independently ask questions following an enquiry using question stem cards. Make predictions for new values (e.g. if we cont to test conductors, name another metal that they think would conduct)</p> <p>Decide which type of scientific enquiry to undertake to answer a question (from 5 types of enq above)</p> <p><b><u>Observing:</u></b></p> <p>During an investigation, decide whether they need to take repeat samples (e.g to check for faulty connections)</p> <p><b><u>Testing:</u></b></p> <p>Choose type of enquiry to carry out to answer a specific question and justify their choice.</p> <p>Choose from a range of practical resources to gather evidence to answer their questions.</p> <p>Look for patterns and relationships in results.</p> <p><b><u>Recording:</u></b></p> <p>Decide on own table layout to record data; help to make decisions about how to analyse this data.</p> <p><b><u>Communicating:</u></b></p> <p>Use simple scientific language to discuss their ideas orally and in writing.</p>	<p><b><u>How it fits in with the rest of the curriculum:</u></b></p> <p>From early years: will know that some objects need electricity to work and that switches turn electrical items on and off.</p> <p>Y3: Hazard Alley trip: electrical safety in the home.</p> <p>Y6: Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.</p> <p>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.</p> <p>Use recognised symbols when representing a simple circuit in a diagram.</p>
<p><b>Conductors and insulators:</b></p> <p>Not everything can carry the electricity from the source to the device. Some materials let the electricy through (conductors) and others don't (insulators).</p> <p>Some common insulators are wood, plastic, rubber, paper, air. Many metals are conductors. Copper, graphite and silver are the best electrical conductors.</p> <p>Switches work by breaking the circuit- they include a material through which electrical current cannot</p>		<p><b><u>Cross curricular links:</u></b></p> <p>Keeping Safe.</p> <p>DT: circuits and switches, make a lighthouse/ traffic lights/burglar alarm/ quiz game.</p>



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<p>pass (often this material is air). Make different switches: paper clip swivel switch, push to make (foil pressure pad type) switch and slider switches (lolly sticks with sliding foil sleeve) Make a working electrical model.</p>	<p>Communicate their findings in ways that are appropriate for different audiences (electrical safety poster for younger children) <u>Concluding:</u> Use relevant scientific vocabulary. Draw simple conclusions based directly on straightforward evidence.</p>	
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