

Physics

Strand: Electricity

Working Scientifically Drives All of the Substantive Knowledge

NC Objectives	Key Scientific Knowledge	Key Vocabulary	Working Scientifically
Year 4			
To identify common appliances that run on electricity	<p><i>Revise: what do we know about electricity? Where do we see it/ use it? Natural/ domestic/ everyday uses?</i></p> <p>To understand that electricity is a form of energy</p> <p>To understand that some electricity has a natural 'source' e.g. lightning, nervous electricity in our bodies, but some can be harnessed/ 'man-made' e.g. electricity from power stations/ solar energy</p> <p>To identify electricity as a type of energy</p> <p>To be able to identify common appliances from everyday life which use electricity e.g. washing machine, kettle, toaster, light, stereo</p>	<p>Energy, electricity, electrical, device, appliance, energy</p> <p>Sort/ group</p>	<p><i>Chn should be able to explain that electricity is a form of ENERGY, just like light or sound.</i></p> <p>Identify and name, then sort/ group items which do/ do not use electricity.</p> <p>Ask questions: how do we know which items do/ don't use electricity? We plug them in to the 'mains' or they have a battery. List items which have batteries inside. Discuss how some items can seemingly 'store' charge e.g. kindle, iphone, ipad</p>
To construct a simple series electrical circuit, identifying and naming its basic parts, including	To be able to construct an electrical circuit and identify and name: cell (2 cells= battery), wire, bulb, switch, buzzer	Circuit, electrical, buzzer, bulb, cell, battery, wire, switch	-Children should raise questions e.g. What happens if I in a circuit?

cells, wires, bulbs, switches and buzzers			<p>-Chn consider the most appropriate method of scientific enquiry and investigate</p> <p>Chn create simple series circuit, ensuring that all items in the circuit work e.g. bulb/ buzzer/ cell.</p>
To 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	<p>To understand that in order to work, a circuit must be a complete 'loop' or circle with a cell to power the components in the circuit.</p> <p>To consider why a circuit may not be working e.g. bulb is broken.</p> <p>To understand that all circuits are based on loops and to be able to link this to everyday life where we can't 'see' the loops e.g. one cable going to a bulb can look like an incomplete circuit.</p>	Circuit, electricity, flow, bulb, loop, light up,	<p>Predict and testing what happens when bulb is not part of a loop/ incomplete circuit; chn make suggestions about why the lamp does not light up.</p> <p>Record data and present findings oral/ written</p>
To recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit	<p>To being to use some common circuit symbols e.g. wire, cell, bulb, buzzer, switch</p> <p>To identify switches in everyday life and their uses (to be able to turn on/ off).</p>	Circuit symbol, switch-open/ closed, predict,	From testing/ circuit diagrams, predict whether a circuit will light up the lamp with switch open/closed?

	To be able to describe that the switch open/ closes the circuit (open= light off, closes = light on)		
To recognise some common conductors and insulators, and associate metals with being good conductors.	<p>To be able to describe an electrical conductor as a material which will allow electricity to pass/ flow through.</p> <p>To understand how to test electrical conductivity e.g. put test item in circuit- does the bulb light up?</p> <p>To be able to identify metals as electrical conductors.</p>	Electrical conductor, insulator, conduct, metal,	<p>Test a range of everyday materials in a simple circuit; gather and record data in table; present findings and relate to a relevant use e.g. What material could I make a lightning conductor out of?</p> <p>What other materials might they want to test? What other questions does this raise? E.g. How do electricians keep safe?</p> <p>Chn can design and create their own switches using everyday items and to apply their understanding of conductors.</p>
Year 6			
To associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit	<p><i>Revise Yr 4 knowledge and vocabulary: What is a circuit/ electricity? How do we know if a circuit is not working? What does a switch do? Can we identify any components in a circuit diagram?</i></p> <p>To understand that the number of cells in a circuit affects the brightness of a bulb.</p> <p>To understand how to keep safe when working with electricity (not overloading circuit; no water nearby)</p>	<p>Electricity, energy, circuit</p> <p>Voltage, volts (V), electrical safety</p>	<p>Predict and test what happens when the number of cells in a circuit is changed. Ask questions about how the voltage might affect the brightness of the bulb/ other factors possibly affecting this.</p>

	To understand that the voltage (V) of the cell affects the brightness of the bulb.		
To 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	To know how to test what affects the brightness of a bulb e.g. fair testing- change the length of the wire and keep everything else constant.	Compare, causal, because of, fair test, variable, factor, component, brightness,	Present Findings Write detailed explanations providing causal links between e.g. voltage and brightness of bulbs/ loudness of buzzers or length of wire and brightness of bulb.
To use recognised symbols when representing a simple circuit in a diagram.	To be able to use circuit symbols to create circuit diagrams (e.g. bulb, buzzer, wire, cell, switch, motor)	Circuit symbols, circuit diagram	Create circuit diagrams using circuit symbols to represent their experiments/designs.