

# Science

## Electricity Year 6

### Remember when

Electricity is a form of energy that can be carried by wires and is used for heating and lighting, and to provide power for devices. (Y4)

Sources of light and sound may need electricity to work. (Y3/Y4)

Where electricity comes from. (Y4)

Which appliances need electricity. (Y4)

What a circuit is, the components of a circuit and how it works. (Y4)

What electrical conductors and insulators are. (Y5)

What happens when a switch is added to a circuit. (Y4)

What forces and resistance are. (Y3/Y5)

### Sticky knowledge

- Children will know that adding more cells to a complete circuit will make a bulb brighter/buzzer louder/ motor spin faster
- Children will know that adding more bulbs to a complete circuit will make the bulbs dimmer. More motors will spin slower and more buzzers will be quieter
- Children will know that turning a switch off breaks a circuit so the electricity cannot flow
- Children will know the symbols that represent bulbs, wires, buzzers, cells and motors
- Children will know how to draw simple circuit diagrams
- Changing other components in a circuit may change how a bulb, motor or buzzer performs

Circuit Symbols	
Symbol	Component
	ammeter
	battery
	bulb
	buzzer
	cell
	motor
	resistor
	switch (open)
	switch (closed)

### Key vocabulary

appliance  
battery  
bulb  
cells  
circuit  
components  
conductor  
electricity

insulator  
materials  
motor  
series circuit  
switch  
wires

### National Curriculum

- 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.

### Common Misconceptions

- Larger-sized batteries make bulbs brighter
- Complete circuit uses up electricity
- Components in a circuit that are closer to the battery get more electricity.

LO	Knowledge and Skills	Lesson outline																						
<p><b>Lesson 1</b></p> <p><b>LO:</b> To know how to make a simple circuit and explain how a switch works.</p> <p><b>Enquiry Type:</b> N/A</p>	<p><b>Sticky Knowledge:</b> Children will know that turning a switch off breaks a circuit so the electricity cannot flow</p> <p><b>Skill:</b> Report and present 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</p>	<p>Children to have wires, cell and bulb- recap prior knowledge from year 4.</p> <table border="1"> <thead> <tr> <th colspan="2">Circuit Symbols</th> </tr> <tr> <th>Symbol</th> <th>Component</th> </tr> </thead> <tbody> <tr> <td></td> <td>ammeter</td> </tr> <tr> <td></td> <td>battery</td> </tr> <tr> <td></td> <td>bulb</td> </tr> <tr> <td></td> <td>buzzer</td> </tr> <tr> <td></td> <td>cell</td> </tr> <tr> <td></td> <td>motor</td> </tr> <tr> <td></td> <td>resistor</td> </tr> <tr> <td></td> <td>switch (open)</td> </tr> <tr> <td></td> <td>switch (closed)</td> </tr> </tbody> </table>	Circuit Symbols		Symbol	Component		ammeter		battery		bulb		buzzer		cell		motor		resistor		switch (open)		switch (closed)
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<p><b>Lesson 2</b></p> <p><b>LO:</b> To know the symbols used when representing a simple circuit</p> <p><b>Enquiry Type:</b></p>	<p><b>Sticky Knowledge:</b> Children will know the symbols that represent bulbs, wires, buzzers, cells and motors</p> <p>Children will know how to draw simple circuit diagrams</p>	<p>Children will identify the scientific symbols and create diagrams with the correct symbols</p> <table border="1"> <tbody> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>Children will also be encouraged to use the correct vocab when explaining</p>																						

Research	<b>Skill:</b> Record data and results of increasing complexity using scientific diagrams and labels	A memory quiz at the end of the session will be done- children to draw and explain how a complete circuit works.	
<b>Lesson 3</b> <b>LO:</b> To know how the brightness of a lamp and volume of a buzzer can be changed by adding more or less cells  <b>Enquiry Type:</b> Pattern Seeking	<b>Sticky Knowledge:</b> Adding more cells (voltage) to a complete circuit will make a bulb brighter/buzzer louder/motor spin faster  <b>Skill:</b> Record data and results of increasing complexity using line graphs  Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings where appropriate	Children to work in groups and conduct an investigation- whether the number of cells affects the brightness of the bulb.  Prediction  Variable I will change:  Variable I will keep the same: (to make the test fair)  Results- table  Conclusion- was the prediction correct and what you found out	
<b>Lesson 4</b> <b>LO:</b> To know how the brightness of a lamp and volume of a buzzer can be changed by adding more bulbs/ buzzers  <b>Enquiry Type:</b> Pattern Seeking	<b>Sticky Knowledge:</b> Adding more bulbs to a complete circuit will make the bulbs dimmer. More motors will spin slower and more buzzers will be quieter  <b>Skill:</b> Record data and results of increasing complexity using line graphs  Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings where appropriate	Children will apply what has been learnt through the investigations and recreate a circuit with including a buzzer.  Does increasing the number cells make the buzzer louder?  Children will then draw the circuit using the scientific symbols  Prediction  Variable I will change:  Variable I will keep the same: (to make the test fair)  Results- line graph  Conclusion- was the prediction correct and what you found out	
<b>Lesson 5</b> <b>LO:</b> To be able to set up a fair test to test variations in electrical components  <b>Enquiry Type:</b> Comparative/ Fair test	<b>Sticky Knowledge:</b> Changing other components in a circuit may change how a bulb, motor or buzzer performs  <b>Skill:</b> Use test results to make predictions to set up further comparative and fair tests	Children will apply what has been learnt through the investigations and recreate a circuit with including a buzzer, bulb and motor.  Children to set up own investigations with a range of different materials.  Children will then draw the circuit using the scientific symbols  Prediction  Variable I will change:  Variable I will keep the same: (to make the test fair)  Results- graph  Conclusion- was the prediction correct and what you found out	
<b>Lesson 6</b> <b>LO:</b> To apply understanding of electricity and present findings.	<b>Sticky Knowledge:</b> Recap all sticky knowledge from this unit  <b>Skill:</b> Record data and results of increasing complexity using scientific diagrams and labels  <b>Enquiry Type:</b> N/A	Children to be given example results from a number of different experiments and present the results through different ways: bar graphs, line graphs, scatter graphs and pie charts.	
Working towards	<b>End of unit assessment</b> Working at Age related expectations		Working at a greater depth

