



Topic: Electricity

Year 4

Strand: Physics

**What I should know by the end of this unit:**

- Electricity is a form of energy
- Where electricity comes from
- Which appliances run on electricity
- How a circuit works
- Understand the difference between conductors and insulators

Key Knowledge	
Which <b>appliances</b> run on <b>electricity</b> ?	<ul style="list-style-type: none"> <li>• Some <b>appliances</b> use <b>batteries</b> and some use <b>mains electricity</b>.</li> <li>• <b>Batteries</b> come in different sizes depending on how much and for how long the <b>appliance</b> is used.</li> <li>• Common <b>appliances</b> that use <b>electricity</b>.</li> </ul> <div style="display: flex; flex-wrap: wrap; justify-content: space-around; text-align: center;"> <div style="margin: 5px;"> toaster</div> <div style="margin: 5px;"> lamp</div> <div style="margin: 5px;"> kettle</div> <div style="margin: 5px;"> laptop</div> <div style="margin: 5px;"> X-box</div> <div style="margin: 5px;"> phone</div> <div style="margin: 5px;"> torch</div> <div style="margin: 5px;"> headlights</div> <div style="margin: 5px;"> television</div> </div>
How does a <b>circuit</b> work?	<ul style="list-style-type: none"> <li>• A complete <b>circuit</b> is a loop that allows <b>electrical current</b> to flow through <b>wires</b>.</li> <li>• A <b>circuit</b> contains a <b>battery (cell)</b>, <b>wires</b> and an <b>appliance</b> that requires <b>electricity</b> to work (such as a <b>bulb</b>, <b>motor</b> or <b>buzzer</b>).</li> <li>• The <b>electrical current</b> flows through the wires from the <b>battery (cell)</b> to the <b>bulb</b>, <b>motor</b> or <b>buzzer</b>.</li> <li>• A <b>switch</b> can break or reconnect a <b>circuit</b>.</li> <li>• A <b>switch</b> controls the flow of the <b>electrical current</b> around the <b>circuit</b>. When the <b>switch</b> is off, the <b>current</b> cannot flow. This is not the same as an incomplete <b>circuit</b>.</li> </ul>
What are <b>electrical conductors</b> and <b>insulators</b>	<ul style="list-style-type: none"> <li>• When objects are placed in the <b>circuits</b>, they may or may not allow <b>electricity</b> to passthrough.</li> <li>• Objects that are made from materials that allow <b>electricity</b> to pass through a create a complete <b>circuit</b> are called <b>electrical conductors</b>.</li> </ul> <p>Objects that are made from materials that do not allow <b>electricity</b> to pass through and do not complete a <b>circuit</b> are called <b>electrical insulators</b></p>



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Procedural Knowledge

- Research how to work safely with **electricity**.
- Make a variety of **circuits**, investigating which **circuits** work and why.
- Name the basic parts including **cells, batteries, wires, bulbs, switches, motors** and **buzzers**.
- Draw **circuits** using pictorial representations (not circuitsymbols).
- Create **circuits** using **switches**.
- Investigate which materials are **electrical conductors** and **insulators**

Key Vocabulary

appliances	a <b>device</b> or machine in your home that you use to do a job such as cleaning or cooking. <b>Appliances</b> are often <b>electrical</b> .
battery	small <b>devices</b> that provide the <b>power</b> for <b>electrical</b> items such as torches
bulb	the glass part of an <b>electric</b> lamp, which gives out light when <b>electricity</b> passes through it.
buzzer	an <b>electrical device</b> that is used to make a buzzing sound
cell	a synonym for <b>battery</b>
circuit	a complete route which an <b>electric current</b> can flow around
component	the parts that something is made of
conductor	a substance that heat or <b>electricity</b> can pass through or along
current	a flow of <b>electricity</b> through a <b>wire</b> or <b>circuit</b>
device	an object that has been invented for a particular purpose
electricity	a form of <b>energy</b> that can be carried by <b>wires</b> and is used for heating and lighting, and to provide <b>power</b> for <b>devices</b>
energy	the <b>power</b> from <b>sources</b> such as <b>electricity</b> that makes machines work or provides heat
fuel	a substance such as coal, oil, or petrol that is burned to provide heat or <b>power</b>
generate	cause it to begin and develop
insulator	a non- <b>conductor</b> of <b>electricity</b> or heat
inlets	where the supply of water, <b>electricity</b> , or gas enters a building
motor	a <b>device</b> that uses <b>electricity</b> or fuel to produce movement
power	<b>Power</b> is <b>energy</b> , especially <b>electricity</b> , that is obtained in large quantities from a fuel <b>source</b> and used to operate lights, heating, and machinery
source	where something comes from
switch	a small control for an <b>electrical device</b> which you use to turn the <b>device</b> on or off
wires	a long thin piece of metal that is used to fasten things or to carry <b>electric current</b>



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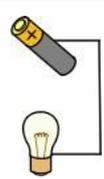
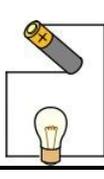
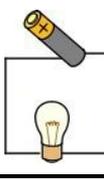
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Question 1: Another name for a battery is:	Start of unit:	End of unit:
circuit		
light		
buzzer		
cell		

Question 2: Which of these need electricity to work?	Start of unit:	End of unit:
torch		
mobile phone		
games console		
car		

Question 3: How will you know if a material conducts electricity?	Start of unit:	End of unit:
Electricity will flow freely and the circuit will work		
Electricity will not flow and the circuit will not work		
The battery will not work		

Question 4: Which of these are conductors of electricity?	Start of unit:	End of unit:
plastic comb		
cardboard strip		
aluminum spoon		
copper coin		

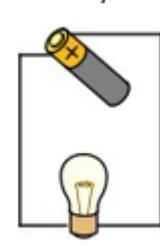
Question 5: Which of these circuits will light?	Start of unit:	End of unit:
		
		
		

Question 6: Objects that are made from materials that do <b>not</b> allow electricity to pass through are called:	Start of unit:	End of unit:
conductors		
insulators		
batteries		

Question 7: Why is it dangerous to use an electrical appliance nearwater?	Start of unit:	End of unit:

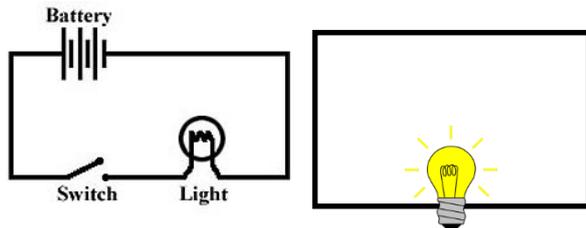
Question 8: A circuit will not work if...(tick three):	Start of unit:	End of unit:
there is no battery		
the switch is off		
there is a break in the circuit		
there is no switch		

Question 9: When more batteries are added to a complete circuit...	Start of unit:	End of unit:
the light bulb does not go on		
the light bulb becomes brighter		
the circuit does not work		
the switch goes off		

Question 10: Why will this circuit not work?	Start of unit:	End of unit:
		

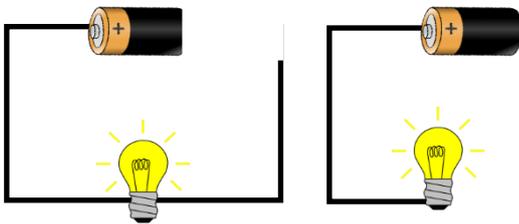


Diagrams and symbols



These are complete **circuits** - they have a **battery (cell)** and a **component (bulb)**.

The **wires** are placed in the right places of the **battery** for the **circuit** to work.



These **circuits** will not work as they are incomplete.