



## Example Planning – Year 5 Science

	Session	Main Focus	Vocab	Resources	Activity Description
1	<p><b>Circuits</b></p> <p>Make a mind map of what children already know about electricity and circuits – whole class ideas on IWB.</p> <p>Show children a CD player – How can we make the CD player work? Which would be the best way to use it in the classroom/garden?</p> <p>Provide the children with wires, bulbs, buzzers, batteries (cells). Can they name these components and guess the purpose of each in a circuit?</p> <p>Set children a challenge to make:</p> <ul style="list-style-type: none"> <li>• A circuit using a cell and one bulb so that the bulb lights up</li> <li>• A circuit using a cell so that two bulbs light up</li> </ul> <p>Discuss the brightness of the bulbs in each circuit. Can children explain why the brightness of the bulbs differs?</p>	<p>that a circuit needs a power source</p> <p>that a complete circuit is needed for a device to work</p> <p>that circuits powered by batteries can be used for investigation and experiment, appliances connected to the mains must not</p>	<p>Battery</p> <p>Bulb</p> <p>Cell</p> <p>Circuit</p> <p>Electricity</p> <p>Lead</p>	<p>CD player</p> <p>Cells</p> <p>Wires</p> <p>Bulbs</p> <p>Bulb holders</p> <p>Crocodile clips</p> <p>Pictures of circuits</p>	<p>explain why devices in some circuits shown in drawings will work but devices in other circuits will not <i>eg the switch is open so there is a break in the circuit and the bulb won't light</i></p> <p>identify the purpose of components in a circuit</p>

	<p>Provide children with drawings of circuits and ask them to explain which will work and which will not.</p> <p>Ask children to draw and annotate a complete circuit and indicate the purpose of each part. E.g. the battery provides the power/electricity.</p> <p>Discuss the dangers of electricity – look at devices which run on batteries and those which require electricity. <b>Point out that batteries can be used for investigation but appliances connected to the mains must not.</b></p>				
2	<p><b>Insulators and conductors</b></p> <p>Show the children a plastic covered lead and ask them:</p> <p><i>What is inside the plastic covering for electricity to pass through?</i></p> <p><i>What is the plastic covering for?</i></p> <p>Explain that an electrical conductor is a material that allows electricity to pass through. A material that does not allow electricity to pass through is called an insulator. (Refer back to work on materials.)</p> <p>Provide children with a range of materials and ask them how we will carry out an investigation to find out which are insulators and which are conductors.</p>	<p>that some materials are better conductors of electricity than others</p> <p>how to find out which materials allow electricity to pass through them</p> <p>to use results to draw conclusions about which materials conduct electricity</p> <p>that metals are good conductors of electricity, most other materials are not and that metals</p>	<p>Circuit</p> <p>Conductor</p> <p>Insulator</p>	<p>4F PM1</p> <p>Wires</p> <p>Bulbs</p> <p>Bulb holders</p> <p>Cells/batteries</p> <p>Crocodile clips</p> <p>Range of materials:</p> <p>Nails</p> <p>Paper clips</p> <p>Coins</p> <p>Lolly stick</p>	<p>construct a circuit to test which materials let electricity pass through</p> <p>explain that with some materials the bulb did not light because the circuit was not complete</p> <p>make a generalisation about which materials did/did not conduct electricity <i>eg metals let electricity pass, plastics did not, metals are good conductors of electricity and plastics are not</i></p> <p>explain that metals are used <i>eg for cables and wires</i> because they are good conductors and</p>

	<p>Ask them to predict which objects will allow electricity to pass through (conductor) and which will not let electricity to pass through (insulator).</p> <p>Record results on 4F PM1 (Science directions teaching file).</p> <p>Discuss results and identify a pattern – all metals are conductors and other materials are not.</p>	<p>are used for cables and wires, plastics are used to cover wires and as covers for plugs and switches</p>		<p>Scissors</p> <p>Corks</p> <p>Fabric</p> <p>Plastic bag/carton</p> <p>Safety pins</p> <p>Spoons</p> <p>Forks</p>	<p>plastics <i>eg for plugs</i> because they are insulators</p>
3	<p><b>Switches</b></p> <p>Demonstrate a range of switches on familiar devices and how they can be used to turn devices on or off. <i>Can children think of any other appliances which use switches? What does the switch do?</i></p> <p>Ask children:</p> <p><i>Why is it useful to use switches in circuits?</i></p> <p><i>How do switches work?</i></p> <p>Show children a simple aluminium foil ‘fold switch’ and ask them to make one to control a circuit.</p> <p>Ask children:</p>	<p>that a switch can be used to make or break a circuit to turn things on or off (using both batteries or mains)</p>	<p>Switch</p> <p>Conductor</p>	<p>4F PM2</p> <p>Aluminium foil</p> <p>Paper clips</p> <p>Split pins</p> <p>Card</p> <p>Wires</p> <p>Bulbs</p> <p>Batteries/cells</p> <p>Bulb holders</p>	<p>construct a circuit in which a switch turns a specific device on or off explain how their switch works</p>

	<p><i>Why is aluminium used in this switch?</i></p> <p><i>Could we use cling film instead?</i></p> <p>Ask the children to make another switch using split pins and paper clips.</p> <p>Ask:</p> <p><i>Why is a paperclip used in this type of switch?</i></p> <p><i>Could we use a match stick instead of a paper clip?</i></p> <p>Ask children to practice making different types of circuit using bulbs, motors and buzzers.</p> <p>Ask them to draw and annotate their circuits.</p> <p>(See 4F PM2 – Science directions teachers file)</p> <p>Discuss possible problems of the bulb not lighting/buzzer not sounding etc.</p>			<p>Crocodile clips</p> <p>Motors</p>	
4	<p><b>Bulb Brightness and combining cells</b></p> <p>Provide children with cells, bulbs, bulb holders, wires and crocodile clips.</p> <p>Demonstrate what happens when more bulbs are added to a circuit. (bulbs should be dimmer)</p> <p>Ask questions:</p> <p><i>Why are the bulbs so dim?</i></p> <p><i>How could you make them brighter?</i></p> <p><b>Point out to children that bulbs and motors are designed to be used with batteries of a</b></p>	<p>to make predictions about the effect of including additional batteries in a circuit</p> <p>that care needs to be taken when components in a circuit are changed to ensure bulbs/motors do not burn out</p>	<p>Cell</p> <p>Battery</p> <p>Circuit</p> <p>Brightness</p> <p>Dim</p>	<p>Cells of different volts</p> <p>Bulbs</p> <p>Bulb holders wires crocodile clips</p> <p>Planning sheet</p>	<p>describe what is likely to happen <i>eg it may be brighter but it may burn out</i></p> <p>describe how device and battery should be matched <i>eg if it's a 1.5 volt bulb it needs a 1.5 volt battery</i></p> <p>suggest a way of changing the brightness</p>

	<p><b>particular voltage and that if the voltage is exceeded the device may burn out.</b></p> <p>E.g. a 2.5V bulb needs a 2.5V battery</p> <p>Provide a few examples of when the bulb may be brighter/dimmer and burn out.</p> <p>Ask children to explore what happens to the brightness of the bulb when more than one battery is used in a circuit.</p> <p>Ask them to make a simple circuit and suggest how they might measure the brightness of the bulbs:</p> <p>Complete experiment planning sheet:</p> <ul style="list-style-type: none"> <li>• Draw the circuit you are going to use.</li> <li>• What are you going to change?</li> <li>• What do you think will happen?</li> <li>• How will you measure the brightness of the bulb?</li> <li>• Table of results</li> <li>• What have you found out?</li> </ul> <p>Discuss results.</p>	<p>how to change the brightness of bulbs and speed of a motor in a circuit</p> <p>to make suggestions about what can be investigated and predictions about what will happen</p> <p>to plan to change one factor and keep others constant</p> <p>to make comparisons indicating whether the results support the prediction made</p>			<p>of a bulb and predict what will happen <i>eg if we use two bulbs it won't be as bright as with one; if we use two batteries the bulb will be brighter</i></p> <p>compare circuits fairly by changing one factor at a time</p> <p>make comparisons <i>eg with two batteries the bulb is much brighter than with one but if we used three batteries the bulb might burn out; or when we used one bulb it was quite bright, with two bulbs it was dim and with three bulbs you could hardly see them and decide whether the prediction was right</i></p>
5	<p><b>Making use of electricity</b></p> <p>Set children a task in order to put their understanding of circuits into action.</p> <p>Challenge:</p>			<p>Cells of different volts</p> <p>Bulbs</p> <p>Bulb holders</p> <p>wires</p> <p>crocodile clips</p>	

<p><i>Work in small groups to make a torch for Harold Carter. The torch must have a fully working circuit with a bulb that is effective to help him when he is working in the tombs. Harold Carter must be able to switch his torch on and off!</i></p> <p>Provide them with a selection of cells, bulbs, bulb holders, wires and crocodile clips.</p> <p>When children have completed their task, encourage them to talk about the circuit they have used and how it works.</p> <p>Write an explanation as to how it works with an annotated diagram.</p>			Planning sheet	
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