

Environmental Studies

Topic: Electricity

Class: Primary 7 **Dates:**

Please give an overview of the topic including ES outcomes and key features to be covered.

<p>Environmental studies outcomes</p> <p>Science</p> <ul style="list-style-type: none"> • Living things • Energy and forces • Earth and space <p>Social subjects</p> <ul style="list-style-type: none"> • People and place • People in the past • People in society <p>Technology</p> <ul style="list-style-type: none"> • Technology capability <p>Skills strands</p> <ul style="list-style-type: none"> • Knowledge and understanding • Preparing for tasks • Carrying out tasks • Reviewing and reporting on tasks • Developing informed attitudes <p>Significant outcomes and strands from other curricular areas</p> <p>ES:</p> <p>EL:</p> <p>M:</p> <p>EA:</p> <p>RME:</p> <p>HE:</p> <p>ICT:</p>	<p>Science</p> <p>AO: energy and forces</p> <p>Properties and uses of energy – Level C</p> <ul style="list-style-type: none"> • construct simple battery operated circuits, identifying the main components • classify materials as electrical conductors or insulators and describe how these are related to the safe use of electricity <p>Properties and uses of energy – Level D</p> <ul style="list-style-type: none"> • describe the effect of changing the number of components in a series circuit <p>Conversion and transfer of energy – Level C</p> <ul style="list-style-type: none"> • give examples of energy being converted from one form to another <p>Conversion and transfer of energy – Level D</p> <ul style="list-style-type: none"> • give some examples of energy conversions involved in the generation of electricity • describe how electrical energy is distributed to our homes • name some energy resources <p>Skills in science: investigating – Level C</p> <p>Preparing for the task</p> <ul style="list-style-type: none"> • suggest a question for exploration and decide how they might find out an answer • make reasoned predictions about a possible outcome • suggest ways of making a fair test <p>Carrying out the task</p> <ul style="list-style-type: none"> • select and use appropriate measurement devices or make appropriate observations • record findings in a greater range of ways <p>Reviewing and reporting on the task</p> <ul style="list-style-type: none"> • make a short report of an investigation, communicating key points clearly • explain what happened, drawing on their scientific knowledge • make links to original predictions <p>Skills in science: investigating – Level D</p> <p>Preparing for the task</p> <ul style="list-style-type: none"> • identify two or three questions to investigate • provide reasons for planning decisions • include fair testing in planning by changing one factor • show awareness of the significance of variables <p>Carrying out the task</p> <ul style="list-style-type: none"> • make an appropriate series of accurate measurements • select an appropriate way of recording findings <p>Reviewing and reporting on the task</p> <ul style="list-style-type: none"> • make an organised report of an investigation using appropriate illustrations • provide explanations related to scientific knowledge • draw conclusions consistent with findings • identify limitations of approach used • vocabulary
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Environmental studies

Development of topic

Electricity

Please develop topic by listing key questions and learning activities to be carried out and resources to be used.

Key questions/learning activities	Teacher's notes	Resources	Assessment	Evaluation
1. What is electricity? <ul style="list-style-type: none"> pre-topic assessment, what do pupils know about electricity? what appliances use electricity and what would life be like without electricity? make a record chart of the information 		Renfrewshire Pack/SOLSN CD-ROM	Pre-topic assessment <ul style="list-style-type: none"> discussion record chart 	
2. Why must we take care when using electricity? <ul style="list-style-type: none"> discuss and highlight electrical safety the children should identify and prepare a list of the potential hazards in the home, school and the community and suggest ways in which these can be avoided prepare a labelled poster promoting electrical safety skill – interpreting and evaluating; draw conclusions 			Discussion Completed list Completed poster	
3. How does a light bulb light? <ul style="list-style-type: none"> pupils will use equipment provided and in groups try to light the light bulb discuss how the light bulb can be made to light introduce the word circuit, highlighting and explaining the role of each component in the circuit role play to visualise/reinforce how a circuit works record findings using report format skills – observing and measuring; interpreting and evaluating; reporting and presenting 	Take care that the battery voltage is about the same as that marked on the bulb. To work a circuit must be complete and connected to both terminals of a live battery. Look out for bulbs with broken filaments. When drawing circuit, pupils might wish to use arrows to show flow of electricity. We show the direction of current from the positive (+) terminal to the negative (-). Many pupils believe that electricity flows from both terminals, to 'clash' in the bulb to give out light. In reality the flow is in one direction and occurs throughout the circuit, including the battery itself. Copper wires can become dull in colour due to a reaction with oxygen in the air. They will work better if their ends are cleaned up with fine sandpaper.	Equipment from electricity box	Discussion/ observation of children as they work Report writing – completed report	
4. How does a switch work? <ul style="list-style-type: none"> ask children to add a switch to their circuit discuss what happens when the switch is closed – highlight that the circuit is complete and the electricity flows what happens when the switch is open? record findings using report format Skills – observing and measuring; interpreting and evaluating 			Discussion/ observation of children as they work Report writing – completed report	

<p>5. How can circuits be drawn/recorded?</p> <ul style="list-style-type: none"> • discuss difficulties with recording circuits • introduce the commonly used symbols for wires, bulbs, switches and batteries • record these symbols on worksheets and draw circuit diagrams of the circuits already completed • skills – recording 	<p>The symbols should include: battery, wire, bulb, switch, motor, bell, buzzer.</p>	<p>Renfrewshire Pack/SOLSN CD-ROM</p> <p>Equipment from electricity box</p>	<p>Worksheet activities</p> <p>Discussion with children as they work</p>	
<p>6. What else can be included in a circuit?</p> <ul style="list-style-type: none"> • follow on from circuit diagrams – introduce the symbols for motors and buzzers • draw circuit diagrams on the blackboard – pupils will construct circuits • skills – interpreting and evaluating 			<p>Completed circuits – children able to identify the components of the circuit</p>	
<p>7. How does a light bulb light?</p> <ul style="list-style-type: none"> • pupils will construct a test circuit and investigate a range of materials to identify which type of materials conduct electricity (conductors) and those which do not (insulators) • discuss and identify groups • using their previous knowledge of how switches work pupils will identify suitable materials and construct their own switches • skills – observing and measuring; recording; interpreting and evaluating 	<p>Make sure that your circuit will work properly with the proper match between battery and device to be operated</p>	<p>BP Link personnel to assist with workshop sessions</p>	<p>Discussion/ observation of children as they work</p> <p>Recording</p>	
<p>8. What happens in a circuit when additional bulbs are added?</p> <ul style="list-style-type: none"> • plan a fair test using a different number of bulbs • pupils will identify variables, predict, record findings and write a report – including a circuit diagram • discuss findings – identify this as a series circuit • discuss where series circuits would be used • skills – predicting; observing and measuring; interpreting and evaluating; presenting and reporting 	<p>The more bulbs in a circuit, the less bright they become. If one bulb ‘blows’ the circuit is broken and no other bulbs will light (this happens with some Christmas tree lights). If more batteries are added to a circuit (remember + to –) then a bulb becomes brighter; if too much electricity flows, the bulb will ‘burn out’. Bulbs are made to match a certain number of batteries. Multiple batteries are usually used in torches to give a very bright light.</p>		<p>Observation of children as they work</p> <p>Recording</p> <p>Report writing – completed report</p>	