

Question: **How could we survive without electricity for one day?**

Why is electricity a vital part of our ever day lives?

National Curriculum Link

Science Y4: Electricity

KS2 Science Working Scientifically

IB Learner Profile Links

Inquirers – Nurture skills for research and curiosity

Knowledgeable – Develop conceptual understanding and engage with issues and ideas

Communicators – Express yourself confidently and work cooperatively to solve problems

Thinkers – Use critical and creative thinking skills

Reflective – Consider the wider world and our own ideas and experience

Risk-takers – Work independently and cooperatively to explore ideas and innovative strategies

Prior Skills – Y3 (Light)

- Understand that electricity can produce light
- Recognise that they need light in order to see things
- Recognise that dark is the absence of light
- Make and record a prediction before testing
- Measure using different equipment and units of measure
- Record their observations in different ways (labelled diagrams, charts etc.)
- Describe what they have found using scientific words
- Make accurate measurements using standard units
- Explain what they have found out and use their measurements to say whether it helps to answer their question

New Skills – Y4

- Identify common appliances that run on electricity
- Construct a simple series electric circuit
- Identify and name the basic part in a series circuit, including cells, wires, bulbs, switches and buzzers
- 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
- Recognise that a switch opens and closes a circuit
- Associate a switch opening with whether or not a lamp lights in a simple series circuit
- Recognise some common conductors and insulators
- Investigate materials to identify that metals with being good conductors
- Ask a variety of scientific questions
- Make systematic and careful observations
- Set up a simple fair test to make comparisons
- Plan a fair test and isolate variables and explain why it was fair and explain which variables have been isolated
- Suggest improvements and predictions
- Decide which information needs to be collected and decide which is the best way for collecting it
- Use findings to draw a

Future Skills – Y6

- Identify, name and use the basic parts of a simple electric series circuit (cells, wires, bulbs, switches, buzzers, motors)
- Use recognised symbols when representing a simple circuit in a diagram.
- Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells (batteries) 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
- Ask a variety of types of scientific questions
- Choose the most appropriate scientific enquiry method to answer a question and outline the method
- Plan and carry out an investigation by controlling variables fairly and accurately
- Make predictions based on scientific knowledge
- Draw conclusions from

	<p>simple conclusion</p> <ul style="list-style-type: none"> • Report on findings from enquires in a range of different ways, including oral and written explanations. 	<p>observations and findings based on scientific knowledge</p> <ul style="list-style-type: none"> • Report and present findings from enquiries, including conclusions in oral and written forms such as displays and other presentations
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Knowledge, Skills and Understanding for topic area

- Identify common appliances that run on electricity
- Construct a simple series electric circuit
- Identify and name the basic part in a series circuit, including cells, wires, bulbs, switches and buzzers
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- Recognise some common conductors and insulators
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Knowledge, Skills and Understanding for Working Scientifically

- Ask a variety of scientific questions
- Make systematic and careful observations
- Set up a simple fair test to make comparisons
- Plan a fair test and isolate variables and explain why it was fair and explain which variables have been isolated
- Suggest improvements and predictions
- Decide which information needs to be collected and decide which is the best way for collecting it
- Use findings to draw a simple conclusion
- Report on findings from enquires in a range of different ways, including oral and written explanations.

Challenge

- Can they explain how a bulb might get lighter?
- Can they recognise if all metals are conductors of electricity?
- Can they work out which metals can be used to connect across a gap in a circuit?
- Can they explain why cautions are necessary for working safely with electricity?
- Can use test results to make further predictions and set up further comparative tests?

Resources

- Bulbs
- Bulb holders
- Buzzers
- Motors
- Switches
- 20 + batteries different types
- Battery holders
- Crocodile clips
- Circuit board (optional – one to show)
- Sample materials – metal spoons, paper clips, aluminium foil, copper coins, rubbers, plastic rulers, card, graphite, pencils, wood.
- Materials for making games linked to electricity.

Suggested Quality Texts

Non-fiction: Books in library linked to topic

Fiction: Magic School Bus Electric field trip – Joanna Cole

The Electric storm Anne Capeci

Website/Apps

Links to practical experiments to try out and reading journals.

www.primaryupd8.co.uk

Electrical circuits

<http://www.hyperstaffs.info/work/physics/child/index.html>

Brilliant website <http://www.andythelwell.com/blobz/guide.html>

Electrical dangers in the home

<http://www.switchedonkids.org.uk/electrical-safety-in-your-home>

<http://www.juniorcitizen.org.uk/kids/electricalsafety/electricalsafety.php>

Extended Writing Opportunities

Children write a letter to their parents explaining about spending a day without electricity and asking for their support for this to happen at home also.

Non chronological about the importance of electricity today, compare and contrast with the past.

Explanation of how electricity powers something.

Instructions for making a game linked to electricity element.

Numeracy Skills

Draw Bar charts 1:1, 1:2, 1:5 & 1:10 scale. Frequency table and results tables.

Wow starter/experience

Visit to the Catalyst Museum Manchester. Opportunity for a Mad Science show and workshop activities linked to Electricity.

Cross Curricular Links/Enquiry time:

DT: Children to design and make a game which they could play as an alternative to an electrically powered game. Make 3D models and toys. Use bulbs and batteries to light vehicles a dolls' house, traffic lights, dragon or monster's eyes.

Make a 'steady hand game with a buzzer.

Art: Make a card with something that flashes inside it. E.g. A birthday cake with flashing candles.

Make 3D models and toys. Use bulbs and batteries to light vehicles, a lighthouse, a toy theatre, a dolls' house, traffic lights, dragon or monster's eyes. Make a 'steady hand game with a buzzer. Make a toy vehicle or model move with a small electric motor.

Cut out pictures of electrical appliances and machines to make collages. Sort out according to use, e.g. light, heat, sound, moving things, and make a chart.

'Lights in the gloom' pictures: Use the wax resist or wax and scratch technique to make pictures of Christmas tree lights, lightning flashes, lampposts, lit windows of a cityscape, fairground lights, a lighthouse, etc.