

Introduction

In this year 4 unit about electricity, children will learn about common electrical appliances and how to construct simple series circuits. They will become familiar with the key words linked to the topic and how to apply them appropriately. Children will learn about cells, wires, bulbs and buzzers and about the different types of switches. They will be able to troubleshoot and identify whether or not a bulb will light in a simple series circuit and be able to identify a complete circuit. The children will also learn about conductors and insulators and know that metals are very good electrical conductors.

Accompanying this unit is a helpful [Knowledge Organiser](#) that collates the key subject knowledge for the unit and is used throughout the lessons. [Reasoning Cards](#) to develop deeper thinking skills in science are provided within this unit.

Health and Safety

Lessons 2, 3 and 4

Children will be using electrical equipment to build their own circuits. Electrical equipment should be stored safely and always checked for any wear and tear before children use it. Batteries should always be removed from battery cases to prolong their life and stop corrosion. You must assess all risks involved with the activities in this resource and provide suitable supervision. Twinkl cannot be held responsible for, and shall not accept any liability arising from, any activity.

Children should be reminded to disconnect their circuits if they are not using them as the bulbs can get hot. They should also be reminded to report any broken equipment to the responsible adult in charge.

If using an energy ball, please note that bringing conductive materials or electronic devices close to the energy ball may cause the glass to become hot. The high voltage radio frequency energy coupled to them from within the ball may cause a mild electric shock to the person touching it, even through a protective glass casing. Please ensure children are supervised at all times when near the energy ball.

Activities listed within the resource should always be supervised by an appropriate adult. Children should be supervised when using sharp items, such as scissors or other tools. By using this resource, you acknowledge that it is the responsibility of supervising adults to ensure the safety of children in their care and that we will accept no liability as a result of the activity.

Lesson 5

Children should be reminded how to use and split pins safely and be closely supervised by an adult when making holes in card (using sticky tack behind the hole) and when handling split pins. Remind children of the safety measures used when working with electricity, as followed in earlier lessons. Recap that they should not be experimenting with switches (or any electrical items or electricity) without suitable adult supervision and should only use proper school electricity kit equipment which is specifically for school circuit building.

Some ingredients and/or materials used might cause allergic reactions or health problems. You should ensure that you are fully aware of the allergies and health conditions of those taking part. If you have any concerns about your own or somebody else's health or wellbeing, always speak to a qualified health professional. Activities listed within the resource should always be supervised by an appropriate adult. Children should be supervised when using sharp items such as scissors or other tools. Please make sure you are aware that children may put craft items into their mouths, and that they should wash their hands afterwards. By using this resource, you acknowledge that it is the responsibility of supervising adults to ensure the safety of children in their care and that we will accept no liability as a result of the activity.

Home Learning

Electricity Crossword

In this task, children look at the clues and fill in the crossword with key words associated with the electricity unit.

Circuits

In this task, children complete the questions by troubleshooting the problems with different circuits. They must identify whether the circuits are complete or not. As the questions progress, the children are encouraged to show deeper understanding by offering their thoughts on the brightness of the bulbs or how to fix an incomplete circuit.

Interests and Talents/Broader Development

Children may be interested in developing their knowledge of the different ways that energy can be generated and looking at how some energy companies offer 'green' tariffs.

Some children may have a special interest in electricity because a family member works in the trade. Exploring the health and safety precautions that are obeyed within industry will help to alleviate any fears that they may have about loved ones.

Children may have a special interest in animals that utilise electricity (e.g. electric eels, angler fish). This might be a way to engage them with a different aspect of electricity.

Digital Resources

The following resources are not essential to use as part of the PlanIt unit; however, they would help children to revise and consolidate the learning in the lessons. Please be aware that in order to access these digital resources, you will need to have an 'Ultimate' subscription.

[Interactive Electricity Word Search.](#)

[Circuit Components Animation with Etta and Granbot.](#)

Assessment Statements

By the end of this unit...

Working Towards the Expected Level:

Scientific Knowledge

- Children can define what an electrical appliance is and are starting to identify those that are mains- or battery-powered.
- With support, children can identify different circuit components and explain what they do.
- With support, children can build series circuits, identifying whether they are complete or incomplete.
- With support, children can explain what electrical conductors and insulators are and give some examples of these.
- With support, children can identify some different switches and start to explain how switches work in a circuit.
- With support, children can apply their knowledge of electricity to different situations.

Working Scientifically

- With support, children can group and classify things (appliances) and record their findings using labelled diagrams.
- With support, children can use a range of (electrical) equipment and record findings using labelled diagrams.
- With support, children can make predictions, use a range of (electrical) equipment and draw simple conclusions from their results.
- With support, children can decide how to set up a simple practical enquiry, make predictions and draw simple conclusions from their results.
- With support, children can report and present their results and conclusions to others in oral forms.
- With support, children can use straightforward scientific evidence to answer questions and identify similarities, differences, patterns and changes relating to simple scientific ideas and processes.

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Working At the Expected Level:

Scientific Knowledge

- Children can define what an electrical appliance is and identify those that are mains- or battery-powered.
- Children can identify different circuit components and explain what they do.
- Children can build series circuits, identifying and explaining whether they are complete or incomplete.
- Children can explain what electrical conductors and insulators are and give several examples of these.
- Children can identify several different switches and explain how switches work in a circuit.
- Children can apply their knowledge of electricity to different situations.

Working Scientifically

- Children can group and classify things (appliances) and record their findings using labelled diagrams.
- Children can use a range of (electrical) equipment and record findings using labelled diagrams.
- Children can make predictions, use a range of (electrical) equipment and draw simple conclusions from their results.
- With some guidance, children can decide how to set up a simple practical enquiry, make predictions and draw simple conclusions from their results.
- Children can report and present their results and conclusions to others in oral forms.
- Children can use straightforward scientific evidence to answer questions and identify similarities, differences, patterns and changes relating to simple scientific ideas and processes.

Working At Greater Depth:

Scientific Knowledge

- Children can define what an electrical appliance is and identify a variety of appliances that are mains- or battery-powered, including more unusual appliances.
- Children can confidently identify different circuit components and explain what they do. They can explain the terms 'battery' and 'cell'.
- Children can confidently build series circuits, identifying and explaining whether they are complete or incomplete. They can independently explain how to make an incomplete circuit complete.
- Children can confidently explain what electrical conductors and insulators are and give a range of examples of these.
- Children can identify a range of different switches and confidently explain how switches work in a circuit.
- Children can confidently apply their knowledge of electricity to different situations in depth.

Working Scientifically

- Children can confidently group and classify things (appliances) and record their findings independently using labelled diagrams. They can use their scientific reasoning skills to answer questions on these classifications.
- Children can confidently use a range of (electrical) equipment and record findings using labelled diagrams. They can identify patterns in their results.
- Children can independently make predictions, use a range of (electrical) equipment and draw simple conclusions from their results.
- Children can independently decide how to set up a simple practical enquiry, make predictions and draw simple conclusions from their results.
- Children can confidently report and present their results and conclusions to others in oral forms.
- Children can confidently and independently use straightforward scientific evidence to answer questions and identify similarities, differences, patterns and changes relating to simple scientific ideas and processes.

Lesson Breakdown

1. Appliances

Identify common appliances that run on electricity.

Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions.

To classify and present data, identifying common appliances that run on electricity.

Resources

[Lesson Pack](#)

Standard School Equipment:

- Sticky notes
- Flipchart/whiteboard



60 mins

2. Making Circuits

Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.

Making systematic and careful observations, using a range of equipment.

Recording findings using labelled diagrams.

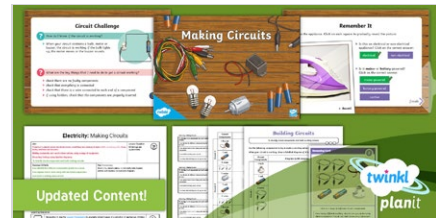
To identify circuit components and build working circuits.

Resources

[Lesson Pack](#)

Standard School Equipment:

- Circuit equipment: bulbs, wires, buzzers, motors, cells (batteries), switches and bulb/battery holders (if needed for your specific equipment)



90 mins

3. Complete Circuits

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.

Setting up simple practical enquiries, comparative and fair tests.

Making systematic and careful observations, using a range of equipment.

Using results to draw simple conclusions.

To investigate whether circuits are complete or incomplete.

Resources

[Lesson Pack](#)

Standard School Equipment:

- Circuit equipment: bulbs, wires, cells (batteries) and bulb/battery holders (if needed for your specific equipment)

Resources That May Need Purchasing:

- Energy Ball or similar. Alternatively, you could find a suitable video of one being used.



70 mins

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4. Conductors and Insulators

Recognise some common conductors and insulators, and associate metals with being good conductors.

Setting up simple practical enquiries, comparative and fair tests.

Using results to draw simple conclusions.

To investigate which materials are electrical conductors or insulators.

Resources

[Lesson Pack](#)

Standard School Equipment:

- Circuit equipment: bulbs, wires, cells (batteries) and bulb/battery holders (if needed for your specific equipment)
- Coins, plastic rulers, paper, aluminium foil, metal paperclips, rubbers and other classroom materials suitable for the conductor/insulator investigation (ideally wood, glass or fabric ones)

Resources That May Need Purchasing:

- Energy ball (used in an earlier lesson) or a suitable video.



60 mins

5. Switches

Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit.

Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.

To explain how a switch works in a circuit, build switches and report my findings.

Resources

[Lesson Pack](#)

Standard School Equipment:

- Circuit equipment: a range of suitable school electricity kit switches (if available), wires, bulbs, cells (batteries), bulb/battery holders (if needed for your equipment)
- Split pins
- Binder clips
- Cardboard
- Paperclips
- Modelling clay/sticky tack or a hole punch



90 mins

6. Electrical Discussions

Using straightforward scientific evidence to answer questions or to support their findings.

Identifying differences, similarities or changes related to simple scientific ideas and processes.

To discuss and solve problems about electricity using reasoning skills.

Resources

[Lesson Pack](#)

[Watt's in a Circuit? eBook](#)

Standard School Equipment:

- If demonstrating any of the circuits - bulbs, wires, cells, switches, bulb/battery holders, paperclip with a plastic covering



60 mins