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| <b>Lesson</b>   | 2 of 5 | <b>National Curriculum links</b>   | <b>Key lesson question</b>   | <b>How do we draw circuits using scientific symbols?</b> |
| <b>Learning objective</b>   |        | <b>NC Y6:</b><br>Children will: <ul style="list-style-type: none"> <li>• use recognised symbols when representing a simple circuit in a diagram</li> </ul> <b>Working scientifically:</b> <ul style="list-style-type: none"> <li>• recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs</li> </ul> | <b>Resources</b>   |  |
| I can use scientific symbols to draw circuit diagrams for simple series circuits. |        |  | <ul style="list-style-type: none"> <li>• lesson presentation (PPT)</li> <li>• activity worksheet</li> <li>• focus assessment sheet</li> <li>• electrical components for pairs or groups of children</li> <li>• component symbol sheet</li> </ul> |  |

## Teaching input

- **Scientific enquiry types and skills** – Review the ‘scientific enquiry types’ and ‘working scientifically skills’ the children will use in this lesson, highlighted on the slide.
- **How can circuits vary?** – The slide shows the lesson questions the children will answer in this unit. The current lesson’s question is highlighted on the slide.
- **Key vocabulary for this lesson** – Go through the key vocabulary for this lesson and their definitions. Have any of the children heard these words before? Did they already know their meanings?
- **Problem solving** – Introduce Millie. Choose a child to read what Millie says about the scientific enquiry type, ‘Problem solving’. Go through the keyword and its definition in the ‘New word alert!’ box.
- **Word detective** – Read through the information on the slide.
- **Build a circuit** – The children are to make a circuit that lights up a bulb when they close the switch. Then, they are to draw a diagram of their circuit on a piece of paper. Children may have been introduced to circuit diagrams previously, so use this activity to assess prior knowledge. Take feedback from the class before the answers are displayed on the following slide.
- **Symbols** – Read through the information on the slide. Children are introduced to the standard scientific symbols that are used to represent each of the different components. The children are to look at the symbols on their component symbol worksheets. They will use these throughout the lesson. Read through the facts in the ‘Did you know?’ box.
- **Circuit diagrams** – The children are to draw a circuit diagram for the simple series circuit displayed on the following four slides on another piece of paper using the component symbols on their worksheets. Children should ensure that there are no gaps between any of the lines, and there should not be a line through the bulb or other components. Take feedback from the class before the answers are revealed on the following slides.
- **Cells and batteries** – When including two or more cells in a circuit, the cell symbol can be combined or use the battery symbol, which has a dotted line to represent more than two cells. The children are to discuss the question on the slide with their learning partners, in groups or as a class. Take feedback from the class before the answers are revealed on the following slide.
- **Spot the error** – The children are to spot the mistakes in the circuit diagrams on the slide with their learning partners, in groups or as a class. Three common mistakes that are made when drawing circuits have been given as examples here. Take feedback from the class before the answers are revealed on the following slide.
- **Activity** – The children are to use the electrical components on their component symbol worksheet to make the circuits listed on their activity worksheets and draw accurate circuit diagrams using the correct symbols.
- **Challenge** – The children are to look at the circuit diagram on the slide and discuss the question with their learning partners, in groups or as a class. The cells in this circuit have been placed with the positive terminals facing towards each other. You could model this or get the children to try it out and observe that the electricity will not flow around the circuit, and neither of the bulbs will be lit. Take feedback from the class before the answers are revealed on the following slide.

## Main activity

Children are given a list of components that they should use to create four different circuits. They should then draw an accurate circuit diagram to represent the circuit.

## Challenge

Look at the series circuit: When the switch is closed, will one bulb, two bulbs or no bulbs light up? The cells in this circuit have been placed with the positive terminals facing towards each other. You could model this or get the children to try it out and observe that the electricity will not flow around the circuit and neither of the bulbs will be lit.

## Cumulative quiz questions

4. Match the component and the symbol
5. Which circuit diagram matches the circuit?
6. What error has been made in drawing this circuit diagram?

## Self-assessment

- I can use symbols to represent components in a circuit.
- I can draw a circuit diagram to represent a series circuit.
- I can spot and correct errors in circuit diagrams.

## Key vocabulary

**component** – part of an electrical circuit that helps it function e.g. light bulb  
**circuit** – an electrical circuit is a pathway (normally wires) through which electricity flows  
**series circuit** – a circuit where the components are connected in a single path  
**terminal** – the ends of a cell or battery have a positive + and a negative - terminal