

Nova's Night-time Circuit Challenge

Learning objective: To understand the components of a simple circuit and how changing the voltage of cells affects a bulb's brightness.

Read the passage carefully, then answer the questions below. Ensure you use scientific vocabulary in your answers.

Nova the barn owl was busy setting up a starlit display for her friends. She connected a small bulb to a battery using copper wires to create a simple series circuit. 'The flow of electricity is like a river,' Nova hooted thoughtfully. She noticed that when she used a single 1.5V cell, the bulb glowed with a soft, steady light. However, when she added a second cell to the circuit, the bulb shone much brighter. Nova checked the connections, ensuring there were no gaps in the wires, which would break the circuit and stop the current from flowing. She learned that the bulb's filament converts electrical energy into light and heat. If she used a material that was an insulator, like a plastic straw, instead of the copper wire, the current would stop immediately because the electrons could not flow through the material. With her circuit perfected, Nova felt ready to teach her friends how energy transforms during the night.

Word bank: circuit · component · voltage · conductor · insulator · filament · brightness · cell

1. Identify two components Nova used to build her simple series circuit. (2 marks)

2. What happened to the brightness of the bulb when Nova added a second cell to the circuit? (2 marks)

3. Why did the bulb stop glowing when Nova replaced the copper wire with a plastic straw? (2 marks)

4. Explain why Nova needed to ensure there were no gaps in the wires. (2 marks)

5. Do you think it is more important to have a strong power source or good conductors in a circuit? Justify your opinion. (3 marks)

Draw: Draw a scientific diagram of a simple circuit featuring one cell, one switch, and one bulb, using standard circuit symbols.



Extension challenge: Research how a motor behaves differently to a bulb when the voltage is increased in a circuit. Write two sentences explaining your findings.