

Year 5 Design Technology: Introduction to Electronic Systems

Learning objective: To understand the components of a simple circuit, identify symbols, and apply knowledge of switches and conductivity in design.

Read each question carefully. Use your scientific and technical knowledge to explain how electronic components function within a circuit. Ensure your answers are clear and use accurate terminology.

Max the monkey is designing a glowing warning sign for his treehouse hideout. He has decided to use a simple series circuit to power an LED. He must choose his materials carefully to ensure the electricity flows correctly while keeping his design safe for his friends.

Word bank: Circuit · Conductivity · Insulator · Component · Switch · Battery · Terminal · Voltage

1. Name two essential components required to create a complete circuit that powers a bulb. (2 marks)

2. Explain the difference between a conductor and an insulator. Provide one example of each material that Max might use in his project. (3 marks)

3. Max wants to add a switch to his circuit so the light can be turned off during the day. Describe how a switch works to break or complete a circuit. (3 marks)

4. Compare and contrast a series circuit with two bulbs versus a series circuit with one bulb. What happens to the brightness of the bulbs and why? (4 marks)

5. Max is buying components for his sign. A battery pack costs £2.50, an LED costs £0.75, and a switch costs £1.20. If he buys two battery packs and three LEDs, what is the total cost? (3 marks)

6. Justify why it is important for Max to use insulated wire when connecting his battery to his LED. What might happen if the insulation was damaged? (5 marks)

Draw: Draw a circuit diagram for Max's warning sign. Include the symbols for one battery (cell), one switch, and one LED. Use a ruler to draw your connecting wires.



Extension challenge: Design a new electronic feature for Max's treehouse, such as an automatic alarm or a light-sensitive sensor. Explain how your chosen components would interact to achieve this. Total: /25