

Design Technology: Engineering an Electronic Gadget

Learning objective: To design a functional electronic product, identifying key components and explaining how a circuit powers a chosen design.

Follow the structure below to detail your electronic invention. Use technical vocabulary to explain how your device works and consider the user experience.

Max the monkey has challenged us to create an innovative electronic device that solves a common problem using a simple series circuit.

Word bank: conductive · insulator · switch · circuit · resistor · power source · prototype · user-friendly · integrated · subsequently · furthermore · consequently

1. Product Concept: Describe your invention and explain why it is a useful addition to the home or classroom. Start with: 'My design is a... which aims to solve the problem of...' (2 marks)

2. Circuit Components: List the essential components required for your device (e.g., cell/battery, bulb, motor, switch, wires). Explain why these specific components are necessary. Start with: 'To function correctly, my circuit requires... because...' (3 marks)

3. Technical Process: How will you ensure the electricity flows through the circuit effectively? Explain how the switch will control the flow of current. Start with: 'The flow of electricity is controlled by... when the switch is closed, the circuit...' (3 marks)

4. Safety and Materials: Compare and contrast the materials you have chosen for the casing. Why is it important to use insulators around your conductive wiring? Start with: 'For the outer casing, I have chosen... to ensure safety because...' (2 marks)

5. Justification: Justify why your design is better than a non-electronic alternative. What might happen if the battery power was insufficient? Start with: 'My electronic design offers... compared to a manual version. If the voltage were too low, the device would...' (3 marks)

6. Evaluation: Imagine you are testing your prototype. What specific criteria would you use to measure its success? Start with: 'To evaluate the effectiveness of my invention, I would test...' (2 marks)

Extension challenge: Design a 'Budget Breakdown' table for your gadget. If a battery costs £1.50, a motor costs £2.25, and wiring/switches cost £0.75, calculate the total cost for 10 units. If you sold each unit for £7.50, what would your total profit be? Explain how you might reduce these costs without compromising the quality of the electronics.