

Kit's Electronic Invention Blueprint

Learning objective: To design a functional electronic product using components such as switches, bulbs, and buzzers while understanding circuit safety and efficacy.

Kit the fox needs your help to design a new electronic gadget! Use this template to plan your invention. Think about how your circuit will function, the materials you will need, and how to make your design safe and user-friendly. Ensure you justify your design choices using your knowledge of electrical components.

Word bank: circuit · component · conductive · insulator · voltage · switch · buzzer · resistor · series · parallel · prototype

1. Invention Purpose: Describe what your electronic device does and who it is designed to help. Explain why this invention is necessary. (3 marks)

2. Circuit Components: List the essential components required for your circuit. Justify why you have chosen these specific items to achieve your goal. (4 marks)

3. Safety Features: Explain the measures you have taken to ensure your device is safe to use. What might happen if the circuit were to overheat or short-circuit? (3 marks)

4. Budgeting: If a battery pack costs £2.50, a buzzer costs £1.25, and a pack of wires costs £0.80, calculate the total cost for five prototypes. Show your working out. (3 marks)

5. Component Arrangement: Compare and contrast using a series circuit versus a parallel circuit for your design. Which would be more efficient and why? (4 marks)

6. Design Evaluation: If your device fails to function during testing, what systematic steps would you take to identify and resolve the fault? (3 marks)

Draw: Draw a detailed schematic diagram of your electronic invention. Label your components clearly (e.g., cell, bulb, switch) and use arrows to show the flow of electricity.



Extension challenge: Imagine your invention is being manufactured for sale. Write a persuasive 'pitch' for Kit the fox, explaining why a shop should stock your product and how its design improves upon existing technology.