

Max's Electronic Circuit Design Lab

Learning objective: To design, document, and evaluate a functional electrical circuit incorporating a switch, power source, and output component.

Welcome to the Lab! Max the monkey needs your help to build a gadget. Follow this template to plan your electronic project. First, choose your components, then describe how your circuit will function, and finally, evaluate your design. Remember to use technical vocabulary to explain how the flow of electricity creates your desired effect.

Word bank: circuit · component · power source · switch · conductor · insulator · bulb · buzzer · motor · flow · complete · series

1. Project Goal: Describe the device you are building and explain the purpose of your circuit. What specific problem is your electronic gadget solving? (3 marks)

2. Component List: List the three essential components you need to create a complete circuit. Explain why each one is necessary for the circuit to function. (4 marks)

3. Scientific Reasoning: Explain why a switch is a vital component in your design. How does it change the state of the circuit when it is opened or closed? (3 marks)

4. Predicting Outcomes: What might happen if you accidentally used an insulator instead of a conductor in your circuit? Justify your answer using your knowledge of materials. (4 marks)

5. Comparative Analysis: Compare the use of a buzzer to a motor as an output component. In what situation would one be more effective than the other? (4 marks)

6. Evaluation: If your circuit fails to work upon testing, describe the step-by-step process you would use to identify and resolve the fault. (4 marks)

Extension challenge: Design a 'Greater Depth' extension: Imagine you are tasked with adding a second bulb to your circuit. Construct a logical argument explaining whether you would connect the bulbs in a series circuit or a parallel circuit to ensure they both shine with maximum brightness. Justify your decision using your understanding of how electricity flows through different pathways.