

Max's Engineering Workshop: The Art of Prototyping

Learning objective: To understand the purpose of prototyping in Design Technology by selecting appropriate materials and justifying design choices for a functional product.

Max the Monkey is designing a new, sturdy basket to carry his fruit collection to the top of the jungle canopy. He needs your help to create a prototype. Read the scenario for each stage of his design process, then answer the questions to explain your reasoning as a junior engineer.

Word bank: prototype · evaluation · functionality · materials · iteration · durability · modification · specification

1. Max initially uses paper to build his basket. It collapses under the weight of five apples. Why is a prototype essential here before he builds the final version using expensive materials? Explain your reasoning. (3 marks)

2. If Max wants his basket to be waterproof to protect his berries from rain, compare and contrast the suitability of using cardboard versus plastic mesh as a prototyping material. (3 marks)

3. Max decides to add a handle. He has a budget of £5.00 for his final product and spends £1.50 on woven seagrass. If he needs to buy four metal hooks at 60p each, does he have enough money left? Show your calculation. (3 marks)

4. Justify why it is better to identify a flaw in a prototype made of scrap materials rather than waiting until the finished product is constructed. (3 marks)

5. What might happen if Max skipped the prototyping phase entirely and went straight to building his final basket? Predict two potential consequences. (4 marks)

6. If the basket is too heavy for Max to carry, suggest a modification he could make to his design. Explain how you would test if your modification was successful. (4 marks)

Draw: Draw a labelled sketch of a prototype basket. Use arrows to point out which materials you have chosen for the base, the sides, and the handle, and explain why you chose those specific materials for durability.



Extension challenge: Design a 'testing plan' for Max. List three specific tests he should perform on his basket prototype (e.g., a weight test or a shake test) and explain what success would look like for each test.