

Max's Mechanical Masterpiece: Designing a Moving Toy

Learning objective: To design, create, and evaluate a functional mechanism using levers and linkages.

Read the prompts below to help you structure your design proposal. Max the monkey needs your help to build a moving toy for his forest friends. Use the word bank to help make your writing more descriptive.

My mechanical toy design features a clever lever system that creates an exciting movement when the handle is pushed.

Word bank: pivots · linkages · levers · fulcrum · mechanism · friction · sturdy · furthermore · consequently · in contrast · specifically

1. What is the intended purpose of your moving toy, and which specific mechanism will you use to make it function? Explain why you chose this design. (3 marks)

2. Describe the materials you have selected to ensure your mechanism is durable. Justify your choices by comparing them to alternative materials you could have used. (3 marks)

3. How will you position the fulcrum to ensure the lever moves effectively? What might happen if the fulcrum is placed too close to the edge? (3 marks)

4. Identify one potential challenge you might face when assembling your linkages. How will you overcome this problem to ensure the toy moves smoothly? (3 marks)

5. If you were to sell your toy to the forest friends for £2.50, how would you ensure the quality of the finish justifies the price? Explain your reasoning. (2 marks)

6. Evaluate your design: What is the most innovative part of your mechanism, and how does it enhance the user's experience? (2 marks)

Extension challenge: Design a 'Mark II' version of your toy. How could you incorporate a second lever or a rotating wheel to create a more complex, multi-stage movement? Write a paragraph explaining the scientific principles behind your upgraded design.