

Max's Mechanical Marvels

Learning objective: To understand how mechanisms such as gears, pulleys, and levers transmit and change motion to create movement in a product.

Read each question carefully and use your knowledge of mechanisms to explain how different parts work together. Max the Monkey needs your help to build a new playground toy!

Max the monkey is designing a new system to elevator heavy baskets of fruit to his treehouse. He is experimenting with simple machines to make the job easier. He needs to understand how to transfer force and change the speed or direction of movement using different mechanical components.

Word bank: gear · lever · pivot · pulley · load · effort · friction · rotation

1. Max wants to use a lever to elevator a heavy crate. Define what a 'pivot' is in this context and explain why it is essential for a lever to work effectively. (2 marks)

2. If Max connects two gears together, and the first gear turns clockwise, which direction will the second gear turn? Explain your reasoning. (2 marks)

3. Describe the difference between a 'load' and an 'effort' when using a pulley system to hoist an object. (2 marks)

4. Max notices that his wooden gears are getting stuck. Suggest one way he could reduce the friction between the moving parts. (2 marks)

5. If you wanted to make a mechanical toy move faster, would you choose a larger gear to drive a smaller gear, or a smaller gear to drive a larger one? Explain why. (2 marks)

Draw: Draw a labelled diagram of a simple lever system. Clearly label the 'effort', the 'load', and the 'pivot'.



Extension challenge: Imagine you are designing a mechanical gate for a zoo. Write a short paragraph explaining which mechanism (a gear, pulley, or lever) you would use to open it and why.