

Max's Mechanical Masterclass Quiz

Learning objective: To identify and explain the function of mechanical systems including levers, pulleys, and gears.

Help Max the monkey solve his mechanical puzzles! Read each question carefully and circle your answer or write your response in the space provided.

Answer Key: 1. A (Gear), 2. True, 3. Pulley, 4. C (Pivot), 5. False, 6. Effort, 7. B (To increase force), 8. Lever, 9. A mechanism that uses wheels to change direction or speed, 10. True. Greater Depth: 1. Gears change rotational speed or direction. 2. A lever reduces the effort needed to lift a load by increasing distance from the pivot. 3. Pulleys allow us to lift heavy objects by changing the direction of the force. 4. Friction can slow down movement or wear out parts. 5. If a gear is missing, the mechanical chain is broken, stopping movement. 6. Design a pulley system to lift a 2kg weight using minimal force.

Word bank: Lever · Pulley · Gear · Pivot · Load · Effort · Mechanism · Friction

1. Which component consists of a toothed wheel used to transmit motion? A) Gear* B) Pulley C) Pivot D) Axle (1 mark)

2. True or False: A lever is a simple machine that uses a rigid bar to lift a load. (1 mark)

3. What type of mechanism uses a wheel and a rope to lift heavy items with less effort? (1 mark)

4. The point upon which a lever turns or balances is called the: A) Effort B) Load C) Pivot* D) Gear (1 mark)

5. True or False: Adding lubricant to a mechanism increases friction. (1 mark)

6. In a lever system, the force applied by the user is known as the _____. (1 mark)

7. Why do we use a system of gears in a clock? A) To make it look shiny B) To change the speed or direction of rotation* C) To stop it from breaking D) To hold the batteries (1 mark)

8. Which simple machine would be most effective for prising open a heavy wooden crate? (1 mark)

9. 9. Define the term 'mechanism' in your own words. (1 mark)

10. 10. True or False: A larger gear turning a smaller gear will cause the smaller gear to spin faster. (1 mark)

Draw: Draw a diagram of a simple seesaw. Label the 'Pivot', the 'Load' (a 5kg sack of bananas), and the 'Effort' (Max the monkey pushing down).



Extension challenge: Greater Depth Challenges: 1. Explain why gears are used in bicycles to climb steep hills. 2. Compare and contrast how a pulley and a lever help humans move heavy objects. 3. Justify your answer: Why is it important to consider friction when designing a moving toy? 4. What might happen if the teeth on two meshed gears were different sizes? 5. If you were designing a lifting machine for an elephant, would you choose a pulley or a lever? Justify your choice. 6. If a gear system costs £15 to build and you sell it for £25, how much profit is made on 12 units?