Max’s Mechanical Marvels: Levers and Pulleys Quiz

Learning objective: To understand how levers and pulleys act as simple machines to increase force or change the direction of a load.

Max the monkey is busy building a new treehouse! Use your knowledge of simple machines to help him solve these mechanical puzzles. Read each question carefully and select or write the best answer.

Answer Key: 1: C, 2: True, 3: Fulcrum, 4: B, 5: False, 6: Load, 7: A, 8: True, 9: Effort, 10: Pulley. Greater Depth Guidance: Ensure pupils use precise terminology when justifying their answers, focusing on the relationship between distance from the pivot and the force required.

Word bank: Fulcrum · Load · Effort · Pivot · Pulley · Mechanical advantage · Gravity · Resistance

1. 1. Max is using a long branch as a lever. What is the name of the fixed point the lever turns on? A) The load B) The force C) The fulcrum* D) The pulley (1 mark)

2. 2. True or False: Using a pulley allows you to change the direction of the force applied to lift an object. (1 mark)

3. 3. If Max wants to lift a heavy rock with less effort, should he move the fulcrum closer to the rock or further away from it? (One-word answer) (1 mark)

4. 4. Which of these is an example of a lever? A) A door handle B) A pair of scissors* C) A flag pole D) A screw (1 mark)

5. 5. True or False: A single fixed pulley reduces the amount of weight you have to lift. (1 mark)

6. 6. In a lever system, what do we call the object being moved or lifted? (1 mark)

7. 7. Max needs to lift a basket of fruit to his treehouse. Which machine is best for lifting heavy loads vertically? A) Pulley* B) Wheelbarrow C) Inclined plane D) Wedge (1 mark)

8. 8. True or False: The longer the lever arm, the less effort is usually needed to move a heavy load. (1 mark)

9. 9. What is the term for the amount of physical force exerted to operate a machine? (1 mark)

10. 10. If you use a system of multiple wheels and ropes to lift a bucket, you are using a: A) Lever B) Pulley* C) Spring D) Gear (1 mark)

Draw: Draw a diagram of a lever being used to lift a heavy stone. Clearly label the 'Fulcrum', the 'Load', and the point where you apply 'Effort'.

Extension challenge: 1. Justify why a builder would choose a pulley system over a lever to lift materials to the top of a three-storey building. 2. Compare and contrast the way a seesaw works to the way a pair of tweezers works. 3. What might happen if the fulcrum on a lever were made of a soft, squishy material instead of a hard, fixed one? 4. Explain why moving the fulcrum closer to the load makes the task easier. 5. If a pulley kit costs £12.50 and a lever kit costs £8.75, calculate the total cost for Max to buy both. How much change would he get from £25.00? 6. Design a new tool for Max that combines a lever and a pulley; explain how it would function.