Max’s Mechanical Marvels: A Design Technology Quiz

Learning objective: To identify and describe the function of mechanical systems including levers, linkages, and cams to create movement in products.

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

Answer Key: 1.C, 2.True, 3.Lever, 4.A, 5.False, 6.Pivot, 7.B, 8.True, 9.Cam, 10.A. Extension Task: Pupils should explain that a linkage allows movement to be transferred from one part of a model to another, often changing the direction or distance of the motion.

Word bank: Lever · Pivot · Linkage · Cam · Follower · Mechanism · Friction · Motion

1. 1. Which mechanical component rotates to push a 'follower' up and down? A) Lever B) Hinge C) Cam* D) Axle (1 mark)

2. 2. True or False: A lever is a simple machine that helps us lift or move heavy objects with less effort. (1 mark)

3. 3. What do we call the fixed point on which a lever turns or balances? (One word answer) (1 mark)

4. 4. Which system uses a series of connected strips to create complex movement? A) Linkage* B) Pulley C) Gear D) Spring (1 mark)

5. 5. True or False: Mechanisms only work using electricity. (1 mark)

6. 6. What is the specific term for the joint that allows two parts of a mechanism to rotate or swing? (One word answer) (1 mark)

7. 7. If you want to change circular motion into vertical motion, which part is most essential? A) A fixed base B) A cam* C) A glue stick D) A cardboard box (1 mark)

8. 8. True or False: Friction can sometimes slow down a mechanism, making it harder to operate. (1 mark)

9. 9. Max is building a pop-up toy. Which component would be best to make a figure move up and down rhythmically? (One word answer) (1 mark)

10. 10. Why is the shape of a cam important? A) It determines the pattern of the movement* B) It dictates the colour C) It makes the model lighter D) It prevents rust (1 mark)

Draw: Draw a diagram of a simple lever mechanism. Label the 'pivot', the 'effort' (where you push), and the 'load' (the object being moved).

Extension challenge: Max has been tasked with creating a mechanical toy for a school fair. He has a budget of £5.00 for materials. 1. Justify why a linkage might be more effective than a single lever for a complex toy design. 2. Explain what might happen to the movement if the pivot point on a lever is moved closer to the load. 3. If Max buys cardboard for £2.50 and brass fasteners for £1.20, how much change does he have, and how could he use that remaining money to improve his mechanism's durability?