Nova’s Forces and Motion Challenge

Learning objective: To identify and describe the effects of forces on objects, including magnetism, friction, and air resistance.

Join Nova the owl for a night-time science mission! Read each question carefully and select the best answer or write your explanation. Remember to think about how things move and interact in our world.

Answer Key: 1. A (Force); 2. True; 3. Friction; 4. B (Rough surface); 5. False (They attract); 6. Gravity; 7. Air resistance; 8. C (They slow the object down); 9. True; 10. Pull.

Word bank: friction · magnetism · resistance · surface · gravity · force · repel · attract

1. 1. What is the scientific name for a push or a pull? A) Energy *B) Force C) Speed D) Weight (1 mark)

2. 2. True or False: Friction is a force that acts in the opposite direction to movement. (1 mark)

3. 3. Which force slows down a toy car when it rolls across a carpet compared to a smooth wooden floor? (1 mark)

4. 4. Which surface creates the most friction? A) Polished glass B) Rough sandpaper C) Smooth ice D) Plastic (1 mark)

5. 5. True or False: Opposite poles of two magnets (North and South) will repel each other. (1 mark)

6. 6. What is the name of the invisible force that pulls objects towards the centre of the Earth? (1 mark)

7. 7. When a parachute opens, what force acts against gravity to slow the person down? (1 mark)

8. 8. How do surface textures affect the speed of a moving object? A) They don't affect it B) They speed it up *C) They can slow it down D) They make it fly (1 mark)

9. 9. True or False: Magnets can exert a force without touching an object. (1 mark)

10. 10. To open a heavy door, do you usually apply a push or a pull force? (1 mark)

Draw: Draw a diagram showing Nova the owl dropping a feather and a stone at the same time. Label the forces of gravity and air resistance acting on both items.

Extension challenge: Greater Depth Challenges: 1. Explain why a racing car driver might choose tyres with very little tread for a dry track. 2. Compare and contrast the movement of a ball on grass versus ice; justify your answer using the concept of friction. 3. What might happen if the force of gravity suddenly became much weaker on Earth? 4. Design an experiment to test which material creates the least friction for a sliding block. 5. If you were building a bridge, how would you use your knowledge of forces to ensure it stays standing? 6. Justify why air resistance is important for a skydiver.