Forces and Motion with Nova the Owl

Learning objective: To identify that some forces require contact to act, and to explore the effects of friction on different surfaces.

Read each question carefully and use your knowledge of forces to answer. Remember to use scientific vocabulary where possible.

Nova the owl is observing how objects move across the forest floor. Whether she is sliding a wooden block across a tree stump or watching a pebble roll through the grass, she knows that forces are at work every single day.

Word bank: friction · surface · force · contact · resistance · grip · smooth · rough

1. Nova pushes a toy car across a carpet and then across a smooth wooden floor. On which surface will the car travel further and why? (2 marks)

2. Define what 'friction' is in your own words. How does it affect the movement of an object? (2 marks)

3. Give one example of a contact force and one example of a non-contact force (such as magnetism). (2 marks)

4. If you were designing a new pair of trainers for running, would you make the soles smooth or rough? Explain your reasoning using the word 'grip'. (2 marks)

5. Look at these items: a magnet, a football, a glue stick, and a compass. Which one uses a non-contact force to work? (1 mark)

Draw: Draw a diagram showing a ball rolling down a ramp. Add arrows to show the direction of the movement and the direction of the friction acting against the ball.

Extension challenge: Nova wants to test which materials provide the most friction. Design a simple experiment using a toy car, a ramp, and three different materials (like foil, sandpaper, and felt) to test how far the car travels on each.