Nova’s Forces Challenge: Understanding How Things Move

Learning objective: To identify the effects of air resistance, water resistance, and friction, and to explain how gravity acts on objects.

Read each question carefully and use your knowledge of forces to provide clear, scientific explanations. Make sure to use the correct terminology.

Word bank: Gravity · Friction · Air resistance · Water resistance · Surface · Opposing force · Newton · Mass

1. Nova the owl is watching a leaf fall from a tree. Explain why the leaf eventually reaches the ground and name the force that pulls it downwards. (2 marks)

2. Max is pushing a heavy wooden crate across a carpeted floor. He notices it is much harder to push than it was on the smooth kitchen tiles. Explain why this happens using the term 'friction'. (2 marks)

3. Finn the dolphin is swimming through the ocean. Explain what 'water resistance' is and how it affects Finn as he tries to swim quickly. (2 marks)

4. Kit the fox designs a paper parachute. Explain how 'air resistance' helps the parachute fall slowly to the ground instead of dropping like a stone. (2 marks)

5. If Max wants to reduce the friction on his crate, suggest one practical change he could make to the surface or the object to help it move more easily. (1 mark)

Draw: Draw a diagram of a cyclist riding a bike. Use arrows to label the direction of movement, the force of gravity, and the air resistance pushing against the cyclist.

Extension challenge: Research how 'streamlining' helps vehicles like racing cars or aeroplanes travel faster. Write a short paragraph explaining why these shapes are designed the way they are.