Nova’s Forces and Friction Challenge

Learning objective: To identify the effects of air resistance, water resistance, and friction as forces that act between moving surfaces.

Nova the Barn Owl has been observing how different objects move. Below is a list of scenarios involving forces. For each question, decide whether the force being described is friction, air resistance, or water resistance, and explain how it affects the object's movement.

Word bank: Friction · Air resistance · Water resistance · Surface · Streamlined · Opposing force

1. A cyclist is pedalling quickly on a flat road. As they speed up, they feel a force pushing against them from the air. What is this force, and what happens to the cyclist if they crouch down to become more streamlined? (2 marks)

2. Max the monkey is sliding a heavy wooden crate across the playground floor. The crate stops moving when he lets go. Why does the crate stop, and what would happen if the floor were covered in ice? (2 marks)

3. Finn the dolphin is swimming through the ocean. He has a streamlined body shape. How does his shape help him move through the water compared to a flat, square-shaped object? (2 marks)

4. If you rub your hands together quickly, they get warm. Which force is responsible for this heat, and why does it occur? (2 marks)

5. A parachute uses a large canopy to slow down a skydiver. Which force is the parachute using to keep the skydiver safe, and how does the size of the canopy change this force? (2 marks)

Draw: Draw a diagram of a racing car. Use arrows to show the direction the car is travelling and use a different coloured arrow to label the air resistance pushing against it.

Extension challenge: Design an experiment to test which surface creates the most friction: carpet, wood, or tile. Write down your prediction: which surface will allow a toy car to travel the furthest distance and why?