

Nova's Guide to Invisible Forces

Learning objective: To identify the effects of air resistance, water resistance, and friction, and understand how they act between moving surfaces.

Read the passage carefully and answer the questions below. Ensure you use full sentences for your answers.

Nova the barn owl loves to glide silently through the night sky. While observing her flight, she ponders the invisible forces at work. When Nova spreads her wings, she pushes against air particles. This is called air resistance, a type of friction that acts against her motion. To fly faster, Nova tucks her wings to become more aerodynamic, reducing the drag caused by the air. Down in the pond, Finn the dolphin experiences water resistance, which is much stronger than air resistance because water is denser than air. Finn must use his powerful tail to push through the water. Meanwhile, on the ground, Leo the lion walks across the grass. He relies on friction between his paws and the earth to move forward; without this grip, he would slide around like he was on ice. Whether it is an object moving through a fluid or sliding across a solid, forces are always working to change speed or direction. Nova knows that understanding these invisible pushes and pulls is the key to mastering movement in our world.

Word bank: resistance · friction · surface · gravity · aerodynamic · velocity

1. According to the text, what is air resistance? (2 marks)

2. Why does Finn the dolphin have to work harder to move than Nova does in the sky? (2 marks)

3. What does the author mean when they describe Nova as being 'aerodynamic'? (2 marks)

4. Why would Leo the lion struggle to walk if the ground were covered in smooth, slippery ice? (2 marks)

5. Do you think life would be easier if friction did not exist? Explain your reasoning using an example from the text. (3 marks)

Draw: Draw a diagram showing Nova the owl flying and Finn the dolphin swimming. Use arrows to show the direction of the water or air resistance pushing back against them.



Extension challenge: Research how sports equipment, such as racing bicycles or swimming costumes, are designed to reduce resistance. Write a short paragraph explaining your findings.