

Forces and Motion: Mastery Flashcards

Learning objective: To identify, explain and analyse the effects of different forces, including gravity, air resistance, water resistance and friction.

Use these flashcards to test your knowledge of forces. Nova the owl suggests you read the front, try to articulate the scientific principle, then reveal the answer to check your understanding.

What is the force of gravity?

Gravity is a non-contact force that pulls objects towards the centre of the Earth, giving objects weight.

How does friction affect a moving object?

Friction is a contact force that acts between two surfaces rubbing together, which slows down moving objects and produces heat.

What is air resistance?

A type of friction caused by air particles pushing against a moving object, often slowing it down as it travels through the atmosphere.

Explain the role of water resistance for a submarine.

Water resistance is a force that acts on objects moving through water; a submarine must be streamlined to reduce this drag and move efficiently.

Define a 'mechanism' in the context of forces.

A device, such as a pulley, lever, or gear, that allows a smaller force to have a greater effect, helping us lift or move heavy loads.

Why do larger parachutes fall more slowly?

A larger parachute has a greater surface area, which increases the amount of air resistance pushing upwards against it.

What is the unit used to measure force?

Force is measured in Newtons (N), named after the scientist Sir Isaac Newton.

Compare and contrast air resistance and water resistance.

Both are types of drag (friction) that oppose motion. Water resistance is generally much stronger because water is denser than air.

Justify why ice skaters wear blades to move across a rink.

The thin blade reduces the surface area in contact with the ice, which minimises friction, allowing the skater to glide with minimal resistance.

What might happen if there were no friction at all on Earth?

Without friction, objects would never stop moving once they started, and it would be impossible for us to walk, hold objects, or drive vehicles safely.

Explain why a crumpled piece of paper falls faster than a flat sheet.

The flat sheet has a larger surface area exposed to air resistance, which causes it to experience more upward force than the crumpled sheet.

How do gears act as a force multiplier?

Gears use teeth of different sizes to change the speed or force of a rotation, allowing a small input force to create a large output force.