



Forces

Year 5

Knowing More, Remembering More

Remembering previous learning

What is a force? Forces are pushes or pulls.

What is a contact force? A push or a pull that affects objects which are touching.

What is friction? Friction is a contact force that pushes against a moving object.

What does Friction cause? Friction can make objects slow down or stop.

What type of surface has low friction? Smooth surfaces, such as ice, wood and plastic, have lower levels of friction.

What type of surface has high friction? Rough surfaces, such as concrete, sand and carpet, have higher levels of friction.

The smoother the surface, the further an object will travel. The rougher the surface, the slower an object will travel.

In this unit children will:

- Explain that unsupported objects fall towards the Earth because of the force of gravity acting between Earth and the falling object
- Identify the effects of air resistance, water resistance and friction, that act between moving surfaces
- Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect

Key Learning Steps

1. Friction
2. Air resistance
3. Plan - parachute experiment
4. Investigate - parachute experiment
5. Evaluate - parachute experiment
6. Plan - water resistance
7. Investigate - water resistance
8. Explore gravity
9. Use small forces for greater effects

Working Scientifically:

- 5.3 Make predictions based on scientific knowledge.
- 5.5 With support, plan different types of scientific enquiry. Where appropriate, identify the dependent, independent and controlled variables.
- 5.7 Take accurate measurements using a range of scientific equipment. Start to repeat readings when appropriate.
- 5.10 Report and present findings from enquiries, including conclusions.
- 5.11 Begin to identify cause and relationships in oral and written forms such as displays and other presentations.
- 5.12 Use scientific evidence to answer questions.
- 5.13 Make conclusions based on scientific evidence and from their own testing and findings.

Key Vocabulary:

- force
- contact force
- non-contact force
- friction
- motion
- air resistance
- drag
- streamline
- surface area
- water resistance
- gravity
- independent variable
- dependent variable
- controlled variable
- weight
- lever
- gear
- pulley
- machine
- repeatability
- precision
- anomalous result

Key Scientists:



Classic
Archimedes
 (c.287 - c.212 BC)
 Ancient Greek physicist and engineer.



Classic
Sir Isaac Newton
 (1642 - 1727)
 English scientist and mathematician.



Contemporary
Torin Clark
 Investigating artificial gravity.

Knowing More, Remembering More

Knowing more in Y5

What makes stationary objects move? When the force applied is greater than the friction an object will move.

What does friction cause? Friction can make objects slow down or stop. It can also cause some materials to wear away.

What does friction produce? Friction produces heat.

What is air resistance? Air resistance is a friction force between the air and a moving object which can slow objects down. The larger the surface area, the _____ an object takes to reach the ground.

What is water resistance? Water resistance is a type of force caused by friction which slows things down that are moving through a liquid. Water resistance occurs in all liquids, not just water.

What does streamline mean? Having a shape that has little resistance to a flow of air or water.

What is gravity? Gravity is an invisible force that pulls things towards the centre of the earth.

How quickly do objects fall to the earth? Heavier objects do not fall to the ground quicker than lighter objects.

What is a gear? Gears are wheels with teeth that allow a small force to produce a larger force with greater speed.

What is a lever? A lever is a bar resting on a pivot used to move heavy objects.

What is a pulley? Pulleys use a rope or cable through a wheel to allow for heavy objects to be lifted.