

Science Knowledge Organiser—Forces

Curriculum Objectives

By the end of this unit, your child will be able to:

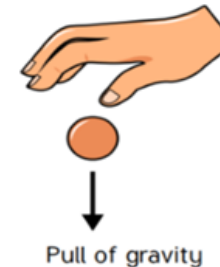
- Identify and explain the different forces acting on objects.
- Explain Newton's role in discovering gravity.
- Accurately measure an object's weight and mass.
- Explain how to increase the effects of air resistance.
- Explain how to minimise the effects of water resistance.
- Make generalisations about the properties of materials that create the most friction.
- Explain how a mechanism they have designed alters force and motion to achieve a purpose.
- Set up reliable and accurate investigations.
- Identify dependent, independent and controlled variables.
- Draw conclusions based on their results.

Forces

A **force** is a **push** or **pull** that acts upon an object. We can't see forces, but they are an important part of our everyday lives. We **push** and **pull** objects to do many different things. When we **push** or **pull** objects we can move the object, change the shape of the object or make the object change direction.

Gravity

Gravity is a force which acts at a distance. It is a pull force that pulls objects towards the centre of the Earth. The planets and the Sun do not touch, yet the planets stay in orbit around the Sun due to the force of gravity.



Friction

Friction is a force created between two surfaces when they rub together. Friction creates heat and always slows down an object. Rough surfaces create more friction than smooth surfaces.



Air Resistance

Air resistance is a force that acts in the opposite direction to gravity. It acts between a moving object and the air molecules around it, slowing the object down. Air resistance is a type of friction. Parachutes are used to increase air resistance and slow down the parachutist, so they can land safely. Modern cars and planes are **streamlined** in design to reduce air resistance, allowing them to move faster.



Key Vocabulary/Terminology



Force	A push or pull that acts upon an object that can cause it to move, change shape and direction.
Resistance	An opposing or slowing force.
Weight	The measure of the force of gravity on an object.
Mass	A measure of how much matter (or 'stuff') is inside an object.
Earth's gravitational pull	The pull that Earth exerts on an object, pulling it towards Earth's centre. It is the Earth's gravitational pull which keeps us on the ground.
Streamlined	When an object is shaped to minimise the effects of air or water resistance.
Upthrust	A force that pushes objects up, usually in water.

Water Resistance

Water resistance is the force responsible for making it difficult for us to move through the water. It acts between a moving object and the water molecules around it, slowing the object down.

