

Y5 Science

Forces, Earth and Space



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.

The **Moon** orbits Earth in an oval-shaped path while spinning on its **axis**. At various times in a month, the **Moon** appears to be different shapes. This is because as the **Moon rotates** round Earth, the **Sun** lights up different parts of it.

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.

swimmer's force

water resistance

gravity

air resistance

cyclist's driving force

friction

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.



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**.



Read our key knowledge and facts about different forces.

Did you know?

Sir Isaac Newton was a scientist who developed the first description of the force of gravity. Newton said that he started thinking about gravity after watching an **apple fall from a tree** but it did not actually hit him on the head, as it is often claimed!



The Moon has a smaller **mass** than Earth so the **gravitational pull** on the Moon is smaller than it is on Earth.



Jupiter has a greater **mass** than Earth so the **gravitational pull** on Jupiter is stronger than on Earth.

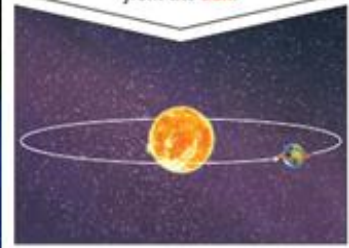
Key Knowledge



It appears

to us that the **Sun** moves across the sky during the day but the **Sun** does not move at all. It seems to us that the **Sun** moves because of the movements of Earth.

Earth **rotates** (spins) on its axis. It does a full **rotation** once in every 24 hours. At the same time that Earth is **rotating**, it is also orbiting (revolving) around the **Sun**. It takes a little more than 365 days to orbit the **Sun**. Daytime occurs when the side of Earth is facing towards the **Sun**. Night occurs when the side of Earth is facing away from the **Sun**.



Vocabulary	Definition
Weight	The measure of force of gravity on an object.
Mass	A measure of how much matter (or stuff) is inside an object.
Streamlined	When an object is shaped to minimise the effects of air or water resistance.
Mechanism	Mechanisms are simple machines with moving parts that change input forces and movement into a set of useful output forces e.g. pulleys, gears and levers.
Upthrust	A force that pushes objects up, usually in water.
Sun	A huge star that Earth and other planets in the solar system orbit around. A star is a giant ball of gas held together by its own gravity.
Earth	A large spherical object which orbits the sun on it's axis.
Moon	A natural satellite which orbits Earth or other planets. Each planet's gravitational pull keeps their moons in their orbit around each planet.
Axis	An imaginary line that a body rotates around e.g.. Earth's axis runs from the North Pole to the South Pole.