

Science – Forces

Investigation

Scientists design and carry out investigations.

Biology

Scientists have an understanding of life and living processes.

Chemistry

Scientists have an understanding of materials and their properties.

Physics

Scientists have an understanding of physical processes.

What should I already know?

The planets and the Sun do not touch, yet the planets stay in orbit around the Sun due to the force of gravity.

Objects will move differently on different surfaces due to friction.

Not all forces need contact as magnetic forces can work at a distance. and that magnets will attract or repel each other.

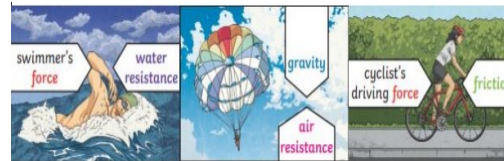
What am I going to learn?

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. Gravity is a force which acts at a distance. It is a pull force that pulls objects towards the centre of the Earth.



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.. Water resistance and air resistance are forms of friction..

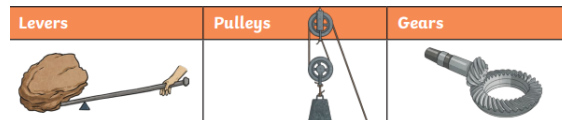
Air resistance is a force that acts in the opposite direction to gravity. It acts between a moving object and the air molecules around it, slowing the object down.. Parachutes are used to increase air resistance and slow down the parachutist, so they can land safely. Modern cars and planes are streamlined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



Water resistance 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.

Pulleys can be used to make a small force lift a heavier load. The more wheels in a pulley, the less force is needed to lift a weight.

Gears or cogs can be used to change the speed, force or direction of a motion... Levers can be used to make a small force lift a heavier load. A lever always rests on a pivot.



Key Vocabulary

Definition

| | |
|------------------|---|
| forces | a push or pull that acts upon an object that can cause it to move, change shape or change direction |
| gravity | A pulling force exerted by Earth or anything else that has mass. |
| weight | Weight is a measurement of the force exerted on a mass by gravity. |
| mass | Mass is a measurement of the amount of mater something has |
| friction | A force that acts between two surfaces or objects that are moving, or trying to move, across each other |
| Newton | Newtons are a measure of force named after scientist Sir Isaac Newton. |
| pulley | A pulley is a machine that helps to move objects around by making a mall force a large force. |
| upthrust | Upthrust is a force tht pushes objects up, usually in water. |
| air resistance | A frictional force that ats to slow an objct's movement when it moves through the air. |
| water resistance | A frictional force that acts to slow an object's movement when it moves through the water. |

Key Scientist(s)



Newton theorised that a force must pull objects downwards after observing an apple fall from a tree. This sparked his curiosity about why objects fall downwards rather than sideways or upwards.

Working Scientifically

Create a variety of parachutes and carry out fair tests to determine which designs are the most effective.