

Knowledge Organiser: Forces

Vocabulary	Meaning
<i>forces</i>	Pushes or pulls.
<i>gravity</i>	A pulling force exerted by the Earth (or anything else which has mass).
<i>Earth's gravitational pull</i>	The pull that Earth exerts on an object, pulling it towards Earth's centre. It is Earth's gravitational pull which keeps us on the ground.
<i>weight</i>	The measure of the force of gravity on an object.
<i>mass</i>	A measure of how much matter (or 'stuff') is inside an object.
<i>friction</i>	A force that acts between two surfaces or objects that are moving, or trying to move, across each other.
<i>air resistance</i>	A type of friction caused by air pushing against any moving object.
<i>water resistance</i>	A type of friction caused by water pushing against any moving object.
<i>buoyancy</i>	An upward force that a liquid applies to objects.
<i>streamlined</i>	When an object is shaped to minimise the effects of air or water resistance.
<i>mechanism</i>	Parts which work together in a machine. Examples of mechanisms are pulleys, gears, and levers.

Forces can make an object

- Stop moving
- Start to move
- Move faster
- Move more slowly
- Change its shape
- Change direction

Sir Isaac Newton



Sir Isaac Newton is famously thought to have developed his theory of gravity when he saw an apple fall to the ground from an apple tree.

Weight is how strongly gravity is pulling an object down. It is measured in newtons (N).

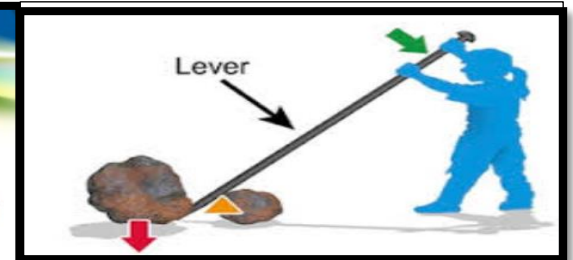
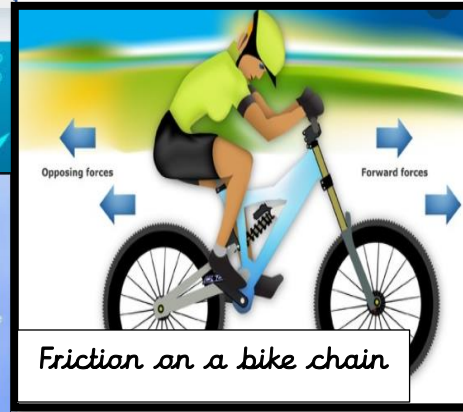
Mass is how much matter is inside an object. It is measured in kilograms (kg).

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.

Example of forces in action

Water and air resistance are forms of friction. Friction is sometimes helpful and sometimes unhelpful. For example, air resistance is helpful as it stops the sky diver hitting the ground at high speed. Friction on a bike chain can make the bike harder to pedal so it is unhelpful.



Levers can be used to make a small force lift a heavier load. A lever always rests on a pivot.



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



Gears can be used to change the speed, force, or direction of a motion. When two gears are connected, they always turn in the opposite direction to each other.



This shark is streamlined. It has a pointed nose to cut through the water, and a smooth, low, curved back to allow the water to flow over and around it.

It does not create much water resistance so it can move through the water quickly.