



Knowledge Organiser

Key Concepts:

There are four main forces; gravity, upthrust, thrust and friction (including air resistance water resistance)

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

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

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.

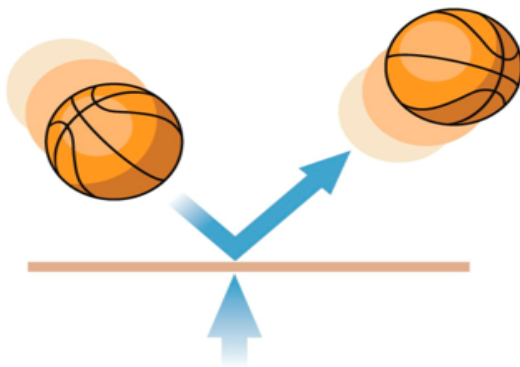


Forces can cause things to: start to move, change direction, change shape, speed up, slow down or stop moving

Forces can be applied in three ways; push, pull and twist. Sometimes they work together e.g. twist and push

Most forces need contact between objects but magnets can work at a distance.

What you should already know...



- Forces are pushes and pulls which make things move and stop moving.

-Most forces need contact between objects, but magnets can act at a distance.

Magnets are made of materials that create a magnetic field (the area in space where the force of magnets can be detected).

-Forces are shown by arrows in diagrams. The bigger the arrow, the bigger the force.

-When forces are unbalanced, objects can speed up, slow down, or change direction.

Key Vocabulary:

Friction

A **force** that acts between two surfaces or objects that are moving across each other

Force

A push, pull or twist

Buoyancy

An upward **force** that a liquid applies to objects

Air resistance

A type of friction caused by air pushing against an object

Mechanism

Parts which work together in a machine

Gravity

A pulling force exerted by the Earth (or anything else with mass)

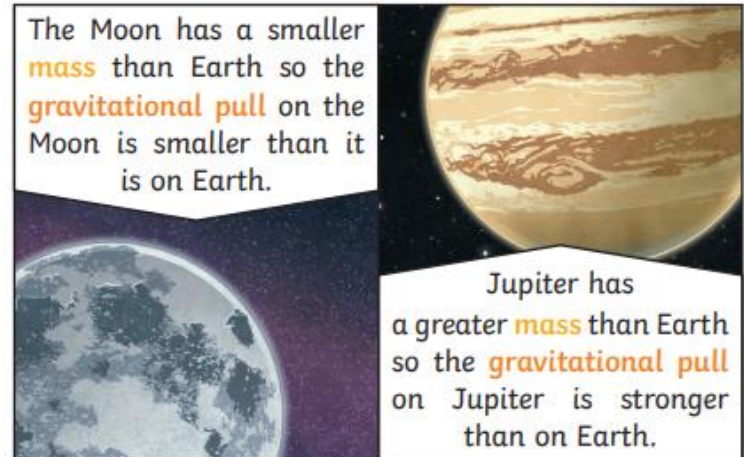
Thrust

Forward 'push' that acts on an object


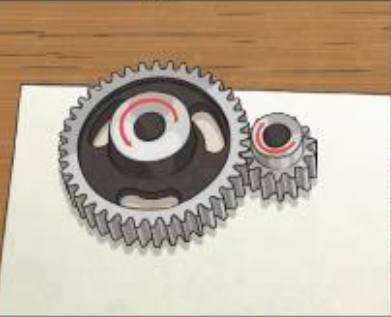

Streamline

When an object is shaped to reduce **friction**

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.

Pulleys	Gears/Cogs	Levers
		
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. When two gears are connected, they always turn in the opposite direction to each other.	Levers can be used to make a small force lift a heavier load. A lever always rests on a pivot.

Machines and Mechanisms

Scissors

Wheelbarrows

Fishing rods

Shovels

Boat Oars

Well

Exercise Equipment

Elevators

Window Blinds

Examples of **forces** in action:



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

Brooms