

NPA Knowledge Organiser: Year 5 Science - Autumn 1



Forces

Force – A force is a push or pull. Forces make objects start moving, stop moving, speed up, slow down or change direction.

Gravity – A force which pulls things down towards the centre of the Earth.

Forcemeter – Piece of equipment used to measure the size of a force.

Newton (N) - The unit for measuring force.

Air resistance - The force that slows down objects moving through the air.

Water resistance – A force that slows down objects moving through water.

Friction – When one surface moves against another, the rubbing force that tries to stop them is called friction. It gives grip.

Mechanisms – A device that allows a small force to be increased to a larger force.

Simple machines – Levers, pulleys and gears are all types of simple machines.

Real-life examples of forces in action:



A skydiver falls fast until they open their parachute.



Dolphins have a streamlined shape.

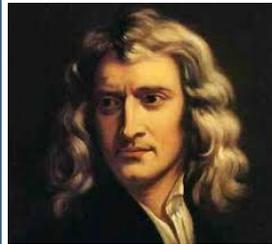


A non-slip mat uses friction.



Seeds fall to the ground because of gravity.

Sir Isaac Newton (1642-1726)



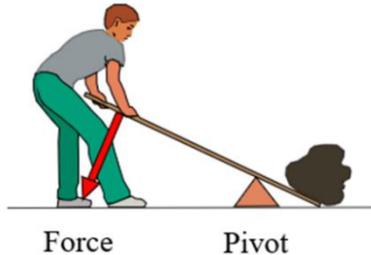
Sir Isaac Newton was an English scientist and mathematician. He discovered the concept of gravity when sitting under a tree and an apple fell to the ground near him.

<https://www.bbc.co.uk/bitesize/topics/zvpp34j/articles/zywcrdm>

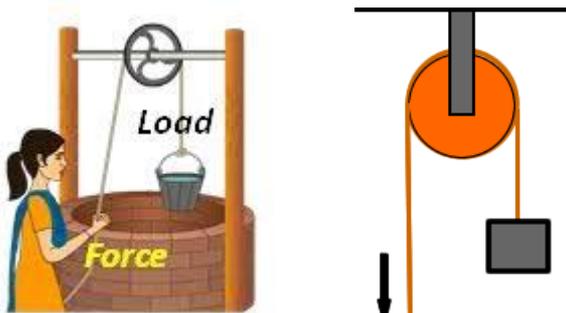
Simple machines

These are used to make tasks easier.

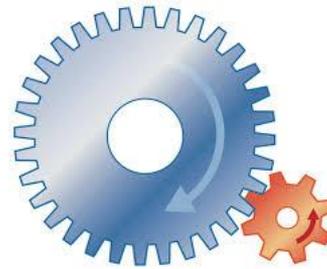
This means you need to use less force.



A **lever** tilts on a pivot which is nearer to the end of the pivot with a heavy load.



Pulleys have a rope or cable which goes over a wheel. This is pulled to lift, lower or move heavy objects.



Gears are toothed wheels which lock together and turn each other to form simple machines.

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

- explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object
- identify the effects of air resistance, water resistance and friction, that act between moving surfaces
- recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect