
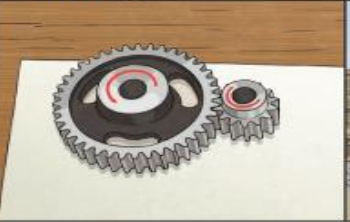



Mass is how much matter is inside an object. It is measured in kilograms (kg). Mass is how much matter is inside an object. It is measured in kilograms (kg).

## Knowledge Organiser Forces

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

Key Word	Definition
Sir Isaac Newton	An English physicist and mathematician, one of the most influential scientists in history.
gravity	A force that attracts something with mass towards earth, measured in Newtons per kilogram.
resistance	A force exerted on something to slow it down or stop it.
lever	A simple machine used to move an object or operate a machine.
gear	Toothed wheel that engages with another to change speed or direction of a machine.
pulley	A wheel which a cord passes through; it helps to raise heavy weights.
mass	The measure of how much matter is in an object.
friction	The force or resistance when one object rubs on another.

Pulleys	Gears/Cogs	Levers
		
Pulleys can be used to make a small <b>force</b> lift a heavier load. The more wheels in a pulley, the less <b>force</b> is needed to lift a <b>weight</b> .	Gears or cogs can be used to change the speed, <b>force</b> 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 <b>force</b> lift a heavier load. A lever always rests on a pivot.

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.

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.

This shark is **streamlined**.



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

## Lesson Sequence

1

- To understand the effect of gravity.

2

- To identify the effects of friction acting between moving surfaces.

3

- To identify and explain the effects of air resistance.

4

- To identify and explain the effects of water resistance.

5

- To recognise that levers and pulleys allow a smaller force to have a greater effect.

6

- To recognise that gears allow a smaller force to have a greater effect.

## Isaac Newton



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.

