


Year Five Knowledge Organiser: Forces

- 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.

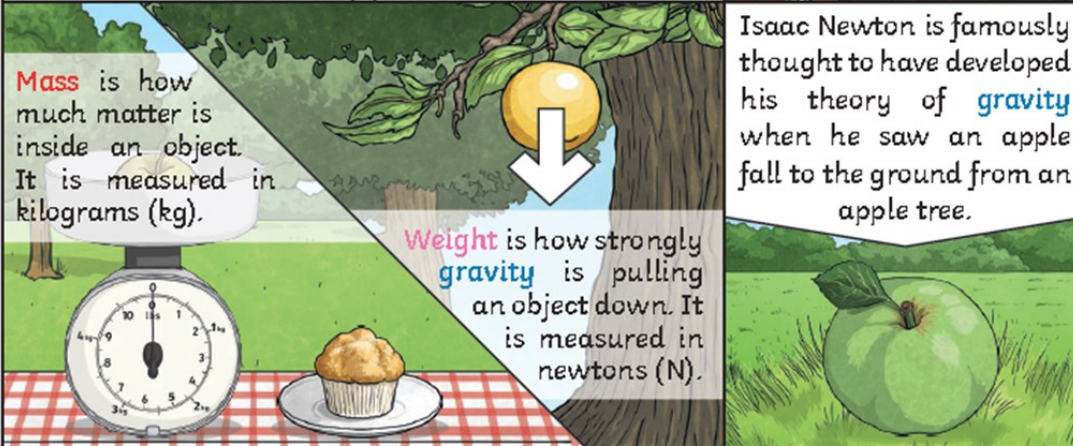
Forces		Isaac Newton
start to move.	stop moving.	
change direction.	move faster.	
change its shape.	move more slowly.	

**Forces** can make an object...

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

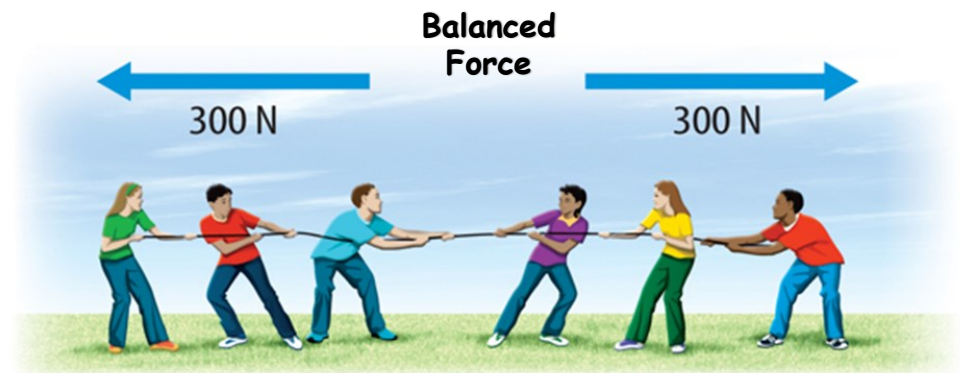
**Weight** is how strongly gravity is pulling an object down. It is measured in newtons (N).

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.



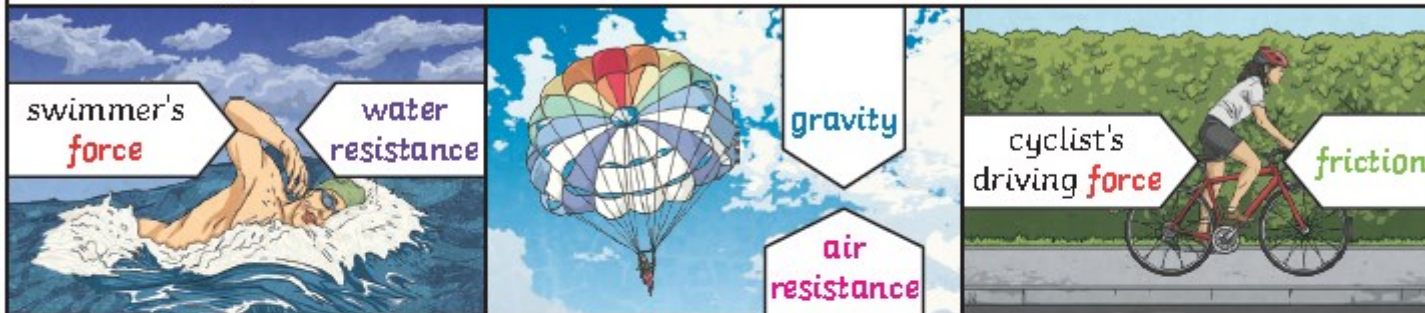
**PUSH**

**PULL**





## 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.

## Key Vocabulary

**Air resistance** - A force that is caused by air with the force acting in the opposite direction to an object moving through the air

**Force** - A push or pull upon an object resulting from its interaction with another object

**Friction** - The resistance that one surface or object encounters when moving over another

**Gears** - A toothed wheel that works with others to alter the relation between the speed of a driving mechanism (e.g. engine) and the speed of the driven parts (e.g. the wheels)

**Gravity** - The force that attracts a body towards the centre of the earth

**Levers** - A rigid bar resting on a pivot that is used to move a heavy or firmly fixed load


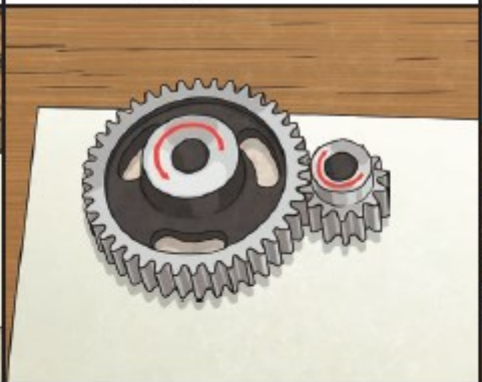

**Mass** - The weight measured by an objects acceleration under a given force or by the force exerted on it by gravity

**Pull force** - To draw or haul towards oneself or itself, in a particular direction

**Pulleys** - A wheel with a grooved rim around that changes the direction of a force applied to the cord

**Push force** - To move something in a specific way by exerting force

**Water resistance** - A force that is caused by water with the force acting in the opposite direction to an object moving through the water

Pulleys	Gears/Cogs	Levers
		
Pulleys can be used to make a small <b>force</b> lift a lighter 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 lighter load. A lever always rests on a pivot.