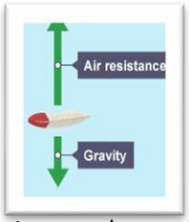
Forces Knowledge Organiser

A force is a push or a pull. Forces make things move, change speed, direction or shape.

Gravity – the force that pulls things to the ground. Gravity also holds Earth and other planets in their orbits around the sun.

Friction – friction is a force between 2 surfaces that are sliding or trying to slide across each other. Friction works in the opposite direction to which the object is moving. It slows down the moving object and also produces heat. It can be helpful in certain situations but not helpful in others.

Air resistance – a type of friction between air and another material.

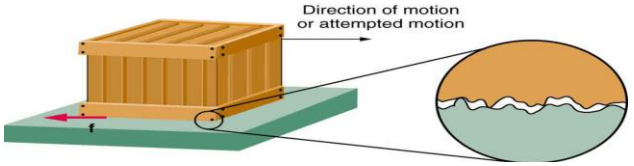


Water resistance – a type of friction between water and another material. When you go swimming there is friction between your skin and the water particles.

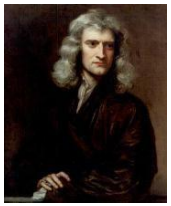
Air resistance, water resistance and friction all act between moving surfaces. They all have the effect of slowing moving objects down.

Objects that are designed to move smoothly through the air or water are called **streamlined**.

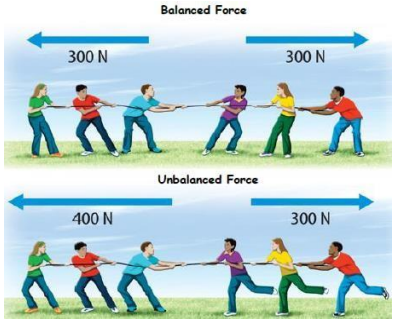
We can use a **lubricant** (like oil) to reduce the friction between the moving parts in an engine. This stops the engine wearing out or producing too much heat.



FORCE METER – is marked in Newtons and measures the weight of an object.



Sir Isaac Newton who developed the theory of gravity.



A **balanced** force means that an object will not change shape, speed or direction.

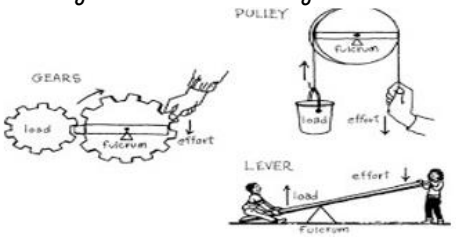
An **unbalanced force** will result in a change to the object.

Some mechanisms, such as levers, gears and pulleys allow a small force to have a greater effect.

A **lever** is a rigid bar balanced on a fulcrum which can be used to move massive objects easily.

Gears are interconnected cogs (wheels with teeth) that can increase or decrease the amount of force being used.

Pulleys are mechanisms that can be used to lift heavy objects. A rope runs over a grooved wheel, which allows a force to change direction.



Forces Knowledge Organiser

Key Vocabulary

Force: A push or pull on an object.

Push: To apply force in the direction away from oneself.

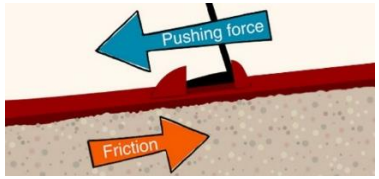
Pull: To apply force in the direction towards oneself.

Movement/Motion: The act of changing position or going from one place to another.

Gravity: The force that pulls objects towards each other; the reason things fall to the ground.

Air Resistance: The force that pushes against an object as it moves through the air.

Friction: The force that opposes the motion of objects rubbing against each other.



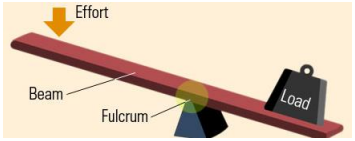
Water Resistance: The force that opposes the motion of an object as it moves through water.

Balanced: When forces acting on an object are equal, and there is no change in motion.

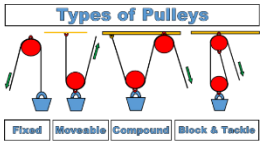
Unbalanced: When forces acting on an object are not equal, causing a change in motion.

Machines: Devices or tools that make tasks easier by changing the force, speed, or direction of a movement.

Lever: A simple machine consisting of a rigid bar that pivots around a fixed point.



Pulley: A simple machine with a wheel and a rope, used to lift or move loads.



Design: The plan or pattern of something before it is made.

Surface Area: The total area of the surface of a three-dimensional object.

Aerodynamic: The design and study of objects moving through air and how they interact with the air.

Measurement: The process of finding the size, length, or amount of something using standard units.

Newton: The unit of measurement for force.