

Year 5: FORCES

WHAT IS A FORCE?



A force is a push or a pull on an object in a particular direction.

The pull of a force is measured in Newtons and can be measured using a device called a force meter (seen in the image on the left).

Forces can be either balanced or unbalanced.

If they are balanced the object will be stationary or moving at the same speed.

If they are unbalanced then the object will be moving, either accelerating or slowing down, or changing direction.

LEVERS & PULLIES

A lever is a rigid length pivoting on a fulcrum

A pulley is a wheel with a fulcrum that supports a moving cable or belt.

A gear is a rotating wheel with cut teeth that mesh with the teeth of another gear so that one gear turns in the different direction.

Gears, levers and pulleys are simple and allow small forces to have great effects.

FORCES ACTING ON OBJECTS:

Gravity

Gravity is a force that acts between all objects in the universe.

The mass of objects and proximity increase the strength of the force.

Unsupported objects are pulled towards the Earth by the force of gravity.

Resistance

Air resistance is a force felt by an object as it moves through air

It is caused by the object bumping into the gas particles that make up air.

The more gas particles it bumps into the more air resistance it experiences.

Falling objects will accelerate until the air resistance matches the gravitational force where it will stop accelerating and fall at a steady speed.

This speed is called terminal velocity.

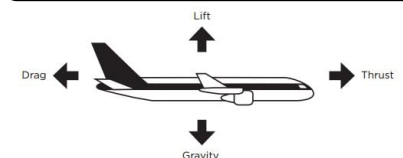
A parachutes shape increases the air resistance experienced giving it a much slower terminal velocity.

Water resistance is the force felt by an object as it moves through water. It is caused by the object bumping into water particles.

The shape of an object determines how much resistance it experiences. Shapes of objects which experience little resistance are called streamlined.

FORCES DIAGRAM:

A force diagram with arrows showing the different forces acting upon the object.



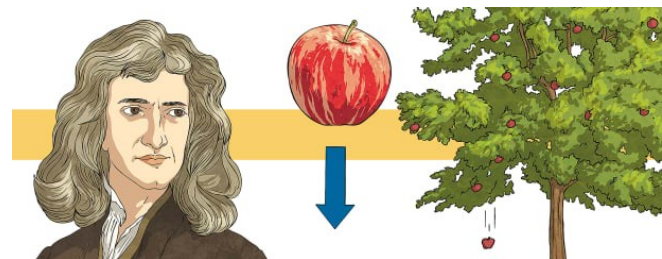
WHO:



Sir Isaac Newton

1643 - 1727

A force is measured in a unit called Newtons, named after a British scientist, called Sir Isaac Newton who discovered lots about gravity and how planets in the Solar System move.



KEY VOCABULARY:



ACCELERATION: increase in speed or rate



AIR RESISTANCE: the force that is in opposition to the object passing through the air



BUOYANCY: the ability of something to float in water or another liquid



EFFORT: a force exerted by a machine or in a process



FORCE METER: an instrument designed to measure force precisely



FULCRUM: the point at which a lever is placed to get purchase or the point it is supported.



GRAVITY: the force which causes things to drop to the ground



LOAD: a weight or source of pressure borne by someone or something



MASS: how heavy an object is



MESH: when the teeth of one gear wheel join together with the teeth of another gear wheel



MOTION: the activity of changing position or moving from one place to another



NEWTON: a unit of measure used when measuring the power of forces



PIVOT: the central point, pin, or shaft on which a mechanism turns



RESISTANCE: a force which slows down a moving object or vehicle



RIGID: a material that is unable to be forced out of shape or bent.



STREAMLINED: having a form that presents little resistance to a flow of air or water



TERMINAL VELOCITY: the constant speed that a free-falling object reaches when forces prevent further acceleration.



UNSUPPORTED: not held in place



WATER RESISTANCE: a type of force that uses friction to slow things down through water



WEIGHT: the mass or amount of matter.