

Forces

Key Knowledge

Mass, Weight and Force

Key Vocabulary

Force	A push or pull on an object
Balanced	When things are equal
Unbalanced	When things are not equal
Contact Force	A force which can only act when touching an object
Non-Contact Force	A force which can act without touching an object
Gravity	Pulls objects on Earth towards the centre of Earth
Friction	Applied between two sliding surfaces
Water Resistance	Applied on objects moving through water
Air Resistance	Applied on objects moving through air
Magnetism	Applied when two objects are magnetic
Upthrust	Pushes up on objects in water
Mass	How much 'stuff' is in an object
Weight	How much gravity is acting on an object
Grams and Kilograms	What we measure mass in
Newtons	What we measure weight in
Streamlined	Shaped to move easily through water

Gravity



A non-contact force which pulls all objects on Earth to the centre of the Earth. All objects have gravitational force but larger objects have more.

Friction



A contact force which acts when two surfaces are sliding or a trying to slide over each other. Rub your hands together to feel friction for yourself.

Magnetism



A non-contact force which acts between two magnetic objects. A magnet can both push and pull. Attracting is pulling and repelling is pushing.

Air resistance



A contact force which acts on objects moving through the air. Air resistance is a type of friction and is the force that pushes up against a parachute that is falling towards the ground.

Water resistance



A contact force which acts on objects moving through water. Water resistance is a type of friction and is the force you can feel pushing against you when you try to walk in a swimming pool.

Upthrust



A contact force which pushes upwards against objects in water. Upthrust is also known as buoyancy and is the force which makes things float instead of sink.

Levers



Levers can be used to turn a small force into a larger force. They can help us to change how a force is used and do things such as lift heavy objects. There are different kinds of levers.

Pulleys



Pulleys can be used to make a small force lift up a much heavier load. If you add more wheels to a pulley, you need to use less force to lift something.

Gears



A gear is also known as a cog. They are like wheels but have 'teeth'. A gear or set of gears can be used to change the speed or direction of a force. If one gear turns clockwise then the other will turn anti-clockwise.

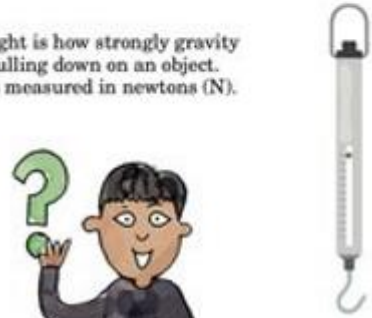
Read more: Fatal Forces AND The Fight for Flight (Horrible Science)

Research more: STEM learning Farm Machinery 2040
<https://www.stem.org.uk/resources/elibrary/resource/464888/farm-machine-2040-english>

Mass is how much matter is inside an object. We measure mass in grams and kilograms and can use scales to do this.



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



When two forces acting on an object are equal in size but they are acting in opposite directions, the forces are balanced. If an object is still, it will stay still and if an object is moving, it will continue to move at the same speed and in the same direction.



When forces are unbalanced, an object may start to move, stop moving, change speed or change direction.

