

Year 5 Merlins

Science

Spring 2

Forces



What Are Forces?

A force is a push or pull that acts upon an object. We can't see forces, but they are an important part of our everyday lives. We push and pull objects to do many different things. When we push or pull objects we can move the object, change the shape of the object or make the object change direction.



Key Vocabulary	Definition
buoyancy	An object's ability to float.
force	A push or a pull.
friction	A force caused by two surfaces touching each other.
fulcrum	The place where the lever turns or is supported.
gear	A mechanical part with teeth that interlock with another gear or belt to transfer motion and power while changing speed, or direction in a mechanical system.
gravity	A force that pulls objects towards the centre of the Earth.
lever	A simple mechanism that uses a bar to pivot around a fixed point called a fulcrum.
pivot	A shaft or pin on which something turns.
pulley	A wheel of a fixed axle.
resistance	A type of friction that slows objects down when travelling through air or water.
streamline	To shape an object to reduce air or water resistance.
surface area	The total area of all the faces of an object.
upthrust	A force that pushes objects up in air or water.
variable	A value or element that is likely to change or vary.

Friction

Friction



Air Resistance



Water Resistance



Water resistance and air resistance are both 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. Water resistance means the swimmer must exert a greater force to get through the water. Friction on a bicycle chain can make it harder to pedal, so it's unhelpful.

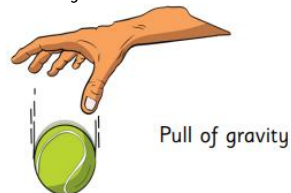
Isaac Newton (1643–1727)

Isaac Newton was a scientist and mathematician who studied forces and helped us to understand how gravity works on earth the scientific study of energy and forces is called physics. Physics helps us to understand how the universe behaves. He is famously thought to have developed his theory of gravity when he saw an apple fall to the ground from a tree. The unit we use to measure force is called a Newton (symbol N).



Gravity

Gravity is a force which acts at a distance. It is a pull force that pulls objects towards the centre of the Earth.



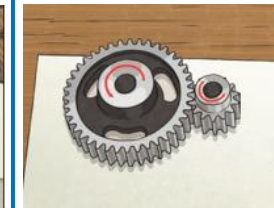
Pulleys, Gears/Cogs and Levers

Pulleys



Pulleys can be used to make a small force lift a bigger load. The more wheels in a pulley system, the less force is needed to lift a weight.

Gears/ Cogs



Gears or cogs can be used to change the speed, force or direction of a motion. When two gears are connected, they always turn in opposite directions.

Levers



Levers can be used to make a small force lift a heavy load. A lever always rests on a pivot.