



## Vocabulary

- force** a push or pull on an object
- pull** applying force so an object moves towards another
- push** applying force so an object moves towards another
- balanced forces** opposite forces acting, equal in size, not cause a change in motion
- unbalanced force** forces that cause a change in motion
- newton** a unit of measurement of force
- friction** the resistance of motion when one object rubs against another
- gravity** a force that pulls objects towards to centre of the Earth
- air/water resistance** a frictional force between a moving object an air/water
- buoyancy** a force in water causing an object to rise or fall
- mechanism** parts moving together in a machine
- lever** a type of mechanism involving a pivot, used to lift heavy objects
- pulley** a type of mechanism that is used to help lighten heavy loads



# Physics

## Science Y4: Forces

### Key diagrams and knowledge

Forces are at work on everyday things all the time. Everything that changes speed, stops, starts and changes direction has forces acting on it. These forces are invisible and only their effects are noticed, A force is a result of a push or a pull. Gravity is an example of a pulling force – a force that pulls objects towards the centre of the Earth.

There are two types of forces – those that work at distance and those that are in contact. Gravity and magnetism work at a distance, whereas friction, air resistance and water resistance work in contact. If an object is stationary or moving at a constant speed, then the forces acting on it are balanced. Unbalanced forces cause changes to movement (start, stop, speed up, slow down and changes of direction).

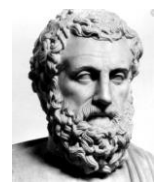
Force is measured in Newtons, named after Sir Isaac Newton, a prominent scientist in this field. Forcemeters measure force.

Levers, pulleys and gears are simple machines, or mechanisms. They are devices that make things easier to do, whether it is lifting, turning or changing the direction of movement.

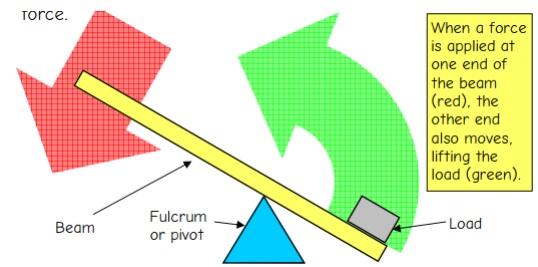
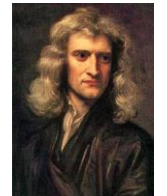


## Scientists

Aristotle, ancient Greece



Sir Isaac Newton, 1643 – 1727 BCE



Links to prior learning and next steps:

- Y2: Forces (push, pulls, friction)
- Y3: magnets

Links to other subjects:

- History: Ancient Greeks
- DT: moving pictures, pulleys, levers