

# Forces

## Science Knowledge Organiser Year 5 Term 1

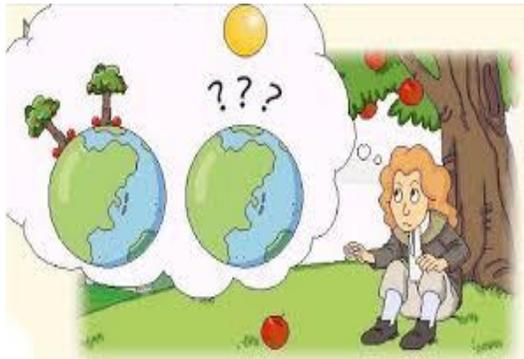
The forces of **weight (gravity)** and **upthrust** need to be **balanced** for a ship to float.



### Key People

**Sir Isaac Newton**- He discovered what is called the Law of Universal Gravitation. This discovery came about when he saw an apple falling from a tree, and this led him to the answer that “Whatever goes up must come down.” Eventually, this discovery allowed people to understand how the planets and the sun moved around.

**Galileo Galilee**- Disagreed with the idea that everything revolved around the Earth and that Earth was at the centre of the Universe. He discovered that actually everything revolves around the Sun. At the time no one believed him and he was treated badly because of his view.



### Useful web links:

<https://www.bbc.co.uk/bitesize/topics/znmmn39>

<https://www.youtube.com/watch?v=fvOmaf2GfCY>

<https://www.developingexperts.com/s/unit-library/units/33>

### Key Knowledge

#### What I should already know:

Everything on Earth is powered by forces, pushes and pulls which act on our bodies and the things around us. Forces make things move and stop moving. When forces are unbalanced, objects can speed up, slow down or change direction. Drawing on your knowledge from Y3, you should know how objects move on different surfaces.

#### What I will know by the end of the unit:

- Gravity is a force that pulls objects towards the centre of the Earth
- Air resistance is a force that slows down moving objects
- Water resistance is a force that slows down moving objects too
- Forces are measures in Newtons
- Friction is a force between two objects that are touching
- Some mechanisms, such as pulleys, gears and levers, allow a smaller force to have a bigger effect

### Key Questions

- Why do unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object?
- What are the effects of air resistance, water resistance and friction that act between moving surfaces?
- What is the difference between mechanisms (including pulleys), levers and gears and how to they allow a smaller force to have a greater effect?

### Forces acting on moving object



### Key Vocabulary

- air resistance** – the force that air exerts on a moving object
- balanced** – when the forces acting on an object are opposite and equal such that the object does not move
- force** – a push, pull, twist or turn – gravity, friction and up thrust are all examples of forces
- force diagram** – a diagram which represents forces and the directions they are acting with arrows
- force meter** – a device used to measure forces (sometimes called a newton meter)
- friction** – is the force between two moving surfaces
- gravity** – the force that causes all objects to fall to the ground
- lever**- A **lever** is a **simple** machine made of a rigid beam and a fulcrum
- mass** – the amount of material in an object measured in grams (g)
- Newtons** – the units used to measure forces (N)
- pulley**- A machine consisting of a wheel over which a pulled rope or chain runs to change the direction of the pull used for lifting a load.
- speed** – how fast an object is moving
- stationary** – not moving
- unbalanced** – when one force acting on an object is greater than the other forces, the object moves in the direction in which that force is acting
- up thrust** – a force in water which pushes upwards
- water resistance** – the force that water exerts on a moving object
- weight** – the force downward on an object caused by gravity

### Scientific Enquiry

- We will be Investigate the effect of friction in a range of contexts
- We will investigate the effects of water and air resistance on a range of objects