Year 5 Knowledge Organiser

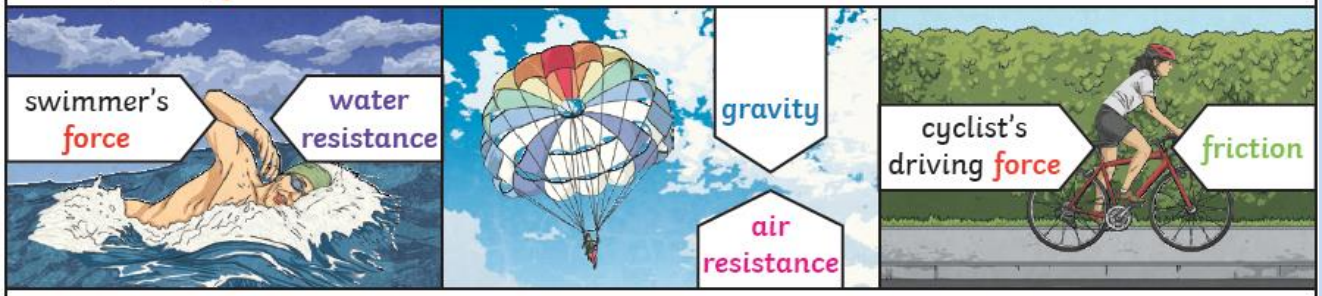
Science - Forces

National Curriculum

Pupils should be taught to:

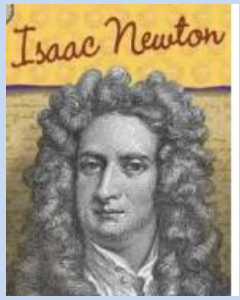
- explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object
- identify the effects of air resistance, water resistance and friction, that act between moving surfaces
- recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.

Examples of forces in action:

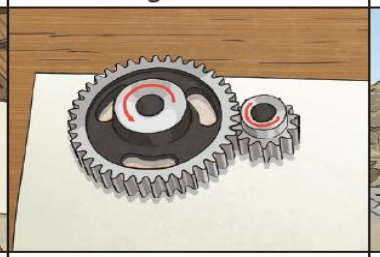


Water resistance and air resistance are forms of friction. Friction is sometimes helpful and sometimes unhelpful. For example, air resistance is helpful as it stops the skydiver hitting the ground at high speed. Friction on a bike chain can make the bike harder to pedal so it is unhelpful.

Sir Isaac Newton



Isaac Newton was born in 1643 and became famous for his work on **gravity and his three laws of motion**. He was also well known for his work on light and colour, and what is now called calculus (a branch of mathematics).
The famous story of an **apple falling to the ground from a tree** illustrates how Newton's work on gravity was inspired by

Pulleys	Gears/Cogs	Levers
		
Pulleys can be used to make a small force lift a lighter load. The more wheels in a pulley, the less force is needed to lift a weight.	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 the opposite direction to each other.	Levers can be used to make a small force lift a lighter load. A lever always rests on a pivot.

Key Vocabulary	
forces	Pushes or pulls
gravity	A pulling force exerted by the Earth (or anything else which has mass).
Earth's gravitational pull	The pull that Earth exerts on an object pulling it towards Earth's centre. It is the Earth's gravitational pull which keeps us on the ground.
Weight	The measure of the force of gravity on an object.
mass	A measure of how much matter (or stuff) is inside an object.
Friction	A force that acts between two surfaces or objects that are moving, or trying to move, across each other.
Air resistance	A type of friction caused by air pushing against any moving object.
Water resistance	A type of friction caused by water pushing against any moving object.
buoyancy	An upward force that a liquid applies to objects.
streamlined	When an object is shaped to minimise the effects of air or water resistance.
mechanism	Parts which work together in a machine. Examples are pulleys, gears and leavers.