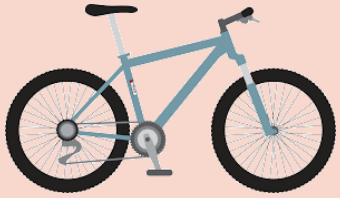
What are forces?

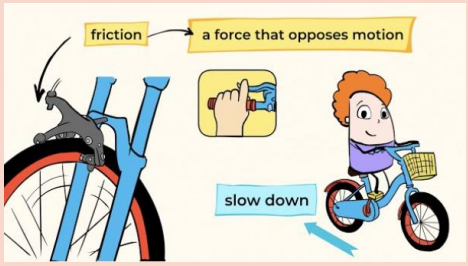
Pushes and Pulls

These **forces** change the **motion** of an object. They will make it start to move or speed up, slow it down or even make it stop.

For example, when a cyclist pushes down on the pedals of a bike, it begins to move the wheels. The harder the cyclist pedals, the faster the bicycle chain pushes and pulls the wheels making movement.



When the cyclist pulls the brake lever, this pushes the brakes against the wheels causing a force called friction. This slows down the wheel and eventually stops the bicycle.



How do different surfaces affect the motion of an object?

Friction is a force that holds back the motion of an object. Some surfaces create more friction than others which means that objects move across them slower.

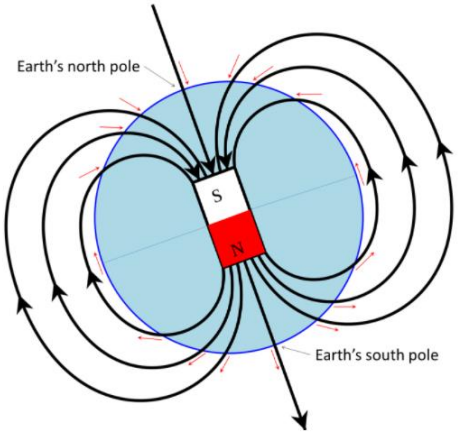
Forces act in opposite directions to each other. When an object moves across a surface, friction acts as an opposite force.

Gravity

Gravity is the force that pulls things to the ground on Earth (and other planets). On a ramp, the force that causes the object to move downwards is gravity

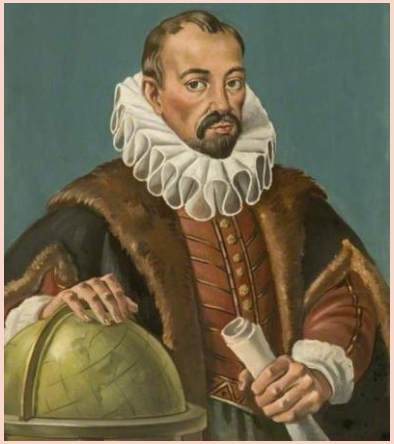
Key Vocabulary

Force	The scientific word for the pulling and pushing effect
Friction	The force that makes it difficult for things to move when they touch each other.
Motion	Moving from one place to another
Magnet	A piece of iron or other material which attracts some metals towards it
Magnetic	Something that acts like a magnet
Pole	North and South ends of a magnet
Attract	The force of one object pulling another object towards it
Repel	The force of one object pushing another object away from it
Magnetic field	The area around a magnet where the magnetic forces work



William Gilbert

William Gilbert founded the scientific study of magnetism.

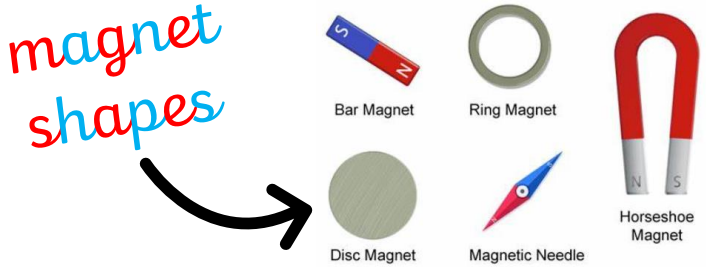


Gilbert discovered that our planet has two magnetic poles; he discovered these poles and established that the Earth behaves like a giant magnet.

Magnetic Materials

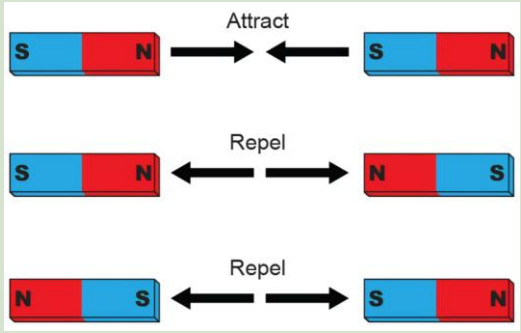
Magnets are made of a group of materials called ferromagnetic metals. These are metals such as **nickel** or **iron**.

Magnetic materials are always made out of metal, but not all metals are magnetic, such as aluminium, copper, gold and silver.



Magnetic Forces

Magnets produce an area of force around them called a **magnetic field**.



When an object enters this **magnetic field**, they will be **attracted** to or **repelled** from the magnet if they are magnetic.

Investigation

Can different surfaces and materials effect the strength of a magnet?

What materials can a magnet pull through?

If you were to find the results of this hypothesis, you would need to complete a **fair test** how strong a magnet is between lots of different materials, such as wood, paper and fabric.

A **fair test** is when you test each material fairly, with the only **variable** in the experiment being the change of material.

You would not need to change how far the magnet is away from the object. This is how a scientist would conduct an experiment!