

Knowledge Organiser

Key Forces and Magnets Knowledge



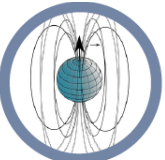
Magnets have two poles, a north and a south pole. The pole is where the pull of the magnet is strongest. When opposite poles are near to each other they will attract, however when the same poles are near to each other they will repel.



Not all metals are attracted to magnets; only those containing iron, steel and nickel.



Magnets are made with metals containing cobalt, nickel, iron or steel that has been exposed to a magnetic field.



The exposure to magnetic fields means the metal's molecules rearrange in a north-south pattern. This polarisation results in the magnet being magnetised.



Objects can move differently on different surfaces. This is a contact force; friction is a force that tries to slow down objects over a surface.



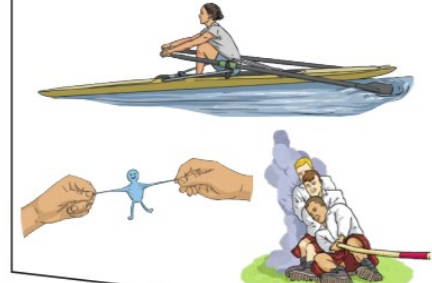
Friction always works in the direction opposite to the direction in which the object is moving, or trying to move.

Types of Movement

Pushes



Pulls



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

Magnetic vs. Non-Magnetic

Magnetic ✓



These objects contain iron, nickel or cobalt. Not all metals are **magnetic**.

Non-magnetic ✗



These objects do not contain iron, nickel or cobalt.

Key Knowledge

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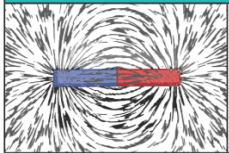
Different **surfaces** create different amounts of **friction**. The amount of **friction** created by an object moving over a **surface** depends on the roughness of the **surface** and the object, and the **force** between them.

The driving **force** pushes the bicycle, making it move.

Friction pushes on the bicycle, slowing it down.



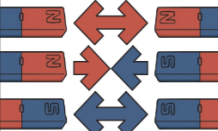
Key Knowledge



Like **poles** **repel**.
Opposite **poles** **attract**.



A **magnetic field** is invisible. You can see the **magnetic field** here though. This is what happens when iron filings are placed on top of a piece of paper with a **magnet** underneath.



The needle in a compass is a **magnet**. A compass always points north-south on Earth.

Key Figures



William Gilbert (1544 - 1603): Gilbert was an English physician and scientist, the first man to research the properties of the lodestone (magnetic iron ore), publishing his findings in the influential 'De Magnete' ('The Magnet'). He also invented the term 'electricity'.



Sir Isaac Newton (1643 -1727): Sir Isaac Newton PRS was an English mathematician, physicist, astronomer, theologian, and author who is widely recognised as one of the greatest mathematicians and most influential scientists of all time.

Vocabulary/Terminology

Magnet

A magnet is a rock or a piece of metal that can pull certain types of metal toward itself.

Attract

When two opposing poles are close to each other they will attract (pull together).

Repel

When two like poles are near each other they will repel (push away from each other).

North and South Poles

A magnet has a north and a south pole.

Magnetic Field

Magnetic fields are areas where an object exhibits a magnetic influence.

Friction

Friction is a force that holds back the movement of a sliding object.

Force

A force is a push or pull acting upon an object.

Contact Force

A force that needs to touch an object before it can affect it (e.g. friction).

Non-Contact Force

A force that affects something from a distance like gravity and magnetism.

Force Meter/ Newton Meter

An instrument used to measure forces.