



# FORCES AND MAGNETS

KNOWLEDGE ORGANISER



Y3

## Overview



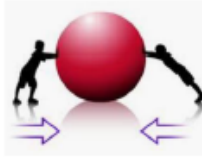
- Forces are pushes and pulls which make things move and stop moving.
- Most forces need contact between objects, but magnets can act at a distance.
- Magnets are made of materials that create a magnetic field (the area in space where the force of magnets can be detected).
- Magnets have at least one north pole and one south pole.
- Magnets can attract or repel one another. They attract some materials & not others.

## Forces

### What are forces?

- A force is the push or pull of an object in a particular direction.

- Forces are shown by arrows in diagrams. The bigger the arrow, the bigger the force. The direction of the arrow shows the direction of the force.



### Pushes and Pulls



- A push is the force that moves an object away from something.



- A pull is the force that brings an object towards something.




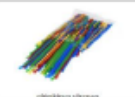
- A push and a pull are opposite forces, moving objects in different directions.

### Balanced and Unbalanced Forces

- If two forces are balanced, they are the same size but are acting in opposite directions. If the two forces are acting on an object, then its motion will not change.

- When two forces acting on objects are not equal in size, they are called unbalanced. Unbalanced forces change the way and/or speed that something is moving, e.g. they can make objects speed up/slow down.

## Magnets

magnetic	non-magnetic
 washer	 eraser
 iron filings	 darning cotton

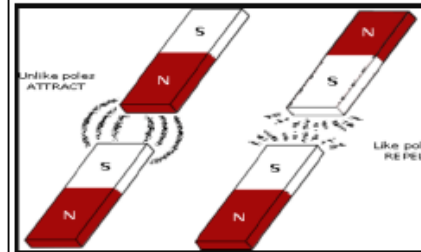
- A magnet is an object that is made of materials that create a magnetic field.

- Magnets create a 'magnetic force' – this is a force that causes objects to attract (pull closer together) or repel (push further apart).

- Unlike most other forces, 'magnetic force' does not require objects to touch one another – magnets can act at a distance.

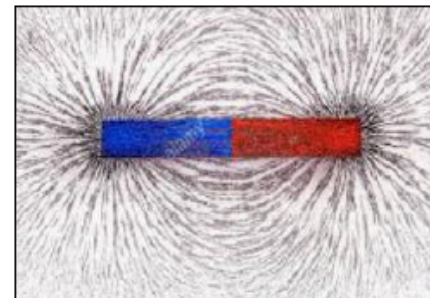
- Magnets have two poles – a north pole and a south pole.

- The north pole of one magnet will repel the north pole of another magnet. However, it will attract the south pole of another magnet.



## Magnetic Fields

- A magnetic field is the area in which a magnetic force can be felt. A magnet will only attract or repel a magnetic object when it enters its magnetic field.



- Magnetic fields cannot be seen with the human eye. However, spreading iron filings over the magnetic field allows us to see the magnetic field, as the filings cling to it.

- Magnetic fields can pass through air. Some can even have an effect through solids and liquids (depending on the strength of the magnet).

### Magnetic Materials

Iron      Steel      Nickel      Cobalt      Gadolinium

### Non-Magnetic Materials

Copper      Gold      Rubber      Wood      Leather