



Key Knowledge & Vocabulary

Some **forces** need contact between two objects, but **magnetic forces** can act at a distance.

Magnets attract or **repel** each other and attract some **materials** and not others.


Some magnetic materials include **iron**, **nickel**, **cobalt** and **alloys**, including **steel**, that contain magnetic metals.

Magnets have two **poles (North and South)** and two magnets will **attract** or **repel** each other, depending on which **poles** are facing. The **Earth** is a giant bar magnet.

Magnets have 'real world' uses e.g. fridge doors, and **electromagnets** are useful too.

Working Scientifically

Fair testing 

Observing over time 

Researching 

Classifying, identifying and comparing 

Exploring 

Seeking patterns 

Which did you use in science lessons and why?

Key Concepts

Forces	Magnet	Pole	Attract	Repel	Electromagnet
Forces are pushes and pulls in a particular direction. If two forces are balanced, it means the forces are the same size but are acting in opposite directions. When two forces acting on an object are not equal in size, we say that they are unbalanced forces. These do change the way something is	When two magnets are close, they create pushing or pulling forces on one another. Some magnets are stronger than others. Strong magnets will create bigger pushing or pulling forces than weak magnets.	These forces are strongest at the ends of the magnets. The two ends of a magnet are known as the north pole and the south pole.	If you put two magnets together with different poles pointing towards one another, the magnets will pull towards each other. We say they attract each other.	If you try to put two magnets together with the same poles pointing towards one another, the magnets will push away from each other. We say they repel each other.	Electromagnets, in which a magnetic field is generated by electricity, are very useful as the magnetic force can be switched on and off. They are used in scrap yards to pick up iron and steel, and in speakers and headphones.

Linking Thinking Across Our Learning Journey

Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Cause and effect	Cause and effect	Everyday materials	Everyday materials	Magnets	Electricity	Space	Forces

Magnetic metals

ELEMENTS THAT CAN BE MAGNETIC:

Elements that can be magnetic

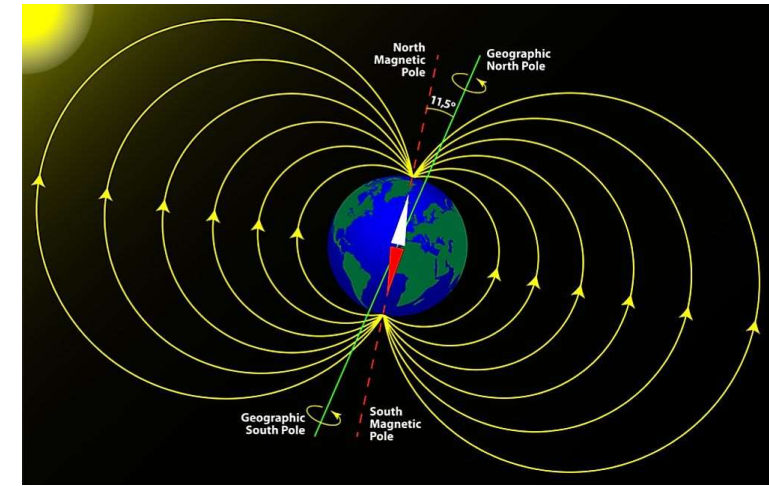
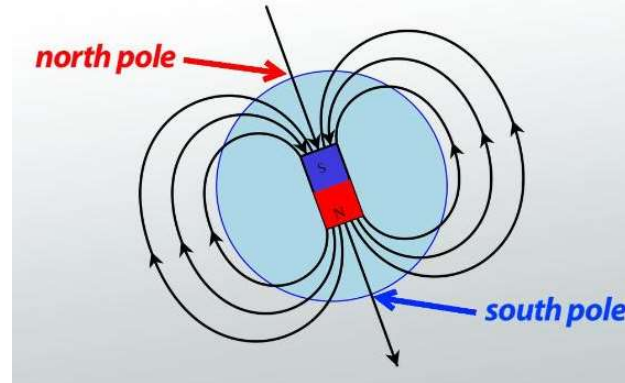
- Fe: Iron**
soft iron loses magnetism easily
- Co: Cobalt**
used to harden tools
- Ni: Nickel**
used to make jewelry

Other magnets:

- Compass
- Earth

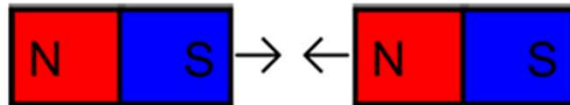
Ferromagnetic		Antiferromagnetic		Diamagnetic		Paramagnetic											
H	Li	Ba	Na	Mg	Al	Si	P	S	Cl	Ar	Ne	Ar	Ne				
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn
Fr	Ra	Ac															
Ce		Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu			

Magnetic poles

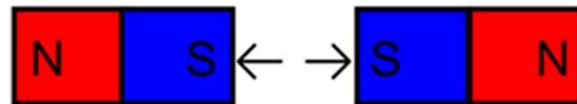


Electromagnets

Attraction and repulsion



Opposite poles **attract**



Same poles **repel**

