Your notes

KS3 Science: revision notes

P2.2 Magnetism

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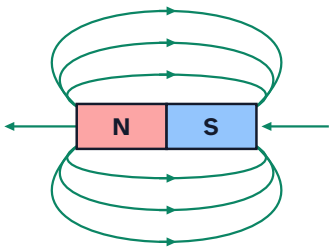
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Magnets

- Every **magnet** has a **north pole** and a south pole. Like poles **repel**; unlike (opposite) poles attract.
- **Magnetic materials** are attracted to **magnets**: iron, nickel, cobalt and steel (which contains iron). Copper, aluminium, gold, plastic and wood are not magnetic.
- Magnetism is a non-contact force.

Magnetic fields

- A **magnetic field** is the area around a **magnet** where **magnetic materials** feel a force.
- **Field lines** go from the **north pole** to the south pole. The closer together the lines, the stronger the field, so the field is strongest at the poles.
- You can see the field pattern with iron filings or map it with a plotting **compass**.
- The Earth has a **magnetic field**, like a giant bar **magnet**. A **compass** needle is a small magnet that lines up with it, pointing north.



Field lines go from north to south. Closer lines: a stronger field.

Electromagnets

- A current in a wire makes a **magnetic field** around it. Coiling the wire into a **solenoid** makes the field stronger; putting an iron **core** inside makes it stronger still.
- An **electromagnet** can be switched on and off, and its strength can be changed.
- It gets stronger with more turns of wire, a bigger current, or an iron **core**.
- Uses: cranes that lift scrap iron, electric bells, door locks, loudspeakers, relays and MRI scanners.

Investigating electromagnets

- Count how many paperclips the **electromagnet** picks up.
- Independent variable: the number of turns (or the current). Dependent variable: the number of paperclips. Control variables: the **core**, the wire and the size of the paperclips.
- Plot the results on a graph and describe the pattern: more turns pick up more paperclips.

Key terms

Magnet	An object that attracts magnetic materials and has a north and a south pole.
North pole	The end of a magnet that points north.
Attract	Pull together.
Repel	Push apart.
Magnetic material	A material attracted to a magnet, such as iron, nickel or cobalt.
Magnetic field	The area around a magnet where magnetic materials feel a force.
Field lines	Lines that show the shape and direction of a magnetic field.
Compass	A small magnet that lines up with a magnetic field.
Electromagnet	A magnet made by passing a current through a coil of wire.
Solenoid	A coil of wire that makes a magnetic field when a current flows.
Core	The iron bar inside an electromagnet that makes it stronger.
Permanent magnet	A magnet that always has its own magnetic field.

Quick questions

Cover the answers and test yourself: remembering is what makes it stick.

Your notes

1. What happens when two north poles are brought together?
2. Which of these metals is magnetic?
3. Which of these is a magnetic material?
4. Where is the magnetic field of a bar magnet strongest?
5. Which way do magnetic field lines point?
6. What can you use to plot the magnetic field around a magnet?
7. How can you make an electromagnet stronger?
8. What is an advantage of an electromagnet over a permanent magnet?

Answers

1. They repel
2. Iron
3. Nickel
4. At the poles
5. From north to south
6. A plotting compass
7. Add more turns of wire to the coil
8. It can be switched on and off

What to do next

Practise 14 questions on this topic

Try 4 exam questions, with mark schemes

Read the lesson, one step at a time

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