Electromagnetism

What is a circuit breaker?	A device that uses an electromagnet to break a circuit if the current is too big.
What is core?	Soft iron metal which the solenoid is wrapped around.
What is an electric bell?	A device that uses an electromagnet to make sound using a 'make and break' circuit.
What is a electromagnet?	A non-permanent magnet turned on and by controlling the current through it.
What is a loudspeaker?	A device that uses an electromagnet to make sound from a varying potential difference. Turns an electric signal into a pressure wave of sound.
What is a magnet?	A material with a magnetic field around it in which a magnetic material experiences a force.
What is magnetic field?	A region in which there is a force on a magnet or magnetic material.
What are magnetic field lines?	Imaginary lines that show the direction of the force on a magnetic material.
What is an electrical conductor?	A material that allows current to flow through it easily, and has a low resistance.
What is an electrical insulator?	A material that does not allow current to flow easily, and has a high resistance.

Magnets

1	What is a magnetic force?	Non-contact force from a magnet on a magnetic material.
2	What is magnetic field?	A region in which there is a force on a magnet or magnetic material.
3	What is electric charge?	A property of a material, the electric charge can be positive, negative, or neutral.
4	What is an electric field?	A region where a charged material or particle experiences a force.
5	What is an electron?	Tiny particles that are part of atoms and carry a negative charge.
6	What is an electrostatic force?	Non-contact force between two charged objects.
7	When does lightning occur?	Occurs when electrons jump from one charged area to another and produce a big current.
8	What is a negatively charged object?	An object that has gained electrons as a result of the charging process.

Photosynthesis and plant nutrition

1	What is fermentation?	A type of anaerobic respiration in which glucose is converted into ethanol, carbon dioxide, and energy.
2	What is fertiliser?	Chemicals containing minerals that plants need to build new tissues.
3	What is haemoglobin?	The substance in blood that carries oxygen around the body.
4	What is photosynthesis ?	The process plants and algae use to make their own food, glucose. In photosynthesis, carbon dioxide and water react together to make glucose and oxygen.
5	What is a producer	Organism that makes its own food using photosynthesis.

Glossary

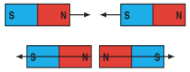
1	producer	Organism that makes its own food using photosynthesis.
2	aerobic respiration	Breaking down glucose with oxygen to release energy and producing carbon dioxide and water.
3	algae	Green uni-cellular or multi-cellular organisms that perform photosynthesis and live underwater.
4	anaerobic respiration	Releasing energy from the breakdown of glucose without oxygen, producing lactic acid (in animals) and ethanol and carbon dioxide (in plants and microorganisms).
5	biotechnology	The use of biological processes or organisms to create useful products.
6	chlorophyll	Green pigment in plants and algae which absorbs light energy.
7	deficiency	A lack of minerals that causes poor growth.
8	plasma	Liquid that transports blood cells and other materials around the body.
9	potassium	A mineral needed by plants for healthy leaves and flowers.
10	iodine	Indicator used to test for the presence of starch.
11	magnesium	A mineral needed by pants for making chlorophyll. It is an element in group 2 of the Periodic Table.

Science | Year 8 | Summer term

Magnetism

Magnets

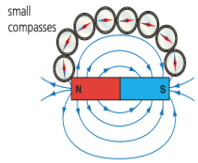
- A **magnet** has two poles, a north and a south pole
  - North poles **attract** south poles
  - South poles **attract** north poles
  - South poles **repel** south poles
  - North poles **repel** north poles



- **Magnetic materials** will experience a magnetic force when placed near a magnet, this is a type of non-contact force as the materials do not have to touch for the force to be apparent
- The three magnetic metals are iron, nickel and cobalt

Magnetic fields

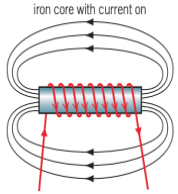
- A **magnetic field** is an area where a magnetic material will experience a force
- A **permanent magnet** will have it's own magnetic field
- **Magnetic field lines** represent the field, these always travel out of the north pole of the magnet, and into the south pole
- The closer together the magnetic field lines are, the stronger the magnetic field will be
- We can find out the shape of a magnetic field in two ways:
  - Using plotting compasses
  - Using iron filings



- The Earth has its own magnetic field, which acts like a giant bar magnet inside the centre of the Earth
- This magnetic field allows compasses to work when navigating around the Earth

Electromagnets

- **Electromagnets** are made by wrapping a coil of wire around a magnetic **core**
- Electromagnets only work when electricity is flowing through the coil, which means that they can be turned on and off
- Electromagnets are also stronger than **permanent** magnets
- The electromagnet will produce the same magnetic field shape as a bar magnet



- You can increase the strength of an electromagnet by:
  - Increasing the number of turns on the coil around the core of the electromagnet
  - Increasing the current which is flowing through the coil of wire
  - Using a more magnetic material for the core, e.g. iron rather than aluminium

Using electromagnets

Electric Bells

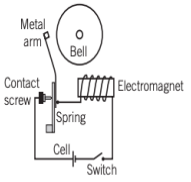
The electromagnet attracts the iron armature

When it moves, it breaks the circuit, no longer allowing current to flow

The coil and core are no longer magnetic meaning the spring is no longer attracted and returns to its original position

The bell is rung once

The circuit is complete again, restarting the process

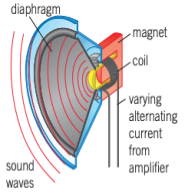


Circuit breakers

- Circuit breakers detect large changes in current in a house, and will break a circuit
- When a large current flows, the electromagnet becomes strong enough to attract an iron catch which will break a circuit
- They can then be reset and used again
- This makes them suitable as an electrical safety device in a home

Loudspeakers

- Loudspeakers use an electromagnet in order to generate sound
- A current passes through the coil and creates an electromagnet, this repels another permanent magnet which moves the cone in and out creating sound



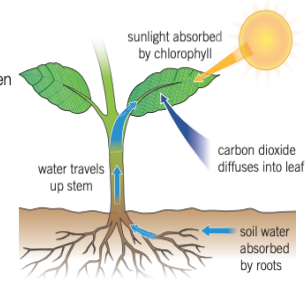
Photosynthesis

Photosynthesis

- **Photosynthesis** is the process which occurs in the chloroplasts to produce glucose using sunlight

water + carbon dioxide + sunlight → glucose + oxygen

- Any organism that can use photosynthesis to produce its own food is known as a **producer**, these are not just limited to plants but can include other organisms such as **algae**



- The rate of photosynthesis can be affected by:
  - Light intensity – the higher the light intensity the higher the rate of photosynthesis up to a point
  - Carbon dioxide concentration – the higher the carbon dioxide concentration the higher the rate of photosynthesis up to a point
  - Temperature – the optimum temperature is the temperature at which photosynthesis occurs at the highest rate, before and after this the rate will be less