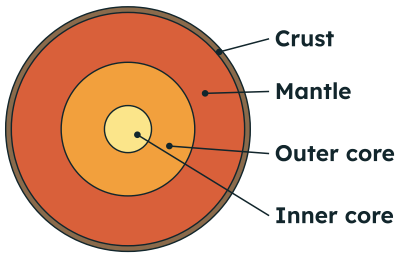
KS3 SCIENCE · CHEMISTRY

# Earth and atmosphere revision sheet

Name _____

## 1. Inside the Earth



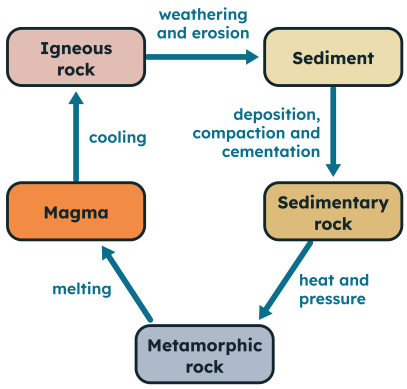

The Earth cut in half. The crust is drawn thicker than it really is.

- The Earth is made of layers: the **crust**, the **mantle** and the **core**.
- **Crust:** thin, solid rock, between 5 and 70 km thick. We live on it.
- **Mantle:** about 2900 km thick. It is hot, solid rock that can flow very slowly. It makes up most of the Earth.
- **Outer core:** liquid iron and nickel. **Inner core:** solid iron and nickel, at over 5000 °C.
- The deeper you go, the hotter it gets.

## 2. Three types of rock

| | TYPE | HOW IT FORMS | WHAT IT IS LIKE | EXAMPLES |
|---|---|---|---|---|
|  | Igneous | Magma (molten rock) cools and turns solid. | Crystals locked together, so it is hard. Slow cooling gives big crystals. | Granite, basalt |
|  | Sedimentary | Layers of sediment are squashed and stuck together. | Grains, often in layers. May contain fossils. | Sandstone, limestone, chalk |
|  | Metamorphic | Heat and pressure change an existing rock, without melting it. | Crystals, often in bands or thin sheets. | Marble, slate |

## 3. The rock cycle




- Over millions of years, rocks change from one type to another.
- **Weathering** wears rock down: frost cracks it, plant roots split it and slightly acidic rain slowly dissolves it. The pieces stay where they are.
- **Erosion** moves the pieces away, carried by rivers, ice or wind.
- **Deposition:** the pieces settle in layers. **Compaction:** the weight above squashes them. **Cementation:** minerals from the water glue the grains together.
- **Heat and pressure** change a rock while it is still solid. **Melting** turns rock into magma, and **cooling** turns magma into igneous rock.
- Short cuts: any rock at the surface can be weathered, and any rock can be changed by heat and pressure, or melted.

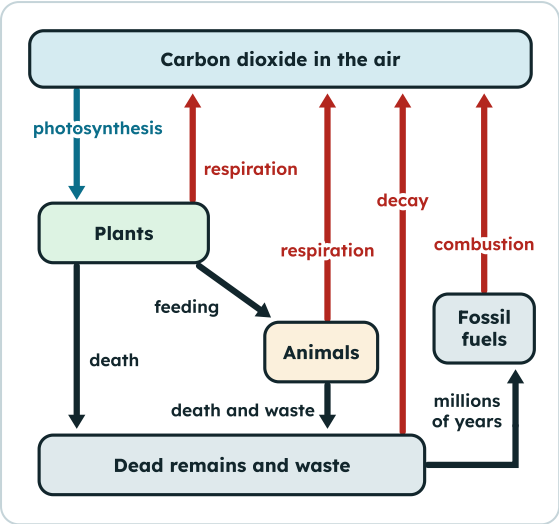
## 4. The atmosphere

The **atmosphere** is the layer of gases around the Earth. Air is a mixture of gases. In every 100 particles of clean, dry air:




- The last 1% is mostly **argon** (about 0.9%). **Carbon dioxide** is only about 0.04%, and there are tiny amounts of other gases.
- Plants and animals need oxygen for aerobic respiration, and fuels need it to burn.
- Real air also holds water vapour, and pollution can change the mixture a little.

## 5. The carbon cycle




- Carbon atoms are used again and again. They move between the air, living things and the ground.
- Arrows: blue takes carbon dioxide out of the air, red puts it back, and black passes carbon on.
- **Photosynthesis** takes carbon dioxide out of the air. Plants use the carbon to make glucose.
- **Feeding** passes the carbon from plants to animals.
- **Respiration** in living things puts carbon dioxide back into the air.
- **Decay:** decomposers (bacteria and fungi) break down dead remains and waste. As they respire, they give out carbon dioxide.
- **Combustion** (burning) of fossil fuels releases carbon that was locked underground for millions of years.
- Some carbon dioxide also dissolves in the sea.



## 6. Climate change

- **The greenhouse effect:** the Sun warms the ground. The warm ground gives out energy as radiation. **Greenhouse gases** (carbon dioxide and methane) absorb some of it, so less energy escapes to space.
- **The cause:** burning fossil fuels in power stations, vehicles and homes adds carbon dioxide to the air. Cutting down forests leaves fewer trees to take it in.
- **The evidence:** the carbon dioxide in the air has risen by half since about 1750, and the average surface temperature of the Earth has risen by about 1 °C. This is **global warming**.
- **The effects:** ice sheets and glaciers melt and sea level rises. There is more extreme weather: heatwaves, droughts, floods and stronger storms.



## 7. Resources and recycling

- **Natural resources** are materials from the Earth that we use to make things. Metal ores, crude oil and limestone are examples.
- Ores and crude oil are **non-renewable**: they took millions of years to form, so they are not replaced as we use them. Wood is renewable, because new trees can be grown.
- The faster a resource is extracted, the sooner it runs out: 600 tonnes of ore, dug out at 50 tonnes a year, lasts 600 ÷ 50 = 12 years.
- **Recycling** means processing a used material so that it can be used again. Less has to be extracted, so the resource lasts longer. Recycling a metal also needs less energy than extracting it from ore, mines damage less land, and less waste goes to landfill.

## Key words

**Crust:** the thin, solid outer layer of the Earth

**Mantle:** the thick layer of hot rock under the crust

**Core:** the centre of the Earth, made mostly of iron and nickel

**Magma:** molten rock below the surface of the Earth

**Igneous rock:** formed when magma cools and turns solid

**Sedimentary rock:** formed from layers of sediment squashed and stuck together

**Metamorphic rock:** formed when heat and pressure change an existing rock without melting it

**Sediment:** small pieces of rock that settle in layers

**Weathering:** the wearing down of rock by physical, chemical or biological processes

**Erosion:** the movement of pieces of rock by water, ice or wind

**Rock cycle:** the processes that change rocks from one type to another

**Atmosphere:** the layer of gases around the Earth

**Carbon cycle:** how carbon moves between the air, living things and the ground

**Fossil fuel:** coal, oil or natural gas, formed from the remains of dead organisms

**Greenhouse gas:** a gas that stops some energy escaping from the Earth to space

**Global warming:** the gradual rise in the average surface temperature of the Earth

**Natural resource:** a material from the Earth that we use to make things

**Recycling:** processing a used material so that it can be used again

Pictures are illustrations made for this sheet, not real photographs.