Your notes

KS3 Science: revision notes

C2.3 Earth systems

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The Earth and its rocks

- The Earth has a thin rocky **crust**, a hot **mantle** of rock that flows very slowly, a liquid outer **core** and a solid inner core, both made of iron and nickel.
- **Igneous rocks** form when magma or lava cools and becomes solid. Slow cooling underground makes large crystals (granite); fast cooling at the surface makes small crystals (basalt). They are hard, with interlocking crystals.
- **Sedimentary rocks** form from layers of sediment. They are often porous, made of grains, and may contain fossils: sandstone, limestone (from shells), chalk and mudstone.
- **Metamorphic rocks** form when existing rocks are changed by heat and pressure without melting: limestone becomes marble, and mudstone becomes slate.

The rock cycle

- **Weathering** breaks rocks down where they are: physical (freeze-thaw, when water freezes in cracks, expands and splits the rock), chemical (**acid rain**) and biological (plant roots).
- **Erosion** and transport carry the pieces away, for example in rivers. **Deposition** drops the sediment in layers, often at the bottom of the sea.
- Compaction and cementation turn the layers into **sedimentary rock** over millions of years.
- Heat and pressure make **metamorphic rock**; melting makes magma, which cools to form **igneous rock**. Uplift brings rocks back to the surface.

The water cycle

- Water evaporates from the sea and transpires from plant leaves. The water vapour rises, cools and condenses into clouds. It falls as **precipitation** (rain, snow or hail), then flows back to the sea in rivers or through the ground.

- Living things need water for transporting substances, for chemical reactions and for controlling temperature.

The atmosphere and air pollution

- Dry air is about 78% nitrogen, 21% oxygen, 1% argon and 0.04% carbon dioxide.
- Burning fossil fuels releases carbon dioxide (which causes global warming), sulfur dioxide and nitrogen oxides (which cause **acid rain**), soot particles (which cause breathing problems) and carbon monoxide (which is toxic).
- Pollution can be reduced by using renewable energy and public transport, and by fitting catalytic converters to cars.

Key terms

Crust	The Earth's thin, rocky outer layer.
Mantle	The hot layer of rock below the crust, which flows very slowly.
Core	The centre of the Earth, made of iron and nickel.
Igneous rock	Rock formed when magma or lava cools and becomes solid.
Sedimentary rock	Rock formed from layers of sediment squashed and cemented together.
Metamorphic rock	Rock formed when existing rock is changed by heat and pressure.
Weathering	The breaking down of rocks where they are.
Erosion	The wearing away and carrying off of rock pieces.
Deposition	When sediment is dropped in layers.
Rock cycle	The ways rocks change from one type to another over time.
Evaporation	Liquid water turning into water vapour.
Condensation	Water vapour cooling and turning into liquid water.
Precipitation	Water falling from clouds as rain, snow or hail.
Acid rain	Rain made acidic by gases such as sulfur dioxide.

Quick questions

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

1. How are igneous rocks formed?
2. Why does granite have large crystals?
3. Which of these is a sedimentary rock?
4. What does marble form from?

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5. Which type of rock is most likely to contain fossils?
6. What is weathering?
7. What is freeze-thaw weathering?
8. What happens during compaction?

Answers

1. When molten rock (magma or lava) cools and turns solid
2. Its magma cooled slowly underground
3. Sandstone
4. Limestone changed by heat and pressure
5. Sedimentary
6. The breaking down of rocks where they are
7. Water freezes in cracks, expands and splits the rock
8. Layers of sediment are squashed by the weight above them

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

Free revision for GCSE and KS3 at lycolearn.co.uk. Some notes are for one exam board only, and say so in brackets.

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