

SCIENCE · Y3–Y4

Rocks & Minerals

Knowledge Organiser — Year 3–4 Science

Key vocabulary

1

Rock

A naturally occurring solid made of one or more minerals.

2

Mineral

A natural, non-living solid with a fixed chemical make-up. Rocks are made of minerals.

3

Igneous rock

Formed when magma (melted rock) cools and hardens. E.g. granite, basalt.

4

Sedimentary rock

Formed when layers of sediment are pressed together over millions of years. E.g. sandstone, limestone.

5

Metamorphic rock

Formed when existing rock is changed by intense heat or pressure. E.g. marble, slate.

6

Fossil

The preserved remains or traces of a prehistoric organism, found in sedimentary rock.

7

Sediment

Tiny particles of rock, sand, or organic material deposited by water, wind, or ice.

8

Erosion

The wearing away of rock and soil by wind, water, or ice.



9

Weathering

The breaking down of rock in place by weather, plants, or chemicals. Does not involve movement.

10

Permeable

Allows water to pass through. Sandstone is permeable; slate is not.

11

Crystal

A mineral that has grown into a regular, repeating 3D shape. Salt, quartz, and calcite form crystals.

12

Magma

Molten rock beneath the Earth's surface. Called lava once it reaches the surface.

Three rock types

How each one forms

- IGNEOUS — 'fire rocks'. Magma cools underground (granite — slow, large crystals) or on the surface after a volcano (basalt — fast, small crystals).
- SEDIMENTARY — sediment settles in layers in seas and lakes. Over millions of years, layers compact into rock. Contains fossils.
- METAMORPHIC — existing rock is buried, heated, or squeezed. The minerals rearrange. Limestone → marble. Mudstone → slate.
- Easy memory check: IGNEOUS = cooled magma; SEDIMENTARY = layers and fossils; METAMORPHIC = changed by heat/pressure.
- Each type can become another type — this is the ROCK CYCLE.

The rock cycle

How rocks change over millions

- 1. Magma rises from the mantle and cools → IGNEOUS ROCK forms.
- 2. Rock at the surface is broken down by WEATHERING and EROSION.
- 3. Fragments are carried away and deposited as SEDIMENT.
- 4. Sediment piles up, compresses, and hardens → SEDIMENTARY ROCK forms.



- 5. Rock buried deep is heated and squeezed → METAMORPHIC ROCK forms.
- 6. With enough heat, rock melts back into MAGMA → cycle starts again.
- The whole cycle takes millions of years. Rocks we walk on today formed long before humans existed.

Fossils

How they form and what they

- Fossils only form in SEDIMENTARY rock — because the layers trap and preserve remains.
- An organism dies and is buried in sediment. Soft parts decay; hard parts (bones, shells) remain.
- Over time, minerals replace the original material — the shape is preserved in rock.
- Some fossils are trace fossils: footprints, burrows, or teeth marks preserved in rock.
- Mary Anning (1799–1847): fossil hunter who found ichthyosaur and plesiosaur skeletons in Lyme Regis, England.
- Fossils show us what life looked like millions of years ago — evidence for evolution.
- Most living things do NOT become fossils — the conditions must be exactly right.

