Subject Knowledge Organiser

Science – Rocks

Year 3

What I have already learnt

Materials and Their Uses: You have learned about different types of materials (wood, metal, plastic, glass) and their properties, such as hardness, transparency, and flexibility.

The Natural World: You know about the natural environment, including features like mountains, rivers, and how weather affects landscapes.

Basic Earth Knowledge: You've explored basic knowledge about the Earth, such as seasons, weather patterns, and living organisms.

What I will have learnt by the end of this unit

- I will be able to identify different types of rocks (igneous, sedimentary, and metamorphic) and understand how they are formed.
- I will know how fossils are created and their importance in learning about Earth's history.
- I will understand that soil is made from rocks and organic matter and recognize different types of soil.
- I will understand the properties of different rocks and soils and how these properties make them useful in different ways.

What I will have learnt by the end of my Key Stage

I will have a deeper understanding of how rocks, soils, and fossils are part of the Earth's natural processes.

I will be able to explain the rock cycle and how rocks change over time.

I will understand how fossils provide evidence of life millions of years ago and how soils support plants and animals in ecosystems.

Key Knowledge

Types of Rocks:

- Igneous Rocks: Formed from cooling magma or lava (e.g., basalt, granite).
- Sedimentary Rocks: Made from layers of sand, mud, and pebbles that are compressed over time (e.g., limestone, sandstone).
- Metamorphic Rocks: Formed when existing rocks are changed by heat and pressure (e.g., marble, slate).

Formation of Rocks: Rocks are created and changed by Earth's processes such as cooling, weathering, pressure, and erosion.

Fossils: Fossils are the remains or traces of ancient living organisms preserved in rocks, usually found in sedimentary rock layers.

Soil: Soils are made from tiny rock particles mixed with organic matter (decayed plants and animals), air, and water. There are different types of soils, such as clay, sand, and loam.

Properties of Rocks and Soils: Different rocks have different properties, such as hardness, permeability (whether water can pass through), and grain size. Soils also have different properties depending on their composition and how they are formed.

Wider opportunities
Diversity and Cultural Capital

Geology Field Trips: Visiting local geological sites or museums to explore rock formations, fossils, and soils first-hand.

Cultural Contributions: Learning about how different cultures and civilizations have used rocks for building, art, and tools (e.g., Stonehenge in the UK, pyramids in Egypt).

Environmental Awareness: Understanding the importance of soils in growing food and maintaining ecosystems, as well as the impact of soil erosion and rock weathering on the environment.

Careers in Geology: Introducing careers like geologists, archaeologists, and environmental scientists to inspire children's interest in Earth science.

My Skills and Knowledge that I may use from other subjects

Maths:

- Measuring the size, weight, and properties of rocks during experiments.
- Collecting and recording data in tables and graphs when investigating rock permeability and hardness.

Geography:

- Understanding different landscapes and landforms (e.g., mountains, valleys) where rocks are found.
- Learning about how weathering and erosion shape the land over time, such as rivers breaking down rocks.

History:

- Exploring how rocks have been used throughout history, such as in building materials for ancient structures like castles, monuments, and pyramids.
- Understanding how fossils help us learn about the Earth's past and the creatures that lived millions of years ago.

Art and Design:

- Using rocks as inspiration for creative artwork, such as making rock sculptures or fossil drawings.
- Understanding the use of natural materials in art and architecture from different cultures.

English:

- Developing your ability to describe rocks and fossils using precise and scientific vocabulary.
- Writing explanations and reports on your scientific investigations and findings about rocks and soils.

Key Skills I will learn/use

Observation: Closely examining rocks, soils, and fossils to identify their characteristics.

Classification: Sorting rocks into different categories based on their properties (e.g., hardness, colour, grain size).

Scientific Investigation: Conducting experiments to test rock properties, such as permeability and hardness, and observing how soils differ.

Drawing Conclusions: Using data collected from observations and experiments to reach conclusions about the properties of rocks and soils.

Critical Thinking: Reflecting on how rock types and soil properties affect their uses in everyday life and the environment.

Recall and Remember

What are the three main types of rocks?
Igneous, sedimentary, metamorphic.

How is sedimentary rock formed?
It is formed by layers of sediment being compressed over time.

Where are fossils usually found?
Fossils are usually found in sedimentary rocks.

What are soils made of?
Soils are made of small rock particles, organic matter, air, and water.

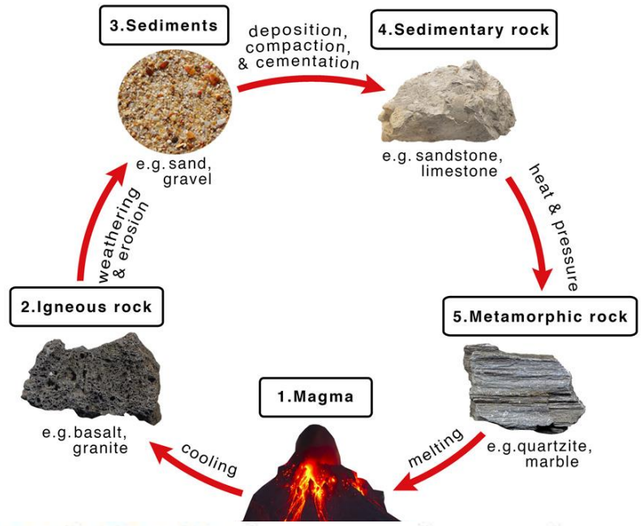
What does the word "permeable" mean?
A material that allows water to pass through it.

Can you give an example of an igneous rock?
Granite or basalt.

What are fossils, and why are they important?
Fossils are remains of ancient organisms that tell us about life millions of years ago.

How do rocks change over time?
Rocks can change through weathering, erosion, heat, and pressure, forming different types of rocks.

Steps of the Rock Cycle

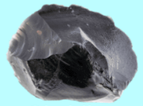


Types of Rocks

Igneous
- Forms from magma or lava solidification
- Hard, no layers


Granite

Intrusive slow magma cooling


Obsidian

Extrusive rapid lava cooling

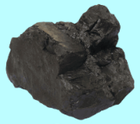
Sedimentary
- Forms from sediment compaction
- Crumbly, layered


Sandstone

Clastic compacted broken rocks


Limestone

Chemical compacted dissolved minerals


Coal

Organic compacted biogenic matter

Metamorphic
- Forms by transformation of other rocks
- Relatively hard, may or may not have layers

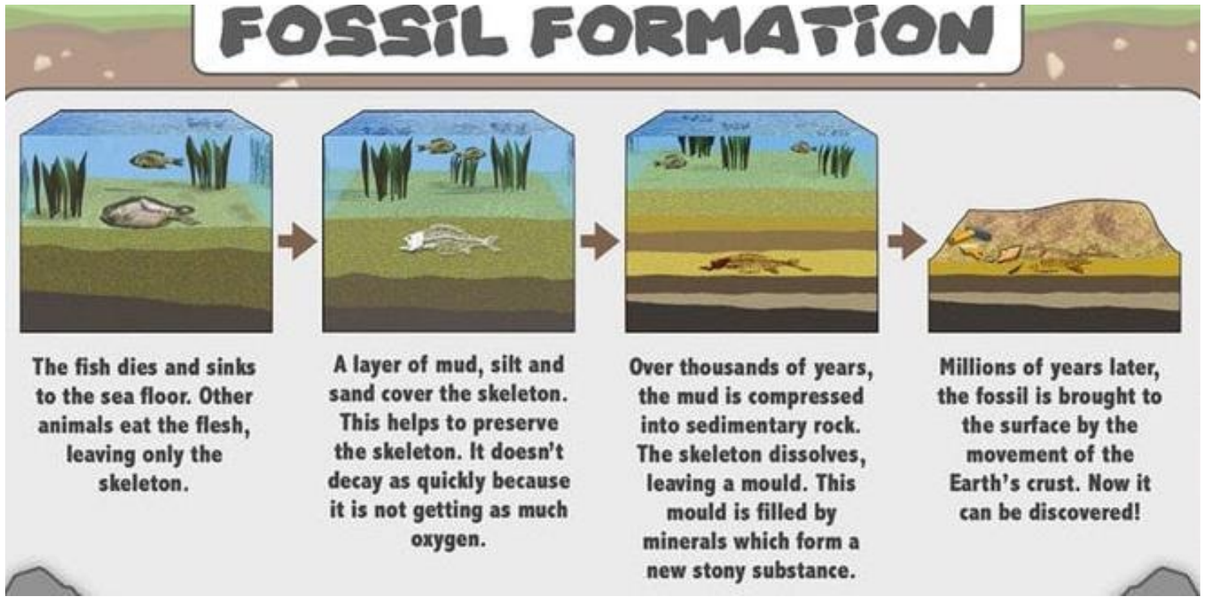

Slate

Foliated has layers


Marble

Non-Foliated no layers

Body fossils show us what a plant or animal looked like. They are the fossilised remains of an animal or plant, like bones, shells and leaves.



Key Scientific Concepts

Biology

Chemistry

Physics

Scientific enquiry

Science for the future

Key Vocabulary

Rock: A solid natural material made of minerals.

Igneous: Rocks formed from cooled molten rock.

Sedimentary: Rocks formed from compressed layers of sediment.

Metamorphic: Rocks changed by heat and pressure.

Fossil: Remains or impressions of ancient organisms preserved in rock.

Erosion: The wearing away of rock by wind, water, or ice.

Weathering: The breaking down of rocks into smaller pieces by natural forces.

Permeable: A rock or soil that allows water to pass through it.

Organic Matter: Material from living organisms, such as decayed plants or animals, found in soil.

Mineral: A natural, solid substance found in rocks.