

EARTH'S STRUCTURE AND ROCK CYCLE

Earth's Structure and Rock Cycle

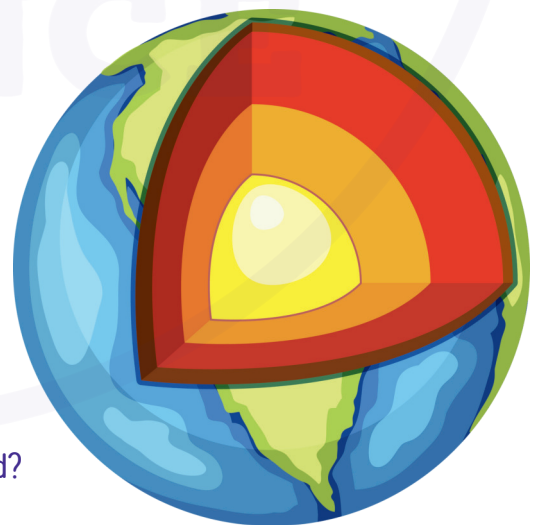
- The Earth is structured in four main layers: the crust, mantle, outer core, and inner core, each with distinct properties.
- Rocks are classified into three main types: igneous, sedimentary, and metamorphic, based on their formation processes.
- The rock cycle is a continuous process that describes how rocks transform from one type to another through weathering, erosion, deposition, heat, pressure, melting, and cooling.
- Dynamic processes such as plate tectonics, volcanic activity, and sediment deposition drive the changes within the Earth and the rock cycle.

Key Facts to Remember

- **Crust:** The Earth's outermost layer, made of solid rock, supports life, and varies in thickness from 5 km under oceans to 70 km under continents.
- **Mantle:** A thick, semi-solid layer beneath the crust composed of silicate materials, flowing slowly and driving plate tectonics.
- **Outer Core:** Made of molten iron and nickel, creating the Earth's magnetic field through convection currents.
- **Inner Core:** Solid due to immense pressure, consisting mainly of iron and nickel, with temperatures reaching up to 5,400°C.
- **Igneous Rocks:** Formed when magma or lava cools and solidifies. Intrusive examples: Granite; extrusive examples: Basalt.
- **Sedimentary Rocks:** Formed from compressed layers of sediment over millions of years. Examples: Sandstone (formed from sand), Limestone (from marine organisms).
- **Metamorphic Rocks:** Created when existing rocks undergo heat and pressure. Examples: Marble (from limestone), Slate (from shale).
- **Rock Cycle Processes:** Include weathering (breaking rocks into smaller pieces), erosion (movement of sediments), deposition (settling of sediments), compaction (pressing sediments together), cementation (binding sediments), melting (rock becomes magma), and cooling (magma solidifies into igneous rock).

Quick Questions

1. Name the four layers of the Earth.
2. What is the difference between the outer and inner core?
3. How are igneous rocks formed?
4. What processes turn sediment into sedimentary rock?
5. Name a metamorphic rock and its parent rock.
6. What role does erosion play in the rock cycle?
7. How does the mantle's movement affect the Earth's crust?
8. What type of rock is formed when magma cools underground?



Fun Fact

The deepest mine in the world, the Mponeng Gold Mine in South Africa, goes over 4 kilometers into the Earth's crust, but it's still just scratching the surface compared to the Earth's total depth!