SS1 Geography

Week 7: Rocks (Detailed Lesson Note)

Objectives

- Understand the meaning and classification of rocks
- Describe characteristics of rocks including texture, color, and permeability
- Explain how different types of rocks are formed
- Identify the common uses of rocks

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1. Meaning of Rocks

Rocks are naturally occurring solid aggregates of one or more minerals or mineraloids. They make up the Earth's crust and are the foundation of the landscape.

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2. Types of Rocks

Rocks are classified into three main groups based on their mode of formation:

a. Igneous Rocks

- Formed when molten rock material (magma or lava) cools and solidifies
- **Intrusive igneous rocks:** Form beneath the Earth's surface, cool slowly, e.g., granite
- **Extrusive igneous rocks:** Form on the surface after volcanic eruption, cool quickly, e.g., basalt
- Characteristics: Usually hard, dense, crystalline texture
- Common uses: Building materials, road construction, monuments

b. Sedimentary Rocks

- Formed by the accumulation and compression of sediments like sand, mud, and organic remains
- Usually layered and may contain fossils
- Examples: sandstone, limestone, shale
- Characteristics: Softer than igneous rocks, porous, less dense

- Uses: Cement making, building stones, decorative stones

c. Metamorphic Rocks

- Formed when existing rocks are subjected to heat and pressure, causing physical and chemical changes without melting
- Examples: marble (from limestone), slate (from shale), gneiss (from granite)
- Characteristics: Hard, dense, foliated or banded appearance
- Uses: Construction, flooring, roofing, sculpture

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3. Characteristics of Rocks

a. Texture

- Refers to the size, shape, and arrangement of mineral grains
- Igneous rocks: coarse or fine-grained texture depending on cooling speed
- Sedimentary rocks: often gritty or layered
- Metamorphic rocks: foliated (layered) or non-foliated

b. Color

- Varies based on mineral composition
- Light-colored rocks contain quartz and feldspar
- Dark-colored rocks contain iron and magnesium

c. Permeability

- The ability of rock to allow water to pass through
- Sedimentary rocks like sandstone are usually permeable
- Igneous rocks like granite are often impermeable

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4. Formation of Rocks

- **Igneous rocks** form from cooling magma/lava
- **Sedimentary rocks** form from deposition and compression of sediments

- **Metamorphic rocks** form from existing rocks transformed by heat and pressure

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5. Uses of Rocks

Rock Type	Common Uses
Igneous	Building blocks, road stones, monuments
Sedimentary	Cement production, building, fossils
Metamorphic	Flooring, roofing, sculpture

Summary Table

Rock Type	Formation	Characteristics	Uses
Igneous	Cooling of magma/lava	Hard, crystalline	Construction, monuments
Sedimentary	Compacted sediments	Layered, softer	Cement, building stones
Metamorphic	Heat and pressure	Hard, foliated or banded	Flooring, roofing