

# Rock System and Classification

## Types of Rocks



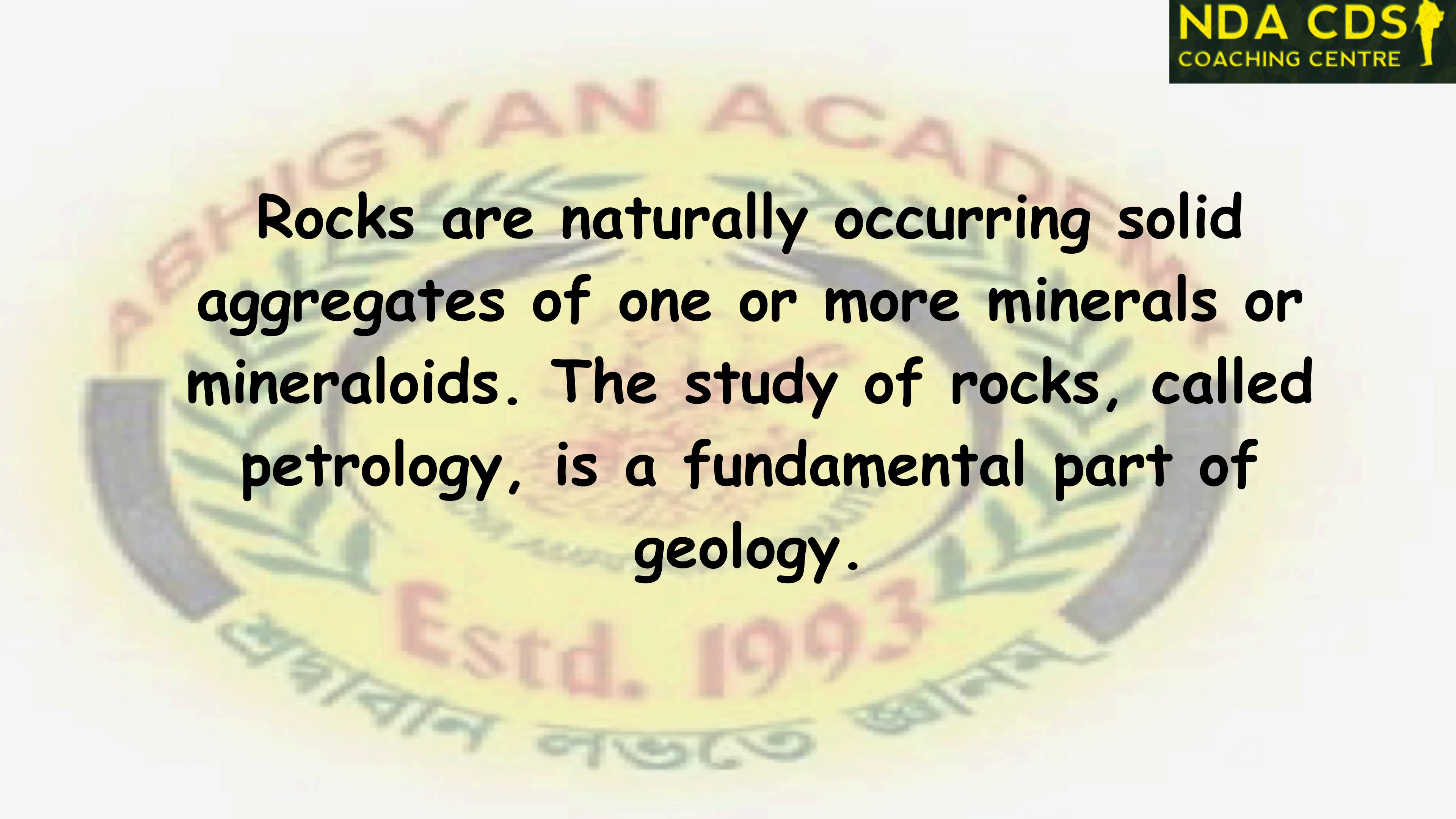
Igneous



Sedimentary



Metamorphic



Rocks are naturally occurring solid aggregates of one or more minerals or mineraloids. The study of rocks, called petrology, is a fundamental part of geology.

## Classification of Rocks

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

### 1. Igneous Rocks

- Formation: Formed from the solidification of molten magma or lava.
  - Types
- Intrusive (Plutonic): Formed below the Earth's surface; slow cooling allows large crystals to form. Example: Granite.
- Extrusive (Volcanic): Formed at or near the Earth's surface; rapid cooling results in small or no crystals.  
Example: Basalt.

# COLLECTION OF IGNEOUS ROCKS



Igneous rock forms through the cooling and solidification of magma or lava. Igneous rock may form with or without crystallization, either below the surface as intrusive (plutonic) rocks or on the surface as extrusive (volcanic) rocks.

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## 2. Sedimentary Rocks

- Formation: Formed from the accumulation and lithification of sediment (material derived from pre-existing rocks or biological activity).
- Types:
  - Clastic: Made from fragments of other rocks. Example: Sandstone.
  - Chemical: Formed from precipitation of minerals from water. Example: Limestone.
  - Organic: Composed of organic material, such as plant debris. Example: Coal.

## -Steps in Formation:

1. Weathering: Rocks break down into smaller pieces.
2. Erosion: Sediments are transported by wind, water, or ice.
3. Deposition: Sediments settle out of the transporting medium.
4. Compaction: Layers of sediments build up and squeeze together.
5. Cementation: Minerals precipitate from water and glue sediments together.

# Types of Sedimentary Rocks

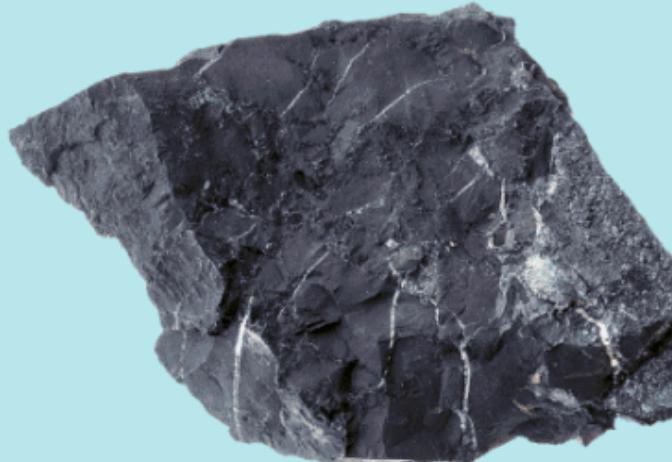
Sedimentary rocks form from compaction of sediment.

## Clastic

Form by compaction of rock fragments (clasts)



**Sandstone**



**Shale**

## Chemical

Form by precipitation of minerals



**Limestone**



**Gypsum**

## Organic

Form by accumulation of animal or plant debris



**Coal**



**Chalk**

### 3. Metamorphic Rocks

- Formation: Formed from the alteration of pre-existing rocks (igneous, sedimentary, or other metamorphic rocks) due to heat, pressure, and/or chemically active fluids.
  - Types:
    - Foliated: Have a layered or banded appearance due to the alignment of mineral grains under pressure. Example: Schist.
    - Non-foliated: Do not have a layered texture. Example: Marble.

## Key Points

- **Rock Cycle:** Describes the transitions through geologic time among the three main rock types.
- **Texture and Composition:** Key properties used to identify and classify rocks.
- **Mineral Content:** Determines the chemical and physical properties of rocks.

These classifications help geologists understand Earth's history and processes, as well as the distribution of natural resources.

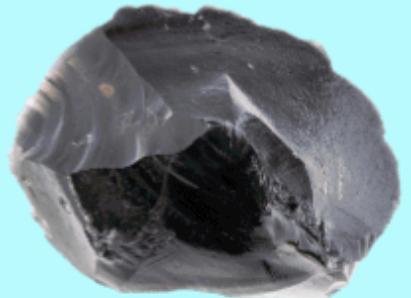
# Types of Rocks

## Igneous

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



Granite



Obsidian

**Intrusive**  
slow magma cooling

**Extrusive**  
rapid lava cooling



Sandstone



Limestone



Coal

## Sedimentary

- Forms from sediment compaction
- Crumbly, layered

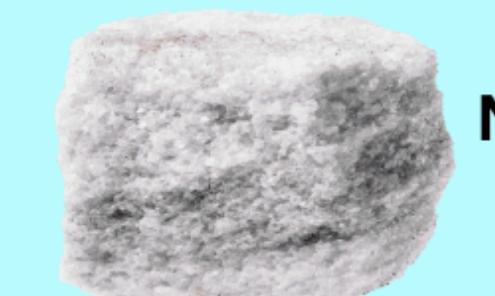
**Clastic**  
compacted  
broken rocks

**Chemical**  
compacted  
dissolved minerals

**Organic**  
compacted  
biogenic matter



Slate



Marble

**Foliated**  
has layers

**Non-Foliated**  
no layers



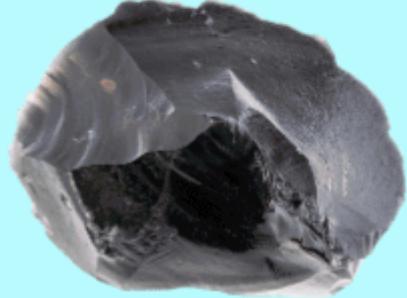
# Types of Rocks

## Igneous

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Limestone



Coal

**Extrusive**  
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## Metamorphic

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



Slate



Marble

**Foliated**  
has layers

**Non-Foliated**  
no layers

**Clastic**  
compacted  
broken rocks

**Chemical**  
compacted  
dissolved minerals

**Organic**  
compacted  
biogenic matter

