

LESSON 2 : ROCKS AND MINERALS

Objective of the chapter

- *Rocks are made up of minerals*
- *Rock formation occur in many ways*
- *Various uses of rocks*

For better understanding, this chapter is split into 5 sessions. You can learn one topic each day. Please take notes in a rough copy.

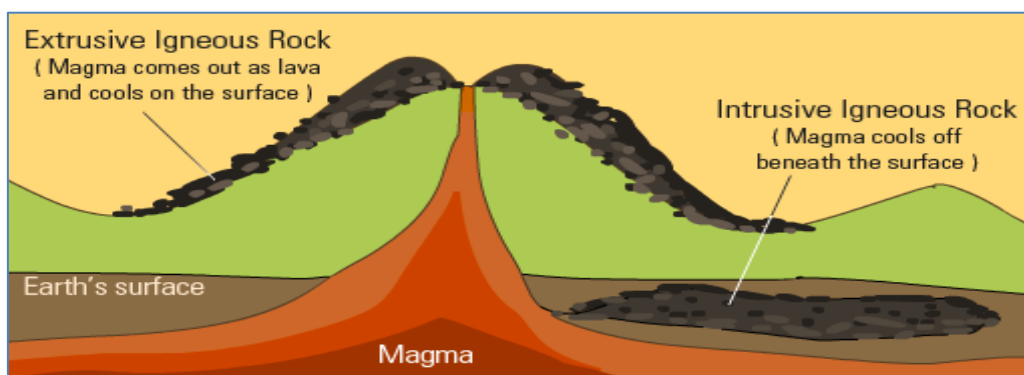
Introduction:-Earth is made up of soil and rocks. However, deep inside, it is mostly rock. If you look at a piece of rock with a magnifying glass, it is made up of small grains called minerals.

Minerals are the building blocks of rocks and are of different types. The rocks on the Earth's crust divided into three main types based on how they are formed.

1. **Igneous rocks**
2. **Sedimentary rocks**
3. **Metamorphosis rocks**

Igneous rocks:- Deep inside the Earth, the temperature is so high that rock melt. Molten material is known as Magma. Magma gets pushed upwards towards the surface of the Earth where it cools to form solid rocks again. These rocks are known as igneous rocks. Sometimes, the molten rock spills out onto the surface of the earth through cracks or a Volcano, called Lava.

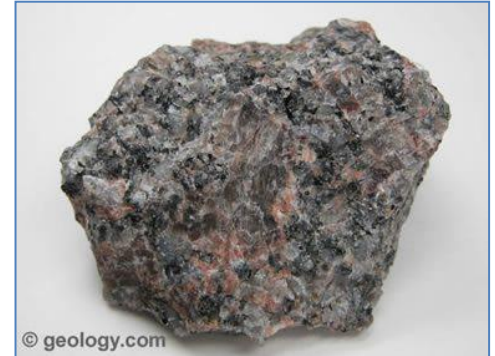
Formation of igneous rocks



Types of igneous rocks:-

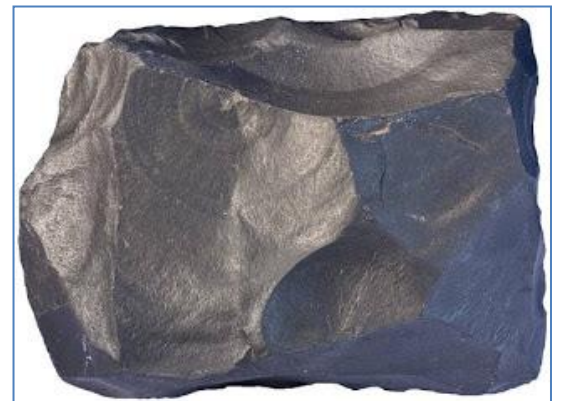
Granite:- Granite is formed when magma cools slowly under the surface of the Earth.

- It is hard and has large grains.
- It is used in buildings and statues.
- It is made up of feldspar, quartz and mica.
- It may be white, grey, pink black in colour.



Basalt:- It is formed when Volcanic Lava cools very fast and hardens quickly above the surface of the Earth.

- It is dark coloured
- It is used in constructions.
- It is glassy and fine grained.



Obsidian:- It is formed when Magma cools quickly. When obsidian is broken it forms sharp edges.

- It is dark coloured, glassy and colourful.
- Ancient humans used these rocks to make tools.



Pumice:- It is formed when frothy lava cools quickly on the Earth's surface. As it cools, the gases in the froth remains trapped inside.

- It looks like sponge with holes
- It is used as a body scrubber.
- It is also used to polish furniture and floors.



DAY 2

SEDIMENTARY ROCKS

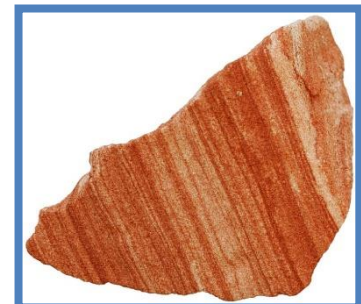
It is formed from older rocks that have been broken into tiny fragments (a small piece of a large object). Wind and rains carry these tiny bits of rocks to rivers, lakes and seas where they sink to the bottom and form layers called sediments. These layers turn into rocks. over millions of years and are known as sedimentary rocks.

Sometimes, the remains of dead organisms like their shells and bones get preserved in the sediments or leave behind an impression. These preserved materials or impressions in sedimentary rocks are known as **fossils**. Fossils tell us about life forms millions of years ago.

Types of sedimentary rocks

Sandstone:- It is formed when grains of sand get compressed and cemented together. It consists mostly of a mineral called Quartz.

- It is used in construction of buildings.
- Red fort is made of red sandstone.



Limestone:- It consists of mineral called Calcite. Calcite is formed from the shells and skeletons of tiny sea animals. When these animals die, their shell and skeletons settle on the sea bed and form limestone.

- It is used to make cement and bricks
- Chalk is a kind of Limestone.

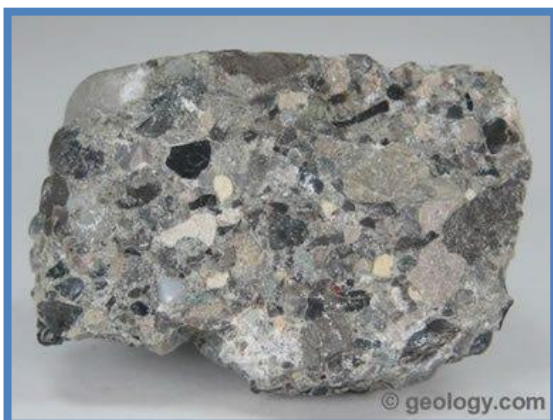


Shale:- It is formed when layers of clay and slit harden.

- It is smooth and mostly used to make cement, tiles and bricks.



Conglomerates look like pebbles cemented together with minerals.



Give one word for the following

- 1. The glossy igneous rock**
- 2. The rock formed from sand**
- 3. The rock formed from pebbles and sand.**

DAY 3 : METAMORPHIC ROCKS

Originally, sedimentary or igneous rocks which undergo a change. The high temperature and pressure deep inside the earth forces this change. The rock undergoes a change in appearance and becomes tougher and harder.

Types of Metamorphic Rocks

Marble Formed when limestone undergoes a change.

- Can be carved and polished easily
- In White, Black, Pink, Green, Grey etc colours
- Used to make statues and tiles
- Taj Mahal is made of white marble



Quartzite

Formed of Sandstone

- Hard and tough
- Used to make monuments, statues, jewellery



Slate

Formed from shale

- Splits into thin sheets
- Found in many colours
- For writing slates, blackboards and roof tiles



Gneiss

Formed from Granite

- Coarse grains and irregular bands
- Different colours
- Often glitters due to Mica



DAY 4

WEALTH FROM ROCKS

Building Materials :- Some common rocks / product from rocks are :-

- Limestone, marble, Granite
- Cement
- Slate

Metals:- Many minerals in rocks contain metals. Rocks containing metals are called Ores. Eg: Magnetite is an ore of Iron.

- Magnetite has the property of attracting iron
- Magnetite can be used to find direction.



Gemstones:- Minerals are found in the form of crystals.

- They are hard and can be cut and polished into beautiful stones called gemstones.
- Rubies, diamonds, sapphires are used to make jewellery.



Fuels:- Coal is a type of sedimentary rocks. When plants died, they got buried in the swamps. Many layers of mud, sand and other dead plants were deposited on them. The heat and the pressure from the layers above changed the dead plant into coal.

Crude oil is also called petroleum. It was formed from the dead remains of plants and animals in the sea. When these plant and animals died they sank to the bottom of the sea. The heat and pressure changed the dead remains into petroleum.

IMPORTANCE OF COAL AND PETROLEUM

- ❖ Coal is used as a fuel for cooking and to heat houses.
- ❖ To generate electricity and factories to run machines.
- ❖ Petroleum (petrol and diesel) to run vehicles and machines.
- ❖ We get paints, fertilisers, cosmetics and other products from it.

We must conserve these fuels and look for other sources of energy like solar energy. Burning of these fuels also causes air pollution which is one of the biggest health hazards.

Recap

1. Rocks are made up of minerals.
2. There are three kinds of rocks. Igneous, sedimentary and metamorphous.
3. Rocks are used as building material and as gemstones in jewellery.
4. Coal is formed from the remains of plants.
5. Petroleum is formed from the remains of plants and animals in the sea.

DAY 5

Book Exercises and Q/A's

1. Answer the following questions

(a) What are rocks made up of?

Ans. Rocks are made up of minerals.

(b) How are igneous rocks are formed?

Ans. Igneous rocks are formed by the cooling of lava above or just under the earth's surface.

2. Explain how sedimentary rocks are formed.

Ans. Rocks or mountain are broken down by water , rain and wind. These small bits of rocks are carried by flowing water settle at the river and ocean beds. Repeated deposition of these small bits takes place in layers. These layer get compressed into rocks called sedimentary rocks. Animal remains also get buried in sediments and are called fossils.

3. Define:-

a. Magma:- Hot molten rocks found deep inside the earth.

b. Ore:- Some rocks contain metal that can be extracted. Such rocks are called ore.

c. Sandstone:- It is a rock formed when grains of sand particles get compressed and cemented together.

d. Metamorphic rocks:- Rocks that are formed due to changes in igneous or sedimentary rocks.

Q5. How are rocks useful to us?

Ans. Rock are useful to us in the following ways:-

- a. Metals are extracted from the rocks.
- b. Rock salt, chalk and talcum powder are derived from rocks.
- c. Coals and petroleum are useful fuels obtained from rocks.
- d. Bricks, cement, tiles and concrete made from rocks are used as building material.
- e. Minerals like diamonds, rubies and emerald are obtained from rocks. It is used in jewellery.

Q6. How is coal formed?

Ans. Coal is a type of sedimentary rock. It is formed from the remains of plants that grew in forests. Millions of years ago, when the plant died, they were buried in swamps. Many layers of mud, sand and other dead plants were deposited on them. The heat and pressure from layers above gradually changed the plants material to form coal.

You Now Know...



- 🍃 Rocks are made up of minerals.
- 🍃 There are three kinds of rocks—igneous, sedimentary and metamorphic.
- 🍃 Igneous rocks such as granite and basalt are formed when magma cools, either below or above the surface of the Earth.
- 🍃 Sedimentary rocks such as limestone and sandstone are formed by the deposition of sediments in layers.
- 🍃 Metamorphic rocks such as marble or slate are formed when igneous or sedimentary rocks undergo changes due to heat and pressure.
- 🍃 Rocks are used as building materials, for extracting metals and as gemstones in jewellery.
- 🍃 Coal is a sedimentary rock formed from the remains of plants.
- 🍃 Petroleum is formed from the remains of plants and animals in the sea.



Exercises



A. Multiple choice questions

1. Which of these minerals is **not** found in granite?
a) mica b) feldspar **c) calcite** d) quartz
2. Which of these stones looks like a sponge?
a) granite b) mica c) basalt **d) pumice**
3. Which of these rocks is **not** used for making statues?
a) marble b) quartzite **c) conglomerate** d) granite

4. Which of these is a fuel?

a) limestone

b) coal

c) chalk

d) granite

ores

B. Mark ✓ for true and × for false statements.

1. You are likely to find a number of igneous rocks near volcanoes. ✓

2. Metamorphic rocks are formed from soil and small rock pieces. ×

3. Fossils are found in metamorphic rocks. ×

4. Coal is a kind of rock. ✓

5. Petroleum is formed from the remains of sea animals and plants. ✓

C. Fill in the blanks.

1. Rocks are made of small grains called minerals

2. Molten rock inside the Earth is called magma.

3. When a volcano erupts, the hot liquid that flows out is called lava.

4. Sedimentary rocks change to metamorphic rocks due to high temperature and high temperature.

5. Metals are extracted from their ores.

D. Place the words in the correct column.

basalt, shale, pumice, slate, limestone, marble, gneiss, obsidian, granite, conglomerate, quartzite, sandstone

Igneous rocks	Sedimentary rocks	Metamorphic rocks
Granite Bassalt Obsidian Pumice	Sandstone Limestone Shale Conglomerate	Marble Quartzite Slate Gneiss

E. Answer the following questions.

1. What are rocks made up of?