

Chapter- 7

Rocks and Minerals

STUDY NOTES

Let's Learn**What are rocks made of?**

- Rocks are made of minerals. It may contain one or more minerals.
- Mineral is a natural nonliving substance.
- The type of rock depends on the quality, the quantity and arrangement of minerals in it.

Kind of rocks:

According to their formation rocks are divided into three groups:

- Igneous rock
- Sedimentary rocks
- Metamorphic rocks

Igneous rocks:

- They form the base of all forms of land like plains, mountains and ocean beds.
- Igneous rocks are formed by the cooling and hardening of hot liquid rock material which is called lava.
- The hot liquid rock that lies in huge underground pockets of the earth is called magma. This hot material is pushed upwards by the pressure of other rocks.
- The magma that reaches the surface of the earth is called lava.

Types of igneous rocks:

- **Granite:**
 - The three main minerals in granite are quartz, feldspar and mica.
 - The color of granite is grey or pink depends upon the content of its feldspar.
 - It is used in making buildings, statues and streets.
- **Pumice:**
 - It is light colored igneous rock which has many holes and pockets formed by the gases trapped inside at the time of its formation.
 - It is light grey or cream in colour.
 - Dentist use powdered pumice for polishing our teeth.
- **Obsidian:**
 - Obsidian is another lava rock.

- It almost looks like a black glass because of its sharp edges which are used in making cutting tools.

Sedimentary rocks:

- Sedimentary rocks are formed from pebbles, sand, mud or clay that are deposited in oceans.
- These sediments are brought to the shore by flowing water or floating logs and are piled up in layers. These layers are cemented together by minerals.
- Certain kinds of sedimentary rocks are formed from the shells of tiny sea creatures whereas others are formed from dissolved minerals that settle by the side of oceans.
- Scientists found about life on earth by studying these rocks because the traces of ancient plants and animals called fossils are found in them. These may be shells, bones of animals, prints of leaves or footprints.

Types of sedimentary rocks:

- **Sandstone:**
 - It is made from particles of sand that get cemented together and mostly contain quartz grains.
 - It may be yellow, brown, red or pink- coloured.
 - The Red Fort in New Delhi is made of sandstone.
- **Conglomerate:**
 - It has uneven texture.
 - It is formed from pebbles and gravel cemented together by minerals and sand and carried by water.
 - It is found mostly in shades of grey and orange.
 - It is used as an ornamental rock and for polishing ornaments.
- **Shale:**
 - It is made up of clay and mud particles that are piled up in layers.
 - As shale contains clay it is used to make tiles and bricks.
- **Limestone:**
 - It is made up of a mineral called calcite which was once a part of animal shells.
 - It is mostly grey or white in color.
 - Limestone is used for making bricks and glasses and for separating pure metal from their ores.
 - Chalk is one form of limestone.

Metamorphic rocks:

- These rocks are formed by the transformation of an existing rock in the process called metamorphism, which means 'change in form'.

- Tons and tons of pressure on igneous or sedimentary rocks favours heat buildup, changed them to metamorphic rocks.

Types of metamorphic rocks:

- **Slate:**
 - It is a metamorphic rock made from shale.
 - It breaks into thin layers.
 - It is used to make slates and blackboards.
- **Gneiss:**
 - It is a metamorphic rock that is formed from granite.
 - It has light and dark bands.
- **Marble:**
 - It is formed from limestone.
 - This is found in different colors, white being the most common.
 - It is used to make statues and buildings.
- **Quartzite:**
 - It is formed by the change of sandstone.
 - It is used for making statues.

Minerals:

- They are underground natural resources.

Types of minerals:

- There are two types of minerals found in rocks.
- They are metallic minerals and non-metallic minerals.

Metallic minerals:

- Ores are the rocks which contains metallic minerals in them and can be taken out profitably from them.
- Examples of ores are haematite, bauxite, pyrite and calamine.
- We get iron from haematite, aluminium from bauxite, copper from pyrite and zinc from calamine.
- These are commonly used for making utensils, machines, furniture, wires, coins and coaches of trains and aeroplanes.
- Precious metals like gold, silver and platinum are used for making jewellery.

Nonmetallic minerals:

- Coal and petroleum are valuable underground resources which contributes greatly to our total energy supply.

Coal:

- It is the most valuable mineral stored in the earth.
- It has been used as a fuel for hundreds of years
- Asia has more than 1/3 of the world's coal.
- In India, coal mines are situated in Sohagpur in Madhya Pradesh, Dhanbad in Jharkhand, Raniganj in West Bengal, Neyveli in Tamil Nadu and Singareni in Telangana.

Formation of coal:

- Millions of years ago land was low lying and covered with thick swampy forest. As plants died, they fell into the swamp and began to decay. New vegetation pressed the dead plants to the bottom. Due to extreme pressure the vegetable matter changed into pit, lignite and coal.

Uses of coal:

- It is used as a fuel:
 - for cooking
 - for heating homes and buildings
 - for producing electricity in power plants
 - in steam engines
 - in blast furnaces in the steel industry.

Petroleum:

- Petrol is a fossil fuel.
- Fuels that are formed from the dead and decaying parts of animals or plants buried in the soil are called fossil fuels.
- Petroleum or crude oil is also known as rock oil, fossil fuel, black gold and liquid sunlight.
- In India, petroleum is found in Akhleswar in Gujarat, Digboi in Assam and Bombay high on the Mumbai coast.

Formation of petroleum:

- Petroleum is formed from the dead remains of ancient land and sea creatures. Millions of years ago that dead remains of these living things got buried in layers and gradually changed into oil and gas.

Uses of petroleum:

- It is used for dry cleaning.
- It is used for making lubricating oil, printing ink and medicines.

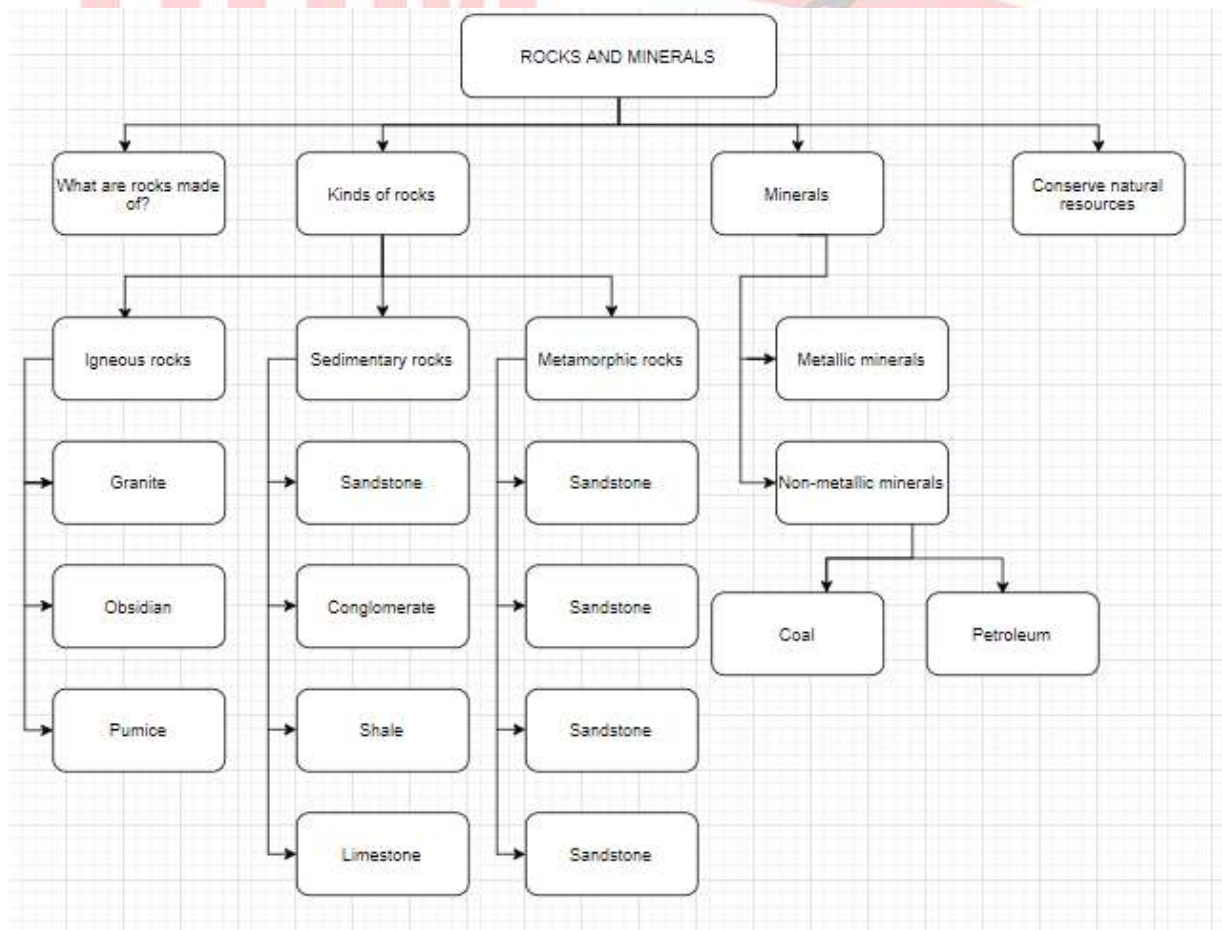
- It is used as a fuel in different forms like petrol, diesel, kerosene, etc.
- Paraffin wax obtained from it is used to make candles, waterproof cartoons and polish.

Conserve natural resources:

We must conserve our natural resources.

- We must keep our stoves and machines in good condition to save fuel at home.
- We should use coal and oil very carefully.
- We should use inexhaustible sources of energy like the sun, wind and water.
- Mineral deposits in the earth are limited therefore they should not be used carelessly or wasted while mining.
- Animals and plants too are the gifts of nature to human beings. Since they depend on each other for their survival, the balance between the two must not be disturbed.

MEMORY MAP



Let's Know More**I. Choose the correct answer.**

1. Precious metals like gold, silver and aluminum / iron/ platinum are used for making jewellery.
2. Silver/ gold/ coal is used as a fuel in blast furnaces in the steel industry.
3. Petroleum or crude oil is also called black gold/ white gold/ black diamond.
4. Limestone is made up of a mineral called calcite/ zinc/ iron.

Let's Do**A. Tick the correct answer.**

1. The base of plains, mountains and ocean beds is
 - a. Metamorphic rocks
 - b. Sedimentary rocks
 - c. Igneous rocks
 - d. None of these
2. This is not a main mineral of granite.
 - a. Quartz
 - b. Calcite
 - c. Mica
 - d. Feldspar
3. The traces of ancient plants and animals found in rocks are called
 - a. Vessels
 - b. Fossils
 - c. Tonsils
 - d. None of these
4. This is formed from trees and other plants which died millions of years ago.
 - a. Sandstone
 - b. Coal
 - c. Granite
 - d. Slate
5. Which of the following is obtained from petroleum and is used for making candles and waterproof cartoons?
 - a. Coal
 - b. Pumice
 - c. Marble
 - d. Paraffin wax

B. Write T for true and F for false.

1. Precious metals like gold and silver are used for making utensils.
2. Asia has more than one-third of the world's coal.
3. Fossil fuel and black gold or some other names of coal.

4. Dentist use powdered pumice for polishing our teeth.
5. Shale is used as an ornamental rock.

Understand and Answer

C. Write short answers.

1. What are rocks made up of?
2. What are minerals?
3. What is slate commonly used for?
4. Name two valuable underground resources.
5. Name any two places in India where coal mines are situated name.

D. Answer these questions.

1. How are igneous rocks formed?
2. What are ores? Name any four common ores.
3. Why are coal and petroleum important to man?
4. Why is petroleum called a fossil fuel?
5. Write 2 uses of limestone.

Teacher's Note

- Visit any old monument or building in your town and find out about the material used to build it. Write your feelings in your notebook.

Improve Your GK

- There are more than 500 active volcanoes in the world.
- Stromboli a volcanic island near Sicily, are active all the time.
- Most volcanoes remain dormant for years before they erupt again.

Answer Key

I.

1. Platinum
2. Coal
3. Black gold
4. Calcite

A.

1. Igneous rocks
2. Calcite
3. Fossils
4. Coal
5. Paraffin wax

B.

1. F
2. T
3. F
4. T
5. F

C.

1. Rocks are made up of minerals.
2. Minerals are underground natural non- living substances found in the rocks.
3. Slate is commonly used for making slates and blackboards.
4. Coal and petroleum are valuable underground resources.
5. In India, coal mines are situated at Dhanbad in Jharkhand and Raniganj in West Bengal.

D.

1. Igneous rocks are formed by the cooling and hardening of hot liquid rock material. The hot liquid rock that lies in huge underground pockets of the earth is called magma. The hot material is pushed upward by the pressure of other rocks. Some of it cools and hardens below the surface of the earth while some flows out on the Earth's surface and then hardens to form igneous rocks. The magma that reaches the surface is called lava.
2. Ores are the rocks which are rich in minerals and these minerals can be profitably obtained from these ores.
 - Four common ores are haematite, bauxite, pyrite and calamine.
3. Coal and petroleum are important to men because:
 - a) They are used as fuel.
 - b) They provide us with a great amount of energy.
 - c) They are used in the production of electricity and running of vehicles.
 - d) Petroleum is used for making lubricating oil, printing ink and medicines.
 - e) Paraffin wax or paint from petroleum is used to make candles, waterproof cartoons and Polish.
 - f) Coal is used for heating homes and buildings.
4. Petroleum is formed from the dead remains of ancient land and sea creatures. Millions of years ago the dead remains of these living things got buried in layers and gradually changed into oil and gas. This is the reason why petroleum is called a fossil fuel.
5. Limestone is used for:
 - making bricks and glass.
 - separating pure metals from their ores.