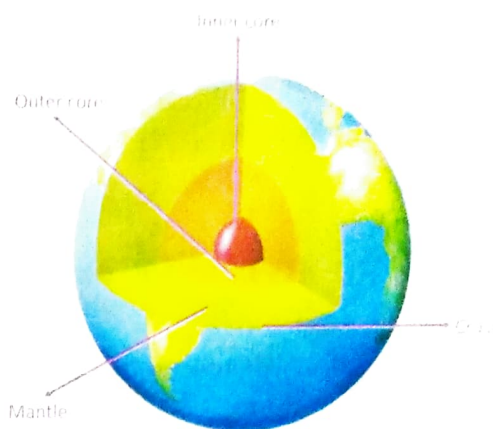
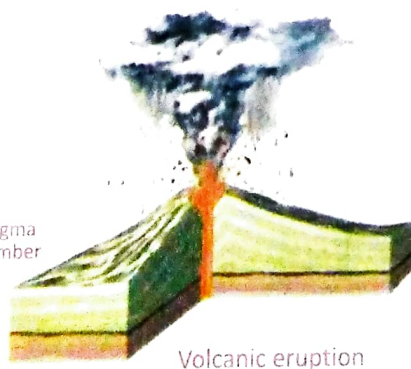
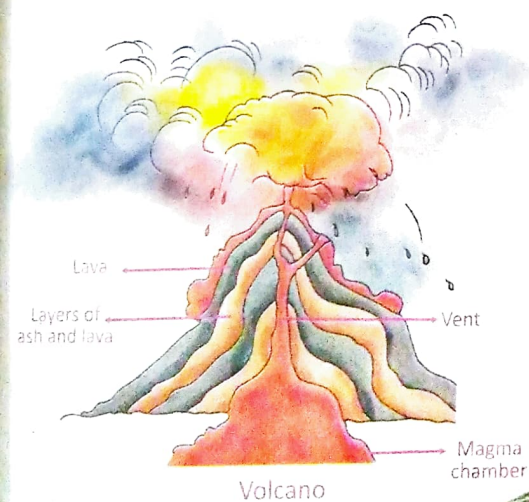


The earth is in the shape of a sphere. The outer surface as we see it is called the **crust**. Below the crust is the **mantle** and the centre of the earth is called the **core**. The earth's surface or the crust is made of rocks. These rocks cover all the landforms like the mountains and the plains. The core contains molten matter called the **magma** along with very hot gases.



The Interior of the Earth

The movement in lava and the hot gases below causes **earthquakes**. Sometimes the lava is thrown out from the core to the crust. This happens during a volcanic eruption. **Volcanoes** generally erupt from mountain tops.



- 💡 **Earthquake** – The movement in the core of the earth that causes a trembling of the earth's surface.
- 💡 **Volcano** – The pushing out of the hot molten magma from the core of the earth.
- 💡 **Lava** – The magma that hits the surface of the earth.

Kinds of Rocks

The rocks in different places have different characteristics on the basis of the weather conditions of the place. Rocks can be divided into three main categories:

Igneous Rocks

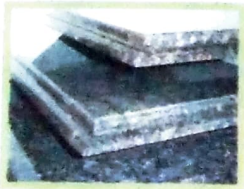
The volcanic eruptions result in the flow of magma on the surface of the earth. The magma flowing out of the volcanic holes onto the surface of the earth is called lava. After some time, this lava cools and hardens to form rocks.



Lava

The rocks formed by the hardening of the lava are called **igneous rocks**.

Igneous rocks can be of three types:



Granite slabs



Granite rock

Granite C-1(a)

(When the rock is formed due to the slow cooling of lava, it is hard in structure. It is called **Granite**.) Granite comes in many colours and patterns and is used on kitchen counters, for flooring etc.

Obsidian

It is formed by the quick cooling of lava. The rock bears a smooth and glassy appearance and is therefore used in making jewellery and ornaments.

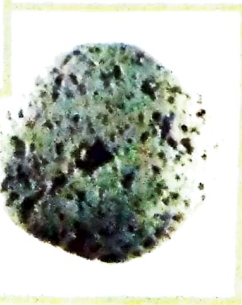


Obsidian jewellery

Obsidian rock



Foot scrubber



Pumice stone

Pumice C-1(c)

(Sometimes while appearing on the surface of the earth, the lava mixes with a lot of hot gases becoming frothy. The rock formed from the cooling of such lava is porous. It is called **pumice** and is used in making scrub for the feet and in lightweight building material like concrete blocks.



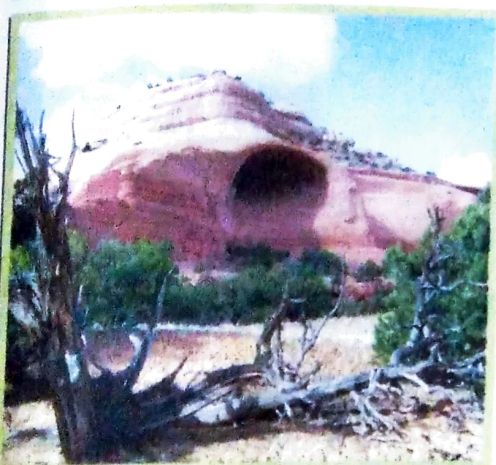
Concrete blocks

Quick Revision:

Name the following:

1. The centre of the earth.
2. The molten matter in the centre of the earth.
3. Throwing out of molten matter from the centre of the earth.
4. Rocks formed by slow cooling of lava.
5. Rocks formed by cooling of a mixture of lava and gases.
6. Smooth and glassy igneous rock.

core
magma
Volcano
Granite
Pumice
Obsidian



Sedimentary Rocks

As the rivers flow down the mountains, they wash off the sand, mud, clay and pebbles down the hill slopes. These

reach the river banks and are deposited in layers. These are then cemented together by

minerals to form **sedimentary** rocks. Sometimes the shells of dead animals add to the rocks giving them amazing colours and patterns.

💡 **Minerals** – Substances found in the earth's surface between the rock layers.

Sandstone

As the name suggests the stone is made of tiny sand size particles that are mainly composed of minerals like quartz and feldspar. Some sandstones are resistant to weathering. This makes sandstone a common building and paving material. The stone has been used in the construction of the Red Fort, New Delhi and in many other palaces in Rajasthan.



Red fort



Sandstone flooring

Sedimentary rocks are the only type of rock that can contain fossils, the remains or imprints of dead **organisms**. The chance of fossilisation is higher when the sedimentation rate is high.



Conglomerate jewellery

Conglomerate

It is a rock of uneven texture with coarse grains formed by cementing together of pebbles and gravel. It is used in construction and is also polished to make ornaments.



Conglomerate rock

Shale

C-1(b)

(It is made of solidified clay and comes apart in thin layers.) It is used in making bricks and cement.



Shale

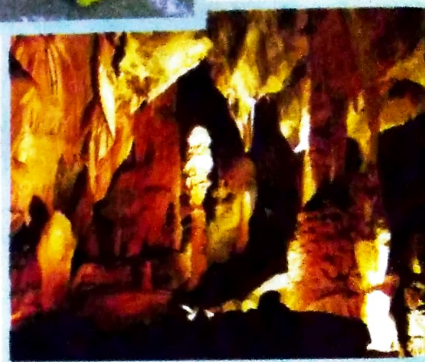
Limestone

They are calcium rich stones made up of fine grains and mineral calcite. They also include the skeletal remains of animals. Limestone is usually porous and allows water to flow through it easily.

As the water drains through these rocks, they tend to form tiny cracks in the rocks. These rocks eventually enlarge forming caves in huge rocks. Chalk is obtained from limestone. The rock is also used in making bricks and glass.



Chalk



Limestone cave

Quick Revision:

Fill in the blanks:

1. Deposition of sand, mud, pebbles and clay in layers, forms Sedimentary rocks.
2. Sandstone is made of minerals quartz and feldspar.
3. Sandstone is resistant to weathering.
4. Conglomerate is an uneven textured rock.
5. Limestone is a porous sedimentary rock.

Metamorphic Rocks C-5

('Metamorphose' means 'to change'. Sometimes physical and chemical changes due to heat and pressure lead to transformation in the igneous, sedimentary or older metamorphic rocks.) This results in complete alteration and formation of new rocks. Such rocks are called metamorphic rocks.

Metamorphosis – A change – physical or chemical.



Slate flooring

Slate

Slate is metamorphosed shale rock. It also exists in thin layers and is used in making bricks and cement.

Gneiss

It is metamorphosed granite with light and dark bands. It is used as a building stone.



Gneiss

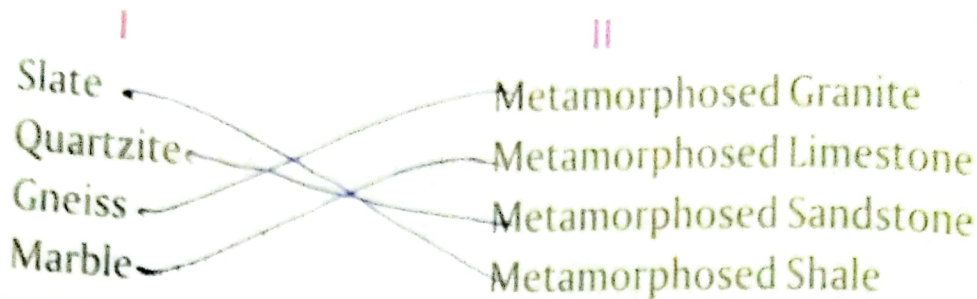


Quartzite

It is metamorphosed sandstone rich in quartz mineral. It is a hard and weather resistant rock used in ceramic industry.

Taj Mahal

Match the rocks with their characteristics:



Minerals

We have discussed that the layers in sedimentary rocks are held together by minerals. These are the solid chemical substances that occur in nature. They have a definite chemical composition, atomic structure and specific physical properties. They are extracted from the layers of rocks. They may be expensive or affordable depending on how commonly they are available.

- Luster – Shine
- Ore – Naturally occurring compounds containing minerals

Minerals can be of two types:

Metallic minerals

Minerals that have a luster are **metallic** in nature. They are extracted from naturally occurring ores. For example iron, zinc, aluminium, copper, gold and silver are metallic minerals. They are used in making utensils, furniture, wires, coins, bodies of ships, airplanes and railway coaches.

Non-metallic minerals

The minerals without a luster are called **non-metallic** minerals. Silica, lime, quartz, feldspar, talc and graphite are examples of non-metallic minerals.



The dead animal and plant remains are decomposed in the soil forming the fertile top layer of the soil called the **humus**. The humus is rich in nutrients necessary for plant growth, like potassium and nitrogen.



Soil Erosion

C-6

(The washing away or the removal of the top fertile layer of the soil due to heavy rainfall or strong winds is called **soil erosion**.) This happens when the top soil layer of humus is exposed because there are no plants and their roots to bind the soil. The plants have either been grazed by the animals or removed as a result of deforestation. Erosion makes the soil unfit for the growth of plants and eventually turns into barren land.

Deforestation - Excessive cutting of trees.



Deforestation



Grazing by animals

Soil Conservation

Terrace Farming

The hill slopes are exposed to wind and rain. Thus, to protect the soil from erosion, steps are cut on the hill slopes. These steps are used for farming, called **step or terrace farming**. The edges are raised so that the rain water fills up these steps and the plants are able to absorb water.

overgrazing and deforestation are the causes of soil erosion.



Terrace farming



Sediment deposit on river banks act as natural bunds.

Bunds on Banks

The bunds are built on the banks of the river which prevent the soil on the river banks from being flown away by the river water.

Crop Cover

Different crops require different seasons and weather conditions for growth. Once the crop is ripe and it is harvested the land should not be left uncultivated for a long time. Instead another crop suitable to prevailing weather conditions should be cultivated. This prevents the exposure of soil to sun, air and rain.



Wheat farming



Rice farming

Fact File

Talc is the softest material known on earth.
Diamond is the hardest material known.

New Words

Igneous Rocks

– Rocks made by cooling of lava.

Sedimentary Rocks

– Rocks formed due to deposition and binding of layers of mud, clay, sand and pebbles.

Metamorphic Rocks

– Rocks formed due to physical and chemical changes in igneous or sedimentary rocks.

Humus

– The fertile top soil consisting of dead, decaying plant and animal matter.

Soil Erosion

C-3(b) – (The washing away or removal of top fertile layer of soil. is called soil erosion.)

Terrace Farming

C-3(c) – (Farming on steps cut along the hill slopes. is called terrace farming)

Let's Revise

1. The innermost layer of earth is called the core.
2. (The movement in magma and hot gases below the crust causes earthquakes.) C-3(a)
3. Slow cooling of lava forms granite and quick cooling forms obsidian.
4. Sandstone is made of fine particles and conglomerate is made of coarse grains.
5. Slate and shale exist in thin layers.
6. Quartzite is hard and weather resistant.
7. Metallic minerals have luster.
8. Bunds prevent soil erosion along river banks.



Let's Answer

A. Cross the odd one out:

- | | | |
|-----------------|------------------|-----------|
| 1. Core | Mantle | Crust |
| 2. Granite | <u>Sandstone</u> | Pumice |
| 3. Conglomerate | Limestone | Sandstone |
| 4. <u>Shale</u> | Gneiss | Quartzite |

Tree
Obsidian
Gneiss
Marble

B. Fill in the blanks:

- Magma that flows out on the earth's surface is called lava.
- Igneous rocks are formed by cooling of molten matter.
- Granite rock is formed by slow cooling and Obsidian by quick cooling of molten matter.
- Pumice rock is used in making lightweight building material.
- Sandstone is made of quartz and feldspar.
- Limestone is made of mineral calcite.
- Gneiss is metamorphosed granite and Quartzite is metamorphosed sandstone.
- Gold and Silver are metallic minerals.
- Bunds are built on river banks to prevent soil erosion.
- Limestone and Sandstone rocks exist in layers.

C. Answer these:

- How are the following rocks formed?
 - Granite
 - Shale
 - Pumice
- Write one use each of:
 - Obsidian
 - Sandstone
 - Quartzite
- Briefly explain:
 - An earthquake
 - Soil erosion
 - Terrace farming
- Tabulate the differences between:
 - Metallic Vs Non-Metallic minerals
 - Sedimentary Vs Igneous rocks
- What are metamorphic rocks? How are they formed?
- What is soil erosion? How is it caused?
- Write two ways in which soil can be conserved.

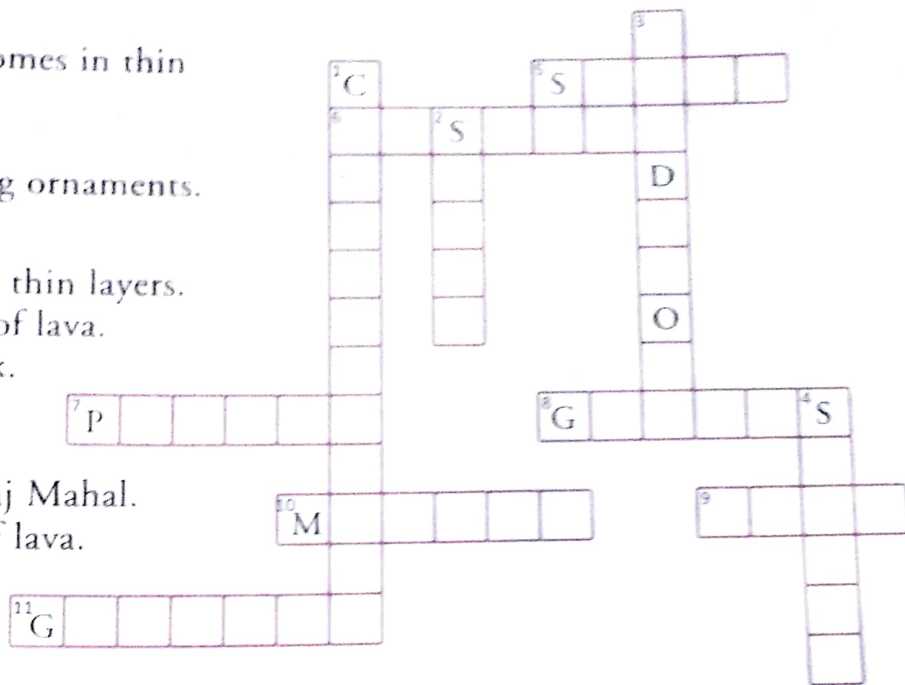
D. Cross Word:

Down:

1. Rock formed by cementing of pebbles and gravel.
2. Rock made of solidified clay, comes in thin layers.
3. A sedimentary rock.
4. A lustrous metal used in making ornaments.

Across:

5. Metamorphosed rock, comes in thin layers.
6. Rock formed by quick cooling of lava.
7. A light and porous igneous rock.
8. Metamorphosed granite.
9. Softest non-metallic mineral.
10. Rock used in construction of Taj Mahal.
11. Rock formed by slow cooling of lava.



Art Fun

Draw, name and colour two reasons for exposure and erosion of soil.

- Ans 2. Obsidian - It is used to make jewellery and ornaments.
- Sandstone - It is used to make building and paving material.
- Quartzite - It is used in ceramic industry.

Scrap fun

Collect samples of at least six different types of rocks from a marble market near your house. Paste them in your scrap book. On a political map on India, mark where these rocks are available in India.