



## SYLLABUS

1. The three kinds of rocks — sedimentary, igneous and metamorphic — some examples of each kind — how they are made in nature.

Rocks contain minerals — some common minerals and their uses (e.g. salt, talc, Plaster of Paris, chalk, lime, precious and semi-precious stones).

Ores are minerals from which metals can be extracted — the names of a few ores and the metals which can be obtained from them (e.g. Bauxite — aluminium, magnetite and haematite — iron, copper pyrites and malachite — copper) — Formulae of these ores are **not** required.

2. Erosion — wind, water and changes of temperature cause weathering of rocks (briefly) — this leads to the formation of soil.
3. Types of soils — sand, clay and loam — water retaining capacities of these — which one is suitable for plants. What plants take from the soil — minerals, moisture and nitrogen. How these are put back (i) by nature and (ii) by the farmer.
4. What are fossils ? Fossil fuels — coal and petroleum — how they are formed (briefly) — burning fossil fuels gives us energy (as heat/light) — it uses up atmospheric oxygen and releases carbon dioxide into the air — why fossil fuels are considered non-renewable sources of energy.
  - \* Examining samples of different types of rocks, minerals, semi-precious stones (D).
  - \* Comparing the water retained by equal amounts of the three types of soils (D/E).
  - \* What happens if water in a plastic bottle is placed overnight in the freezer compartment of a refrigerator ? Why should a glass bottle not be used ? (D/E).
  - \* Finding out more about the extraction/uses of coal/petroleum. What alternatives are being used to reduce pollution caused by the burning of these ? Discussion to follow.

## INTRODUCTION

Earth is a unique planet in the solar system which has air, water and a suitable surface temperature. Such a system has made existence of all forms of life possible on the earth.

From the surface inwards up to the centre, the earth shows three major regions:

1. Core : The central part
2. Mantle : The middle region
3. Crust : The uppermost layer

### 1. Core

The innermost region of the earth is called the core. It is mainly made up of iron and is the hottest region of the earth (about  $5000^{\circ}\text{C}$  temperature) which is solid in form. The outer portion of the core is made up of molten iron.

### 2. Mantle

This is the middle layer of the earth which is about 2900 km thick below the earth's crust. It is made up of molten and solid rocks and is much hotter than the earth's surface. The red-hot molten material is called **magma**. When this magma gets forced out of volcanoes, it is called **lava**. It is the slow motion of magma which causes disturbances on the earth, like earthquakes and volcanic eruptions. The uppermost part of the mantle together with the solid uppermost crust is called **lithosphere** (meaning rocky layer).

### 3. Crust

This is the uppermost layer, about 35 to 60 km in thickness which is made up of rocks. It supports all forms of life. About three-fourth of it is covered by oceans and the rest is divided into seven continents. Crust is made up of different materials, such as soil, minerals, water, air, etc., which supports life. Plants use these materials for their growth. We also get many useful substances from the earth's crust like coal, oil, natural gas, gems, precious stones, metals, etc.

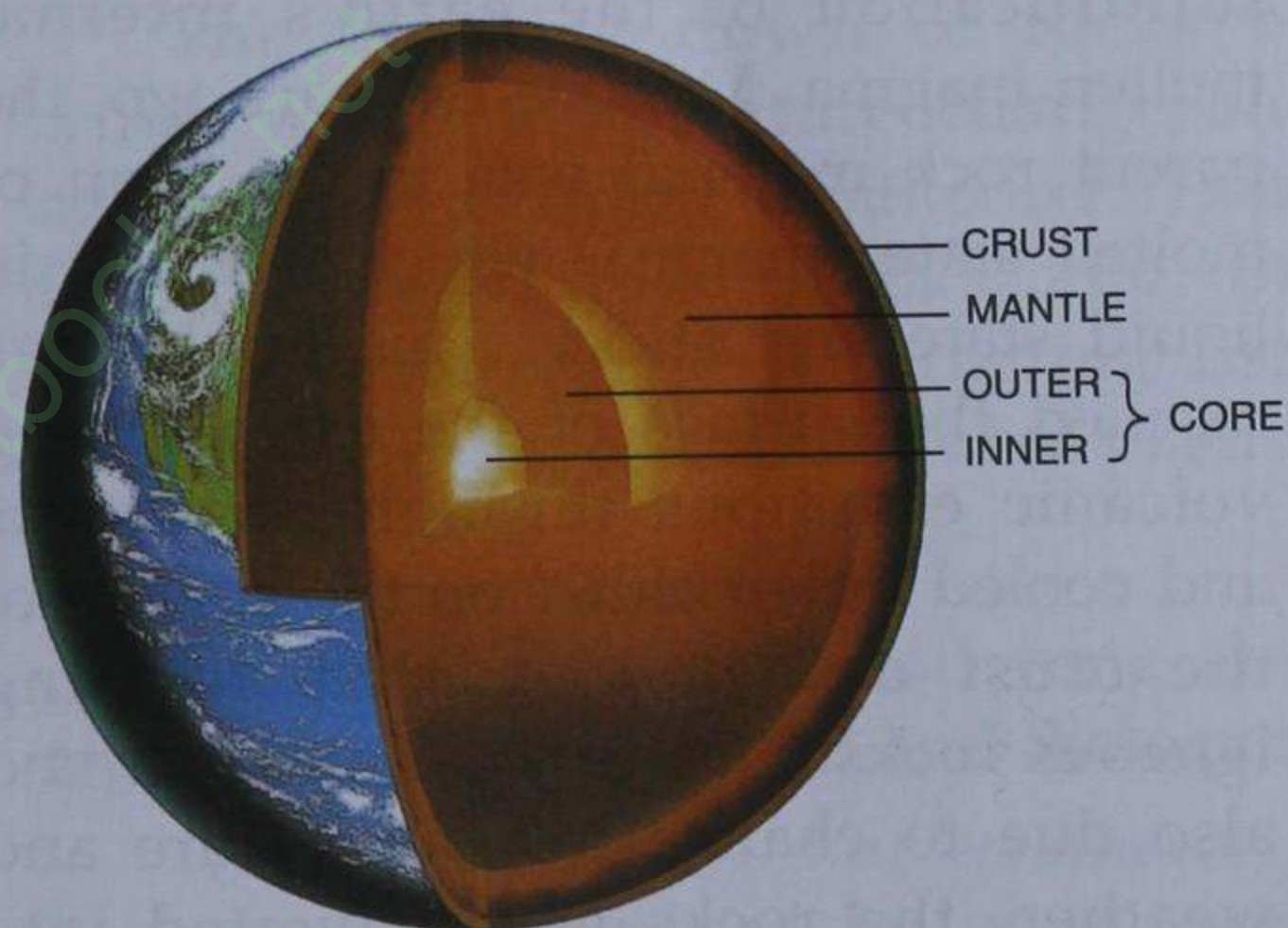


Fig. 7.1 Inside structure of the earth

## ROCKS

Rocks are the supporting bases of the earth's crust. They are solid mineral deposits. These solid mineral deposits are known as rocks. These are made up of minerals in solid state, e.g., silicates, carbonates and oxides. The most abundant element is **oxygen** which is present in a combined state with silica in the form of **silicate rocks**.

There are metallic minerals, like aluminium, copper, lead, gold and silver as well as non-metallic minerals like

quartz, gypsum (source of plaster of paris), mica, etc. Aluminium is the most common metal.

## Types of Rocks

Rocks are mainly of following *three* types —

- (1) Igneous rocks
- (2) Sedimentary rocks
- (3) Metamorphic rocks

### 1. Igneous Rocks

Meaning “fire”, referring to the solidification of the earth’s internal molten magma. Millions of years ago, the parent rock material was in the form of molten state (magma) which was hot in liquid state and sticky. This liquid lava reached the surface of the earth during volcanic eruptions through the cracks and cooled down either on the surface of the crust or below it, thus forming **igneous rocks**. Due to wear and tear and also due to change in temperature and weather, the rocks got converted into soil.

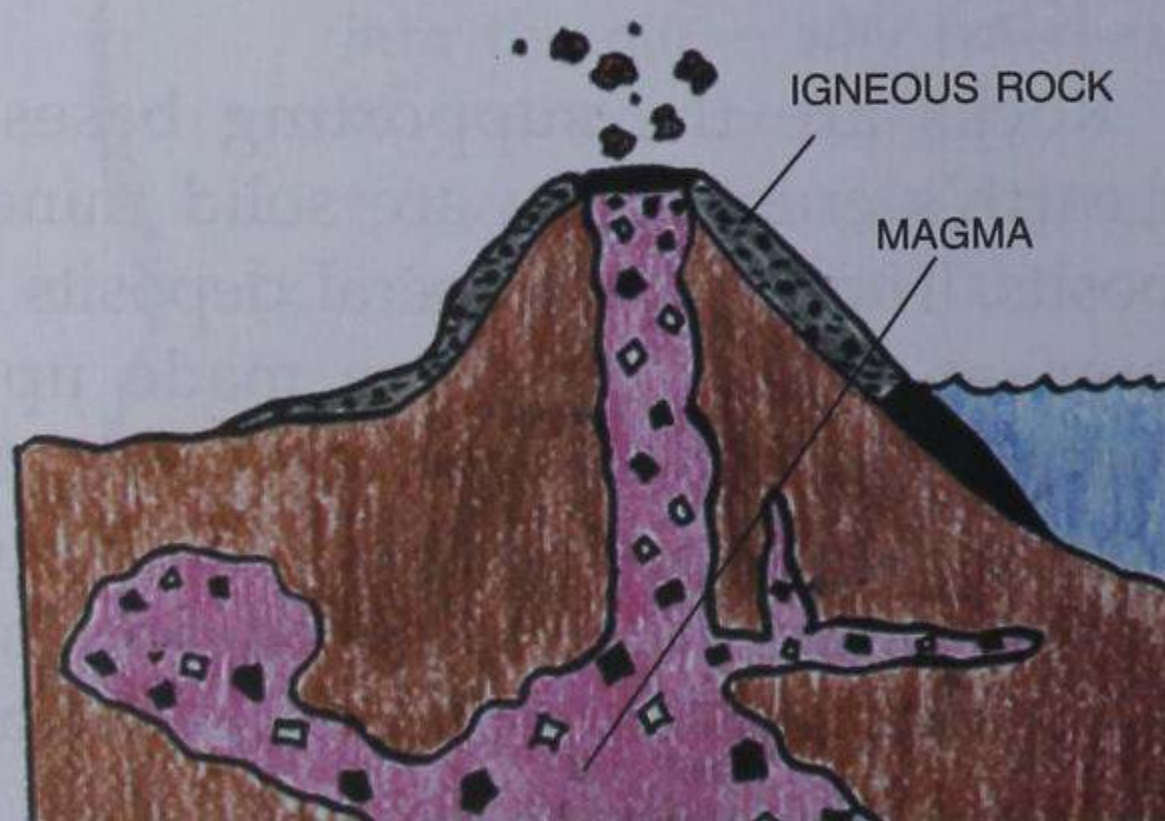


Fig. 7.2 Igneous rocks

Magma which cooled within the crust formed rocks like **basalt, granite,**

**dolomite**, etc. Magma bears many metallic ores (ores are minerals from which metals can be obtained).

### 2. Sedimentary Rocks

Sedimentary rocks are formed from the settling of material sediments derived from the pre-existing rocks and organic matter (living beings). These sediments are carried away mainly by water (river, lakes, etc.), wind and glaciers which later get deposited and form huge layered rocks, e.g., sandstone, limestone, claystone, etc. The constituents of the sedimentary rocks are mainly clay, sand, gravel and pebbles. Coal and oil are made up of the remains (**fossils**) of plants and animals. Sedimentary rocks also yield rich soil.



Fig. 7.3 Sedimentary rocks

### 3. Metamorphic Rocks

These rocks are formed by alteration of the existing rocks by heat, pressure, etc. These are altered forms of igneous and sedimentary rocks under very high pressure and heat, making the rocks hard

and compact. Marble and slate are good examples of metamorphic rocks.

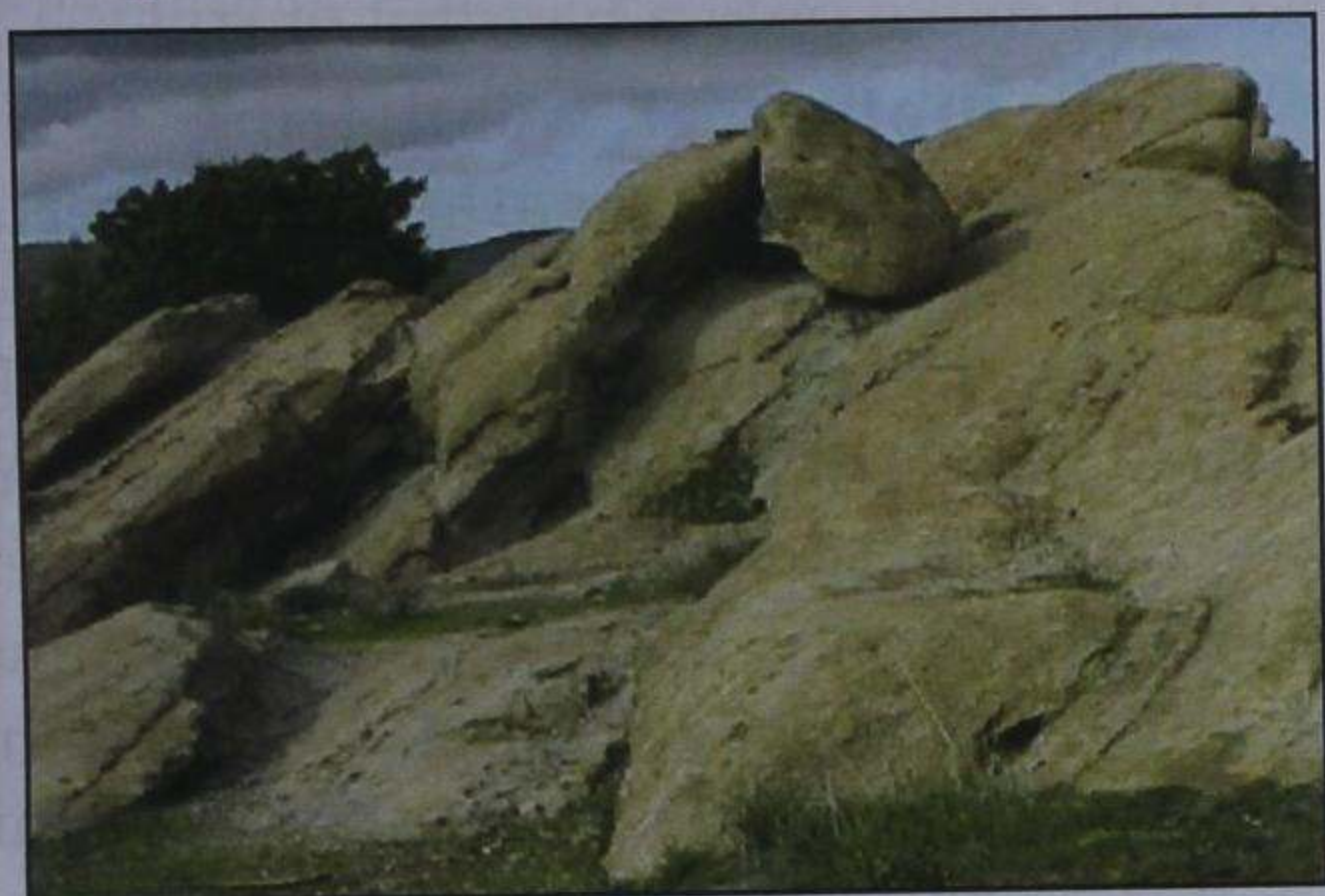


Fig. 7.4 Metamorphic rocks

### Uses of Rocks

1. Most of the houses are built from stones and minerals extracted from rocks.
2. Many sculptures and pieces of art are made of rocks and minerals.
3. Rocks and minerals are used in art and craft.
4. Jewellery is made from metals and *precious* and *semi-precious* stones. These materials are obtained from rocks. Some precious stones are **diamond** ("Heera"), **emerald** ("Panna"), **ruby** ("Manik") and **Sapphire** ("Neelam"). At the same time, stones like **turquoise** ("Feroza"), **topaz** ("Pukhraj"), **aquamarine** ("Beruj") are not so costly. These are semi-precious stones. They are also used in making jewellery.
5. Rocks are a big sources of **minerals** such as aluminium, copper, gold, gypsum, antimony, asbestos, bauxite, cobalt, plaster of paris, etc. All these

minerals are of great importance in our lives.



### ACTIVITY 1

Request your parents to take you to any jeweller's shop/artificial jewellery shop. Ask the shopkeeper to show you various stones used for making jewellery. Note their names and try to find out from which type of rocks they are originated.

### Weathering of Rocks

The breaking down of rocks by wind, water, temperature change and other factors is called **weathering**. These factors break down rocks and the flowing water carries weathering rock particles and deposits them over plains.

### Types of weathering

Weathering is of the following *three* types – Physical, Chemical and Biological.

**(i) Physical/mechanical weathering :** Rocks are decomposed by wind, heat, pressure and other physical or mechanical agents.

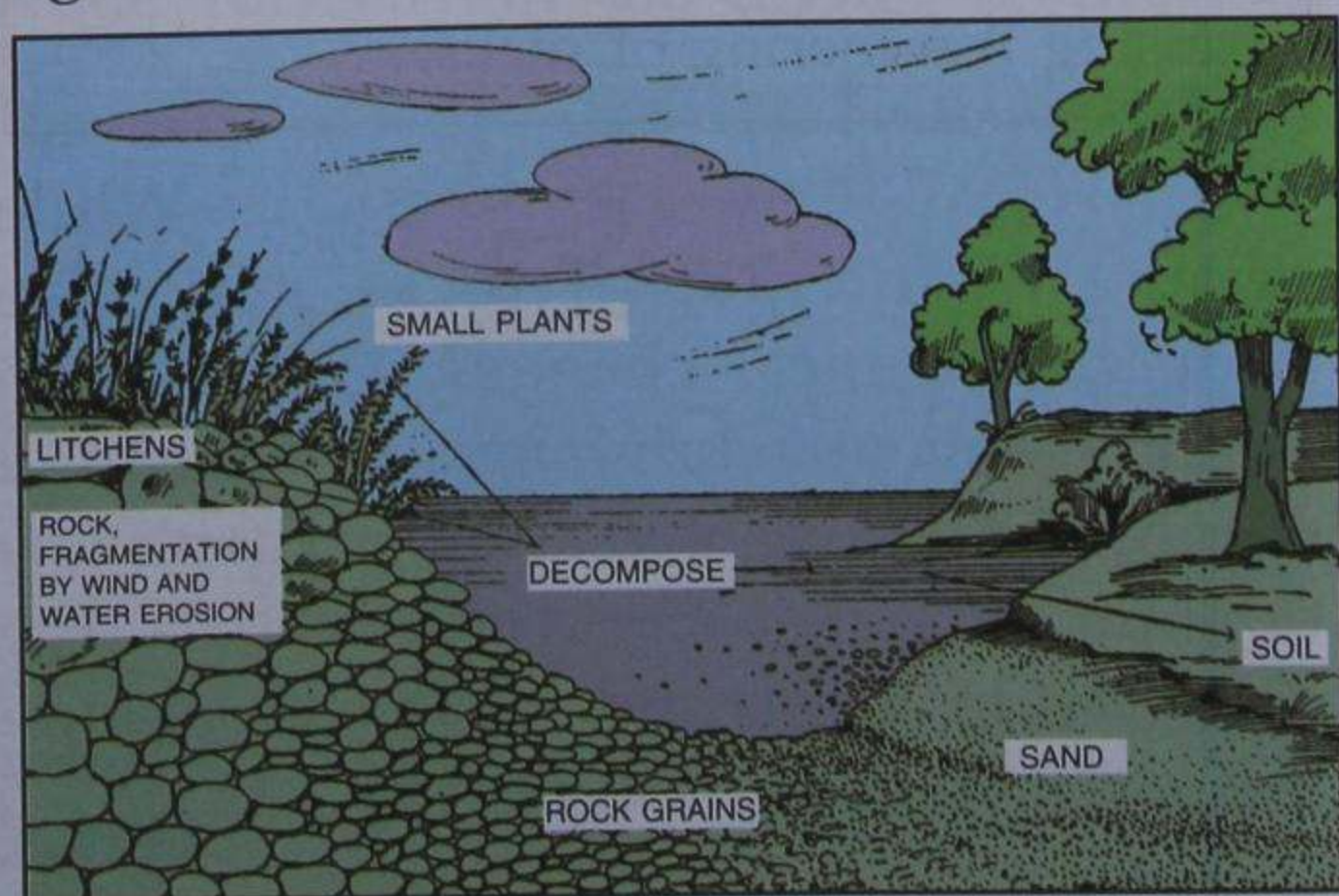


Fig. 7.5 Weathering of rocks into rock grains, sand and soil



## ACTIVITY 2

Take a glass bottle and a flexible plastic bottle. Fill both of them with water. Keep them in the freezer compartment of your refrigerator overnight.

What will you observe the next day ?

You will observe that water of both the bottles gets frozen. In the case of plastic bottle, due to elasticity the bottle loses its original shape. But in the case of glass bottle you may notice cracks.

Why did the glass bottle develop cracks ?

As the temperature of the freezer compartment goes below  $0^{\circ}\text{C}$ , the water starts converting into ice. The volume of the water gets increased when it is converted into ice. This increased volume exerts pressure on the walls of the glass bottle. Since glass is not flexible the glass bottle cracks.

In the same way, rocks crack due to the harsh environmental conditions like pressure, cold temperature and wind, etc., causing weathering of rocks.

**(ii) Chemical weathering** - While getting disintegrated, rocks may also undergo chemical changes. **Water** is an important agent in bringing about chemical change. It can dissolve and react with one or more components of rock materials. The dissolved materials and warm temperature favour chemical weathering.

The weathering of rocks is a continuous phenomenon that helps in soil

formation. It is also a very slow process. It may take hundreds or thousands of years to make only a handful of soil.

**(iii) Biological weathering** - The above mentioned weathered material (soil) undergoes further changes caused by certain micro-organisms. In such soils, algae, lichens, mosses, etc., grow and contribute organic matter through their death and decay. In due course of time, various micro-organisms colonise on such soils. They also contribute organic matter to the soil in the form of wastes or their dead remains.

The organic matter then breaks down into simpler products by the action of micro-organism. This breakdown process, (**decomposition**) is brought about by different bacteria, fungi, etc.

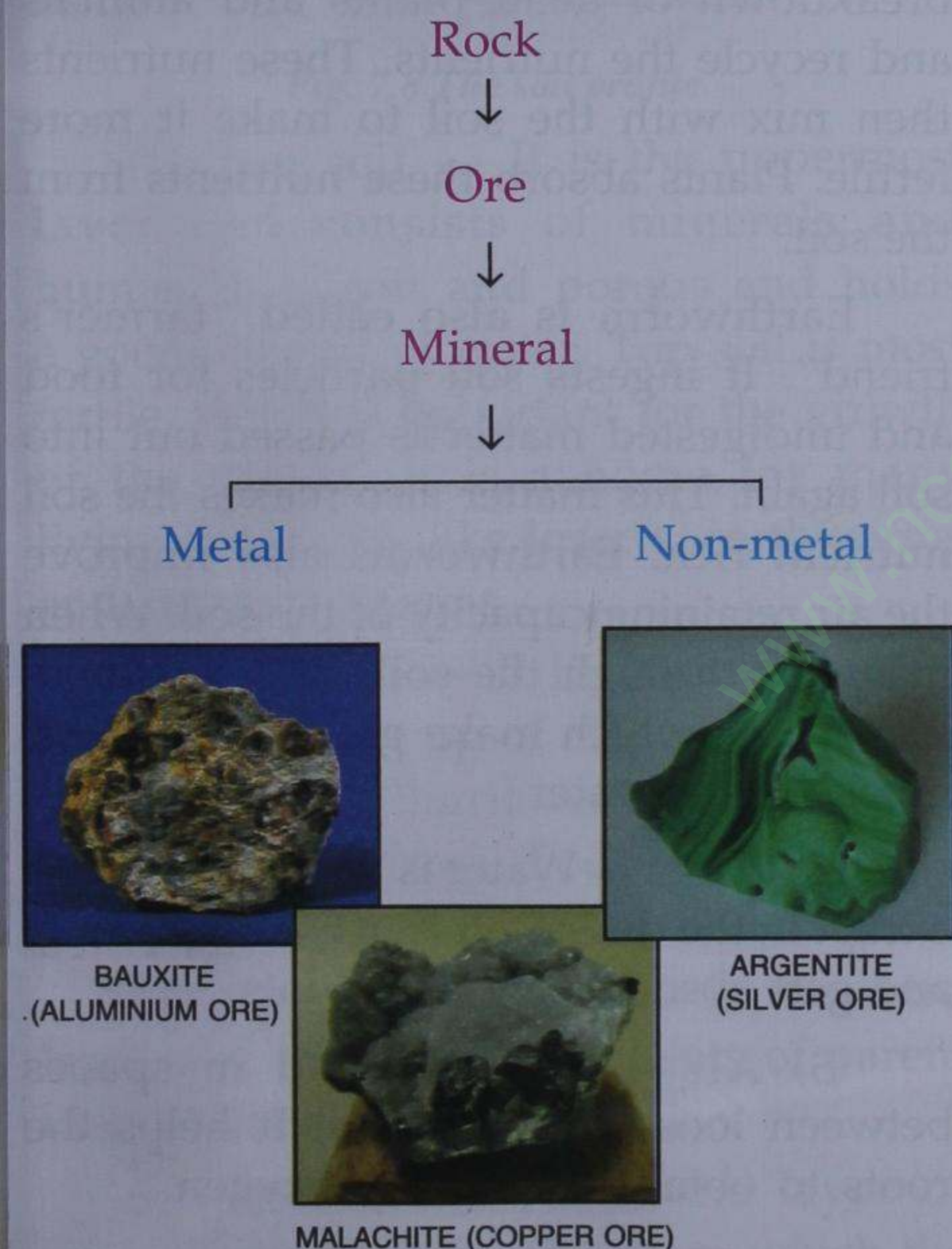
## ORES

The rocks from which minerals can be extracted in large quantities are called **Ores**. Ores are the deposits that contain one or more minerals, usually metals. They are formed by a variety of geological processes. The process of ore formation is called **ore genesis**. The World Bank reports that China was the top importer of ores and metals in 2005 followed by USA and Japan. **Minerals** are naturally occurring deposits in the earth's crust consisting of one or more elements. **Mines** are mineral (ore) rich excavations from where different minerals (metals or non-metals) can be extracted.

A rock is not considered a mineral but many different minerals are found in most of the rocks. A mineral is a

naturally occurring substance which is solid and stable at room temperature. It can be a single element like **copper**, **silver** or **gold**, but most of the minerals are compounds or mixtures of elements. The most common mineral is **silicate**. It is a combination of oxygen and silicon. It makes upto 75% of the earth's crust.

Minerals are divided into metals and non-metals.



*Fig. 7.6 Some examples of ores*

In India, the non-metallic minerals mainly are lime stone, magnesite, dolomite and gypsum.

Metals are extracted from the ores by various methods. One such method is

**heating**. In this method, metals are obtained by heating the ores at a very high temperature.

Mineral ores are generally **oxides**, **sulphides**, **silicates** of metals such as copper. Copper and gold are commonly concentrated in the earth's crust. Their ores are processed to extract these metals.

Some important ores and metals are :

| Ores      | Metals    |
|-----------|-----------|
| Bauxite   | Aluminium |
| Argentite | Silver    |
| Malachite | Copper    |
| Cinnabar  | Mercury   |
| Haematite | Iron      |
| Uraninite | Uranium   |

## EROSION

Erosion means **wearing down** of the earth's surface, and it involves removal of rock material from the mountains.

Agents of erosion are rivers, streams, glaciers, wind, ocean waves and underground water. All these agents erode rocks from the higher levels and



*Fig. 7.7 Mountain erosion*

carry them down to deposit in the lower ones and in the process, change the irregular areas into flat ones. The eroding and depositing activities of various above mentioned agents result in the formation of various land forms. Soil is one such important land form.

## SOIL

**Soil** is a natural resource which is a mixture of broken loose rock particles and organic matter of dead remains of living organisms.

Soil is the uppermost layer of the earth. It **supports plants** by providing water and minerals. Many animals depend on plants for food. We (humans) also depend on soil for growing crops, vegetables, fruits, etc. Soil is also a rich source of metals like iron, aluminium, etc. It also provides clay for making bricks, clay pots, etc.



### Do You Know ?

Science which deals with the study of soil is called **pedology** (*pedon* : ground). The word soil is derived from the Latin word *solum* which means, earthly material. Soil is the basis of agriculture and is important for the human existence and civilization. [Note : Paedology is the science of development of children.]

## Composition of Soil

Soil contains the following five components.

(1) **Inorganic material** — This includes silica, clay, chalk, nitrogen, phosphorus, magnesium, calcium, sodium, iron, etc., which provide rich plant nutrients.

(2) **Organic material** — Decay of plant and animal remains form the organic part and is known as '**humus**'. It helps in the growth of micro-organisms and they in turn help in holding water to the soil.

(3) **Living organisms found in soil**— A large variety of plants, fungi, bacteria, worms, insects and small burrowing animals reproduce and thrive in soil.

Micro-organisms help in the breakdown of dead plants and animals and recycle the nutrients. These nutrients then mix with the soil to make it more fertile. Plants absorb these nutrients from the soil.

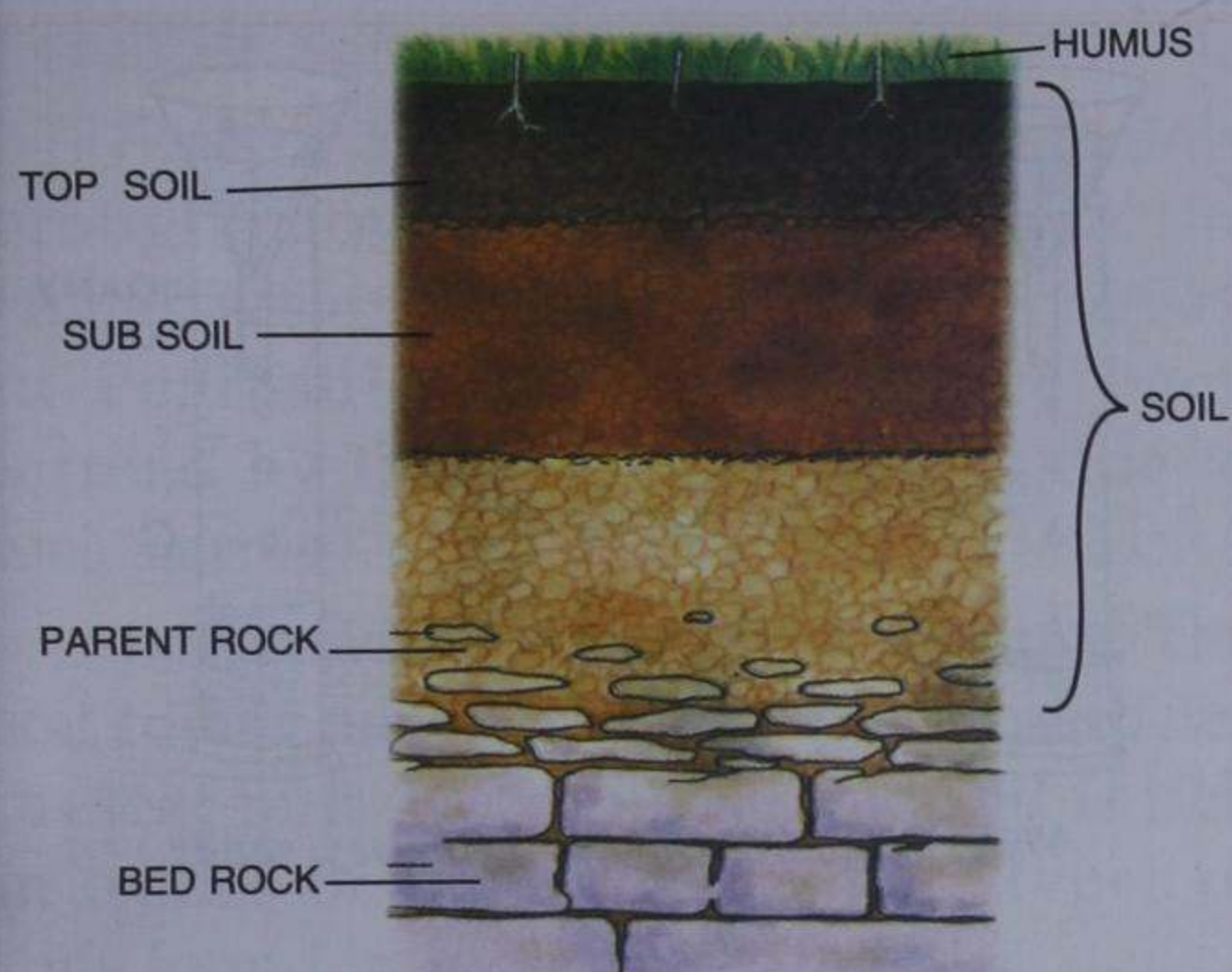
Earthworm is also called "farmer's friend". It ingests soil particles for food and undigested matter is passed out into soil again. This matter also makes the soil nutrient rich. Earthworms also improve the air retaining capacity of the soil. When it moves through the soil, it leaves tube-like spaces which make good passage for air as well as water.

(4) **Water** — Water is found in all soils except in the deserts. It is needed by plants and gets absorbed by their roots.

(5) **Air** — Air is found in spaces between loose soil particles. It helps the roots to obtain respiratory oxygen.

## Soil profile

Various layers of soil present from top to the bottom bed-rock, show different horizons and this arrangement is called **soil profile** (Fig. 7.8) The soil profile shows three layers and the bed-rock.



**Fig. 7.8 The soil profile**

**(1) Top soil** — It is the uppermost layer and consists of minerals and humus. It is soft and porous and holds a good amount of water. Top soil is most fertile, which is important for the growth of the plants. It is a home for many living organisms like insects, earthworms and microorganisms.

**(2) Sub-soil** — It lies below the top soil and is made up of clay, silt and sand particles. It is hard and rich in some minerals like iron. Roots of tall trees generally reach this layer.

**(3) Parent rock** — This is the third layer and consists of fragments of parent rock material.

**(4) Bed-rock** — It is the layer of unweathered parent rock from which the soil is formed. It cannot be dug up easily. It is not the part of soil profile and make a base for them.

### Texture of the soil

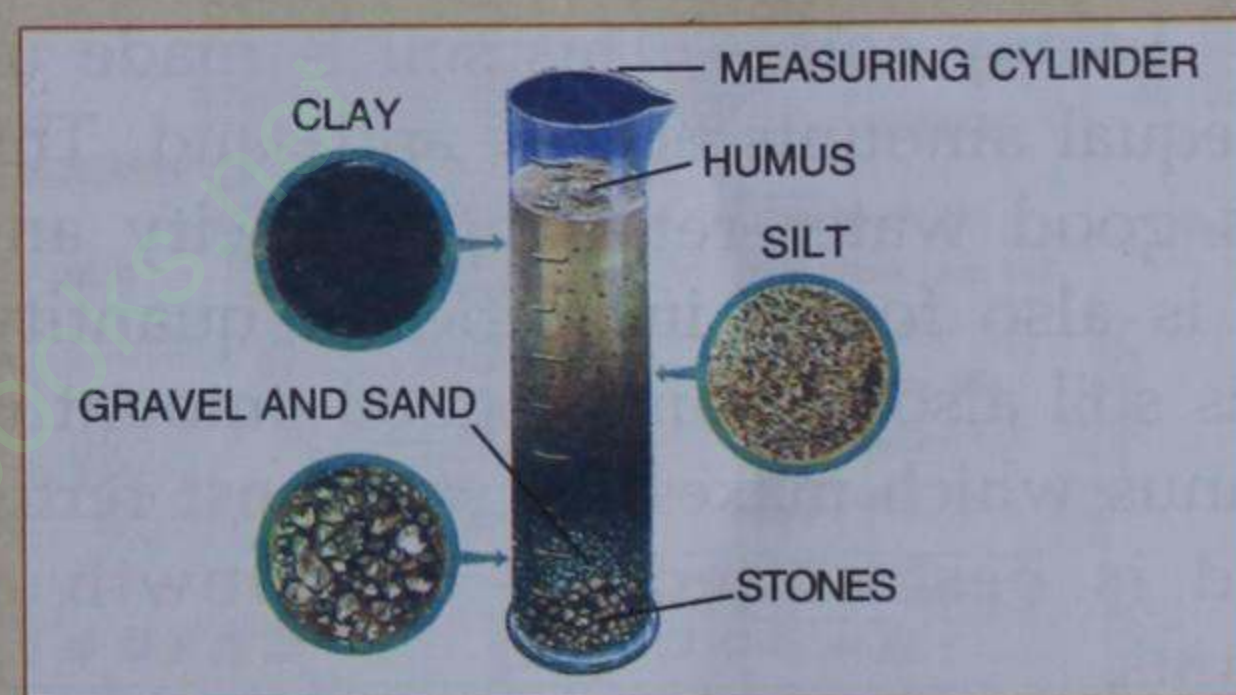
Texture of the soil depends upon the size and arrangement of soil particles.

Soil can be classified into different types on the basis of soil particles and spaces present in between, which decides its water holding capacity.



### ACTIVITY 3

Take some soil from your school garden and put it in a measuring cylinder, beaker or a glass. Add some water and stir it. Allow it to stand for sometime. Observe the various layers.



### Types of soil particles

You can also take soil from different sites like the roadside, a garden pot, a field and compare the different layers.

### Types of soil

On the basis of the texture and the size of particles, the soil can be of three kinds — **clayey**, **sandy** and **loamy**.

**Clayey soil** — Such soil has high percentage of clay particles, little sand and some amount of humus (decomposed remains of plants). It has good water-holding capacity because of no air space. This soil contains a lot of mineral salts in it. It is not very suitable for plant growth because it gets water-logged easily and thus, displaces air from the soil particles.

Therefore, roots do not get oxygen for respiration.

**Sandy soil** — It contains mainly sand and some clay. As they have bigger size of particles, they do not have high water retaining capacity. There is a lot of air present in sandy soil. When the water seeps down through the sand, it takes away with it, the soluble minerals which are otherwise required for the growth of plants. Therefore, such a sandy soil is also not suitable for the growth of plants.

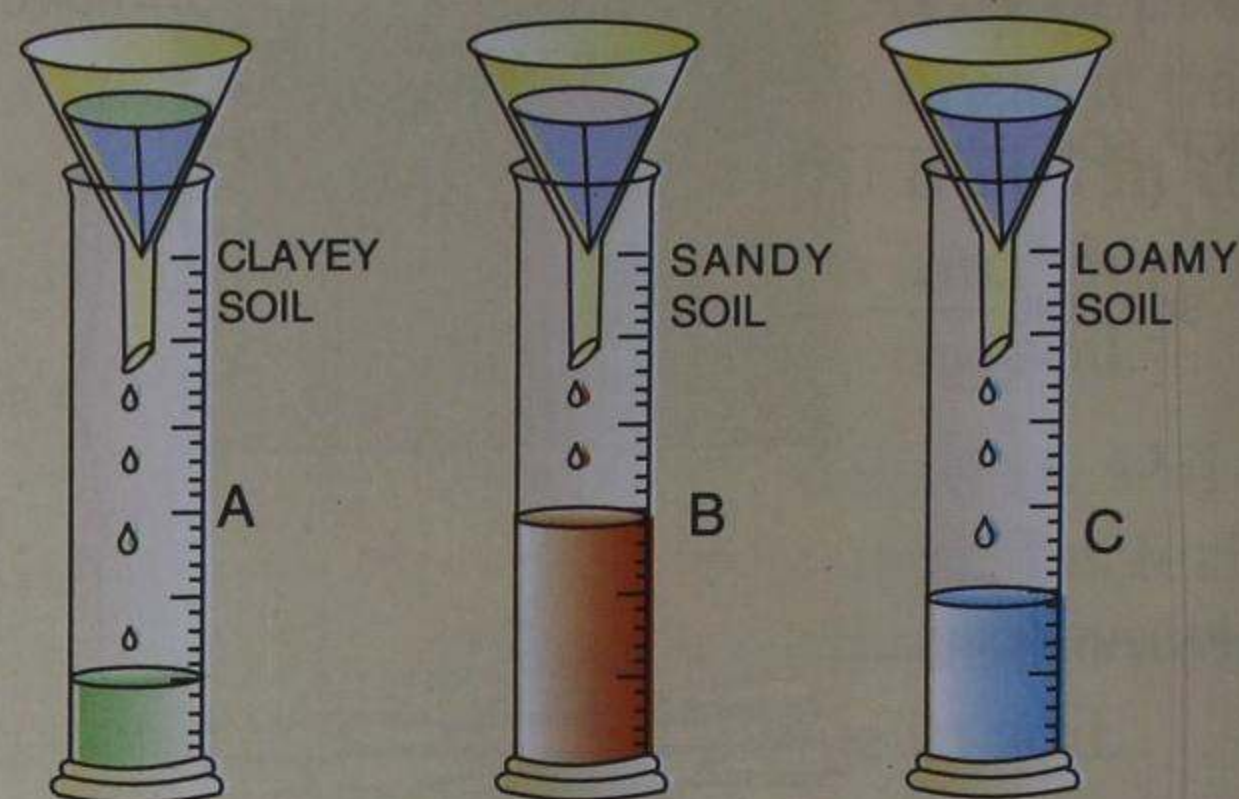
**Loamy soil** — This soil is made up of equal amounts of clay and sand. This has good water-retaining capacity and air is also found in sufficient quantity. This soil also contains a good amount of humus which makes the soil **most fertile and is best suited for the growth of plants**.

**Fertile soil** — A fertile soil is rich in humus, bacteria and minerals. It also has enough water and good texture. Organic humus contains nutrients for the plant growth.



#### ACTIVITY 4

Take three types of soil in equal amounts — clayey, sandy and loamy. Dry them and keep them in separate funnels lined with wet filter paper. Place these funnels on measuring cylinders A, B and C. **Pour 100 mL of water in each funnel.** After about one hour, read the level of water filtered down in the cylinders. Record your observations in a table as given ahead :



*Water retaining capacity of clayey, sandy and loamy soil*

#### Observations

|                                | Measuring cylinder A (with clay) | Measuring cylinder B (with sand) | Measuring cylinder C (with loam) |
|--------------------------------|----------------------------------|----------------------------------|----------------------------------|
| Volume of water (filtered out) | ..... mL                         | ..... mL                         | ..... mL                         |

#### CONCLUSION

- Cylinder A has passed ..... mL water (Fill in the blanks by actual reading and calculations) and retained ..... mL. The amount of water retained is more than that has passed.
- Cylinder B has passed ..... mL of water at a faster rate due to the large size of particles and bigger air spaces in between. Thus, the sandy soil has very little water retention capacity (..... mL).
- Cylinder C has passed more water than in A and less than in B due to the mixture of sand and clay. It also contains humus which retains water. It has retained a moderate quantity of water (..... mL).

**Result :** We conclude that clay has the maximum water-retaining capacity.

## Types of Soils in India

Soils of the northern plains are mainly brought down by the rivers from the Himalayas or by the winds in desert areas. In Peninsular India, soils have been formed by the rocks themselves due to weathering.

Soil contains a variety of colours. The soil colour depends on the type of particles present in it. For example, red-soil is rich in oxides of iron. The *six* main types of soils found in India are as follows.

### (i) Alluvial soil

This soil is formed by the rivers which carry a lot of fine rock fragments to long distances to low lands. It contains all types of soil particles like clay, silt, sand and loam. It is fertile and contains humus which is suitable for cultivation of **wheat, rice, sugarcane, cotton, oilseeds, jute**, etc. It is found mainly in Uttar Pradesh, Bihar, Haryana, Punjab, Orissa and Tamil Nadu.

### (ii) Black soil (Black lava soil)

It is porous and black, called "regur" or "black cotton soil" formed largely due to weathering of volcanic rocks. It is fine grained, rich in iron, potassium, calcium and lack organic matter but retain moisture. It is fertile specially for **cotton** and **sugarcane**. It is found in Maharashtra, Gujarat and Madhya Pradesh.

### (iii) Red soil

It is formed from weathering of old metamorphic rocks. It has high content of iron which gives it the red colour. Humus is low and it has less water-retention capacity. It is good for **wheat, rice,**

**sugarcane, cotton and pulses**. It is found in Tamil Nadu, Goa, Orissa and Madhya Pradesh.



*Fig. 7.9 Map of India showing the different types of soil in different areas*

### (iv) Laterite Soil

It is formed due to high temperature and heavy rainfall with alternate wet and dry periods formed during monsoons. This soil is porous from which silica gets removed by chemical action. It is coarse and red in colour due to rich iron content. It is good for growing **tea, coffee, groundnut, pulses and coconut**. This soil is found in Andhra Pradesh, Tamil Nadu, Assam, parts of Orissa and Kerala.

### (v) Mountain Soil

It is found in the valleys and hill slopes at altitudes of 2100 m to 3000 m. The carbon nitrogen ratio in this soil is

very wide. Its texture generally is silty loam and it is dark brown in colour. Humus is low and is good for **deodar, chir and blue pine**. It is found in areas of Assam, Darjeeling, Uttaranchal, Himachal Pradesh and Kashmir.

#### (vi) Desert Soil

It is a coarse soil because the fine top soil had been blown by wind. It is sandy, porous and contains high percentage of salts but is poor in organic matter. Therefore, it lacks moisture and is not fit for agriculture. Such soil with irrigation, can produce **wheat, rice, grapes and melons**. It is found in Rajasthan, Gujarat and in South Punjab.

**Life in Soil :** One square metre of fertile soil contains more than one billion individual forms of life ranging from micro-organisms to insects and worms and large animals such as burrowing rats. All these organisms help in making the soil loose and to increase its humus content.

### SOIL EROSION

Various agents like water, wind and even human, contribute to the erosion or removal of the top fertile soil. This process is known as **soil erosion**.

#### Agents of soil erosion

(i) **Water** : Rain water on hill slopes, where no vegetation is left to check the flowing force of water, carries away the fertile soil. This happens due to the cutting down of the trees (**deforestation**). The roots of the trees hold soil particles



Fig. 7.10 Soil erosion by rain water

firmly and prevent soil erosion due to rain water.

(ii) **Wind** : In desert areas, wind takes away the exposed top soil loosened due to overgrazing or cultivation which makes the land barren.

(iii) **Human activities** : Some of the human activities such as ploughing and removal of natural vegetation help the rain water and wind to remove the top fertile soil.

### SOIL CONSERVATION

Top soil which supports the life of many organisms, needs conservation by preventing erosion in order to retain soil fertility. Three main methods of conservation of soil are as follows :

(i) **Planting more trees (Afforestation)**: Planting more trees reduces the force of strong winds as well as of the flowing water thus checking floods. Roots of the trees and plants hold the soil particles together.

(ii) **Contour farming (terrace farming, or strip cropping.)** : Soil erosion on hill slopes can be prevented by ploughing along contours in the form of steps (places

of same height on the hills). This prevents direct flow of water down the slope and thus helps in retaining rain water (Fig. 7.11).

**(iii) Regular farming :** The agricultural land should not be left unused for a longer period of time. The dry soil is easily eroded.



*Fig. 7.11 Contour (terrace) farming prevents soil erosion*

## FOSSILS

Fossils are the remains of dead plants and animals which have been buried and preserved as “hardened stony pieces” in the rocks of the earth’s crust through thousands and millions of years. [“Fossil” literally means “dug up”].

## FOSSIL FUEL

Coal, petroleum and natural gas are the three examples of fossil fuels. These are called so because they are dug out from the deeper layers of earth’s crust. These fuels were formed by the slow compression of buried forests. Plants containing cellulose were submerged due to earth’s upheavals (formation of mountains, land slides, moving glaciers) and due to drastic change

in temperature and humidity. Fossil fuels are generally of two types — **solid fuels** and **liquid fuels**.

### Solid Fuels

About 300 million years ago, bacterial decomposition of plants resulted in the removal of hydrogen and oxygen from cellulose (plant cell wall), in the presence of moisture and air. The decomposed plant material was rich in carbon content and got converted into coal. Coal is an example of solid fuel.

**Coal** is an important mineral and is found in abundance, in India. It is a combustible black and brownish black sedimentary rock. It is a carbon rich mineral with sulphur and nitrogenous compounds as impurities. It is mainly used as a source of thermal power, for generating electricity. **Charcoal** is another variety of coal being used for cooking in rural areas, in India. It is mainly used in the manufacturing of chemicals, cement, iron and steel, for water purification as activated carbon, etc.



*Fig. 7.12 Coal*

## Liquid fuels

Petroleum, also called "rocks oil", is an example of liquid fuel. It is believed that petroleum is formed from dead remains of microscopic marine plants and animals which settled in the sediments at the bottom of the warm inland seas millions of years ago. The chemical effect of bacteria under great pressure and heat have converted these remains into petroleum.

Petroleum is found under sedimentary rocks and is extracted by drilling. On drilling, gaseous layers come out first under pressure. The drilled oil is a dark liquid called petroleum or **crude oil**. The crude oil is then refined into various products by fractional distillation. We get **natural gas**, **petrol** (or gasoline), **kerosene**, **diesel**, **petroleum jelly**, **paraffin wax** and **tar** from different fractions of crude oil. All these are very important for mankind. This is the reason that petroleum is also called "**black gold**".



Fig. 7.13 Drilling of petroleum

Fossil fuels are present in the earth in limited quantity, and thus can get exhausted. Since they cannot be regenerated fast enough, they are

considered as **non-renewable** sources of energy. Therefore, we should minimise the use of such fuels for the sake of future use and to prevent air pollution. We should use alternative sources of energy like solar energy, wind energy, etc., which do not create any pollution.

## Harmful effects of fuels

Burning of fossil fuels, like coal produces lot of harmful gases like sulphur dioxide, carbon dioxide, carbon monoxide which cause air-pollution.

Table 4.1 : Harmful effects of gases released during burning of coal.

| Gas                               | Harm Caused                                                                      |
|-----------------------------------|----------------------------------------------------------------------------------|
| SO <sub>2</sub> , CO <sub>2</sub> | Acid rain                                                                        |
| CO <sub>2</sub>                   | Green house effect                                                               |
| CO                                | Death of a person due to inhaling                                                |
| Smoke                             | Produces Smog (Smoke + fog) causing much damage to life, monuments and transport |



## ACTIVITY 5

Ask the students to take a latest outline map of India, and indicate on it the coal and petroleum extracting states of our country. The students can also be asked to show the coal extracting state by grey colour, and petroleum states by pink colour.

Students with the help of books, internet, etc. should try to find the answer to the following questions.

1. What are the reasons why these states are rich in these fossil fuels ?
2. Write the harmful effects of these fuels?
3. Write two most important uses of coal and petroleum.

Coal : 1. .... 2. ....

Petroleum : 1. .... 2. ....

## REVIEW QUESTIONS

1. Give any *five* uses of rocks.
  2. What is meant by "weathering of rocks" ? Briefly discuss the causes of weathering of rocks.
  3. Briefly describe the *three* types of soil.
  4. What is meant by soil erosion ? Discuss the *three* methods by which soil can be conserved.
  5. What is meant by deforestation and afforestation ?
  6. Planting more trees can conserve soil. Explain.
  7. List any *five* living organisms found in the soil, and give functions of any *two* of them.
  8. What are fossils ? Write short note on the *two* fossil fuels.
  9. Fill up the blanks by using the words given below.  
Igneous, core, magma, metamorphic
    - (i) The innermost region of the earth is called .....
    - (ii) The red-hot molten material of the mantle of earth is called .....
    - (iii) The uppermost layer of earth is known as crust which is made of the *three* kinds of rocks  
....., sedimentary and .....
  10. Complete the following words by adding the required alphabets in blank spaces :
    - (i) P ..... R ..... L ..... U ..... (Type of fossil fuel)
    - (ii) I ..... E ..... S ..... (Type of rock)
    - (iii) F ..... S ..... L ..... (Remains of dead plants and animals)
    - (iv) M ..... N ..... E ..... (Middle layer of earth)
    - (v) L ..... M ..... (Type of soil)
  11. Name *five* purposes for which coal is used in India.
  12. Why coal, petroleum and natural gas are called fossil fuels ?
  13. Differentiate between solid fuels and liquid fuels with suitable examples.
-