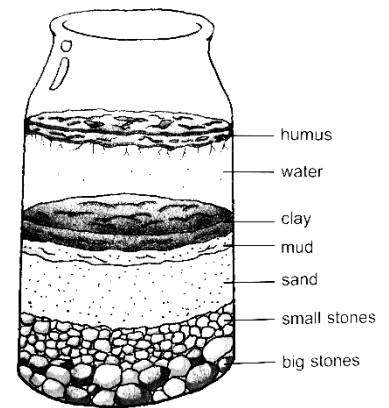




<b>Class: VII</b>	<b>Department: SCIENCE-2023-2024</b>	<b>Date: 13.11.2023</b>
<b>HANDOUT</b>	<b>Topic: SOIL</b>	<b>Note: A4 FILE FORMAT</b>
<b>Name of the student:</b>	<b>Class &amp; Section:</b>	<b>Roll no.</b>

Soil is one of the most important natural resources and is essential for the existence of life on the earth.

- It supports the growth of plants by holding the roots and supplying water and nutrients.
- It is the home for many organisms.
- Soil is essential for agriculture. Agriculture provides food, clothing and shelter for all.



**COMPOSITION OF SOIL-**

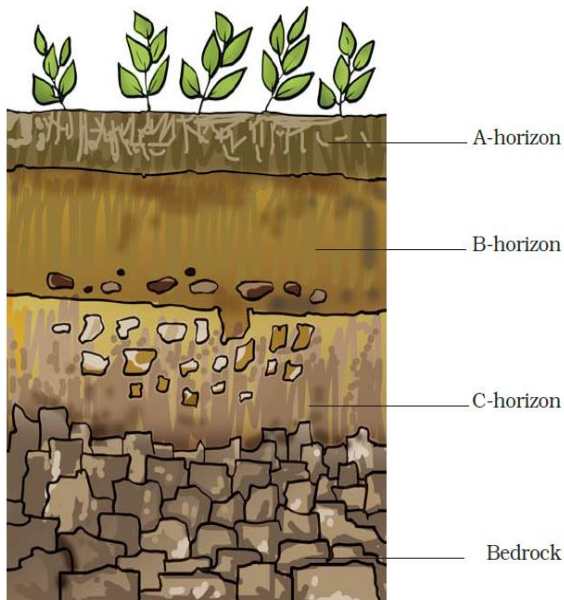
Soil contains humus, water, clay, sand and gravel.

The organic matter formed by the decomposition of dead plants and animals by the microorganisms is called **humus**. It makes the soil fertile.

**SOIL PROFILE –**

Soil is formed by the breaking down of rocks into smaller particles by the action of wind, water and climate. This process is called **weathering**.

The nature of any soil depends upon the rocks from which it has been formed and the type of vegetation that grows in it.



A vertical section through different layers of the soil is called the **soil profile**. Each layer differs in feel (texture), colour, depth and chemical composition. The different layers of soil are called its **horizons**.

**A horizon:**

- This layer is also called **topsoil** and is visible to us.
- It is rich in humus and minerals which makes it dark in colour.
- It is generally soft, and porous and retains more water.
- It also provides shelter to many decomposers, insects, worms, etc.
- The roots of small plants are embedded entirely in the topsoil.

**B-horizon:**

- It forms the middle layer which is less rich in humus and contains more of minerals.

- This layer has a hard texture, and light colour and is more compact than topsoil.
- The roots of plants generally grow till this layer.

### **C-horizon:**

- It is made up of small lumps of rocks with cracks and crevices. These rocks are partly weathered.
- It lacks humus and is infertile.
- The rainwater gets collected in this layer in the form of groundwater.

### **Bedrock:**

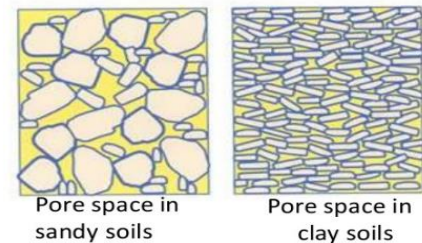
- The last layer of the soil is called the bedrock.
- It contains large pieces of rocks that are not weathered or exposed to any winds or water.
- Bedrock cannot be dug with the help of a spade. It is very hard in texture.

### **TYPES OF SOIL-**

Soils are categorised mainly into three types based on the proportion of particles of various sizes.

#### **Sandy Soil:**

- Particles of sandy soil are big with large space among them.
- These spaces are filled with air. Thus, sandy soil is well aerated.
- Water drains quickly through the large space and sand remains dry.
- It is not fit for growing crops but is used for the construction of buildings along with cementing material.



#### **Clayey Soil:**

- Particles of clayey soil are very small in size and packed tightly.
- It is not well aerated as the space between the particles is very small.
- It is heavy as it retains more water.
- It naturally forms lumps with water and is therefore used in the making of pottery and bricks.

#### **Loamy Soil:**

- Loamy soil contains a similar amount of large and small particles.
- It is the mixture of sand, clay and silt with humus.
- Particles of loamy soil are smaller than sand and larger than clay.
- Space between the particles has the right water-holding capacity and is well aerated.
- It is considered as the best soil for farming and gardening.

### **PROPERTIES OF SOIL-**

#### **Percolation rate of water in soil:**

Percolation can be defined as the property of the soil by which it allows the flow of water through it. The rate at which water percolates or moves through soil may vary in different kinds of soils. Some soils absorb water while others allow it to flow through them. The rate of percolation can be calculated by:

$$\text{percolation rate (mL/min)} = \frac{\text{amount of water(mL)}}{\text{percolation time(min)}}$$

The percolation rate of water is fastest in sandy soil and slowest in clayey soil.

### Moisture in soil:

The amount of water present in the soil is called moisture present in the soil. It can be calculated using the formula-

$$\text{Moisture content} = \text{Weight of moist soil (g)} - \text{Weight of dry soil (g)}$$

The air above the farmland appears shimmering during the daytime- The soil contains water. Due to sunlight, the water from the soil begins to evaporate and turns into water vapour. This water vapour when reflects the sunlight appears as if it is shining and hence the air above the soil makes the land look shimmery.

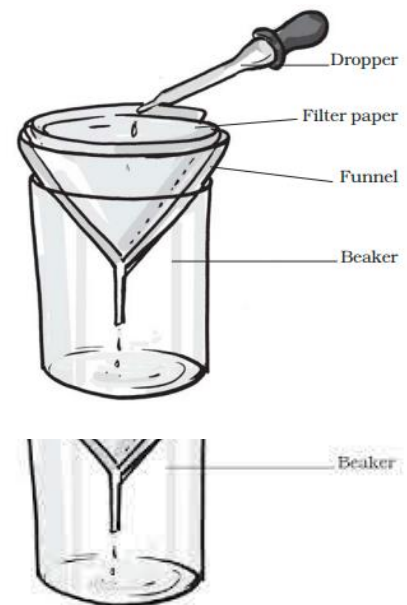
### Absorption of water by soil-

Different soil samples absorb water to a different extent.

- The absorption of water by different soil can be found by samples.
- Take a filter paper, fold and place it as shown in the figure alongside.
- Pour the soil into different funnels placed in different beakers and pour water into the soil with the help of measuring cylinders.
- Continue pouring until it starts dripping.
- Now, check the amount of water left in the measuring cylinder and subtract it from the initial amount which was taken.
- The resulting amount of water is retained by the soil.
- The formula to calculate the percentage of water absorbed is-

$$\text{Percentage of water absorbed} = \frac{(U-V)}{\text{weight of the soil}} \times 100$$

U is the initial volume of water (ml), V is the final volume of water (ml)



The amount of water retained by clayey soil is highest and sandy soil is lowest.

### SOIL AND CROP-

Different types of soil are found in different places. Soil is affected by wind, rainfall, temperature, light and humidity. These are some important climatic factors which affect the soil profile and bring changes in the soil structure.

The climatic factors, as well as the components of soil, determine the various types of vegetation and crops that might grow in any region.

**Sandy soil:** Millets can be grown on sandy soil. Sandy soil is not fit for any crop as it does not retain water. However, some thorns and bushes do grow on sandy soil.

**Clayey Soil:** Clayey soil is best suited for paddy, as it can retain water for a longer time. This is also suitable for growing wheat and grams.

**Loamy Soil:** Loamy soil is considered the best for almost all types of crops. It is suitable for growing lentils and other pulses.

**Sandy Loam:** Sandy loam soil is suitable for the growth of cotton plants as it can easily drain water and is well aerated.

### **SOIL EROSION-**

The gradual removal of topsoil by the action of wind, flowing water, waves and snow is known as soil erosion. Soil erosion affects the fertility of the soil, as humus present in the soil is eroded along with the soil. Some factors affecting soil erosion are as follows-

1. Heavy rains and floods which make the soil particles loose.
2. Deforestation loosens the soil particles. It makes the land barren and increases the chances of flood.
3. Poor farming methods adopted by farmers.
4. Overgrazing by animals.
5. Construction of roads and houses.

### **SOIL POLLUTION-**

Contamination of soil by the presence of man-made chemicals or other undesirable substances is called soil pollution. Some of its causes are as follows-

1. Excessive use of fertilisers, pesticides and insecticides.
2. Waste products from industries which contain chemicals.
3. Untreated sewage water.
4. Non-biodegradable waste like polythene, plastic, metal.

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