NCERT CBSE Class 7th Science Chapter 9 : Soil Extra score study

What is soil?

Soil is the crust part of the earth. It is mainly the mixture of rock particles and humus.

How will you say that the soil is one of the most important natural resources?

Soil is one of the most important natural resources because

- It supports the growth of plants by holding the roots firmly 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.
- Soil is thus an inseparable part of our life.

What are the factors which affect the soil?

Wind, rainfall, temperature, light and humidity are the factors which affect the soil soil profile and bring changes in the soil structure.

What do you mean by soil profile?

A vertical section through different layers of the soil is called the soil profile.

What are horizons?

Each layer of soil differs in feel (texture), colour, depth and chemical composition.

These layers are called horizons.

What factors are used to differentiate various layers of soil?

The layers of soil are different from each other in respect to their texture, colour, depth, particle size and chemical composition.

Describe the different layers in soil profile.

(a) Different layers of the soil are referred to as horizons.The uppermost layer, the top soil, also known as A-horizon is generally dark in color and fertile as it is rich in humus and minerals. This layer is generally soft, porous and can retain more water. This provides shelter for many living organisms such as worms, rodents, moles and beetles. The roots of small plants are embedded entirely in the topsoil.

(b) The next layer, middle layer called B-horizon has a lesser amount of humus but more of minerals. This layer is generally harder and more compact.

(c) The third layer is the C-horizon which is made up of small lumps of rocks with cracks and crevices.

(d) Below this layer is the bedrock, which is hard and difficult to dig with a spade. Water can be held in the tiny gaps.

What is humus?

A non living organic matter formed from remains of dead and decay plants and animal by the activity of micro organism present in soil.

Why is top soil known as the habitat of many living organisms?

Soil is the habitat for many living organisms, like bacteria, fungi, protozoan and earthworms as it contains large amounts of nutrients. Therefore top soil is called the habitat of many living organisms.

Why Upper most layers in a soil profile is described as most productive

In the soil profile, Horizon – A, also known as Topsoil is best suited for the plant growth.

As we know that availability of nutrients and water in soil helps to determine the productivity of soil. Top soil is it is rich in humus minerals along with water Therefore Top soil is considered as more productive.

How soil is formed?

The soil is formed by the breaking down of rocks by the action of wind, water and climate. This process is called weathering.

There are two different types of weathering. Physical weathering and chemical weathering.

Mechanical (physical) weathering is the breakdown of rock into smaller particles due to such factors as as freezing and thawing, release of pressure, water absorption, salt crystal formation, land mass uplift, expansion and contraction from the sun or fire, plant root growth, actions of animals, abrasion, or other means that do not directly affect the rock's chemistry.

Chemical weathering is the dissolution, carbonation, oxidation, or hydrolysis of rock and mineral by chemical means only, mostly from reactions with water or the acids contained in rainwater. Other materials are formed in the process. Warm, tropical climates are ideal environments for chemical weathering to take place as the chemical reactions are quickened by the bountiful rain and warm temperatures.

What is the similarity between chemical and mechanical weathering?

They both reduce the size of a rock body

At what factors nature of soil depend on?

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

Plants help the development of the soil. How?

The plants attract animals, and when the animals die, their bodies decay. Decaying matter makes the soil thick and rich. This continues until the soil is fully formed. The soil then supports many different plants.

The soil is classified on the basis of the proportion of particles of various sizes. How?

If soil contains greater proportion of big particles it is called sandy soil.

If the proportion of fine particles is relatively higher, then it is called clayey soil.

If the amount of large and fine particles is about the same, then the soil is called loamy.

Thus, the soil can be classified as sandy, clayey and loamy.

Soil particles size is an important factor to determine the property of soil. Explain.

Different particles of soil have different sizes which affect its properties such as:

(a) Sand particles are quite large and having large spaces between them. These spaces are filled with air. Water can drain quickly through these spaces. So, sandy soils tend to be light, well aerated and rather dry.

(b) Clay particles, being much smaller, pack tightly together, leaving little space for air. So, clay soils have little air. But they are heavy as they hold more water than the sandy soils.

(c) Loamy soil is a mixture of sand, clay and another type of soil particle known as silt. The size of the silt particles is between those of sand and clay. The loamy soil also has humus in it. It has the right water holding capacity for the growth of plants.

Why loamy soil is known as best for growing plants?

The loamy soil has adequate humus mixed in it. It has the right water holding capacity for the growth of plants. So loamy soil is known as best for growing plants

What is silt? It is a component of which type of soil?

Silt is the soil present as deposits in riverbeds. It is formed by the weathering of rocks in the mountains and flows into the rivers. It is a component of loamy soil which is considered most suitable for growth of plants.

What is percolation of water? How it is different for different types of soil?

The gravity flow of groundwater through the pore spaces in rock or soil is called percolation of water. Percolation rate of water is different in different types of soil. It is highest in the sandy soil and least in the clayey soil.

What are the factors help us to determine the various types of vegetation and crops that might grow in any region?

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

How does moisture affect the fertility of the soil?

The ability of a soil to hold water is called soil moisture. Soil moisture impacts the distribution and growth of vegetation, soil aeration, soil microbial activity, soil erosion, concentration of toxic substances and the movement of nutrients in the soil to the roots, thus affect fertility of soil. For example, clayey and loamy soils both have good water retaining capacity. Crops such as wheat are grown in the fine clayey soils, because they are rich in humus and are very fertile.

What are the main agents of weathering ?

The main agents of weathering are :-

1. Temperature: Temperature changes that cause the rock surface to break apart
2. Frost: Ice expand and produce pressure , causing the crevices in rock to open
3. Water: - Continuous movement of rain water causes braking down of rock particles into fine particles
4. Air : Wind blow across rock surface and carry minute particle and form layer
5. Living organism : - Lichen grow on the surface of rocks and produce acid which corrode the rocky surface .Weathering by living organism is called biological weathering.

How is clayey soil useful for crops?

Clayey soil having a good capacity to retain water. It is also rich in organic matter So best suitable for growing cereals like wheat, And gram

How can soil erosion be prevented?

There are many ways to prevent soil erosion (i) By planting more trees and increasing the vegetation cover.
(ii)By prevented Cutting of trees and deforestation and taking efforts to increase the green areas.
(iii)By maintaining soil in its natural condition by using less manure or by crop rotation
(iv) By arranging proper irrigation

What are the different types of soils found in India?

Laterite Soils :- This typical soil is found in those regions which receive heavy rainfall. This soil is poor in lime content and hence it is more acidic. This soil contains least moisture content. It is basically red in colour because of the presence of iron oxides. It is more popular in the coastal regions of Ratnagiri District and Malabar.

Black Soil :- It is black in colour due to presence of salt and large amount of humus . This soil becomes sticky when is wet. It does not contain adequate nitrogen but it contains sufficient phosphorous required for the growth of the plants. It is generally found in hilly areas.

Red and Yellow Soil : Red and yellow soils are found in areas, which receive low rainfall. They contain huge concentration of iron oxides that are responsible for giving the reddish or yellow colour.

Alluvial Soils : Alluvial Soils are mainly found in the plains of northern India. These soils have low phosphorous and nitrogen content and found in the north western regions of the country

Mountain Soil : Mountain soils are considered as a significant variety of soil in the Himalayan region of the country. They are mainly found in dry and cold district in the northern region of India.