Class-6 (Science)

Chapter-12

Origin and formation of the earth

Lecture-3 Date-12.05.2020

Lesson: 9-10

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Soil and its importance

- Soil is the loose soft surface material of the earth consisting of organic matters, minerals, gases, liquids, and organisms that together support life.
- Soil provides a substrate for plants (roots anchor in soil), a source of food for plants, and a home for many animals (insects, spiders, centipedes, worms, burrowing animals, bacteria, and many others).
- There are minerals in the soil which are used for different purposes.

Soil formation process

Soil is formed by stone, stone chips, dust particles, sands, mud, etc. mixed with the remains of plants and animals .The earth-crust is formed by the solids known as rocks.Generally the soft soils are formed from the hard rocks in two phases:

First phase: For a extended period of time hard rocks and minerals are convert to minute particles due to heat, rain, cyclone, earth-quake, etc. Moreover these small rock particles are concentrated at one place from another due to the flow of wind, ice, water and volcanic eruptions.

Second phase: With the minute particles of rocks and minerals water, air, small living creatures like bacteria and remains of plants and animals get mixed up to form soil.

Layers of soil:

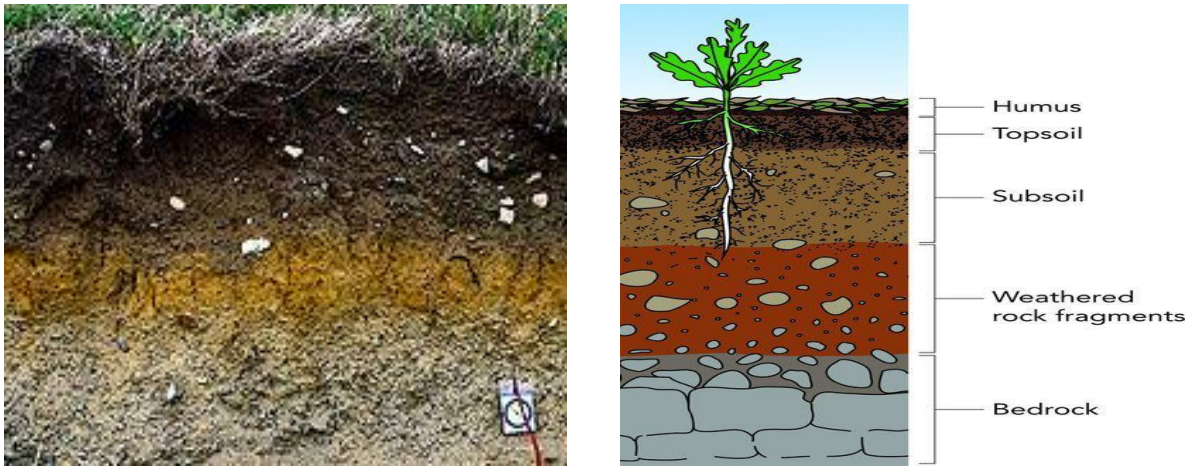


Figure- Layers of soil

The soil is arranged in layers during its formation. It is the vertical section of the soil that is exposed by a soil pit. The layers of soil can easily be identified by the soil colour and size of soil particles. Each layer of soil has distinct characteristics:

- The top layer is called topsoil. In this layer of soil remains of plants and animals are mixed up. Humus is found more in the upper layers of the soil. The black or non-bright elements formed due to the mixing of plant and animal ruins are called humus. Plants get their essential nutrients from the humus. This layer also contains mineral particles. Seeds germinate and plant roots grow in this dark-colored layer.
- The second layer is called subsoil. In this layer humus decreases, for this it is less black and looks brighter to some extent. It contains clay and mineral deposits that it receives from layers above it when mineralized water drips from the soil above.
- The third layer is called regolith or parent rock. This layer is originally formed by minute rock particles. Plant roots do not penetrate into this layer; very little organic material is found in this layer.
- The lowest layer is formed by bed-rock alone. It is a compacted and cemented layer. Different types of rocks such as granite and limestone are found here.
- In the coastal regions, the upper portion of the soil is formed by alluvial soil. The flood water carries alluvial soil to these lands. The upper layer of the soil in those places does not grow that sterile. This soil is suitable for cultivation.

Minerals

The naturally occurring inorganic compounds of metals and non-metals which are generally mixed with other matter such as sand, soil, etc. are known as minerals.

[Inorganic means that it is not made of anything that was ever living.]

Minerals are most commonly associated with rocks due to the presence of minerals within rocks of earth-crust.

Uses of minerals

Many minerals of essential metals and nonmetals are available in nature from which corresponding metals and nonmetals are extracted and used for various purposes. Some important metals found in the soil as minerals are iron, aluminium, copper, silver, gold, zinc, etc.

- Limestone is used as a raw material for manufacturing cement.
- The rods used to construct buildings are made from iron.
- Cars, buses, launches, etc are made of iron.
- Tube wells, plough share, nails, machineries, etc. are also made from iron.
- Some cooking utensils (pots, spoons, etc.) are made from aluminium.
- Electrical wires are made of copper.
- Ornaments are made of silver and gold.

Fossil fuels

The ruins of plants and animals of ancient periods which are found underground are called fossil fuels. They are produced from the fossilized remains of living beings and dug out of the earth later.

Examples- Coals, petroleum and natural gas that we use as fuels are found as fossils under the earth's surface.

Uses of fossil fuels

- The heat produced by burning these fuels is used to run mills and factories, public transports, and to produces electricity.
- Cooking is done with these fuels.
- Urea fertilizer is produced from natural gas.
- Polythene is produced from petroleum.
- Many other necessary materials are prepared from the fuels.

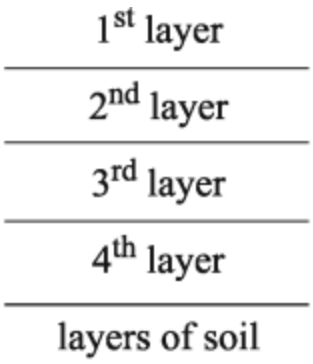
Why coal, petroleum and natural gas are not minerals?

Coal, petroleum and natural gas are organic substances, specifically the remains of animals and plants body of ancient periods which are known as fossil fuels. Since these come from something that were once living these do not qualify as minerals. Though these substances are found underground, these are not inorganic and that's why these are not minerals.

Questions

1. What is soil? Give its importance in short.
2. What is rock?
3. What are minerals? Mention some uses of them.
4. What are fossil fuels? Mention some uses of them.
5. Why coal, petroleum and natural gas are not minerals?

Creative question:



a) What are fossil fuels?
b) Why coal is not mineral?
c) Describe the process of formation of soil from hard rocks.
d) Describe the four layers of soil mentioned in the above stem figure.