# 3. ROCK AND SOIL (KEY)

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## TEACHING TASK

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### CONCEPTUAL UNDERSTANDING QUESTIONS (CUQ's)

**Multiple Choice Questions**

1. B) A layer of material covering Earth's surface composed of various components.
Soil is made up of minerals, organic matter, water, and air, and it supports plant life.

2. C) Rainwater combining with gases in the air to form acids.
This process alters the chemical composition of rocks, which is an example of chemical weathering.

3. D) All of the above.
Rocks can be broken into smaller pieces by physical forces from water, wind, and ice.



4. B) Chemical.
This type of weathering involves the reaction of rainwater with gases in the air, leading to changes in the chemical composition of rocks.

5. D) Decomposition.
This process adds organic matter to the soil as dead plants and animals break down and contribute nutrients.

6. D) All of the above.
The type of soil that forms is influenced by time, climate, and the parent material (rocks) from which it develops, as well as other factors like topography and vegetation.

## LEARNERS TASK

## CONCEPTUAL UNDERSTANDING QUESTIONS (CUQ's)

### Multiple Choice Questions

1. C) Weathering.
The first step in soil formation is weathering, where rocks are broken down into smaller particles through physical, chemical, or biological processes.

2. B) Erosion.
The movement of smaller rock pieces by natural forces, such as water, wind, or ice, is called erosion.

3. D) Rocks.
While rocks are part of the parent material from which soil forms, they are not considered a direct component of soil itself. The primary components of soil are organic matter, minerals, water, and gases.



4. C) Deposition.
The settling of eroded material in a new place is called deposition.

5. D) All of the above.
The settling of eroded material contributes to soil formation by adding minerals, organic matter, and gases, all of which enhance soil quality and fertility.

## LAYERS OF SOIL (KEY)

## TEACHING TASK

## CONCEPTUAL UNDERSTANDING QUESTIONS (CUQ's)

### Multiple Choice Questions

1. C) Organic Layer.
The organic layer consists mainly of fallen leaves, twigs, and other organic matter that has not yet decomposed.

2. A) Topsoil.
The topsoil layer is primarily responsible for providing nutrients to plants as it contains organic matter and minerals that support plant growth.

3. A) Parent Material.
The parent material layer is often described as being like the bottom slice of bread in a sandwich, as it provides the foundation for the layers above it.

4. A) Bedrock.
The bedrock layer serves as the base from which soil forms over time, providing the underlying material that weathering processes break down to create soil.

5. B) Bedrock. The bedrock layer is described as not very useful for plants because it is too hard and compacted, making it difficult for roots to penetrate.

6. B) Bedrock.
The bedrock layer is composed of solid rock.

7. C) Home.
Soil is often compared to a home for plants because it provides essential nutrients, water, and support for their growth.

8. A) It acts like a sponge.
Soil helps in purifying water by filtering and absorbing impurities, acting like a sponge that retains water and allows it to be cleansed as it passes through the soil layers.

9. C) Insects.
Various insects and other organisms, such as earthworms and microorganisms, live in the soil and help maintain its health by aiding in decomposition, aerating the soil, and recycling nutrients.

## ADVANCED LEVEL

**More than One Answer Type**

10. A) Topsoil and B) Subsoil.
Plant roots can access water and minerals from both the topsoil and

subsoil layers.

11. B) Worms, C) Insects.
Birds and fish do not live in soil.

12. B) Building materials, C) Pottery.
They are not typically used for cooking or as fuel.

**Fill In the Blanks**
13. Organic
14. Sponge

**Matching Type**
15.

1. Growing Plants - B. Provides nutrients, water, and support for plant roots to grow.

2. Filtering Water - D. Acts like a sponge, absorbing rainwater and filtering it to provide clean drinking water.

3. Supporting Animals - A. Offers a habitat for worms, insects, and small mammals, aiding in soil health.

4. Building Materials - C. Can be used to make bricks, pottery, and earthen structures.



**Answer the Following Questions**
**16.**
Soil is a complex mixture of organic matter, minerals, gases, liquids, and countless organisms that together support life on Earth. It forms the upper layer of the Earth's crust and plays a crucial role in providing nutrients and water for plants, acting as a habitat for various organisms, and influencing water quality.

Different Layers of Soil

1. Organic Layer (O Horizon):

- This topmost layer is composed mainly of decomposed organic matter, such as fallen leaves, twigs, and other plant materials. It is rich in nutrients and serves as the primary source of food for many soil organisms.

2. Topsoil (A Horizon):

- Below the organic layer, topsoil is a fertile layer rich in minerals and organic matter. It is the most important layer for plant growth, as it provides essential nutrients and is where most biological activity occurs. Roots of plants primarily grow in this layer.

3. Subsoil (B Horizon):

- This layer lies beneath the topsoil and contains fewer nutrients but accumulates minerals leached down from the upper layers. It is denser and often less fertile than topsoil but still plays a role in supporting plant life by storing minerals and water.

4. Parent Material (C Horizon):

- The parent material is composed of weathered rock and minerals that have broken down to form soil. This layer provides the raw materials from which the soil develops. It may not contain much organic material but is essential for the soil's mineral content.

5. Bedrock (R Horizon):

- The bedrock is the solid rock layer beneath the soil layers. It is not soil but provides the foundation from which soil forms over time through weathering processes. Bedrock can influence the type of soil that develops above it.



Importance of Soil Layers

- Nutrient Cycling: The organic and topsoil layers are vital for nutrient cycling, allowing plants to absorb the nutrients they need.

- Water Retention: Soil layers help retain and filter water, promoting healthy plant growth and maintaining the hydrological cycle.

- Habitat: Soil layers provide habitats for a wide variety of organisms, including insects, worms, fungi, and bacteria, all of which contribute to soil health.

In summary, soil is a dynamic and essential resource that supports life by providing nutrients, water, and habitat for organisms. Understanding its different layers helps in managing and conserving this vital resource.

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## LEARNERS TASK

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## CONCEPTUAL UNDERSTANDING QUESTIONS (CUQ's)

### Multiple Choice Questions

1. C) Topsoil.
The topsoil layer is often compared to the top slice of bread in a sandwich, as it is the layer most critical for supporting plant growth.

2. C) Subsoil.
The subsoil layer is often compared to the middle layer of a sandwich, as it is harder and contains fewer nutrients than the topsoil.

3. A) Bedrock.
The bedrock layer lies beneath all the other layers of soil.

4. D) Organic Layer.
The organic layer contains mainly organic matter in various stages of decomposition.



5. B) Topsoil.
Plant roots primarily grow in the topsoil layer, as it is rich in nutrients and organic matter.

6. C) Organic Layer.
The organic layer lies on the surface and is important for adding nutrients to the soil through decomposed organic matter.

7. C) Building materials.
Clay and loam can be used for building materials, including bricks and pottery.

8. C) Skin.
Soil is often compared to skin because it covers the Earth's surface and is essential for supporting life.

## ADVANCED LEVEL

**More than One Answer Type**

9. A) Organic Layer and B) Topsoil.
Both the organic layer and topsoil are involved in the decomposition process, as they contain organic matter that breaks down and enriches the soil.

10. A) Nutrients, B) Water, C) Support for roots.
Soil does not provide sunlight.

11. A) Bricks, C) Pottery.
Glass and metal are not made from soil.

**Fill In the Blanks**

12. Bedrock
13. Loam

**Matching Type**

14.

1. Organic Layer - C. Consists mainly of fallen leaves and twigs.
2. Topsoil - A. Top layer where plants grow their roots.
3. Subsoil - D. Underneath the topsoil, harder with fewer nutrients.
4. Bedrock - B. Composed of solid rock, lies beneath all other layers.



**Answer the Following Questions**

**15.**

Soil is composed of several layers, each with distinct characteristics and functions. Here's an overview of the different layers of soil:

1. Organic Layer (O Horizon)

- Composition: This layer is primarily made up of decomposed organic matter, such as fallen leaves, twigs, and other plant materials.

- Function: It enriches the soil with nutrients and plays a crucial role in supporting soil organisms. This layer is vital for the nutrient cycle and promotes healthy plant growth.

2. Topsoil (A Horizon)

- Composition: Topsoil consists of a mix of organic matter and minerals. It is typically darker in color due to the high organic content.

- Function: This layer is where most biological activity occurs and is critical for plant roots. It provides nutrients, water, and support for vegetation, making it the most fertile layer.

3. Subsoil (B Horizon)

- Composition: The subsoil contains minerals leached from the topsoil but has less organic matter. It is often denser and can be lighter in color.

- Function: While it is less fertile than topsoil, the subsoil still retains important minerals and moisture. It helps support plant roots and contributes to water drainage.

4. Parent Material (C Horizon)

- Composition: This layer is made up of weathered rock and mineral materials that have broken down to form soil. It contains larger rock fragments.

- Function: Parent material provides the mineral base for soil formation. It undergoes weathering processes that contribute to the upper layers.

5. Bedrock (R Horizon)

- Composition: Bedrock is the solid rock layer beneath all the soil layers. It is not soil but the foundational layer from which soil develops.

- Function: Bedrock influences the type of soil that forms above it through the weathering process. It provides stability to the soil layers.

Importance of Soil Layers

Each layer of soil plays a specific role in supporting ecosystems, facilitating plant growth, and maintaining environmental health. Together, they contribute to nutrient cycling, water retention, and habitat provision for various organisms. Understanding these layers is essential for effective land management, agriculture, and conservation efforts.