

# **Soils Honor Answers**

## **1. Define what "soil" means?**

The term soil is used to describe the rock detritus (fragments) at the surface of the earth that have been sufficiently weathered by physical, chemical, and biological processes to support the growth of rooted plants. In addition, soil must have organic matter to be classified as soil.

## **2. Where on earth is all soil located?**

All soil exists on the surface of the earth.

## **3. What are 5 key factors in soil formation?**

Five key factors in the formation of soil are Parent Material, Climate, Organisms, slope, and time.

Parent Material is the type of underlying rock that breaks down to form soil. A soil cannot contain minerals that are not present in the parent material. For example, soils in eastern Tennessee have a limestone content because much of the underlying rock is limestone while in south Georgia much of the soil is much more sandy due to the extensive washing of particles from the Appalachian mountains.

Climate is important in soil formation because different soil types are produced in areas of low rainfall (deserts) versus high rainfall (tropics) and extreme temperature variations (deserts and polar regions) versus moderate temperature variations (temperate zones).

Organisms have an important effect on soil formation. Organisms can break down rocks through a process called chemical weathering. In addition, Organisms have a large effect on the amount of organic material present in soil.

Slope, or topographic influence on soil formation, is emphasized more by pedologists than geologists. If the slope is steep, then water runoff is rapid, erosion will quickly remove the soil as it forms, and the soil profile will thus be very thin and poorly developed. On level terrain, the soil will build.

Time is a factor in soil formation because soil takes a certain amount of time to form. Other outside influences, such as climate, slope, and organisms, will have an impact on how much soil is made given a certain period of time.

**4. Define the following terms:**

**a. A-Horizon**

Top section of soil, usually the darkest, has the most organic matter

**b. B-Horizon**

Second section of soil, little organic matter, soluble minerals and iron oxides present

**c. C-Horizon**

Slightly altered bedrock, broken and decayed, mixed with clay

**d. Organic layer**

Soil horizons containing both organic matter and rock fragments

**e. Mineral layer**

Soil horizons containing only rock fragments

**f. Clay**

Formed by leaching in humid climates, deposited in lower soil layers

**g. Leaching**

The process of water moving through soil and removing various minerals

**h. Silica**

Mineral present in all soils,

**i. Humus**

Tiny particles of decayed leaves, twigs, and animal remains

**j. Soil Profile**

Vertical cross section through the soil Horizons down to bedrock

**k. Parent Material**

Underlying rock, such as bedrock, from which the soil has formed

**l. Pedologists**

Scientists who study soil, usually geologists who specialize

**5. Define the term "Soil Classification". Why are soils classified?**

Soils are defined, based on the presence or degree of development of the various horizons in soil profiles. Modern soil classifications attempt to classify according to definable, observable chemical and physical properties such as the amount and type of organic matter present, the amount and type of parent material, and the presence or absence of minerals due to leaching.

**6. Discuss three characteristics of each of the following soil types:**

**a. Pedalfers**

A- and B-horizons are leached. Soil is rich in insolubles, quartz, clay minerals, and iron oxides. No calcium carbonate present. Abundance of organic matter present.

**b. Pedocals**

Soluble minerals present. Calcium carbonate present. Contain little clay. Low amount of organic matter present.

**c. Laterite**

Deep red soil. Silicates all completely altered. High amount of iron oxides and aluminum. Moderate amount of organic matter present.

**7. Examine a 2-foot vertical section of soil. Label the different types of organic matter found, identify the different soil horizons, and mark the transition from the soil layer to the mineral layer.**

**8. Draw, photograph, or collect and correctly label 5 different soil types.**

**References:**

<http://soils.usda.gov/>

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