**Soil Test Study Guide-Answers**

**A proficient student can explain the process of soil formation and describe soil properties.**

1. What is soil?
* Loose weathered material on Earth’s surface in which plants grow. One of the main ingredients of soil comes from bedrock.
1. What are the horizons of soil in order, what are they made of and what might you see in them?
* Horizon O (Litter)- grass, air, branches, animals, leaves, animal waste
* Horizon A (topsoil)- a crumbly brown soil that is a mixture of humus, rock particles (silt, clay, sand), minerals, air, water, decomposers, roots, burrowing animals, insects, few rocks,
* Horizon B (subsoil) usually consist of clay and other particles washed down from the A horizon but has little humus, some rocks, few roots, could contain burrowing animals, insects, and decomposers
* Horizon C- contains partly weathered rock, few tree roots
* Horizon R (hard rock) solid bedrock
1. What are the percentages of water, air, organic materials and rocks/minerals found in healthy soil?

Water- 25% Air-25% Rocks/Minerals-45% Organic Materials-5%

1. What are soil decomposers, what do they do and give specific examples of soil decomposers?
* Organisms that break the remains of dead organisms into smaller pieces and digest them with chemicals, helping to form humus.
* Soil decomposers include fungi, bacteria, worms, and other organisms.
1. What is soil fertility and what affects soil fertility?
* The measure of how well soil supports plant growth
* The amount of nutrients and organic material
1. What is loam and what is it made of?
* Soil that is made up of about equal parts of clay, sand, and silt. It’s best for growing most types of plants.
1. How do living organisms help the soil and give specific examples of living organisms?
* Some soil organisms make humus, the material that makes soil fertile. These organisms include earthworms, fungi, and bacteria. Other soil organisms mix the soil and make space in it for air and water such as earthworms, burrowing animals, and insects.
1. What is humus and how is it formed?
* The part of the soil that comes from dead plants and animals. It is also called organic material. Humus forms in a process called decomposition.
1. What are the five properties of soil and explain what each one is?
* Ph. - indicates the level of acidity or alkalinity of a soil. Below pH 7 the soils are termed acidic and above pH 7 alkaline or basic.
* Texture-Describes how the soil feels. It depends on the size of individual particles. Smallest to largest- clay, silt, sand and gravel.
* Moisture- the amount of water in the soil.
* Color- The darker the soil the more nutrients it has.
* Fertility- the measure of how well soil supports plant growth
1. What is a soil profile?
* The arrangement of the horizons is known as a soil profile.
1. How is soil formed? Describe the steps that soil horizons form, in order.
* Soil forms as rock is broken down by weathering and mixes with other materials on the surface. Soil is constantly being formed wherever bedrock is exposed.
* C horizon forms first as bedrock is weathered
* A horizon forms as plants and organic material mix in with the weathered rock
* B horizon forms last as rainwater washes minerals down from the A horizon
1. What does most of the work of mixing humus with other materials in soil?

 Earthworms

1. Why do garden plants usually do better in topsoil than in subsoil?
* Topsoil has more nutrients than subsoil
1. Why won’t plants grow well in soil that is mostly clay or mostly sand?
* Soil that is too sand won’t hold enough water and the plants may die
* Clay soil can hold too much water and the plants can drown
1. How do scientists classify soil into major groups?
* Climate
* Plants
* Soil composition

**Proficient students can explain how humans affect the quality of soil and how soil quality affects human health.**

1. What is soil stewardship?
* Careful and responsible management of our soil
1. What is soil conservation?
* Managing soil to prevent its destruction/loss
1. What is conservation plowing?
* Plowing as little as possible leaving the dead leaves and stalks on the ground. (low till or no till plowing)
1. What is contour plowing?
* Farming practice of plowing and/or planting along a slope to slow runoff.
1. What are two ways farmers can prevent nutrient depletion?
* Crop rotation
* Planting crops that add nutrients back into the soil (ex. Legumes)
* Adding nutrients/fertilizer to the soil
1. What is crop rotation?
* The practice of changing the crops that you grow in a field each year to preserve the nutrients in the soil
1. What is terracing?
* Flat step-like areas built on hillsides to prevent erosion
1. What is vegetative cover?
* Refers to trees, grasses, and plants to hold the soil in place
1. How do the following terms apply to soil stewardship: pollution, wind breaks, responsible land use?
* Pollution- fertilizers, pesticides, and other chemicals, minimize trash sent to landfills
* Wind break- a dense row of trees, fences, etc... To prevent the wind from causing wind erosion
* Responsible land use- balancing the use of land between preservation and human activity
1. Why is soil one of Earth’s most valuable resources?
* Everything that lives on land depends on soil
* There is a limited amount of soil and it takes a long time to form
1. Who was George Washington Carver, when it comes to soil?
* Introduced crop rotation, he helped farmers of the South. He told them that the cotton crop was depleting the soil of nutrients and should rotate with peanuts. Peanuts are rich in nutrients and can replace the lost nutrients.
1. What was the Dust Bowl?
* Also known as the Dirty Thirties, was a period of severe dust storms that greatly damaged the ecology and agriculture of the US prairies during the 1930s; caused by severe drought and lack of soil conservation