

## Stronger Than Dirt

### Teacher Background Information

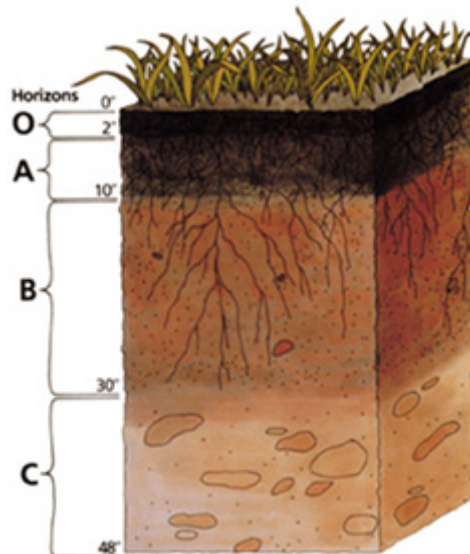
**Lab Summary:** In this lab activity, Students will learn about soil. They will assess different types of soil that they mix in the lab. They will grow, observe and measure the growth of plants in their different soil mixtures. Students will describe the parts of soil.

What is Soil?

From USDA:

**soil** - (i) The unconsolidated mineral or organic material on the immediate surface of the Earth that serves as a natural medium for the growth of land plants. (ii) The unconsolidated mineral or organic matter on the surface of the Earth that has been subjected to and shows effects of genetic and environmental factors of: climate (including water and temperature effects), and macro- and microorganisms, conditioned by relief, acting on parent material over a period of time. A product-soil differs from the material from which it is derived in many physical, chemical, biological, and morphological properties and characteristics.

Soil Profile:



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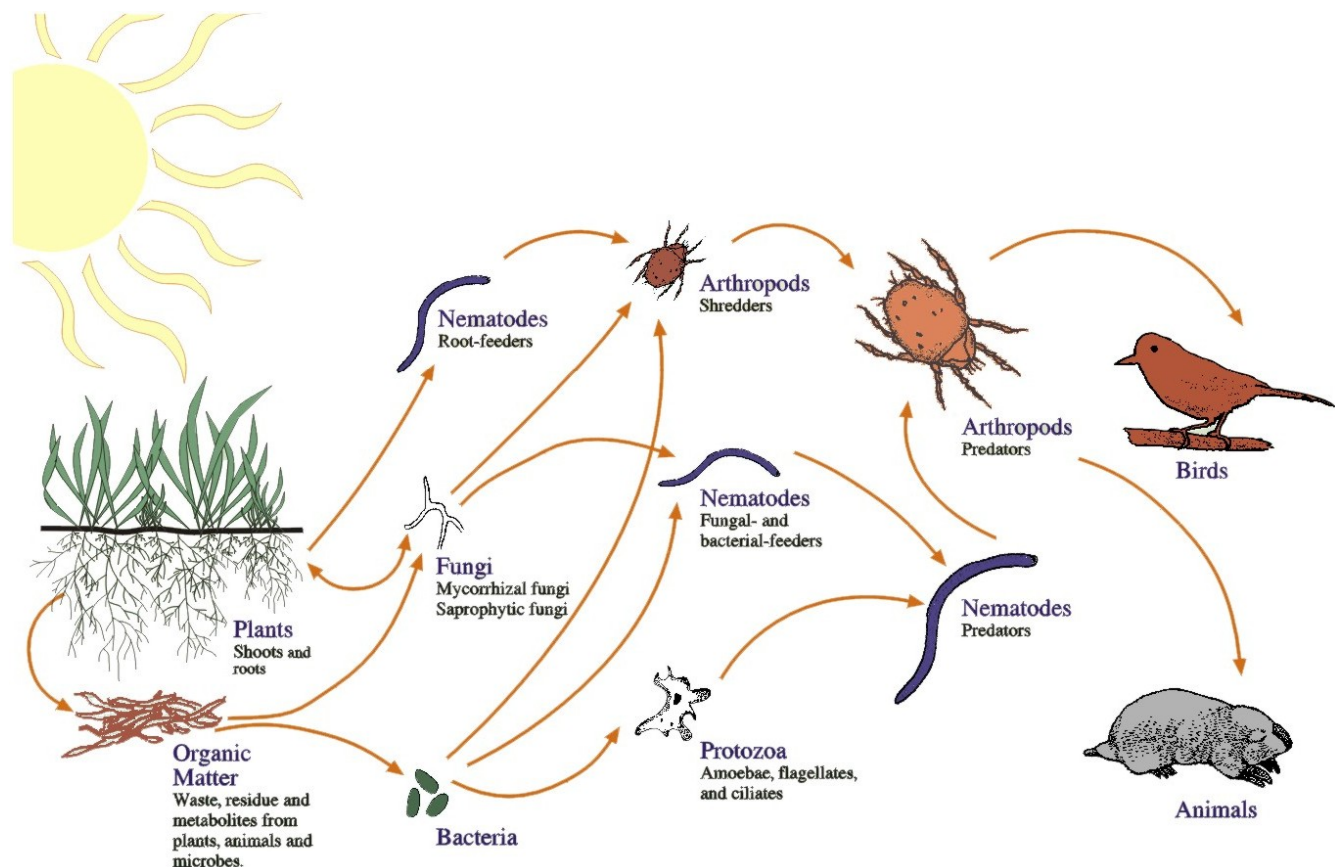
**Key Scientific Vocabulary:** profile, Munsell color chart, ped, abiotic, biotic, silt, sand, clay, taxonomies, limiting factors, horizons, leaching

**Safety:** Although no chemicals will be used in this lab, the use of protective eyewear is recommended, especially if glassware is used. Students should not ingest any seeds as this is poor lab protocol and many seeds are coated with chemicals used to prevent molding.

## Student Pre lab pages:

Students are asked open-ended questions about what soil is and what they think makes a good soil. Discuss with students that there are many different types of soils depending on many different types of conditions, You may wish to list the conditions that create soil by first asking the students what they think. Weathering actions from water and wind are primary factors along with temperature that cause soil development.

Students are asked to identify primary producer, primary consumer, secondary consumer and tertiary consumer. Students will need help identifying fungi, bacteria and protozoa. They will also need to distinguish between the types of nematodes, the smaller being an omnivore and the larger a carnivore predator. They are asked to illustrate the flow of energy though the system. This could also be tricky and interesting to see how they handle the decomposers



**A soil triangle:** This is used to describe soil types. The three major ingredients in soil are clay, silt and sand. Clay has the smallest particle size and sand has the largest. Soil is described by how much of each is in a sample. For example, if it is mostly clay, with some silt, it is called silty clay



## Links and references:

USDA soil website offers great resources for teaching about soils  
<http://soils.usda.gov/education/facts/soil.html>

New York city has information about urban soils  
<http://www.nycswcd.net/files/Nycss%20New%20York%20City%20Soil%20Survey.pdf>