

## Climate Change Lesson 5 - Soil Degradation

### Objectives

- Students will understand the impact of soil degradation by experimenting with different soil compositions
- Students will learn the impact soil degradation has on people, especially those in vulnerable areas

### Vocabulary

- Acidity
- Barren land
- Diversity
- Land fallowing
- Microorganisms
- Nitrogen
- Nutrient cycling
- pH level
- Phosphorus
- Potassium
- Regeneration
- Soil fertility
- Soil structure
- Specie-specific forest
- Tillage

### Materials

- Classroom computer with Internet access, 4-5 plastic bottles, xacto knife, pliers, source of fire (a lighter will work), needle, different types of fertilized and unfertilized soil

### Warm Up

Ask students to write down all the ways that humans use soil.

Discussion Questions:

- *What items in this room needed soil at some point in their production?*
- *Who uses soil the most? Who uses soil the least?*
- *What would happen to humans if there was no soil?*



## Lesson

Print lesson notes ([Basics of Soil](#), [Causes of Soil Degradation](#), [Methods to Maintain Soil Fertility](#)) and have students review, and/or review the lessons as a class.

## Assignment

The experiment can be completed as a class or in smaller groups depending on classroom size. Using the materials (4-5 plastic bottles, an xacto knife, pliers, source of fire (a lighter will work), needle, different types of fertilized and unfertilized soil), have students follow steps 1-7.

Step 1: Gather 4 or 5 one- or two-liter plastic pop bottles. Fill the bottles with hot water and peel off the labels.

Step 2: Cut about one-third of the side of one bottle. This will hold the soil. Cut a hole through a second bottle and insert the first bottle through this hole.

Step 3: Using a pair of pliers, carefully heat a needle. Pierce a bottle cap with the needle. This will be used as a cap for the top drip bottle whose bottom has been cut off to form a funnel.

Step 4: Stack the bottles with the drip funnel at the top. A spacer bottle without a top or bottom is in the middle.

Step 5: Place water in the top funnel and observe the clarity of the water as it flows from the soil bottle to an overflow cup.

Step 6: Experiment by applying different mulches to the surface or by using soils with different percentages of organic matter (garden versus forested soils).

Step 7: Soil high in organic matter and soils covered with mulch will yield clearer runoff. Bare soils or soils low in organic matter will yield much dirtier runoff.

## Resources

[Basics of Soil](#)

[Causes of Soil Degradation](#)

[Methods to Maintain Soil Fertility](#)

