



Soil Percolation



SYNOPSIS

Students conduct an experiment to find out how different types of substrates affect the rate at which water percolates.

OBJECTIVE

Students will be able to understand that different kinds of soils/dirt have different rates at which water percolates into them and explain why this is important for farmers to understand.

MATERIALS

- containers with one open end (e.g., cup, can with one top removed)
- different substrates (e.g., potting soil, sand, dirt from the playground)
- measuring cups
- spoon or shovel
- stopwatch

VOCABULARY

percolate: pass through

soil percolation: ability of soil to absorb water

PROCEDURES

1. Remind the students of the various processes in the water cycle: condensation, precipitation, accumulation, percolation, evaporation, transpiration.
2. Ask them what happens to water that is absorbed underground (*groundwater / water table*).
3. Ask them what happens to water that flows along streets and sidewalks (*runoff / goes into storm drains in urban areas or into streams/rivers/oceans/lakes*)
4. Ask them what happens to rain water that can no longer be absorbed by the ground because the ground is "full" (*runoff / goes into storm drains in urban areas or into streams/rivers/oceans/lakes*). Ask them what they think determines when the ground is "full." (*Accept all answers*).

5. Tell them they are going to do an experiment to find out soil percolation rates of different types of soils.
6. Show them the various soils they will be testing. Have them make a prediction: Which soil do you think will absorb the water the fastest? Which soil do you think will absorb the water the slowest?
7. Explain the steps for the experiment:
 - Label the containers with the types of soil available
 - Scoop two cups of soil into the corresponding container
 - Prepare one cup of water in the measuring cup
 - Prepare to time how long it takes the water to disappear into the soil
 - Pour the water into the soil and begin timing as soon as the water hits the soil
 - Record the data
 - Follow the same steps to test the other soils

CHECK FOR UNDERSTANDING

- Ask the students which soil absorbed the water the fastest? The slowest? Were their predictions correct?
- Ask them why they think the water went into some soils faster than others (*texture of the soil, loose particles versus clumped particles, size of particles*)
- Ask them how this information is relevant to farmers who are choosing where to plant their crops (*crops usually need well-drained soil, hard clumpy clay soil retains too much moisture for many plants*)
- Ask them how this information is relevant for people living in areas where there is a lot of precipitation (*concern for a lot of runoff in soil does not absorb water well, flash flooding*)

EXTENSION

- Have the students research the soil and moisture needs of various plants (e.g., corn versus cactus; redwood tree versus grass) or plant communities (e.g., coastal sage scrub versus mixed evergreen)
- Have students plant one type of plant into various types of soil and record their growth.