



# Homework Activity

## Soil Percolation or Drainage Test



### ***Background:***

1. Besides water's role in photosynthesis, describe the importance of water to the soil fertility.
2. Using adhesion, cohesion and porosity, explain how soil texture affects the soil moisture content?
3. Besides having an effect on the available water, why is soil porosity important to plant health?
4. What is field capacity?
5. How will soil texture affect the field capacity of soils?
6. How will soil structure affect the field capacity of soils?

### ***What you should be learning.***

This simple drainage test will help you determine the suitability of a garden soil for growing plants.

### ***How long will it take?***

This percolation or drainage test will take 2-3 days.

### ***Supplies you will need:***

Shovel  
Hose  
Ruler or tape measure  
Stake (optional)

***What to do.***

This size and depth of the hole is somewhat arbitrary. For example, a hole that is one foot deep is useful because a lot of plants root within this depth. The width of the hole doesn't really matter but if you dig too wide it will take more water to fill. For tree crops it could be helpful to dig a deeper hole since they can root 2-4 feet deep. Water should be put in the hole and allowed to drain so the soil will be saturated when the final test is done. Dry soil will accept water more readily and you want to know what happens when the soil is wet.

The interpretation of measuring how fast the water drains on the second fill is also a bit arbitrary. One quarter inch or more per hour is considered good for most plants. Some plants that require excellent drainage might do better with faster drainage. Soils that accept water at 1/10 inch or less are going to limit plant growth because the soil will stay saturated for a longer period after heavy rain or irrigation.

The purpose of the test is to have some idea of what is happening in the rooting area when water is applied.

*Select a site within your garden that currently lacks a landscape planting.*

*Dig a hole approximately 8 inches across by 12 inches deep. Fill the hole with water.*

7. What are some factors that will affect the infiltration of water into the surrounding soil?

- *Allow the water to drain completely. (Note: If the water doesn't drain completely you have a drainage problem.)*

8. What kinds of soil texture and soil structure would have poor drainage?

- *Refill the hole with water*
- *If you have a stake, hammer the stake into the bottom of the hole and mark the level of water.*
- *Allow the water to drain overnight*
- *Measure the number of inches the water dropped*

9. How many inches did the water drop?

***What do the results suggest.***

10. Divide the inches the water dropped by the number of hours that elapsed.

***Conclusion***

11. What problems would a sandy soil present to a home gardener?

12. How could a home gardener modify the texture of a sandy soil?

13. How could a home gardener modify his/her practices to grow plants in a sandy soil?

14. What problems would a clayey soil present to a home gardener?

15. How could a home gardener modify the texture of a clayey soil?

16. How could a home gardener modify his/her practices to grow plants in a clayey soil?

17. What irrigation and fertilization strategies would you use for the plot that you tested?  
Take into account the existing planting adjacent to the plot and the purpose of the plot.