

• Freddy's Fabulous Soils Experiment •

Here's how you can test various soils to see how porous and permeable they are. To do the test, we're going to put different kinds of soil into four empty soda bottles, and then try pouring some water through (it takes two people to do this).

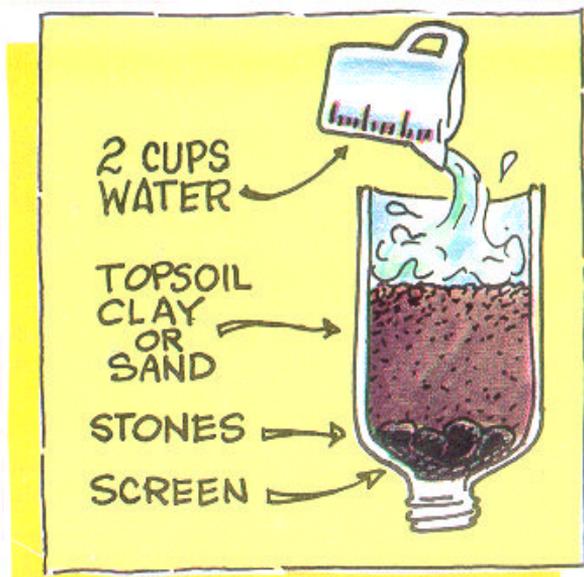
Materials Needed:

One 4-cup measuring cup
 One ruler
 Three 2-liter, empty plastic soda bottles
 Three screw-on caps for the soda bottles
 Three 2-inch by 4-inch pieces
 of window screen
 Nine small stones (about 1/2

Six cups of sand
 Six cups of topsoil
 Six cups of dry clay



After you do the clay, save the bottle with the water still in it. Keep it over night, then repeat the measuring steps again the next day. Was there any difference?



To start with, screw the caps on the three bottles. Cut the bottom two inches off of each bottle. Fold each piece of screen over so that it is two-inches square.

Now, one person holds one of the bottles upside-down. The other pushes one of the pieces of screen into the neck of the bottle to keep the soil from coming out of the neck, then puts three of the small stones on top of the screen. Then pour the topsoil into the bottle.

Next, put two cups of water into the measuring cup, then pour it into the bottle that has the topsoil in it. Wait one minute for the water to soak in. If there is any water standing above the top of the soil, measure it with the ruler and record the results in the space below.

Now, placing the measuring cup under the bottle, unscrew the cap and let the water drain into the cup. After one minute, put the cap back on the bottle and set it aside. Read the amount of water in the measuring cup by using the marks on the side of the cup. Record the results in the space below.

Repeat the process with the other two bottles (take turns with who holds the bottle). Use a different soil sample for each bottle. Use three cups of water for each sample, and wait one minute before each measurement.

What can you learn from all of this? Well, the amount of water standing above the soil after one minute (your first measurement) gives you an idea of the porosity of the soil sample. The more water standing, the less porous the soil (don't forget that you checked the clay twice).

The permeability of the soil was shown by how much water went into the cup after removing the cap. Which of the soils released the water most readily? That one was the most permeable. The one that released the least water was the least permeable.

TYPE OF SOIL	Inches of water above top of soil	Ounces of water drawn out of bottle
Bottle with TOPSOIL		
Bottle with SAND		
Bottle with CLAY		