

Let It Flow!

Objectives:

Students will!

- Hypothesize about the ability of soil to absorb water
- Observe the flow of water in three different types of soil: clay soil, garden soil, and sand
- Engage physically with soil to determine its properties

Educator Notes

- Gather enough materials for students a day in advance (soil samples can be obtained from a commercial source or by yourself)
- Feel free to mix your own soil samples
- Perform the demonstration in front of the class in a space big enough for all students to see, as this experiment is somewhat difficult for early learning children to do on their own

Materials:

- Plastic Cups
- Soil Samples (Clay Soil, Garden Soil, Sand)
- Coffee Filters
- Water
- Sticky Labels
- Pens

Preparation:

Set up the demonstration in a space where all students can gather around and clearly see the experiment. Lay out three cups and place a coffee filter in each of them. Have your cup of water ready. Place a soil sample in each filter respectively: healthy soil (this soil should contain roughly equal proportions of sand, silt, clay, and humus), clay heavy soil, and sand based soil.

Key Vocabulary:

clay | garden | soil | flow

Activity:

Begin the module by asking students to examine and touch each of the soil samples. If there are many students, get them to engage with the soil in small groups, as to not cause a

commotion. Ask students to pay attention to the thickness, textures, and compositions of the respective soil samples. Reveal to the students the clay heavy soil sample, the garden soil sample, and the sand based sample. Begin a discussion and brainstorming as to the students' predictions of water flow in these three samples: Will water go through the clay sample, the sand sample, or the garden soil sample faster? Which soil will drain water the slowest? Do plants need water flow to be fast or slow? Why? Beginning with the clay heavy sample, pour water over the soil. Observe the water flow altogether and note its properties. Next, pour water over the garden sample and observe again. Finally, move onto the sand based sample.

Wrap-Up:

This activity should show students the water flow of three different soil types: clay heavy soil, garden (healthy) soil, and sand based soil. The clay heavy soil sample absorbs the water most, and thus water drains the slowest. The garden soil sample absorbs some water, and also lets an appropriate amount of water drain through. The sand based soil sample is very thin, and thus water passes through it very fast. Students should realize that garden soil sample allows for the best water flow, because it takes in enough water to provide nutrients for itself and for its vegetation, but also assures that water passes evenly and effectively. A fun and interesting comparison to wrap up this activity would be the story of *Goldilocks and the Three Bears*. Just as the bears call one bowl porridge too hot, another too cold, and another just right, suggest that sandy soil is too fast, clay soil is too slow, but garden soil is just right.

Extension Activity (K-5):

For older students, the activity can be expanded to focus on the act of hypothesis. Furthermore, older students should either work in groups or perform the experiment individually. Ask students, after they have engaged with the soil, to write out the following labels: Clay, Garden, and Sand. Then let the students stick these labels on the cup, which they believe corresponds to the label. As the students analyzing the water flow upon each soil, and infer which flow is most suitable for plant growth and health, they should realize that the most steady water flow comes from the garden soil sample, the fastest water flow comes from the sand sample, and the slowest water flow comes from the clay sample.

Sources:

http://www.dltk-teach.com/rhymes/goldilocks_story.htm

<http://www.csgn.org/images/pdf/SoilTexture.pdf>