



Water Water Everywhere: Designing Water Filters

Lesson 3, Lesson 4

Title: Measuring the Absorbency of Soil versus Sand

Grade Level: 1, 2, 3, 4, 5

Written by: Caitlin Newton
Horace Mann Laboratory School, Salem, MA

Prep Time: 15 Minutes
Lesson Time (1): 45 Minutes
Lesson Time (2): None

Lesson Description:

Students compare the absorbency of sand compared to soil and find this using a scale and subtraction. Sand and soil are two earth materials and are choices students can use in designing a water filter.

Strands:

- Measurement and Data
- Operations and Algebraic Thinking
- Mathematical Practices

Standards:

- Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects
- Represent and solve problems involving addition and subtraction
- Construct viable arguments and critique the reasoning of others
- Attend to precision

Objective:

Students compare the absorbency of sand compared to soil and find this using a scale and subtraction.

Materials:

- Each group:
 - 1/4 cup of sand
 - 1/4 cup of soil
 - 1/4 cup of water
 - Measuring cups
 - Plastic cups with 3 drain holes poked into the bottom
 - Scale- triple beam balance or electronic scale
 - 2 small coffee filters
 - Optional: graduated cylinder for volume.

Lesson Plan:

1. Poke three pin sized holes in the bottom of 2 cups.
2. Line each cup with filter paper.
3. Measure out 1/4 cup of soil and place in a cup.
4. Measure 1/4 cup sand and place in a cup.
5. Measure 1/4 cup water and place in a cup.
6. Find the mass of each and record on the worksheet.
7. Pour 1/4 cup water over 1/4 cup of soil and let drain.
8. After water has drained out, measure mass of the wet soil on the scale.
9. Do the same procedure for the sand.
10. Record data on worksheet.
11. Subtract the mass of the dry soil from the mass of the wet soil.
12. Do the same for sand.

Reflections:

Ask: **Which number is larger? What does this tell you about the absorbancy of the sand versus the soil?** Write a complete sentence at the bottom of the worksheet. **How do you think this helps the plants outside? How do you think that this information will help you to design your water filter?**

Assessment:

Students will be able to make a comparison between the two soaked earth materials after looking at the data and results from the experiment. They will observe that soil is more absorbent than sand.