

Focus on: Soil – Water Retention

This lesson is meant to support the unit on Earth Systems, Structures and Processes. It would be best to complete this lesson after completing the soil lessons in this unit. How you guide your students will depend on the information you have already taught and the information you want to introduce.

Clarifying Objectives:

1.E.2.1 Summarize the physical properties of Earth materials including rocks, minerals, soils and water that make them useful in different ways.

1.E.2.2 Compare the properties of soil samples from different places relating to their capacity to retain water, nourish and support the growth of certain plants.

Key Vocabulary:

Definitions can be found at <http://learnersdictionary.com>

- Summarize
- Physical Properties
- Earth Materials
- Rocks
- Minerals
- Soil
- Water
- Compare
- Capacity
- Retain
- Nourish
- Support Growth

Focus Question(s):

Which soil type will best retain water? Why is it important for soil to retain water?

Materials:

School Garden

Science Notebooks

Soil Samples – clay soil with very little organic matter, sandy soil very little organic matter, soil from a woods or forest area, and soil from your school garden. (Although it would be best to use soil samples collected around the school grounds, it is more important to have the different types of soils even if that means bringing them in from outside the school grounds.)

Activities:

1. If students did not investigate soils in previous lessons, have them begin this lesson with a brief soil exploration to discover the differences in the soils. Place a bit of each soil on plates to investigate. (emphasizing color and the components of soil)
2. If you have explored the different soil types, then review your findings. (emphasizing color and the components of soil)
3. Propose the focus question: *Which soil type will best retain water?*

Guiding Questions:

When predicting:

- Where have you seen soil like that?
- What do you know about soil that looks like that?
- Which soil will stay wet the longest?
- Why do you think that?

<ol style="list-style-type: none"> 4. Ask students what it means to retain water. Create a definition in first grade terms. (ability to hold water or stay wet) 5. Have students predict which soil will be better at retaining water and explain the reason behind their prediction. Have students record their predictions in their science notebooks along with the reason. Remind students to be scientists when they are thinking. Scientists have a reason behind their predictions based on what they already know. This is not just a fun guessing game. 6. Add water to each of the soil samples and place them in a window. Do not flood the soil samples. Water them like you would thoroughly water a plant. 7. Have students check the soil each day recording the changes in the soil samples. 8. (Typically the garden and woods soils will retain the water longer due to the larger amounts of organic matter. The clay soil and sandy soil will dry out faster since they are primarily made of rock and may even crack/crumble as they dry out.) 9. Have students record the final results in their science notebooks. What happened? Why did it happen? Were your predictions correct? Why or why not? 	<ul style="list-style-type: none"> - What have you ever seen that makes you think that? <p><i>After the experiment:</i></p> <ul style="list-style-type: none"> - What happened to our soil samples? - What happened to the soils that dried out first? (typically they crack) - Which one stayed moist the longest? Was there more than one? - Why do you think that happened? - Of the ones that stayed wet the longest, what did they have in common? - What did the soils that dried out the fastest have in common? - Why would people want soil that holds water longer?
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