



SfS Away from the Classroom!

ES13: Soil Nutrients (Recommended for Grades 3-8)

Please use the following resources to learn about how nutrients cycle through the soil!

Watch this Video: <https://www.youtube.com/watch?v=NvhY4ssMtbl>

Answer these questions:

- What nutrients does the plant need that it can't make using photosynthesis?
- What kind of organisms are in the soil food web?
- How does the plant increase the number of nutrients it can get from soil?

Activities: Follow the directions for both activities to learn how to test for healthy soil.

For activity 1 you will need:

<ul style="list-style-type: none">• A small shovel• Somewhere to dig up soil	<ul style="list-style-type: none">• A sheet of paper• A pencil	<ul style="list-style-type: none">• A ruler• A timer (on cell phone)
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Follow these directions to examine your soil micro-community!

1. Find a spot no one will mind if you dig a hole and dig a hole about 6 inches deep.
2. Set a timer for 4 minutes.
3. Stare into the hole counting all the small (and large) organisms that travel through your hole during the 4 minutes. Keep a tally of the organisms on your sheet of paper.
 - a. Some organisms will be very small and very fast so watch the edges of the hole closely.
 - b. If you see 10 or more organisms, you've got a good healthy soil food web, if you see less than 10 organisms, your soil doesn't have a lot of nutrients.
4. Put all the soil back into the hole you dug and replant any grass you dug up.
5. If possible try out a couple of different areas and compare how many organisms you see.
 - a. What do you notice about soil with a lot of bugs versus soil with very few?



For activity 2 you will need:

<ul style="list-style-type: none">• Soil• Teaspoon (tsp)	<ul style="list-style-type: none">• 1 tsp white vinegar• 1 tsp baking soda	<ul style="list-style-type: none">• 2 small bowls• 1 tsp water
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Follow these directions to test the pH level of your soil!

If soil is too acidic or too basic plants won't be able to get as many nutrients from it and will grow poorly.

1. Put 1 tsp of soil in both of your small bowls.
2. Add 1 tsp of white vinegar to one bowl of soil and stir until the vinegar and soil are well mixed.
 - a. if bubbles form your soil is basic (not very good for plants).
3. Add 1 tsp of water to the other bowl of soil and stir until water and soil are well mixed.
4. To the bowl of soil and water add 1 tsp of baking powder. Stir the powder into the water and soil mix until it dissolves.
 - a. If bubbles form your soil is acidic (also not very good for plants)
5. If neither the vinegar, nor the baking soda made bubbles you have neutral soil which is perfect for most plants!

Make observations & use Claims, Evidence, and Reasoning!

1. **Claim:** Organisms in the soil help keep plants healthy.
 - **Evidence:**

 - **Reasoning:**

2. **Claim:** The soil I tested was _____ (fill in acidic or basic)
 - **Evidence:**

 - **Reasoning:**