

Garden Lesson: Soil Experimentation

Season: Fall

Grades: 2 and 3

Ohio Science Concepts

- Grade 2 (PS): Changes in motion- forces change the motion of an object
 - Interactions with habitats: living things cause changes on Earth
- Grade 3 (PS): Matter and forms of energy- Matter exists in different states, each of which has different properties
 - Earth's resources: Some of Earth's resources are limited

Science Inquiry and Application Practices

- Observe and ask questions about the natural environment
- Employ simple equipment and tools to gather data and extend the senses
- Communicate observations, investigations and explanations
- Use appropriate mathematics with data to construct reasonable explanations.

Next Generation Science Standards

- 2-PS1-2: Analyze data obtained from testing different materials to determine which materials have properties that are best suited for an intended purpose
- 3-LS4-3: Construct an argument with evidence that in a particular habitat some organisms can survive well, some less well and others not at all.

Ohio Mathematics Standards

- Grade 2: Represent and interpret data
- Grade 3: Solve problems involving measurement and estimation of intervals of time.

Objectives

The students will

- Use hand lenses to examine the components and characteristics of soil and compost
- Observe and identify organisms living in soil
- Conduct an experiment to determine the best medium for growing plants
- Learn practical gardening skills by composting

Materials

- *Observation Station:* hand lenses, popsicle sticks, compost, sorting bins
- *Explore Station:* trowel, labeled containers for soil, soil sample A, soil sample B, class worksheet, clipboard, pencil, seeds, pots, trays, popsicle sticks, marker
- *Garden Station:* trowels, wheel barrow

Overview

In this lesson students employ hands-on investigation to identify differences between soil samples. At the Observe Station hand lenses are used to observe and identify soil components based on physical characteristics. At the Explore Station students begin an experiment to test which type of soil will be best for germination. At the Garden Station students remove unwanted plants from the garden and take these plants to the compost. These activities develop skills in making observations, collecting data and constructing explanations supported by evidence. Additionally, they support topics of Earth's natural resources and the interactions between living and nonliving factors.

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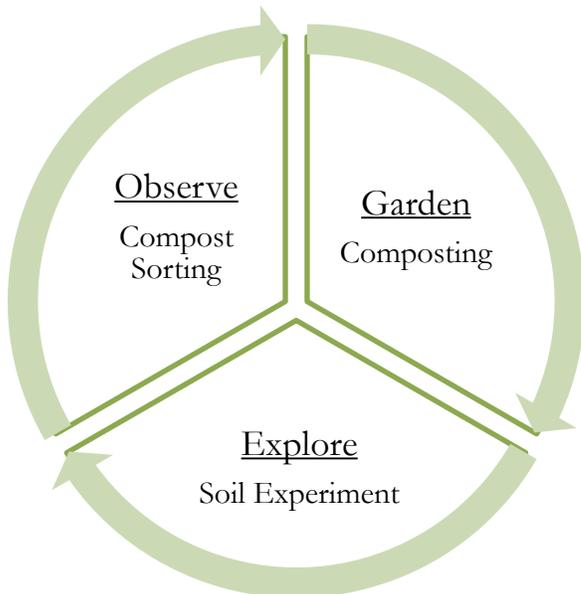
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Outline

- 5 minutes Introduction
- Welcome & review expectations
 - Soil-what is it? Why is it important? Are there living things in soil?
 - Compost-what is it? Is it different from soil?
 - Break into three groups for stations

20 minutes Station Rotation (10 minutes per station)



Observe: Compost Sorting

Materials: tarp, hand lenses, popsicle sticks, compost, sorting bins

- Prep: place a small amount of compost onto the tarp and give each student a hand lens and popsicle stick
- Explain that students will be searching in compost for items that fit the descriptions on the sorting boxes (leaves, roots, wood, etc.)
- Review proper treatment of living creatures
- Ask the students to think about the changes that happen in the compost bin and hypothesize why these changes occur

Explore: Soil Experimentation

Materials: trowel, labeled containers for soil, soil sample A, soil sample B, class worksheet, clipboard, pencil, seeds, pots, trays, popsicle sticks, marker

- Prep: collect a few soil samples and put them into marked trays
- Ask the students to make observations about the soil samples and record their descriptive words on the worksheet
- Predict which type of soil will help the seeds grow and set up the experiment by planting seeds in pots
- Half of the pots will be filled with soil sample A and half will be filled with soil sample B; be sure to mark the pots with a popsicle stick telling which type of soil is in each pot
- Complete Extension worksheet in classroom

Garden: Composting

Materials: trowels, wheel barrow

- Look for plants that don't belong in the garden (weeds or plants that have finished their life cycle)
- Pull these plants out of the garden and put them into the wheel barrow to be added to the compost
- Ask the students to explain what will happen to the plants in the compost pile over time

5 minutes Conclusion: What Can You Do?

- Ask the students to share one thing they learned or saw in the garden
- Tell them to record observations about their experiment and bring them next time
- Ask if students have any questions

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Seeds



Roots



Compost Critters



Will Not Decompose



Leaves & Stems



Wood & Paper



Food Scraps



Extension for Explore Station

Soil Experiment

1) List 2 two words to describe soil sample A:

2) List 2 two words to describe soil sample B:

3) Predict which type of soil would be best for seeds to sprout:

4) Record the planting date and time (estimate): _____

Water and observe the seeds daily. Record the following information when seeds begin to grow:

5) How long did it take the seeds planted in soil sample A to sprout? Write down observations about the seedlings.

SPROUTING DATE AND TIME (estimate): _____

SEEDLING OBSERVATIONS: _____

6) How long did it take the seeds planted in soil sample B to sprout? Write down observations about the seedlings.

SPROUTING DATE: _____

SEEDLING OBSERVATIONS: _____

7) What are your conclusions about the soil samples?



