

Soil: How Does Your Garden Grow?

Materials

- ∞ 4 or 5 large planting containers
- ∞ A variety of soils (silt, sand, clay, commercial garden-type) enough to fill one planting container with each type
- ∞ *Optional: Ask a local produce farmer for soil from his farm, enough to fill one planting container
- ∞ Seeds or starter plants of choice (select varieties that are common to your region)
- ∞ Measuring cups for water
- ∞ Rulers
- ∞ Data observation log or journal for each student

Objective

Students will observe the ways in which types of soil affect the growth of plants

Science Content Standards

[4]A 1: Apply process skills by asking questions, predicting, observing, describing, measuring, classifying, making generalizations, inferring and communicating findings

[4]A2: Observe, measure and collect data from explorations and using this information to classify, predict and communicate.

Introduction

Just as there are limiting factors in Alaska habitats for animal survival, so, too, are plants affected by environmental factors such as climate, weather, and soil. In this experiment, students will observe whether different types of soil impact the success of crops commonly grown by local farmers.

Essential Question

How do soil types serve as limiting factors in plant growth?

Directions

Set the purpose: Ask students why understanding the effects of soil on plant growth would be important to farmers.

Lesson focus: Create a learning center with a “Soil/Dirt” theme. Ideas include picture books (see Resources), photos, samples, tools for working with dirt, and earthworm habitat. Encourage students to bring in articles or artifacts from home that relate to the them.

Procedure:

1. Divide students into 4 or 5 groups (one group per type of soil)
2. Direct students to enough soil to their group's container so that it is 1" away from the top of the planting container; reserve 1 cup of soil for observations to come later.
3. Ask students to make observations about their soil. What does it look like? Feel like? Smell like? Discuss and record ideas in their data observation logs.
4. Direct students to plant their seeds or starter plants in a way that is appropriate for that plant. Explain the importance of all groups using the same amount of seeds/plants in order to limit the experiment variable to soil only.
5. Direct students to water their seeds/plants with a prescribed amount of water.
6. After cleaning up, students should walk around and look at the different types of soils. Ask students to make predictions about which soil they think will promote the greatest plant growth and why.
7. Over the course of the next few weeks, students should monitor their plants carefully, watering them equally and routinely. Log changes in plants daily;

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Suggested Grade Levels

3-5

Lesson Length

- ∞ 1 instructional session
- ∞ Several weeks for observation and data collection
- ∞ 1 wrap-up session

Vocabulary

dirt
soil
silt
clay
organic
limiting factor
control
variable



This lesson plan developed by Mat-Su Borough teacher Valerie Rozzi for Alaska Agriculture in the Classroom, www.agclassroom.org/ak With funding from Alaska Farm Bureau and Alaska Division of Agriculture.

adding measurements, sketches, and anecdotal comments.

8. After several weeks of observation, or whenever the teacher feels adequate growth has taken place in order to draw conclusions, have students log their final data. Draw conclusions and check them against original predictions.

Community Connection

Invite a local crop farmer to speak to the class. Students can present their data, and engage in a discussion about what farmers must consider when plant their crops.

Extension Idea

If students are participating in their school's science fair, use this experiment to model how to prepare a science fair display board; allow several students to develop the class experiment for inclusion in the science fair as a demonstration.

Resources

Books:

A Handful of Dirt by Raymond Bial

Dirt: Jump into Science by Steve Tomecek

Dirt: The Scoop on Soil by Natalie M. Rosinsky, Illustrated by Sheree Boyd

Life in a Bucket of Soil by Alvin Silverstein

Soil (True Books: Natural Resources) by Cristin Ditchfield

Wiggling Worms at Work by Wendy Pfeffer

Artifacts:

Uncle Milton's Ant Farm Live Ant Habitat available at <http://www.unclémilton.com/products/AntFarm/>

Earthworm Nursery by Insect Lore