



Sprouting

Grade Level: K-4

Length: 2- 30 Minute lessons and 5 Minutes for
Daily or Weekly Observations over 4-6 Weeks

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NGSS Standards

K-LS1-1 Use observations to describe patterns of what plants and animals (including humans) need to survive.

2-LS2-1 (with opportunity to design experiment)
Plan and conduct an investigation to determine if plants need sunlight and water to grow.

Crosscutting Concepts

Patterns Observed patterns in nature guide organization and classification and prompt questions about relationships and causes underlying them.

Cause & Effect Events have causes, sometimes simple, sometimes multifaceted. Deciphering causal relationships, and the mechanisms by which they are mediated, is a major activity of science and engineering.

Energy & Matter Tracking energy and matter flows, into, out of, and within systems helps one understand their system's behavior.

Related Resources

Pair With Local Plant Studies Lesson

Overview

Energy from the sun is stored in plants.

Objectives

- Students will understand that energy from sun causes plants to grow.
- Students will practice good observation techniques and collect data.
- Students will demonstrate group cooperation skills.

Materials

- Small Cups, Plant Pots, or Nursery Six-packs (2 per students)
- Tray or Plates
- Seeds (beans or peas work well, 4 per student)
- Soil
- Bowls
- Spray Bottle with Freshwater
- Permanent Marker
- Ruler
- Journals or Paper
- Pencils
- Watercolors or Colored Pencils

Background

This is a very simple experiment in which students observe how energy from the sun helps plants grow.

Notes

Preparation

Ask students how plants grow. Brainstorm a list of different things plants need to grow. Have students repeat the following chant: “Sun, soil, water, and air. Sun, soil, water, and air. Everything we eat and everything we wear comes from sun, soil, water and air!”

Activity

1. Explain to students that even though you can't directly see energy from the sun, you can observe its impact on plants. Pass out two pots and four seeds to each student. Label the pots with students' names.
2. Distribute bowls of soil around the classroom and have students fill their pots with soil until it reaches about $\frac{1}{2}$ inch from the top.
3. Carefully read the instructions on the back of the seed packet to students and pass out rulers. Have students create two small holes in each pot and measure them to the right depth for the seeds. Students should then put one seed in each hole and sprinkle a small amount of soil on top.
4. Place one pot from each student in a tray on a windowsill that gets good sun. Place the other pots on a tray in a shaded area, or, for more dramatic results, in a cabinet with no light access. Have students spray them well with the spray bottle.
5. Choose a time of day or the week to observe plants. Have students record observations in their journals, such as when their seeds first sprout, develop leaves, and flower. Each time, students should measure the height of the plant. If a seed does not sprout or dies, students should make note of that. Plants will need to be watered every 1-4 days, depending on humidity.
6. After a few weeks, discuss the results of the experiment. Compare the growth of the seeds in the sun to those in the shade or cabinet. To help generate conversation ask questions such as: Where did plants grow best? Why do you think that is? What caused the plants to grow at different rates? Steer them to understanding that the sun's energy is now stored in those plants!

>>Educator Tip: For 2nd-4th grade students, or to extend the activity for younger students who are especially intrigued by it, ask the students to work in small groups to plan their own experiment to determine whether plants need water to grow. Help them to isolate the experiment to manipulate just one variable. So, if they are testing whether plants need water, the plants should get different amounts of water but the same amount of sunshine, soil and air.

Wrap-up

Ask students, “What happens to the sun’s energy if we eat a plant?” If you chose a plant that students can eat, allow them to sample their crop. Then ask students to think of other ways we use the solar energy stored in plants: firewood, fossil fuels, clothing, etc. After lunch, discuss how the sun’s energy helped bring that food to their lunchbox or tray.

Assessment

Check for comprehension by asking students to explain what their plant will need to continue to grow. Prompt them to use observations of their plant to support their claim. Then allow students to take their plants home to care for.

>>Educator Tip: With older students, you can have them write a “care manual” for their plant.

For older students, evaluate their experiment design. Students who successfully meet the performance expectation will be able to design a simple experiment with one manipulated variable. The variable will provide information on whether plants need water to survive.

Pair With

- Local Plant Studies Lesson Plan