

Do Plants Need Water?

Summary

Lima beans are planted at successively farther distances from a water source so that students can observe the impact of water on seed germination.

Main Core Tie

Science - 1st Grade

[Standard 4](#)

Time Frame

4 class periods of 15 minutes each

Group Size

Large Groups

Life Skills

Thinking & Reasoning

Materials

For the Teacher:

- chart paper
- approximately 45 lima bean seeds
- planter box or 9x12 disposable baking pan
- potting soil
- small clay flower pot 2 inches in diameter
- string
- water

Background for Teachers

Plants are composed of about 70% water, and water is essential to them in many ways. It is necessary in the beginning stages of the plant's life to soften the seed coat. This allows the root and leaf within to push open the seed. Water dissolves minerals in the soil. Plant roots pick up the water and dissolved minerals. Water transports materials up the stem to the leaves. All stages of a plant's life require water.

Student Prior Knowledge

Students should be able to utilize observational skills and a descriptive vocabulary to articulate similarities and differences in the plants they observe. They should be able to make comparisons of size, color, and height.

Intended Learning Outcomes

- Display a sense of curiosity
- Develop reasoning skills
- Demonstrate problem solving skills

Instructional Procedures

Help your students to carefully observe, predict, and describe the unfolding investigations of plants and how they grow.

Invite students to make predictions about how the seeds will grow. Record their predictions, and amend predictions as needed. Discuss "Do plants need water? Can plants have too much water? Do seeds need water? Can seeds have too much water? What else seems to affect the growth of seeds? Of plants?"

Investigation#1

1. Put the flower pot in the corner of the planter box. For the moment, the pot should be empty. Add soil to the planter box until it is approximately 2 inches deep. Make sure the soil is packed tightly in the box.
2. In the planter box, mark off 4 diagonal rows with the string. The first row should be very close to the pot. Each diagonal row after that is 3 inches apart from the other.
3. Have one group of students plant the first row of seeds very close to the pot.
4. Have the remaining groups plant one row each, following the string markings. Students should push the seeds into the soil with their fingers. Fill the flower pot half full of water. Do not put any water in the soil. Add water to the flower pot as necessary, keeping the soil close to the flower pot slightly moist.
5. Have students predict what will happen. Write their predictions on a chart which can be accessed for later use. (The seeds nearest the water will sprout first. Another row may germinate. The seeds farthest out usually do not sprout due to the lack of water.)
6. Have students keep a record of their observation in learning logs over the next 2 weeks. Analyze findings and have students relate them to the seeds' access to water. Have students compare the findings with their initial predictions which were listed on the chart paper. Discuss the conditions that impacted plant growth.

Investigation #2

1. Review what students learned about conditions that impact the growth of plants from the first investigation. Have them identify the experimental conditions, such as: amount of water, frequency of waterings, amount sunlight, etc. Ask them to predict which conditions will have the most impact on the growth of their lima bean seeds.
2. Place lima bean seeds in a Ziploc bag. Place a paper towel in the bottom of the bag. Staple across the bag to create a shelf for the seed to sit on. The seeds can be watered through the top of the bag. Ask the students how they could use the set up to find out what a seed needs to sprout. Develop a class list of experimental conditions they could create to determine what a seed needs to sprout. A list of possibilities includes:
 - a. sun, but no water
 - b. water, but no sun
 - c. sun and too much water
 - d. sun, air and water
 - e. sun and water, but no air
3. Divide the class into groups of 3-4 and have each group select a different experimental condition to test. Check the seed's progress daily for five days. At the end of five days, have the student groups report their results. Compare the results as a class and discuss the conclusions.

Strategies for Diverse Learners

Students with limited background knowledge may benefit from a discussion of the basic needs of people or pets for growth. Plants too have basic needs. What do you think they might be? Let's investigate and see if we can find out.

Extensions

The book *Science Fair* by William Anton published by Newbridge Discovery Links (ISBN:1-58273-031-8) portrays an excellent format for student investigations and sharing of student projects. This book describes through photographs and text the process of asking a question (What do plants need to live?), forming a hypothesis (Plants need sun, air, soil, and water. Without all of these things, a plant will die.), investigating through experimentation, and sharing results. This book inspires children to follow the same format to investigate their own questions.

Other Literature

How does a Plant Grow? by Lucy Floyd, Harcourt

What Does a garden Need? by Judy Nayer, Newbridge

Assessment Plan

In the students' learning logs, assess:

1. Each student's ability to observe similarities and differences in the plants and to describe those differences
2. Each student's ability to relate the differences they observe to the plant's need for water

Authors

[Julie Cook](#)

[Elasha Morgan](#)