



Planting Popcorn and Plant Needs

Objective

In this lesson, students will learn what plants need to survive. Using popcorn as an example, students will understand that seeds need water, light and soil to grow into mature plants and all living things need air, water, resources from the land, and a place to live to survive. Students will experiment with sprouting popcorn seeds in the classroom with and without water, and then plant popcorn seeds in the school garden for harvesting and eating in the fall.

Handouts

Plant Yoga instructions
Popcorn Seed Observation worksheet
Plant Needs worksheet

Materials

Organic popcorn seeds
Plastic bags that zip close
Paper towels
Water bowls
Sharpie/marker for labeling seed bags
Tape

KEY TOPICS

- Plant Needs
- Conduct Experiment
- Record Observations
- Graphing

Key Topics

Develop and understanding of what plants need to survive
Conduct and experiment to test the theory that plants need water to survive
Label plant needs and record growth observations

Background Information

Popcorn is a plant and the mature dried kernels are the seeds of the plant that can either be popped to eat or saved to plant in the garden to grow more popcorn. Popcorn grows like sweet corn but it is a different variety that is more resistant to pests (like squirrels and raccoons), has harder and smaller kernels, and needs to dry before popping or storing until the spring planting season.

Most organic popcorn seeds will sprout (germinate) in bags with a wet paper towel after 5 days, however some may not. Add at least 4 seeds to each bag to ensure that some do germinate in the experiment. Typically, only about 75% of the seeds germinate.

Lesson Plan

1. From Seed to Plant (see Plant Yoga handout)

a. Plant yoga: Introduce the concept of a baby seed growing into a tall plant with a stem, leaves, flowers, and seeds by leading students in a movement exercise where they act out the process of being a seed to growing into a plant and dropping back into a seed again. Make sure to have space for everyone to move in their own space without running into each other.

b. When students return to their seats, go over what plants need to survive. Have students complete the **Plant Needs Worksheet**. Use PLANTS as an acronym to remember what plants need: **P**- place to live, **L**- liquid (water), **A**- air, **N**- nutrients (from soil), **T**- temperature (warm, popcorn needs above 60 degrees F to germinate), **S**- sun.

c. Ask students if they like to eat plants. Can they think of any plants that they eat at home or at school? Sometimes it's difficult to tell that a lot of the food we eat actually grows from a seed into plants that we eat! Examples: potatoes (french fries), carrots, and popcorn are all plants! Do they think popcorn comes from a plant? YES! Each corn kernel is a seed from the popcorn plant.

2. Popcorn Sprouting Experiment

a. Tell students that they are plant scientists and are going to test the theory that plants need water and light to grow.

b. Distribute materials for experiment: **popcorn seeds, plastic sealable bags, paper towels, water bowl, and sharpie/marker.**

c. Students can work solo or in pairs. Instruct students to put 4 seeds in each bag. In one bag add a wet paper towel by folding the paper towel and submerging it in the bowl of water before placing it in the bag. The other bag of three seeds should be sealed with a folded dry paper towel. Label all seed bags with date and words "dry" or "wet."

d. Tape the seed bags onto a window with **masking tape**. Put the wet bags in one area and the dry bags in another area so students can easily distinguish the two categories.

e. Observation: Tell students to draw the seeds on their **Popcorn seed Observation worksheet**. They will then draw the seeds again in 5 days, and in 10 days (or when you notice sprouting and further development and as fits with your class schedule). Using drawings and simple sentences, students will record their observations of the experiment over time.

3. Extension Lesson: Planting Popcorn in the Garden

Note- plant seeds in garden only after all danger of frost has passed. Anytime between early May and mid June, in the DC area. Do not plant two varieties of corn in the same garden due to cross pollination.

a. Exploring soil, light, air and water: bring students out to the school garden. In an empty bed have students explore the soil independently. Using hand shovels (trowels) or hands, they can dig in the soil and observe dryness, moisture, air, and look for worms and other insects.

b. Ask students to share their opinions about how the soil feels? Do they like how it feels? What does it remind them of? If they were a plant would they like to live and grow here?

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c. Collect all tools and have students smooth out soil and fill in any holes they made during exploration before planting.

d. Demonstrate how to plant the popcorn seeds. Popcorn plants should be planted about a 1/2 inch below the surface of the soil. To make the most of a single 6 by 4 foot raised bed, plant four rows set 12 inches apart. Seeds can be spaced 8 inches apart in each row. You can plant about 24 corn plants in a 6 by 4 foot bed. You can plant new seeds or try to plant the seeds the students sprouted in the classroom. If you're planting the pre-sprouted seeds, plant them closer to the surface with the leaves and half the stem sticking out of the ground. Keep the soil moist but not soggy so the non-sprouted seeds germinates quickly without rotting.

e. You can make the holes and then have each student put one seed in each hole. If you have more than 24 students you can have them double up and put two seeds in each hole. Then once they sprout you will have to cut or "thin" the plants so there is only one plant growing in each hole. This is the best practice just in case one seed doesn't germinate! Typically, only about 75% of the seeds germinate. Corn will take about 90 days form mature cobs. You can then leave the cobs on the plant to dry.

Conclusion:

a. Read a book about what plants need to survive: From Seed To Plant, by Gail Gibbons
b. Remember to revisit observation worksheet as popcorn seeds grow- add more water if needed. Answer the question: Is water necessary for plants to grow?

c. Graph it! Using dry popcorn seeds and glue, make a bar graph to chart results of the experiment. You can make two bar graphs: one with two columns, showing the number of seeds that germinated with water and the number of seeds that germinated without water. The other bar graph can be two columns, one showing the number of seeds that germinated with water and the other column showing the number of seeds that didn't germinate even though they had water. Answer the question: Is water necessary for plants to grow? Does water make all plants grow?

After the Lesson/Extension

a. Continue to complete observation worksheets each week for 3 weeks or as long as the experiment remains relevant. Open the seed bags when leaves begin to form so the plants get the needed air and can grow through the openings. You can then transplant these plants in the garden or put them in pots with soil until its warm enough to plant them in the garden, after threat of frost beginning in May.

b. Students can name their plants and create a fictional story about the life of their popcorn plant, describing the who, what, where, why and how, with the help of the teacher.

Standards

1-LS1-1. Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs

1.W.8 With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question.

1.LD.O.5 Retell stories using standard grammar rules, sequencing story events by answering who, what, where, when, how, and why questions.