



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. Students will experiment with sprouting popcorn seeds in the classroom and plant popcorn seeds in the school garden for harvesting in the fall (if applicable).

Handouts

Plant Yoga instructions
My Popcorn Seed observation worksheet (3 copies)
Plant Needs coloring worksheet

Materials

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

KEY TOPICS

- Plant Needs
- Conduct Experiment
- Record Observations
- Graphing

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

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. **See Plant Yoga handout.**

b. When students return to their seats, go over what plants need to survive: water, light, soil and air. The seeds need water to sprout into a plant; a place to live such as soil; sunlight and nutrients from the soil for food; and constant water to grow big and strong. Have students color the **Plant Needs Worksheet.**

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 ziplock bags, paper towels, and water bowl.**

c. Students can work solo or in pairs. Instruct students to put 3 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 no water added. Label bags with date and "wet" or "dry."

d. Tape the seed bags with water onto a glass window with **masking tape.** Place the dry seed bags in a dark place like a drawer, closet or cubby.

e. Observation: Tell students to draw the seeds on their **My 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). Their drawings 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.

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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? If they were a worm, would they like to live in the garden soil?

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.

f. Corn will take about 90 days form mature cobs. You can then leave the cobs on the plant to dry.

Conclusion:

a. Read book: Growing Vegetable Soup, by Lois Ehlert

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. Make a bar graph: one columns will show the number of seeds that germinated with water and the other column will show the number of seeds that germinated without water. Answer the question: Is water necessary for plants to grow? Does water make all plants grow?

Standards

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

K-ESS3-1. Use a model to represent the relationship between the needs of different plants or animals (including humans) and the places they live.

K.NSO.N.4 Compare sets of up to at least 10 concrete objects using appropriate language (e.g., none, more than, fewer than, same number of, one more than).

K.MD.A.2 Directly compare two objects with a measurable attribute in common, to see which object has "more of"/"less of" the attribute, and describe the difference.

K.LD.Q.3 Describe people, places, things, location, size, color, shape, and action.

K.LD.O.6 Relate an experience or story in logical sequence.