LESSON 2

The Seed: It All Starts Here (Well, Almost All)

Grade level: K-4
Subject Areas: Biology, language arts
Duration: Two 15-minute sessions on consecutive days or one 30-minute session
Setting: Classroom
Season: Any
Conceptual Framework Topics: Life cycles, plant anatomy, growth, reproduction

OBJECTIVES

Students will understand that most plants start from seeds, but some also start from tubers or bulbs. They will realize that there are many different types of seeds and they will learn to recognize the parts of seeds and their functions.

METHOD

Students examine different types of seeds and bulbs, figuring out what plants they come from. They observe and dissect lima beans, learning how water affects seeds and identifying the seed parts and their functions.

MATERIALS

- A variety of different kinds of seeds, such as apple, peach or plum, pepper, rice or wheat, nuts, melon or squash, pumpkin, and 2 dried beans (e.g., lima, pinto, or kidney) for each student.
- Hand lenses
- Tubers, such as potatoes, and bulbs, such as onions
- *Oh Say Can You Seed* by Bonnie Worth (optional)
- *How a Seed Grows* by Helene Jordan (optional)

BACKGROUND

The way plants reproduce is a fascinating process. Out of the more than 300,000 different kinds of plants, more than half are seed plants. Seed plants make their own seeds from which new plants grow. Other ways plants can make new plants are from spores, rhizomes, bulbs, tubers, corms, cuttings, grafts, and buds. Seeds are produced in flowers in some plants and by cones in other plants.

Plant seeds may appear like simple spheres, but seeds actually have very specialized parts. The seed coat, the hard outer layer, protects the seed. Inside are stored food and a plant embryo waiting for the right conditions to grow. Moistening seeds can create changes in the seed as it starts the growing process and makes it easier to examine a seed.

Extensions

Soak several beans and keep them in damp towels for several days. Every day or every other day, dissect a bean and see how it grows.

Sprout a potato in class so that students can see the plants growing from the eyes. Place the potato in a warm, dark place and check it daily. Have your students predict how long it will take and which eye(s) will sprout.

Read and discuss the book *Oh Say Can You Seed* by Bonnie Worth.

Read together the picture book *How a Seed Grows* by Helene Jordan. Follow the experiments suggested in the book.

What do seeds need to grow? Lead a discussion by starting with "What do children need to grow?" Then, ask the students what they think plants might need. Sprout a seed in a jar/clear plastic cup with wet paper towels. (You may want to use a bean seed, alfalfa, or popcorn.) Put some of the seeds in a windowsill to sprout. Put others in a dark corner. Discuss with the students which of the seeds they think will grow the best. Check periodically to see if their predictions match what they see.

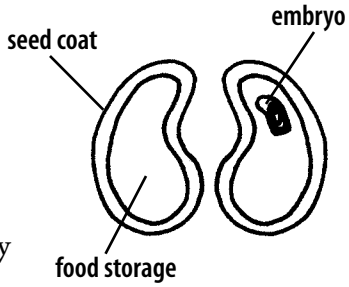
PROCEDURE

1. Begin by asking students what they know about seeds: where they come from, what they are for, what they look like. Now show them the collection of different seeds and ask them which ones are seeds. Discuss with them that different plants produce different kinds of seeds, and that they are all seeds.

2. Give each student 2 beans. Have them observe them closely and describe what they look and feel like. Then have them soak one of their beans in water over night. You can have them wet a paper towel with water and fold it over around the bean; make sure the towel is pretty wet. (It is a good idea to soak some extras yourself). Alternatively, to do this in one class session, you can soak half the beans the night before and simply give each student one dry bean and one soaked one.

3. Have students use a hand lens to examine the outside of the soaked bean. Have them describe how it looks and feels. Compare it to the dried bean. Show them how to peel off the seed covering of the soaked bean. Split them in halves with fingernails (you may need to help younger students with this). Have them draw what they see.

4. On the board draw the bean halves showing the seed coat, embryo, and food storage labeled. Ask if they can figure out the roles of the different parts. (The seed coat protects the seed until it is ready to grow. The embryo grows into the plant using the stored food for energy to grow until it can get energy from the sun.)



5. Some seeds grow from other plant parts (*tubers*, like potatoes, and *bulbs*, like onions). These also are the part we eat. Show the students some of the foods that we eat that are tubers (potatoes) and bulbs (onions). Ask if they know what part of the plant these are from (roots). Discuss with students why they are so big, unlike most roots (food storage). Ask if they know how potato plants are started. Discuss how plants like onions can sprout a new plant from the food stored in the bulb. Can they think of any advantages of reproducing this way? Disadvantages?