Seed Surprises

LEVEL: Grades PreK-3
SUBJECTS: Science, Language Arts
SKILLS: Brainstorming, classifying, collaborating, comparing similarities and differences, demonstrating, describing, developing vocabulary, identifying, observing, sorting

MATERIALS
Literature books about seeds, young plants, and growing things; enough birdseed so each student or group has 1/4 cup; small scooper cup; eight or more egg cartons; 5-pound bag of potting soil; tape or glue; craft or popsicle sticks; paper towels (two per student); newspaper or large plastic bag; and several small plastic bags. **Optional**: transparency of ***Parts of a Plant*** sheet located in the Appendixes.

VOCABULARY
embryo, leaf, plant, root, seed, soil, stem

RELATED LESSONS
The Plant and Me
Root, Root for Life
We're into Pumpkins

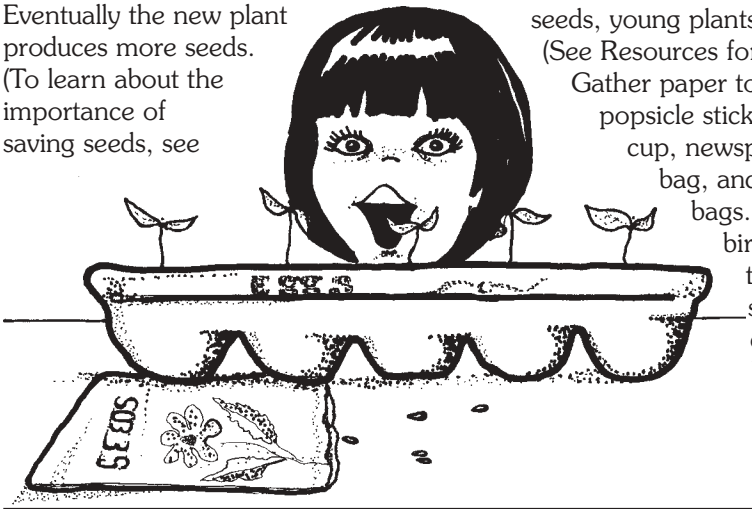
SUPPORTING INFORMATION
Seeds develop when the flower(s) of a plant is pollinated and fertilized. A seed is a young plant (embryo) usually with a food supply and a hard outer coat. In general, seeds require air, moisture and warmth for the embryo to break through the outer coat, push through the soil, and develop into a new plant. Eventually the new plant produces more seeds. (To learn about the importance of saving seeds, see the FLP lesson "Banking on Seeds.")

Seeds are important. They are one means by which plants reproduce. Animals and people eat seeds or the plants they produce. Also, seeds are used for flavorings (e.g., anise, coriander, caraway, black pepper, nutmeg, or beverages such as coffee), dyes, decorations, medicines, and for industrial uses.

As seeds sprout, the parts of the plants develop. The roots, the underground part of the plant, take up water and minerals (substances in the soil needed for growth). The stem, the main part of many plants, supports the leaves and flowers. The leaves help the plant process the sunlight and "breathe" or transpire.

Seeds come in every size, shape and color. Birdseed is used in this lesson because it is a mixture of various seeds. Inexpensive varieties of birdseed contain only three or four kinds of seeds. Higher-quality birdseed has numerous kinds of seeds.

GETTING STARTED
Gather books from the library about seeds, young plants, or growing things. (See Resources for some suggestions.) Gather paper towels, tape, craft or popsicle sticks, birdseed, scooper cup, newspaper or large plastic bag, and several small plastic bags. Using higher-quality birdseed will greatly add to the interest of the sorting exercise. (You can use dry mixed beans if you want larger seeds.) Have students help prepare egg cartons by filling



BRIEF DESCRIPTION
By sorting and planting seeds, students discover seeds come in a variety of sizes, shapes and colors, as well as produce plants.

OBJECTIVES
(Note: All objectives are appropriate for older students; younger students may only accomplish the first two objectives.)
The student will:
- describe the shapes, sizes, and colors of seeds;
- demonstrate that seeds sprout and grow into plants;
- identify conditions seeds require for growth; and
- identify plant parts and their functions.

ESTIMATED TEACHING TIME
Four sessions: 30 minutes each, plus a few minutes each day to water the plants when needed and to check for sprouting. An additional one to three weeks will be needed to grow the plants.

each section half full with potting soil. (Note: Birdseed is not clean enough for people to eat.) **Optional**: Make a transparency of the ***Parts of a Plant*** sheet.

PROCEDURE

SESSION ONE

1. Assess students' background knowledge about seeds by asking:

   - What are seeds?

   - What do they look like?

   - What do we do with them?

   - Where do seeds come from?

   Record students' responses in a visible place.

2. Share the books you gathered from the library. Repeat the questions in Step 1. Add new responses to the list generated in Step 1. Keep this list for possible use in Session Four.

3. Show students the bag of birdseed and ask:

   - What is this?

   - Who do you think eats this?

   - Where did the seeds come from? *(They come from flowers that are pollinated, fertilized and reach maturity.)*

4. Give each student or small group a piece of paper towel, a craft or popsicle stick, and a scoop of birdseed. Ask students to share their observations about the different kinds of seeds.

5. Have students brainstorm categories for the ways the seeds can be sorted *(size, shape, color, feel)*. Select three or four ways to sort the seeds. Using the craft or popsicle sticks as tools, have students sort their seeds into those categories.

6. When finished, ask:

   - How are the seeds different? Why? The same? Why?

   - What can we do with these seeds? *(Feed them to the birds.)*

   - What else? *(*They may have many answers. Lead students to mention planting the seeds.)

SESSION TWO

1. Divide the class into small groups. Give each group an egg carton. Put several groups in charge of planting sorted seeds, one category per egg carton section. Have students do the planting on the large plastic bag or newspaper. Tape or glue a sample of the seed to a craft or popsicle stick marker and place in the egg tray. Have the other groups plant the seed mixture straight from the bag. They also can make markers by taping all the seed types to the stick.

2. Plant the seeds by thickly scattering them on top of the potting soil. Cover seeds with a thin layer of potting soil. Do not let students compact the soil. Ask students what the plants need to grow. Some may know that the necessary conditions for growth are warmth, moisture and air. Water and set the cartons in a sunny window. Each group is responsible for watering its seeds and monitoring the growth. (Do not overwater.) Ask, "What do you think will happen to the seeds?"

   As a class or as individuals, have students write observations and/or keep drawings in a journal. Students should begin with a description and/or drawing of the seeds. (Continue the journal throughout the lesson so students can keep track of what happens to their seeds.)

3. Plant a little birdseed on a wet paper towel inside small plastic bags. The students will be able to see the seed coat break and the roots and leaves grow. Discuss how, instead of the soil, the paper towel is providing moisture for germination. The bags can be sealed for students to pass them around; otherwise, leave them open. Assign a representative from each group to monitor the growth of these seeds.

4. **Optional**: Have students put the extra birdseed outside in bird feeders or on the ground near a window. Have them observe for several days the birds that feed on the seed. Ask:

   - Which kinds of seeds do the birds seem to like the best? The least?

   - What kinds of birds eat seeds?

   - Did anything else eat the seeds?

SESSION THREE

1. After the seeds have sprouted and grown an inch or two, help students discover the stem, leaves and roots. (**Optional**: Show the transparency ***Parts of***

a Plant.) Compare the plants in the egg trays and the bags. Ask:

- What happened to the seeds?
- How are all the plants the same? How are they different?
- What is the plant using to get minerals and water from the soil? *(roots)*
- How is the plant able to use light? *(leaves)*

2. Tell students that birdseed is a mixture of seeds from different plants. Ask:
   - What did the birdseed need to sprout? *(Air, moisture [paper towel], and warmth.)*
   - Would the seeds grow without moisture? Warmth? Air? *(no)*
3. Explain that after planting, seeds sprout and turn into plants. Most plants mature, flower (the flowers are pollinated and fertilized), and new seeds develop. Seeds are spread around by various entities to start new plants. Seeds can be spread by the wind, people, wildlife (deer, birds, insects and squirrels), livestock (cows and sheep), and even pets (dogs and cats.) Many of the fruits and vegetables we eat come from seeds planted just like the birdseed. Ask:
   - What is the most interesting thing you learned about seeds?
   - In what ways are seeds important to you? To birds? To other animals?
4. Give students time to write and/or draw their observations in the class or individual journals started in Session Two.
5. Students continue caring for the plants and recording their progress during the rest of the school year. (Plants may need to be transplanted to a larger container.) In the spring, give students the plants to take home or to plant outside on the school grounds. Remind students how important warmth, air and water are to the plants.

SESSION FOUR

Create a class story or storybook about the sequence of growth of the seeds. Have students write individual stories and/or draw pictures. You may want students to begin by recalling their responses from Session One, Steps 1 and 2. The class story or storybook can be used to demonstrate students' new knowledge about the sequence of growth of plants from seeds.

EVALUATION OPTIONS

1. Have students use the thumbs up, thumbs down sign. "If I say something that is true, point your thumbs up. If I say something false, point your thumbs down." Sample statements:
   - Birds eat seeds.
   - People do not eat seeds.
   - Fruits have seeds inside them.
   - Seeds are always brown.
   - Animals do not eat seeds.
   - Corn grows from seeds.
   - Plants grow from seeds.
   - Plants need soil and milk to grow.
   - Banana plants grow from coconut seeds.
   - Seeds are important.
   - Rocks grow from seeds.
   - All seeds are the same.
2. Have students draw a set of sequence pictures of seeds changing into plants.
3. Students draw and label three <u>different</u> kinds of seeds and how one of these seeds might look if it sprouted.

EXTENSIONS AND VARIATIONS

1. Have students plant the birdseed in a paper cup decorated with a face they painted on it. When the seeds sprout, they become the hair on the head. Students can cut the hair and create stories about the "seedy" character.
2. Role-play changing from a seed to a plant. Have students sit on the floor, curled in a ball and pretend to be a seed. Have students respond physically to your voice clues: "A farmer plants you in soil." (Tell them to close their eyes.) "The sun warms the soil. Rain wets the soil and you. You start to grow in two directions - up and down." (They can stretch and hold hands up.) "Your stems and leaves start to push up out of the soil." (They can lift their heads and open eyes.) "Your roots grow down to find minerals and water." (Have them stand up but keep feet in one spot.) "The sun helps your leaves turn green. The air lets you breathe. You grow and grow and grow." (They can stretch to full height and spread their arms wide.) "At last you're a big, strong plant. Now you make new seeds for future plants! The farmer collects your seeds, some will be planted next year, and others will be made into food."

3. Make seed mosaics. Cut poster board into squares. Give students glue, cotton swabs to spread glue, and four or five kinds of colorful seeds. Split peas, navy beans, lentils, kidney beans, and corn are good examples. Students arrange and glue down the seeds to create colorful designs.

4. Visit the library. Have students select and read books about seeds, young plants, and/or growing things. Students share their books with the class by giving an oral or written report.

5. Have students pretend to be a seed. Write and/or draw about their life from seed to plant. Encourage them to be creative and include ideas such as being carried to another location by an animal or the wind, where they are "planted" as a seed, whether or not someone cares for them, what kind of plant they become, and more.

6. For a math extension have students measure, record, and graph the height of their plants (using English and/or metric units) every few days or weekly. Younger students can cut a piece of string as tall as the plant and paste or tape it into their journal or onto a piece of graph paper.

7. See the FLP lesson "The Plant and Me" to role-play the needs of plants and people. See the FLP lesson "Root, Root for Life" to learn about the importance of roots to plants, soil and people. See the lesson "We're into Pumpkins" to explore the size, shape, and quantity of pumpkin seeds.

ADDITIONAL RESOURCES

Burpee Seed Company (information about starting school gardens). West Atlee Burpee Company, 300 Park Avenue, Warminster, PA. 18975. 1-800-333-5808.

Carle, Eric. *The Tiny Seed* reissued edition. Simon and Schuster (Juv). 1987. ISBN: 0887080154.

Ehlert, Lois. *Eating the Alphabet, Fruits and Vegetables from A to Z*. Hartcourt Brace Jovanovich. 1994. ISBN: 0152009027.

Ehlert, Lois. *Growing Vegetable Soup*. Hartcourt Brace Jovanovich. 1990. ISBN: 0152325808.

Ehlert, Lois. *Planting a Rainbow*. Hartcourt Brace Jovanovich. 1990. ISBN: 0152626093.

Gibbons, Gail. *From Seed to Plant*. Holiday House. 1993. ISBN: 0823410250.

Hickman, Pamela, Heather Collins. *A Seed Grows: My First Look at a Plant's Life Cycle*. Kids Can Press. 1997. ISBN: 1550742000.

Jordan, Helene. *How a Seed Grows* revised edition. Econo-Clad Books. 1999. ISBN: 0833585452.

Jordan, Helene. *How a Seed Grows*. HarperCollins Juvenile Books. 1992. ISBN: 0064451070.

Kottke, Jan. *From Seed to Pumpkin (How Things Grow)*. Children's Press. 2000. ISBN: 0516233092.

Kuchalla, Susan. *All About Seeds (Now I Know)*. Troll Communications. 1989. ISBN: 0893756598.

Legg, Gerald. *From Seed to Sunflower (Lifecycles)*. Franklin Watts, Inc. 1998. ISBN: 0531153347.

Lerner, Carol. *My Indoor Garden*. Morrow. 1999. ISBN: 0688147534.

Medearis, Angela. *Seed Grows! (My First Hello Reader)*. Cartwheel Books. 2000. ISBN: 0590379747.

National Gardening Association. 180 Flynn Ave. Ste 3, Burlington, VT 05401. (802) 863-1308.

Pasco, Elaine. *Seeds and Seedlings*. Blackbirch Marketing. 1996. ISBN: 1567111785.

Wee Sprouts Salad Kit. Wee Share International, P.O. Box 1028, Pagosa Springs, CO 81147; 1-800-U-SHARED.

Wisconsin Fast Plants Program. Department of Plant Pathology, 1630 Linden Drive, University of Wisconsin, Madison, WI 53076. (608) 263-5645. Free newsletter.

EDUCATOR'S NOTES