seeds!

THE PROMISE OF LIFE

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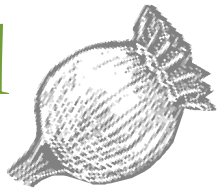
Seeds. They are the beginning and the end — minuscule miracles that contain all that's needed to produce a sunflower, cabbage, or great oak. Seeds can be as large as a coconut or fine and ephemeral as dust. They are round, curved, hairy, smooth, ridged, winged, and tufted. Some are surrounded by fruit and others, loose in pods or bare.

These amazing adaptations of evolution can lay dormant and withstand a host of environmental rigors until conditions suit them. Rice, corn, and many other seeds have sustained humans throughout history.

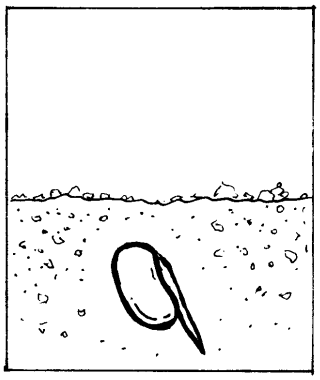
In school, seeds can capture imaginations and spark investigations far beyond the bean in the paper cup. Read on to learn how seeds can intrigue and inspire your classroom gardeners and scientists.

Thinking Like a Seed

The Mystery Revealed



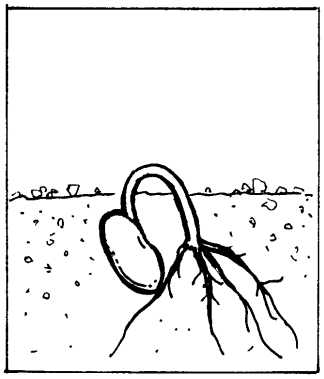
As spring approaches, visions of bountiful gardens, greenhouses, and windowsills inspire classroom growers to plant seeds indoors. By learning a bit about what makes seeds tick, you can better focus students' seed observations and investigations, and enrich their understanding of what these little treasures need to spring to life.



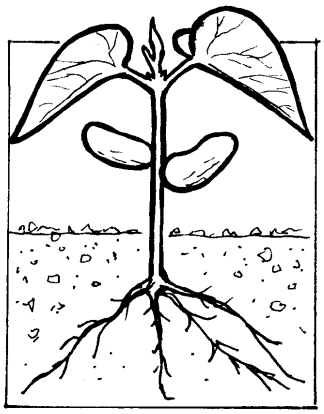
The question of whether seeds are alive or not perennially challenges classroom scientists. In fact, these seemingly lifeless objects do lack "vital signs" and so, are considered dormant, but capable of coming to life. When conditions are right to support growth, seeds waken from their dormancy and burst forth and **germinate.**

The Inside Story

What might be the advantages of remaining hard and dry, unassuming, and "asleep" for long periods of time? In a dry, inactive state, seeds can survive adverse conditions such as freezing temperatures, drought, or fungus attacks, which the adult plant could not. Imagine what would happen if seeds didn't have this ability and germinated in the fall right before a cold winter, for instance.



The tough outer layer, or **seed coat,** protects the seed and the young plant or **embryo** inside. The embryo consists of a preliminary root, shoot, and one or two seed leaves called **cotyledons,** which store food for the embryo. Some seeds also have **endosperm** tissue that contains food reserves to nourish the young plant until it can make its own food using light energy.



Yo Seeds, Wake Up!

Just like humans, seeds have needs that must be met if they are to thrive and grow. Armed with the genetic information needed to make a new plant, seeds wait to break dormancy until they have an ample supply of water, optimum temperatures, and a

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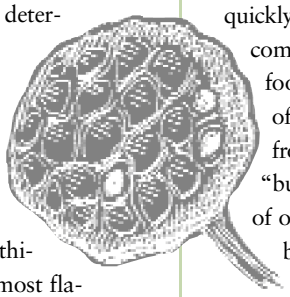
Seed Genetics, 101

Each seed contains very specific genetic material, which causes it to grow into a specific type of plant. Will tomatoes be large or small, yellow or red? That's what the genes determine. For centuries, farmers and gardeners repeatedly saved and replanted seeds from their healthiest plants and most flavorful fruits and vegetables. They passed these favorites down through the generations and took them with them when they moved. Many gardeners continue this process of saving and replanting these **heirloom** seeds.

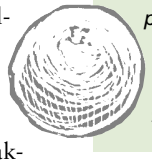


In more recent decades, scientists have learned how to pollinate plants so they'll produce seeds that reflect the "best" characteristics of two different parents. This crossing produces what are called **hybrids.** Such plants often grow vigorously and are bred to have desirable characteristics, such as uniformity or disease resistance. You cannot save the seeds of hybrids and produce the same great plants you'd expect. Some seeds will be sterile and others will show only characteristics of one parent. If you want to have the same hybrid tomatoes, broccoli, or other garden plants year after year, you'll need to use seeds from the original packets or buy new seeds each year.

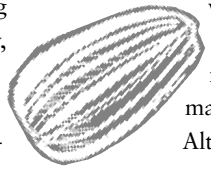
Thinking, *continued from page 1*

well-aerated soil or other spot in which to dig in.

The first step in a seed's awakening is absorbing water. This activates enzymes that make the stored food available to the embryo. As water is taken in, often doubling the original seed volume, the coat splits, making oxygen in the soil available to the tiny plant. The energy that drives the seedling's cells to quickly divide and grow comes from the stored food. During the process of **respiration,** energy from this stored food is "burned" in the presence of oxygen. While humans breathe in oxygen for the same process, it diffuses into plants from their surroundings, including the soil. In a heavy or saturated soil, there's too little oxygen available to support this crucial step.



The tip of the root, which emerges first from the seed, anchors the plant and enables it to absorb water and nutrients. Next, the young shoot begins to grow, relying in the early stages on food supplies from the cotyledons and endosperm. When the seedling's first real leaves come through the soil, the plant finally shifts to making its own food through photosynthesis. The greater the stored food supply (i.e., large seeds), the deeper a seed can be planted and survive until the plant begins producing its own food.



Although relative warmth is required for germination and growth, the ideal range of temperatures varies with different seeds. Not surprisingly, seeds of many plants native to warmer climates (e.g., tomatoes and peppers) require warmer temperatures to germinate than those native to cooler climates (e.g., lettuce). Although germinating seeds are not dependent on sunlight to produce energy, in some cases light can trigger or prevent germination. Often, small-seeded species require light. Consider the possible advantages of this adaptation. Imagine what would happen if small seeds were buried deeply in the dark soil. Without the food reserves to reach the surface, seeds would sprout and die.

DIGGING DEEPER

Seed-Starting Science Studies

Invite your students to observe seeds and pore over seed packets, then generate questions they can tackle with classroom investigations. For instance, *What would happen if we planted the same type of seed at different depths? Does the size of the seed relate to ideal planting depth? Why do roots grow down and shoots grow up? Can we influence this response?*

FAST-GERMINATING SEEDS

QUESTION: Since kids can be impatient, what are some fast-germinating vegetable and flower seeds we can grow?

ANSWER: Some flower seeds that are quick to germinate include bachelor's button — 7 to 10 days; sweet William — 5 to 10 days; gloriosa daisy — 5 to 10 days; ageratum — 6 to 10 days; cosmos — 5 to 7 days; sweet alyssum — 8 to 15 days; zinnia — 5 to 7 days; and marigold — 5 to 7 days.

Vegetable seeds worth trying include corn — 5 to 7 days; cucumber — 7 to 10 days; lettuce — 7 to 10 days; and watermelon — 5 to 7 days. To ensure success, plant your seeds in moistened seed-starting mix and put them in a warm area, such as on top of the refrigerator.

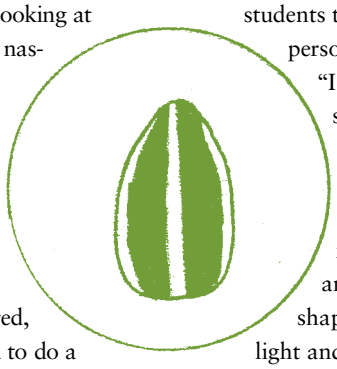
Seeds! was produced by the National Gardening Association with support from the National Garden Bureau (NGB). NGB is a nonprofit organization that disseminates accurate information on gardening with seeds and bedding plants. For more information, visit *www.ngb.org*.

The National Gardening Association provides programs and resource materials to help teachers use plants and gardens to enrich learning. Visit our award-winning Web site, *www.kidsgardening.com,* to learn more about our products and services. For a free copy of our *Gardening With Kids* catalog of teaching tools to help young minds grow, call (800) 538-7476, or e-mail *info@kidsgardening.com*.

Private Eye Seed Sleuths

"My middle school students had been fascinated by the incredible diversity of textures, colors, and patterns revealed when they explored seemingly dull seeds under magnifiers," reports Seattle, WA, teacher Sarah Carlson.

"After looking at seeds from nasturtiums, daisies, morning glories, and other plants we had grown or discovered, we decided to do a more in-depth study with sunflower seeds — the favorites of our classroom birds."

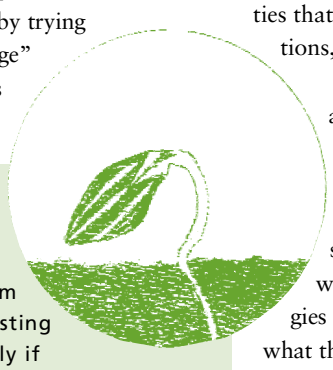


With an eye toward exploring the relationship between form and function, Sarah's students used an approach to observing and thinking by analogy detailed in *The Private Eye* by Kerry Ruef (*www.the-private-eye.com/html/home.htm*). Each student began by drawing a circular frame using a petri dish as a template, then chose a sunflower seed to inspect. Using "jeweler's loupe" magnifiers, students then got up close and personal with their seeds.

"I started by reviewing some techniques with the kids, such as drawing the seed larger-than-life, trying to fill the frame, and focusing on basic shapes and patterns of light and dark," explains Sarah.

Alluring Analogies

As students observed their seeds at five and ten times magnification, Sarah had them identify at least five things their seeds reminded them of or looked like, then write down the analogies: *The sunflower seed reminds me of a zebra ... a tree branch ... a butterfly cocoon.* Next, students asked, *Why does it remind me of that?* "We followed up by discussing whether we can create theories about the function of what we observe based on what it reminds us of," explains Sarah. "That is, if it reminds us of something, it might function in a similar way," she adds. For instance, if a seed coat resembles a shield, might it in any way act like a shield for the seed inside? If it resembles a cocoon, how might it help the seed if it also acts like a cocoon? The class discussed how they might test their theories or hypotheses, for instance, by trying to "damage" seed coats (by freezing, burning, pounding, and so on), then seeing if seeds would still sprout.



To prepare to explore the mystery of seed germination, students sandwiched seeds between paper towels in petri dishes, then moistened them with a sprayer. They stored the dishes out of the sun and opened them daily to let in air. "As the tiny roots and shoots emerged in only three days, students were delighted to see what had seemed 'dead' spring to life," says Sarah. Again, students were inspired to look closely and think in analogies: *The roots remind me of blood vessels or a map because the roots are like roads going off from the main road.* "These descriptions provided fertile ground for more discussions about how the structures of many living and nonliving things have similarities that reflect their functions," she explains.

As a culminating activity, students created accordion-shaped books featuring their artistic depictions of seedling stages along with their edited analogies and descriptions of what their vigilant inspection revealed. "These and other up-close seed and plant part investigations really helped students see the connections between the form and function of living things, appreciate their diversity and similarities, and develop a more intimate view of nature," notes Sarah. "What's more, as they honed their observational skills and ability to focus, they produced some simply amazing art!" she adds.

Use NGA's exclusive Seed Identification Kit on page 10 for more seed-based activities.

DIGGING DEEPER

Germination Testing

If your class has seed packets that are more than a year old, invite them to test the seeds to see if they're worth replanting. (They'll also be testing their math skills!) Most seeds can last several years or longer, particularly if they're kept cool and dry. Others may fail to germinate. For each type of seed being tested, lay out ten seeds on a most paper towel. Fold up the moist towel like an accordion and place it in a plastic bag. Label each bag with the date and seed variety being tested and leave it at room temperature for a week or ten days. (Seeds that are slow to sprout, like parsley and carrots, will take longer.) As students unroll each towel, have them count the number of seeds, out of ten, that have germinated, then figure out what percentage that represents. If less than 70 percent sprouted, you might want to sow the seeds more thickly. If less than 50 percent sprouted, you might want to toss them and use fresh seed.

Sowing Artwork

If you're overrun with donated seeds, consider using them for artistic creations. You can use a range of garden seeds as well as those from grocery or health food stores, such as rice, split peas, or popcorn. Have students draw pictures on cardboard or poster board. They should next brush white glue onto each part of the drawing, then sow different color seeds to bring the drawing to life. Let the art dry overnight, then turn the picture over and tap it to remove loose seeds. (Older students may want to research where different types of garden plants originated, then glue corresponding seeds on the right regions on a world map.)

Grow Your Own:
Seedling Success

Once your students have created plans for bountiful outdoor gardens, the next step is bringing them to life. If you're in an area with a short growing season or you want to harvest certain crops before school is out for the summer, you can get a

jump on the season by raising your own seedlings. This offers a good opportunity to practice reading and language skills (via seed packet planting instructions), math skills (e.g., using seed packet information to determine when to plant), and science process skills (predicting germination times or inferring why seedlings are leggy).

Scheduling/Planning

Your students' first challenge will be to determine when they'll want to have seedlings ready to give away, sell, or plant outdoors. To develop a planting calendar, they'll need to know:

- the average last spring frost date in your area (check with local gardeners, the Cooperative Extension Service, or the weather service);
- the time required from sowing each type of seed to transplanting it outdoors (check seed packets);
- the time from transplanting to harvest if you want to harvest at a particular time (check seed catalogs and packets).

Students can find out about frost tolerance from seed packets, count back to decide when to plant each crop, and develop a planting calendar. While investigating planting dates, students may also want to find last frost dates for different areas of the country, and discuss why the dates vary. Or they might research the origins of some garden plants and discuss how their temperature preferences may relate to where in the world the plants originated.

In general, the best candidates for an early indoor start are those that tolerate root disturbance and that benefit from a jump on the season. "Cool weather crops," like broccoli, cauliflower, and cabbage can be set out up to a month before the last danger of frost in your area. "Warm

weather crops," like tomatoes, peppers, and melons should be transplanted after all danger of frost is past in your area.

Containers

Many types of containers will work, as long as they're at least 2 to 3 inches deep and have drainage holes. To save space with seedlings that are easy to transplant, you can sow seeds closely in shallow containers (try recycled containers like milk cartons), then transplant them later to larger individual containers or divided ones.

Soil

Use home-mixed or premixed soilless potting mix for starting seedlings, since it is light, holds water, and is weed-free and sterile. Although your students may want to experiment and compare soilless mix with real soil (and should be encouraged to do so!), garden soil does tend to harbor weed seeds and fungus, and is often too heavy for tender seedlings.

Planting

Before planting, wet the soil mix thoroughly. Fill containers, then tap them to settle the soil without packing it tightly. Sow seeds that transplant easily in rows spaced an inch apart, or scatter and cover them with soil. A good rule of thumb is to plant seeds about two to three times as deep as they are wide. A few types of seeds either require light to germinate (check the

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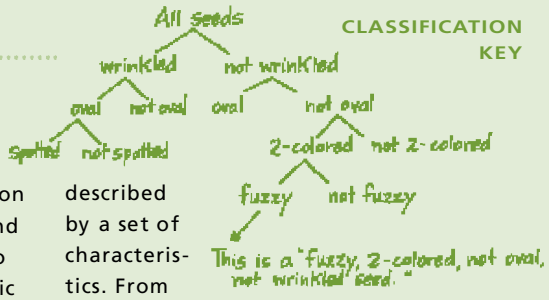
Seed Classification

Consider using a simple classification key for common garden seeds to help students sharpen their observation skills. Have students carefully observe and divide a pile of unlabeled seeds into two groups based on an obvious characteristic (e.g., shape, color, length, texture). Challenge them to do the same to successive groups until each seed type has its own unique description. Discuss why scientists classify organisms according to structure in a similar fashion, so each can be described by a set of characteristics. From here, students can develop simple garden seed keys by writing each characteristic in the form of two yes or no questions (e.g., *Is it round? Is it not round?*), then exchanging keys and trying to identify each seed using another group's key.



SEED PLANTING TAPES

QUESTION: How can my children and I make homemade seed tapes so our seeds are properly spaced?

ANSWER: Seed tapes are simply seeds fastened to a thin biodegradable paper with a glue that dissolves easily. You can make your own seed tapes with a cornstarch gel and some paper towels. First, dissolve 1 tablespoon of cornstarch in 1 cup of cold water. Cook over medium heat, stirring constantly. Once the mixture starts to boil and turns into a gel, remove from heat and allow it to cool to room temperature. When it's cool, put a few spoonfuls into a small plastic bag and seal the top.

Take three or four paper towels, fold them at the perforations, and cut them into 1-inch strips. Unfold and lay them on a flat surface. Using a ruler and pen, mark the strips so your seeds will be properly spaced.

Snip the corner off the gel-filled plastic bag and drop a little glob of gel on each of the marked spots. Place a seed on each speck of gel. The seeds will be firmly attached when the gel dries.

seed package) or are so small that you should press them gently into the top of the soil without covering them.

Keep germinating seeds moist by covering the containers with waxed paper or plastic, or by regularly sprinkling them with water. After the first true leaves appear (the cotyledons), gently tease out closely planted seedlings with a pencil point or popsicle stick and transplant them to containers where they'll have more space. Lift seedlings by their cotyledons rather than by their lifeline: the stem.

Start more sensitive crops like squash or melons in a small cup or container where they'll remain. Plant three or four seeds, then cut all but one seed after the true leaves appear. Plant them gently in the garden after danger of frost, to avoid disturbing the roots.

Light

Although you can grow seedlings on south-facing windowsills that get plenty of light, these seedlings tend to be "leggy." It's best to grow seedlings under fluorescent lights left on 14 to 16 hours a day. To avoid having stretched, leggy stems, keep the lights within a few inches of the top leaves.

Tending Seedlings

It's best to water seedlings when they need it rather than on a regular schedule. Have students test soil moisture with a finger, and water only when the top 1/2 inch of soil is dry. You can begin fertilizing seedlings once their first true leaves have formed, but be careful not to overdo it. The right amount of fertilizer will help keep your seedlings looking dark green (rather than pale yellow), but too much can be harmful. A good rule of thumb is to fertilize with half the recommended dose once every 10 to 14 days. Students may want to experiment to discover for themselves the consequences of too much of a good thing!

Hardening Off

Before you move seedlings outdoors, "harden" them off to get them accustomed to harsher outdoor conditions. Do this by setting them outside for progressively longer periods each day, starting with a few hours and increasing to a full day over the course of a week or so.

DIGGING DEEPER

Discover How Seeds Get Around

Because plants are anchored to the earth, they have to be clever about relocating their offspring (seeds) so they won't have to compete for resources with their parents. Some are carried on the wind or water. Others hitch a ride on passing animals or are naturally catapulted great distances. Those that are concealed in tempting fruits are eaten by animals and deposited elsewhere. Invite students to take a fall seed walk in search of traveling seeds. What types of adaptations (e.g., barbs, fluff, feathers, tasty fruits) that might help different seeds travel can students identify? Challenge them to use classroom materials to "invent" methods of dispersing seeds. Discuss how people move seeds. Read the classic book, *Seeds: Pop, Stick, Glide* by Patricia Lauber.

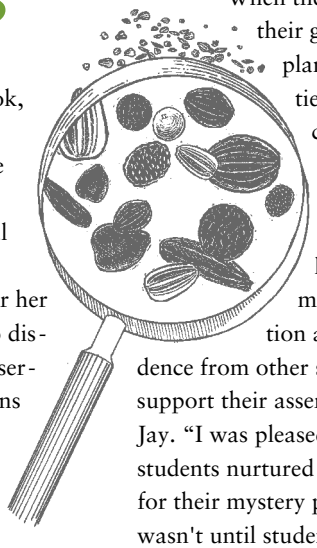
Create Seed Packets

"To prepare my fourth graders for a statewide writing test, and connect it with our garden-based science program, I had students create 'how-to' seed packets to share with other students and parents," reports Carol Smith from San Antonio, TX. Students used standard-sized paper to create giant seed packet envelopes, then researched the types of seeds they would like to include in their packets. Next, they drew pictures of each seed and mature plant and created a seed company name and logo. For the back of the seed packages, students brainstormed what someone would need to know to raise the plant to maturity, then used resource materials to help them create instructions: tools needed, growing conditions (sun, water, temperature), planting details, plant care notes, and so on. "Not only did the students learn about seed needs and care, but improved their writing skills and ability to describe processes step-by-step," says Carol.

Mystery Seeds

"I wanted my students to use their observation and thinking skills and to get involved in basic plant care," reports third grade Cincinnati, OH, teacher Jay Williams. "So I started out by planting a range of seeds such as beans and marigolds and giving one pot to each student. I then told the students that these were mystery seeds and that I was leaving it to the class to determine the seeds' identities."

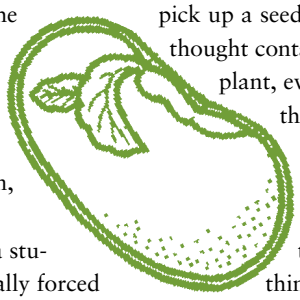
Jay left resources around the classroom, such as the *Eyewitness-Plant* book, identification books, and seed catalogs. He encouraged each student to keep a journal with drawings and observations on his or her mystery plant, and to discuss and compare observations and predictions with other students.



As students began noticing similarities and differences among the plants, reports Jay, they became more inspired to use the reference books and more bold in their predictions. "When they made their guesses about plants' identities. I didn't confirm or deny them, but instead told them to look up more information and use evidence from other students to support their assertions," says Jay. "I was pleased with how students nurtured and cared for their mystery plants. It wasn't until students took the plants home at the end of the year that I finally confirmed their guesses."

Lima Beans and Beyond

"Like most elementary educators teaching about seed structure, I had routinely invited my students to examine the inside of lima beans," reports third grade teacher Nancy Martin of Brooklyn, NY.



"But last year, a student's comment really forced me to question my assumptions," she added. After students observed a variety of seeds and listed what they knew about these objects, one pupil held up a lima bean and pronounced that it contained a baby plant. When Nancy then asked each student to pick up a seed that he or she thought contained a baby plant, everyone chose the lima bean. "In fact, one student declared, 'I don't think that these other things (e.g., peas) have baby plants,'" reports Nancy. "I realized that after all these years of dissecting lima beans, I made the assumption that students naturally make the transfer and accept that all seeds contain embryos," she adds.

Humbled by her discovery, Nancy invited her students to spend weeks bringing in and exploring a much wider range of seeds such as peas, chick peas, various beans, pumpkins, peanuts, and corn. She notes that although embryos were less obvious in certain seeds, students found some evidence in most they explored. "The students were amazed to find evidence of embryos when they examined 'snack' seeds like pumpkin seeds and peanuts." And the class clearly progressed in another way. "The kids are becoming more comfortable questioning me and realizing that they can discover answers for themselves," explains Nancy. "What's more, I'm learning to be less of the goddess on stage, and more of a guide."

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Exchange Seeds

Invite students to exchange seeds of unusual, indigenous, or culturally significant plants with classrooms in other parts of the country or world. Use the School Garden Registry on the kidsgardening Web site (*www.kidsgardening.com*) to locate other classrooms. Share questions and information to discover how the plants are used and valued in different areas.

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Explore Seed Nutrition

The bulk of the world's nutrition comes directly from seeds in the form of wheat, corn, soybeans, and so on, and half the world's population depends on the seeds of one grass alone for food: rice! Most oils are pressed from seeds. When we eat seeds instead of planting

them, we get the food that the plant stored for its own growth. Challenge students to do some research and become seed sleuths. Have them search their food shelves for evidence of whole or processed seeds. (Don't forget the coffee, chocolate, and spices!) Discuss why seeds are so nutritious. Have students bring in a variety of seeds found in their kitchens — lentils, dried beans, brown rice, citrus seeds, and so on — then try to grow them. After exploring seed nutrition, have a "seed snack day" in which each food item students bring in has to contain seeds in some form. Students should be able to explain their seeds' role in the snack.

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Digging Deeper,
continued from page 6

Seedy Math

Just how seedy are your favorite fruits? Ask students to predict how many seeds are in an apple, pepper, tomato, or other fruit, then cut open some samples and do the math. Ask, *Why isn't this planet overrun with peppers, if each fruit produces this many seeds, each seed produces the same number, and so on?* (You might have them figure out how much space the seeds from each pepper would take up if they were planted a foot apart in rows two feet apart. They could then multiply that by the number of peppers on a plant, and so on.)

Discuss the fact that not all seeds that disperse from the parent plant end up in places where they can grow. If they land on rocks or dry, exposed, or very wet places, they may not germinate. Or they may get eaten by animals. (Some animals actually *help* seeds germinate, such as squirrels who collect seeds, hide them for eating later, and then forget them!)

Share Seedy Language

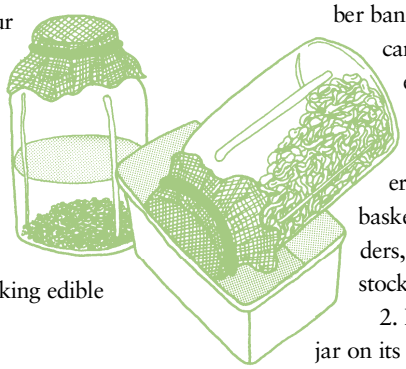
Brainstorm seed symbols in our language (e.g., *good and bad seed, seed money, seed of an idea*). How does the word *seed* give different phrases meaning?

Sprouting Off

For several years, Roger Crowley's third grade students in Montpelier, VT, have become silly about sprouts. They've written sprout stories, developed sprout characters, and magnified sprouts to project on classroom walls.

The sprout project germinated one year when a social studies unit on pioneers sparked student interest in sprouts as a food source. Another year, students grew enough sprouts to start a small business. They developed a logo and advertisements, and took orders for sprouts from the school cafeteria. Next, they used computer spreadsheets to keep accounts and estimate profits. "Our sprout tasting party was a hit," said Roger. "We experimented with all sorts of combinations including sprouts on jello!"

Exploring sprouts in the classroom doesn't have to be *this* involved to provide opportunities for learning across the curriculum. Consider challenging your students to use what they've learned about seeds' germination needs to experiment with different methods of making edible sprouts.



Sprouting Tips

You can use a range of seeds — radishes, lentils, sunflowers, peas, wheat, rye, and even broccoli — for edible sprouts, but it's best to start with the standard alfalfa and mung bean seeds. Make sure to use seeds (from supermarkets, health food stores, or catalogs) that are for eating and have not been treated with fungicides.

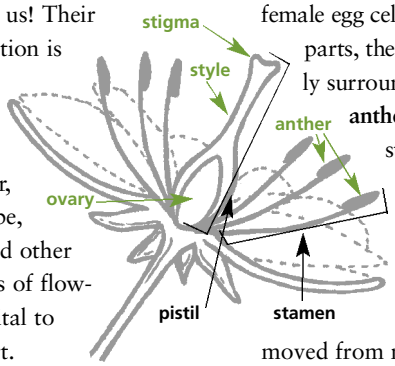
1. Soak 2 tablespoons of alfalfa seeds or 5 tablespoons of mung bean seeds overnight in water. Drain and place seeds in a quart jar. Cover the jar with cheesecloth, secured with a rubber band. (You can later experiment with other containers, such as baskets, colanders, or even stockings!)

2. Place the jar on its side (or tipped slightly downward for better drainage) in a warm, dim, or dark place. Twice a day, rinse seeds with cool tap water and drain them well through the cheesecloth before replacing the jar on its side.

3. After several days, place the jar in the light for a day or two to encourage green color (as photosynthesis begins).

Seed to Seed, 101

Where do seeds come from? Flowers are the key. Although we humans enjoy their beauty, fragrance and, in some cases, nutrition, flowers are not here to please us! Their sole function is to produce seeds. The color, size, shape, smell, and other attributes of flowers are vital to this effort.



Flower structure can vary greatly, but there are a number of basic parts. The female organ, the **pistil,** is generally in the center of the flower. Its sticky **stigma,** which traps pollen, is held up by the tube-like **style.** This leads down to the **ovary,** inside of which are **ovules,** which contain female egg cells. The male parts, the **stamens,** typically surround the **pistils.** The **anther** on top of the stamen produces pollen, which contains male sperm cells.

During pollination, pollen is moved from male to female flower parts by wind, bees, birds, bats, and a host of other animals. Flowers entice pollinators — using bright colors, designs, special shapes, and aromas — to the promise of sweet, nutritious nectar inside. When a pollen grain lands on the stigma, a tiny tube grows from it down to the ovary. Sperm cells then travel through this tube to an ovule, and there joins with an egg cell in a process called **fertilization.** The fertilized ovule will become a seed, and the ovary, a fruit. Without this process, the cycle of life would cease!

Invite your students to explore this phenomenon by observing pollinators and flowers, and then trying to find different stages, from flower to fruit and seed, in their garden. It should be easy to observe this whole continuum in a simple row of bean plants.

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GROWING BIRD TREATS

QUESTION: My kids wondered what kinds of seed treats we could grow for the birds. Any suggestions?

ANSWER: Sunflowers are fun to grow, look beautiful, make great bouquets, and provide a seed feast for all types of birds. Plant a variety of sunflowers, and sow the seeds at two-week intervals, so birds have a constant seed supply. Birds also enjoy seeds from sun-loving perennials such as purple coneflower, black-eyed Susan, and thistle.

Local birds like to eat seeds from native plants. Check with your state department of natural resources, state parks, or local birding groups for information on native plants that birds feed on.

At the end of the gardening season, let some plants go to seed rather than pulling them out. Your kids will be pleasantly surprised by the birds that show up to harvest the crop.

Kids' Books We Like

- ***Miss Rumphius*** by Barbara Cooney. An old woman spends her days blanketing the countryside with lupines.
- ***Seedfolks*** by Paul Fleischman. One by one, 13 people of varying ages and ethnic backgrounds transform a trash-filled inner-city lot into a productive and beautiful garden.
- ***The Carrot Seed*** by Ruth Krauss. A little boy plants a carrot seed and waits patiently, tending to it carefully, while everyone around him insists that "it won't come up."
- ***Tiny Seed*** by Eric Carle. A tiny seed survives while its fellow seeds are eliminated by landing in the wrong place and going through other adversities.
- ***The Reason for a Flower*** by Ruth Heller. This book with beautiful illustrations and gently rhyming text focuses on flowers as seed producers.
- ***The Empty Pot*** by Demi. A beautifully illustrated Chinese tale in which the Emperor, who loves flowers, gives a flower seed to each child in the kingdom.