

Photo Description



This image shows two halves of a butternut squash cut open to reveal the inside. You can see the pale yellow flesh and the central cavity where many tan-colored seeds are clustered together. The seeds are surrounded by stringy material that helps protect them, and the green outer skin forms a protective layer around the whole fruit.

Scientific Phenomena

Anchoring Phenomenon: Why do plants make fruits with seeds inside?

This image demonstrates seed dispersal and plant reproduction. Plants create fruits (like this squash) to protect their seeds and help spread them to new locations. The fruit's flesh is nutritious, which encourages animals to eat it—and when they do, they help scatter the seeds to different places where new plants can grow. The seeds themselves contain everything a new plant needs to start growing. This is nature's way of ensuring plants can reproduce and survive.

Core Science Concepts

- * Seeds contain baby plants: Each seed holds a tiny plant (called an embryo) plus stored food that helps it grow when planted in soil.
- * Fruits protect seeds: The outer skin and flesh of fruits shield seeds from damage, drying out, and being eaten before they're ready to grow.
- * Seeds need certain conditions to grow: Seeds require water, warmth, and oxygen to sprout and begin their life cycle.
- * Plants reproduce through seeds: This is one way plants make new plants—different from how animals reproduce.

Pedagogical Tip:

Use actual squash or pumpkins during harvest season (fall) so students can observe, touch, and count real seeds. Sensory engagement dramatically increases retention for second graders. Let students scoop out seeds with their hands—this multi-sensory experience creates lasting memories of the concept.

UDL Suggestions:

Multiple Means of Representation: Provide labeled diagrams showing a whole fruit, a cross-section, and individual seeds. Use real objects alongside pictures. **Multiple Means of Action & Expression:** Allow students to sort seeds by size, draw seed diagrams, or create a class chart counting seeds from different fruits. **Multiple Means of Engagement:** Connect to student interests by asking, "What's your favorite fruit? Does it have seeds?" This personalizes the learning.

Zoom In / Zoom Out

Zoom In: Inside a Seed (Microscopic Level)

If we could shrink down and look inside one tiny seed with a special microscope, we'd see a baby plant folded up like a little sleeping person! The seed also has a food storage area (called the cotyledon) packed with nutrients—like a packed lunch for the baby plant. The seed coat is a tough outer shell that protects everything inside from getting hurt, dried out, or eaten. When water reaches the seed, it wakes up the baby plant and the seed begins to crack open, starting germination.

Zoom Out: The Garden & Food Chain (Ecosystem Level)

When we zoom out and look at the whole garden or farm, butternut squash plants are part of a big living system. Animals like squirrels, deer, and insects depend on these plants for food. When humans harvest and eat the squash, we scatter seeds in compost piles or gardens. Wild animals might eat dropped squash and spread seeds across forests and fields. The nutrients from the rotting fruit return to the soil, making it richer for other plants to grow. One squash plant's seeds can eventually become dozens of new plants, feeding entire communities of creatures!

Discussion Questions

1. "Why do you think the seeds are inside the fruit instead of on the outside?" (Bloom's: Analyze | DOK: 2)
2. "What do you think happens to a seed if you plant it in water, soil, and sunshine? What will grow?" (Bloom's: Predict | DOK: 2)
3. "If a bird eats this squash and flies to a different place, how might that help new squash plants grow far away?" (Bloom's: Evaluate | DOK: 3)
4. "How is making seeds different from how you grow bigger each year?" (Bloom's: Compare | DOK: 2)

Potential Student Misconceptions

Misconception #1: "Seeds are baby plants, so they need to eat like I eat."

Clarification: Seeds don't eat food like children do. Instead, seeds have their own food storage tucked inside the seed coat. This stored food gives the baby plant energy to sprout and grow roots and leaves. Once the leaves unfold and get sunlight, the plant makes its own food through photosynthesis—no lunch box needed!

Misconception #2: "All seeds look the same, and all fruits have the same number of seeds."

Clarification: Seeds come in many different shapes, sizes, and colors depending on the type of plant. A butternut squash has lots of seeds (sometimes 100+), but an apple might have only 8-10 seeds, and a peach has just one big seed in the middle. The number and size of seeds depends on what kind of plant it is.

Misconception #3: "Seeds will grow into plants anywhere as long as I plant them."

Clarification: Seeds are picky! They need the right conditions to wake up and grow. A squash seed needs warm soil, water, and oxygen to germinate. If it's too cold, too wet, or buried too deep with no air, the seed will stay asleep or even rot. Seeds are smart little packages that wait for "just right" conditions before they start growing.

Extension Activities

1. Seed Counting & Graphing: Give each student half a squash, pumpkin, or melon. Have them count and record the number of seeds, then create a class bar graph comparing seed counts across different fruits. This builds math skills while deepening observation.

2. Seed Planting Experiment: Plant seeds from the fruit in clear cups with soil. Place cups in different conditions: one in sunlight, one in darkness, one with minimal water. Observe and record changes daily for 2-3 weeks. Students learn about seed germination and the conditions plants need.

3. Seed Art & Sorting: Rinse and dry seeds from the fruit. Invite students to sort seeds by size, color, or shape into containers. Then create seed mosaics on paper or make seed collages. This reinforces observation skills and fine motor development.

Cross-Curricular Ideas

ELA Connection – Narrative Writing & Read-Alouds:

After reading *The Tiny Seed* by Eric Carle, have students draw and write their own seed adventure story: "Where does this squash seed go?" Students can dictate or write simple sentences about the seed's journey (traveling by wind, water, or animal), creating a class "Seed Travel Book." This builds comprehension and emergent writing skills while reinforcing the concept of seed dispersal.

Mathematics Connection – Counting, Graphing & Data:

Have students count the seeds in their squash halves, record the numbers, and create a class bar graph showing "How Many Seeds in Each Fruit?" Students can then order the numbers from smallest to biggest, practice skip-counting by 5s or 10s if numbers are large, and answer questions like "Which fruit had the most seeds? How many more seeds than...?" This integrates data literacy with the science concept.

Social Studies Connection – Where Food Comes From & Agriculture:

Connect squash to local farming and Thanksgiving harvest traditions. Invite a local farmer or gardener to visit (virtually or in-person) to discuss how they grow squash, when harvest happens, and how many seeds they plant. Students can map their region's growing season, learn which vegetables grow locally, and understand that real people work to bring food to their tables. This builds community awareness and gratitude.

Art Connection – Seed Mosaics & Nature Collage:

Students rinse and dry seeds from the squash, then arrange them on paper or cardboard to create colorful mosaics, mandalas, or pictures. They might glue seeds to spell letters, create patterns, or make a class collaborative seed art installation. This develops fine motor skills, artistic expression, and repeated exposure to the concept that seeds have interesting shapes and colors worth celebrating.

STEM Career Connection

Plant Scientist (Botanist) – Average Salary: \$63,000/year

Plant scientists study how plants grow, make seeds, and stay healthy. They work in gardens, farms, and laboratories to figure out why some seeds grow better than others, how to help plants make more food, or how to protect plants from bugs and diseases. A botanist might discover a new way to grow squash in places where it's normally too cold—helping more families have fresh vegetables!

Agricultural Farmer or Produce Grower – Average Salary: \$62,000/year

Farmers grow fruits, vegetables, and other crops by understanding seeds, soil, water, and sunlight. They decide when to plant seeds, how to care for the plants, when to harvest fruits like butternut squash, and how to store or sell them to grocery stores and markets. Modern farmers also use science to make sure crops are healthy and productive. Without farmers, we wouldn't have the delicious squash in this photo!

Seed Scientist (Plant Breeder) – Average Salary: \$71,000/year

Seed scientists work to create better seeds that grow into healthier plants, tastier fruits, or plants that can survive tough weather like droughts. They might crossbreed different squash plants to make seeds that grow into bigger squashes, or squashes with better flavor. Seed scientists help ensure that farmers around the world can grow enough food to feed everyone in their communities.

NGSS Connections

Performance Expectation:

2-LS2-1 Plan and conduct investigations to provide evidence that plants get the materials they need for growth chiefly from air and water.

Disciplinary Core Ideas:

- 2-LS2.A The Way Plants Get the Things They Need
- 3-LS1.B Growth and Development of Organisms (bridge to Grade 3)

Crosscutting Concepts:

- Patterns Plants produce seeds in predictable patterns
- Structure and Function The structure of a fruit protects and disperses seeds

Science Vocabulary

- * Seed: A small object made by plants that can grow into a new plant when it has water, soil, and sunlight.
- * Fruit: The part of a plant that holds and protects seeds; many fruits are yummy to eat.
- * Reproduce: When living things make new living things like themselves (plants make seeds; animals have babies).
- * Embryo: A tiny baby plant that is sleeping inside a seed, waiting for the right conditions to wake up and grow.
- * Dispersal: The way seeds travel away from the parent plant to grow in new places (by wind, water, or animals).

External Resources

Children's Books:

- A Seed Is Sleepy by Dianne Hutts Aston, illustrated by Sylvia Long (explores seed structures and germination)
- From Seed to Plant by Gail Gibbons (clear illustrations of the plant life cycle)
- The Tiny Seed by Eric Carle (narrative about seed journey and growth)