

## Photo Description



This image shows a sprouting seed with a green stem growing upward and brown seed coats at the top and bottom. You can see the seed has split open, and a tiny green plant is pushing out to grow. This is what happens when a seed wakes up and starts to become a bigger plant!

## Scientific Phenomena

Anchoring Phenomenon: Seed Germination

This image captures germination—the process where a dormant seed activates and begins to grow into a plant. Scientifically, germination occurs when a seed receives the right conditions: adequate water, warmth, and sometimes light. Water triggers cellular growth, enzymes activate stored nutrients in the seed, and the embryonic plant (radicle, then shoot) emerges through the seed coat. The green stem grows upward toward light (phototropism), while roots grow downward into soil. This is a fundamental life cycle process that demonstrates how plants grow from seeds.

## Core Science Concepts

1. Life Cycles: Seeds are the beginning of a plant's life cycle. Seeds contain a baby plant inside a protective coat that waits for the right conditions to grow.
2. Growth and Change: Plants change and grow over time. When seeds germinate, they get bigger and develop roots and stems in response to their environment.
3. Plant Structure: Germinating seeds show us how plants are organized—seeds contain stored food, and new plants develop roots (grow down) and shoots (grow up).
4. Conditions for Life: Seeds need water, warmth, and sometimes light to germinate. Without these conditions, seeds stay dormant (asleep).

### Pedagogical Tip:

Use real seeds and germination experiments in your classroom! Students learn best through direct observation. Have them plant seeds in clear cups so they can watch daily changes. This concrete experience makes abstract concepts like "growth" and "life cycles" tangible and memorable. Keep a simple observation journal where students draw what they see every 2-3 days.

### UDL Suggestions:

Provide multiple means of representation: Use actual germinating seeds (tactile), photos/videos (visual), and teacher descriptions (auditory). Allow students to draw, write, or verbally describe what they observe about the seed's changes. For students with fine motor challenges, provide pre-drawn diagrams to label rather than requiring detailed drawings. Create a word wall with seed-related vocabulary and images to support all learners.

### Discussion Questions

1. What do you think will happen to this seed in the next few days? (Bloom's: Predict | DOK: 1)
2. Why do you think the green part is growing up instead of down, and the brown root-like part is growing down? (Bloom's: Analyze | DOK: 2)
3. What do you think this seed needed to start growing? How do you know? (Bloom's: Infer | DOK: 2)
4. If we put this seed in a dark closet with no water, what would happen? Why would it be different from the seed in this picture? (Bloom's: Evaluate | DOK: 3)

### Extension Activities

1. Seed Germination Observation Experiment: Give each student a clear cup with damp soil and a bean seed. Have them plant the seed and observe it daily for 2-3 weeks. Students draw pictures and write simple sentences about what they see each week. They can compare which seeds grow fastest, tallest, or healthiest based on different conditions (sunlight, water, temperature).
2. Seed Hunt and Sorting: Take students on a nature walk to collect different seeds (acorns, seeds from flowers, pods, etc.). Back in the classroom, have students sort seeds by size, shape, color, and texture. Discuss why different plants have different seeds and predict which ones might grow quickly or slowly.
3. Germination in a Bag: Place a bean seed in a damp paper towel inside a ziplock bag and hang it on a sunny window. Students can see the root and shoot grow right through the plastic without opening the bag. This is perfect for tracking growth and discussing why roots grow down and shoots grow up.

### 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 Plants need water and air; plants get materials from soil
- 2-LS2.B Plants depend on water and light to grow

Crosscutting Concepts:

- Cause and Effect Water and warmth cause seeds to germinate
- Structure and Function Seed structures (coat, embryo) have specific jobs in germination

### Science Vocabulary

- \* Seed: A small part of a plant that can grow into a new plant if it gets what it needs.
- \* Germination: When a seed wakes up and starts to grow into a plant.
- \* Seedling: A young plant that has just started growing from a seed.
- \* Sprout: The first green part of a plant that grows out of a seed.
- \* Dormant: When a seed is sleeping or resting and not growing yet.
- \* Roots: The parts of a plant that grow down into the soil to get water.

## External Resources

### Children's Books:

- The Tiny Seed by Eric Carle (beautiful story about seed travel and germination)
- From Seed to Plant by Gail Gibbons (clear illustrations of plant life cycles)
- A Seed Is Sleepy by Dianna Hutts Aston (poetic introduction to seeds and germination)

### YouTube Videos:

- "Seed Germination Time Lapse" by National Geographic Kids — Shows a bean seed germinating and growing into a plant over several days in fast motion (3 minutes). [https://www.youtube.com/results?search\\_query=national+geographic+kids+seed+germination](https://www.youtube.com/results?search_query=national+geographic+kids+seed+germination)
- "How Do Seeds Grow?" by SciShow Kids — Explains what seeds need to grow and shows real germination examples with engaging animations (5 minutes). [https://www.youtube.com/results?search\\_query=scishow+kids+how+do+seeds+grow](https://www.youtube.com/results?search_query=scishow+kids+how+do+seeds+grow)