

## Photo Description



This image shows eggshells with seedlings sprouting inside them, placed in soil with dried plant material and green stems around them. The white eggshell halves contain small green leaves pushing through, demonstrating how seeds germinate and begin to grow into new plants. This is a real-world example of the early stages of plant growth.

## Scientific Phenomena

Anchoring Phenomenon: Seed germination and plant growth beginning inside an eggshell container.

Why This Happens: Seeds contain stored energy and nutrients. When seeds are placed in soil with water, air, and warmth, they "wake up" and begin to grow roots downward and shoots (stems and leaves) upward. This process is called germination. The eggshell provides a protective container and can even add nutrients back to the soil as it breaks down, supporting the young plant's growth. This is part of the plant life cycle—the continuous sequence of stages plants go through from seed to adult plant to seed production.

## Core Science Concepts

1. Plant Life Cycles: All plants go through predictable stages: seed → germination → growth → reproduction → seed dispersal. Understanding that plants have life cycles similar to animals helps students see patterns in nature.
2. Conditions for Seed Germination: Seeds need three main things to sprout: water (to activate growth), oxygen (for cellular respiration), and appropriate temperature (warmth). This image shows a practical way to demonstrate all three conditions being met.
3. Plant Structures and Functions: The emerging seedlings show roots growing down (to absorb water and nutrients) and shoots growing up (to reach sunlight). This demonstrates how different plant parts have different jobs.
4. Decomposition and Nutrient Cycling: As the eggshell breaks down in the soil, it returns calcium and other nutrients to support plant growth, showing how natural materials cycle through ecosystems.

### Pedagogical Tip:

For Fourth Grade learners, use the eggshell seedling activity as a concrete, observable example before teaching abstract concepts about plant life cycles. Let students observe daily changes over 2-3 weeks so they can construct their own understanding of how plants grow. This hands-on approach builds stronger conceptual understanding than pictures alone.

### UDL Suggestions:

Multiple Means of Representation: Provide both visual observation (daily sketches of seedling growth), tactile exploration (students can carefully touch the eggshell and soil), and verbal discussion (students describe what they observe). Some students may benefit from time-lapse videos showing germination to compress the timeframe and maintain engagement.

Multiple Means of Action & Expression: Allow students to document growth through drawings, photographs, written descriptions, or verbal presentations. Students with fine-motor challenges can photograph and describe rather than sketch, while others can create detailed labeled diagrams.

## Discussion Questions

1. What do you think the seedling needs from the soil to keep growing bigger?  
(Bloom's: Remember/Understand | DOK: 1)
2. Why do you think we used an eggshell as a pot instead of plastic? What could happen to it over time?  
(Bloom's: Analyze | DOK: 2)
3. If we didn't give the seed water, what would happen to the sprout, and why?  
(Bloom's: Evaluate | DOK: 3)
4. How is the way a plant grows from a seed similar to how you grew from a baby?  
(Bloom's: Create | DOK: 3)

## Extension Activities

1. Eggshell Seedling Garden: Have each student plant a seed in an eggshell half and observe it daily for 3-4 weeks, recording observations through sketches and notes. After seedlings are sturdy, students can plant the entire eggshell (which will decompose) into soil outdoors. This extends learning about both plant growth AND decomposition.
2. Life Cycle Sequencing: Provide students with pictures of plant life cycle stages and have them arrange them in order, then explain what is happening at each stage. Advanced learners can research and illustrate the life cycle of a specific plant (bean, pumpkin, sunflower, etc.).
3. Seed Dissection and Exploration: Provide soaked beans or pumpkin seeds for students to carefully open and observe the seed coat, cotyledon (stored food), and embryo (baby plant). Students can draw and label these parts, connecting the internal structure to what they see happening in the eggshell seedlings.

## NGSS Connections

Performance Expectation:

3-LS1-1: Develop models to describe that organisms have unique and diverse life cycles but all animals have birth, growth, reproduction, and death, in common.

Disciplinary Core Ideas:

- 3-LS1.B Growth and development of organisms (seed germination shows the beginning of growth)
- 3-LS3.A Inheritance of traits (plants grown from seeds carry parent plant characteristics)

Crosscutting Concepts:

- Patterns (Observable patterns in how seeds germinate and plants develop)
- Stability and Change (How conditions affect whether seeds grow or remain dormant)

## Science Vocabulary

- \* Germination: The process when a seed begins to grow and sprouts a root and shoot.
- \* Seedling: A young plant that has just begun to grow from a seed.
- \* Nutrient: Food or minerals that living things need to grow strong and healthy.
- \* Decompose: When something breaks down into smaller pieces and returns materials to the soil.

\* Life Cycle: The series of stages a living thing goes through from birth to death.

### External Resources

Children's Books:

- The Tiny Seed by Eric Carle (classic story about seed travel and germination with beautiful illustrations)
- From Seed to Plant by Gail Gibbons (clear, labeled diagrams showing plant life cycles)
- Up in the Garden and Down in the Dirt by Kate Messner (explores how seeds grow both above and below ground)

YouTube Videos:

- "Plant Life Cycle for Kids" (5:15) by Crash Course Kids

Shows the complete plant life cycle with clear animations and real plant examples.

<https://www.youtube.com/watch?v=VsauPC8dMYc>

- "Seed Germination Time Lapse" (3:42) by National Geographic Kids

Shows a bean seed sprouting and growing over weeks compressed into seconds—perfect for visual learners who need to see the full process quickly.

<https://www.youtube.com/watch?v=c2dP0ZGkRtl>