Germination

Life Science | Lesson Guide

1st Grade

Photo Description

This image shows a tiny green plant sprouting from the soil with small seed shells still attached at the top. The green stem is growing upward, and you can see another seed shell at the bottom of the plant. This is what happens when a seed starts to grow into a new plant!

Scientific Phenomena

Anchoring Phenomenon: Seed Germination

This image captures germination—the process where a seed begins to grow into a plant. Scientifically, germination occurs when a seed receives the right conditions: warmth, water, and sometimes light. The seed contains a baby plant (embryo) and stored food inside. When water is absorbed, the seed "wakes up," cells begin to divide and grow, and the first root pushes downward while the stem pushes upward toward sunlight. This is a fundamental life process that demonstrates how living things grow and change.

Core Science Concepts

* Growth and Change: Seeds grow into plants over time. We can observe the changes by watching the plant get bigger and taller.

* Needs for Life: Plants need water, soil, warmth, and light to grow. Without these things, seeds will not germinate.

* Life Cycles: Every plant starts as a seed, grows, makes flowers or new seeds, and eventually dies. This pattern repeats in nature.

* Observable Structures: Seeds have different parts (seed coat, embryo) that help them grow into plants with roots, stems, and leaves.

Pedagogical Tip:

For First Graders, use repetitive observation language like "I notice... I see... I observe..." when discussing the image. This builds vocabulary and encourages careful observation skills. Consider creating a class anchor chart with observable words students can use when describing plant growth.

UDL Suggestions:

Provide multiple means of representation: Use real seeds, photos, and drawings together so students with different learning preferences can engage. Allow kinesthetic learners to use their hands to gently manipulate a sprouted seed to feel the different parts (root, stem, seed coat). Offer sentence frames for students who need language support: "I see a ___. It is ___."

Discussion Questions

1. What do you think is happening to this seed? Why do you think it is growing upward? (Bloom's: Understand | DOK: 1-2)

2. What does a seed need to grow into a plant like this one? Where could we find these things? (Bloom's: Apply | DOK: 2)

3. If we planted a seed in a dark closet with no water, what do you predict would happen? Why? (Bloom's: Analyze | DOK: 2-3)

4. How is this baby plant different from the seed it came from? What parts do you see? (Bloom's: Analyze | DOK: 2)

Extension Activities

1. Seed Sprouting Experiment: Give each student a clear cup with wet paper towels and a bean seed. Have them place it against the side of the cup so they can watch the root grow down and stem grow up over 1-2 weeks. Students can draw observations every few days. Safety note: Ensure students do not eat seeds and wash hands after handling.

2. Seed Hunt and Sort: Take students on a nature walk to collect different types of seeds (acorns, pine cones, dandelion seeds). Return to class and sort seeds by size, shape, and color. Discuss how different seeds look different but all grow into plants.

3. Plant Needs Investigation: Set up three cups with bean seeds under different conditions: one with water and light, one with water only (in a dark bag), and one with light only (no water). Over two weeks, observe which sprouts grow best and discuss what plants really need.

NGSS Connections

Performance Expectation:
1-LS1-1: Use materials to design a solution to a human problem by mimicking how plants and animals use their external parts to help them grow, survive, and meet their needs.

Disciplinary Core Ideas:
- 1-LS1.A Structure and Function—External parts of plants help them grow and survive
- 1-LS1.B Growth and Development of Organisms—Plants grow and change over time

Crosscutting Concepts:
- Patterns Plants follow patterns of growth and development
- Cause and Effect Water and warmth cause seeds to sprout and grow

Science Vocabulary

* Seed: A small object that contains a baby plant and food, which grows into a new plant when it has water and warmth.

* Germination: The process of a seed starting to grow into a plant.

* Sprout: A young plant that is just beginning to grow from a seed.

* Root: The part of the plant that grows down into the soil and drinks water.

* Stem: The green part of the plant that grows upward and holds up the leaves.

* Soil: The dirt or ground where plants grow and get food and water from.

External Resources

Children's Books:
- The Tiny Seed by Eric Carle (Caldecott Honor; teaches seed growth and life cycles)
- A Seed is Sleepy by Dianne Hutts Aston, illustrated by Sylvia Long (shows seed germination with beautiful illustrations)
- From Seed to Plant by Gail Gibbons (simple, clear non-fiction with labeled diagrams)

YouTube Videos:
- "Seed Germination in Fast Motion" – National Geographic Kids (1:30 min) — Shows a bean seed sprouting in real time; visually engaging for young learners. https://www.youtube.com/watch?v=DHXMJPvKQvA

- "How Do Seeds Grow? | Plant Life Cycle" – Crash Course Kids (4:00 min) — Age-appropriate explanation with animations of seed germination and plant growth stages. https://www.youtube.com/watch?v=8xj5eKJ-AO0