Parts of a Plant

Life Science | Lesson Guide

3rd Grade

Photo Description

A young plant is growing from a dark seed on a white paper towel. The plant has green leaves and white roots that are spreading out. The seed still has part of its shell attached to the growing plant.

Scientific Phenomena

This image shows seed germination - the process where a seed begins to grow into a new plant. The seed absorbed water, which activated the tiny plant (embryo) inside. The embryo used stored food in the seed to grow its first roots and leaves. This is the beginning of a plant's life cycle, where the seed transforms from a dormant state into an actively growing organism.

Core Science Concepts

1. Life Cycles: Plants go through predictable stages from seed to adult plant, and this germination represents the first stage of growth.

2. Plant Structures and Functions: The white structures are roots that absorb water and nutrients, while the green parts are the first leaves that will make food through photosynthesis.

3. Basic Needs of Living Things: Seeds need water, warmth, and oxygen to germinate and begin growing into plants.

4. Growth and Development: Plants change over time as they grow, starting small and developing more complex structures.

Pedagogical Tip:

Have students keep germination journals with daily drawings and observations. This helps them notice small changes over time and develops their scientific observation skills.

UDL Suggestions:

Provide multiple ways for students to record observations - drawings, photos, verbal descriptions, or simple charts. Some students may excel at noticing visual changes while others might better describe what they observe in words.

Zoom In / Zoom Out

1. Zoom In: Inside the seed, tiny cells are dividing and growing rapidly. The plant embryo is using stored starches and proteins as food energy to build new plant tissues and structures.

2. Zoom Out: This single germinating seed represents how plants spread and populate ecosystems. When this plant grows up, it may produce many more seeds that will travel to new places and start the cycle again.

Discussion Questions

1. What do you think this seed needed to start growing? (Bloom's: Apply | DOK: 2)
2. How is this baby plant similar to and different from adult plants you know? (Bloom's: Analyze | DOK: 3)
3. What do you predict will happen to this plant over the next few weeks? (Bloom's: Evaluate | DOK: 3)
4. Why do you think the plant grew roots before it grew bigger leaves? (Bloom's: Analyze | DOK: 2)

Potential Student Misconceptions

1. Misconception: Seeds are not alive until they start growing.
   Reality: Seeds contain living embryos that are dormant but alive, waiting for the right conditions to begin growing.
2. Misconception: Plants get their food from soil through their roots.
   Reality: Plants make their own food using sunlight, air, and water. Roots absorb water and minerals, not food.
3. Misconception: All seeds need soil to grow.
   Reality: Seeds only need water, warmth, and air to germinate. Soil provides support and nutrients for later growth.

NGSS Connections

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

Disciplinary Core Ideas:
- 3-LS1.B - Growth and Development of Organisms

Crosscutting Concepts:
- Patterns
- Systems and System Models

Science Vocabulary

* Germination: When a seed begins to grow into a new plant
* Embryo: The tiny baby plant inside a seed
* Root: The part of a plant that grows down to get water and hold the plant in place
* Seedling: A young plant that just started growing from a seed
* Life cycle: The stages a living thing goes through as it grows and changes

External Resources

Children's Books:
- From Seed to Plant by Gail Gibbons
- A Seed Is Sleepy by Dianna Hutts Aston
- The Tiny Seed by Eric Carle

YouTube Videos:
- "Seed Germination Time Lapse" - Shows bean seeds growing over several days in fast motion: https://www.youtube.com/watch?v=w77zPAtVTuI

- "How do seeds grow?" by SciShow Kids - Explains what seeds need to germinate with simple animations: https://www.youtube.com/watch?v=tkFPyue5X3Q