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.

Cross-Curricular Ideas

1. Math - Measurement and Growth Tracking: Students can measure their germinating seeds each day using rulers or paper clips and record the data on a simple bar graph or line plot. This connects to measurement standards and helps students see plant growth as numerical data they can compare and analyze.

2. ELA - Sequencing and Descriptive Writing: Have students write or dictate the steps of seed germination in order (first, next, then, last) using transition words. They can also write descriptive sentences about what they observe, developing vocabulary and writing skills while practicing science communication.

3. Art - Nature Sketching and Life Drawing: Students can create detailed drawings or paintings of their germinating seeds at different stages of growth. This develops observation skills and fine motor control while celebrating the natural beauty of plant development. Students could also create a collage using actual plant materials.

4. Social Studies - Where Do Seeds Come From: Explore how seeds travel to different places through wind, water, and animals. Students can learn about farmers who grow food from seeds and how different cultures use plants. This connects to understanding how communities depend on plants for food and materials.

STEM Career Connection

1. Botanist - A botanist is a scientist who studies plants! They learn how plants grow, what they need to be healthy, and how to help endangered plants survive. Botanists work in gardens, farms, forests, and laboratories to understand all about the amazing world of plants. Average Salary: $63,000 per year

2. Farmer - Farmers grow plants and crops that feed people and animals. They use their knowledge about seeds, soil, water, and sunshine to help plants grow big and strong. Some farmers grow vegetables, fruits, or grains, and they need to understand plant life cycles to harvest food at just the right time. Average Salary: $68,000 per year

3. Plant Geneticist - Plant geneticists are scientists who study the instructions inside seeds that tell plants how to grow. They work to create seeds that grow faster, stronger, or produce more food. This helps farmers grow more nutritious plants and helps solve food problems around the world. Average Salary: $72,000 per year

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