Seedling

Life Science | Lesson Guide

1st Grade

Photo Description

A small plant with green leaves is growing from a clear plastic bottle. The bottle has dark soil inside it. The plant is sitting by a sunny window.

Scientific Phenomena

This image represents the Anchoring Phenomenon of plant growth and germination in a recycled container. The scientific process occurring is seed germination and early plant development, where a seed has sprouted and is growing into a young plant (seedling). The plant is using sunlight, water, and nutrients from the soil to carry out photosynthesis and grow larger. This demonstrates how plants can adapt to different growing environments, including human-made containers, as long as their basic needs (light, water, air, and nutrients) are met.

Core Science Concepts

1. Plant Needs: Plants require sunlight, water, air, and nutrients from soil to grow and survive.

2. Life Cycles: Seeds can grow into plants through the process of germination, showing the beginning stages of a plant's life cycle.

3. Environmental Adaptation: Plants can grow in different containers and environments as long as their basic needs are met.

4. Recycling and Reuse: Everyday objects like plastic bottles can be repurposed as plant containers, demonstrating environmental stewardship.

Pedagogical Tip:

Use this image to start a class investigation by having students predict what the plant needs to keep growing. Create a simple chart to track the plant's growth over time, allowing students to make daily observations and drawings.

UDL Suggestions:

Provide multiple ways for students to document plant observations: drawing pictures, taking photos, using simple measurement tools like paper clips to measure height, or recording voice notes about what they notice.

Zoom In / Zoom Out

1. Zoom In: Inside the plant's leaves, tiny parts called cells are working to make food from sunlight and air. The roots are taking in water and nutrients through tiny root hairs that we cannot see.

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2. Zoom Out: This small plant is part of a bigger system where plants help clean our air and provide oxygen for animals and people to breathe. When we reuse bottles as planters, we help reduce waste in our environment.

Discussion Questions

1. What do you think this plant needs to keep growing bigger? (Bloom's: Apply | DOK: 2)
2. How is this bottle planter the same or different from a regular pot? (Bloom's: Analyze | DOK: 2)
3. What might happen if we moved this plant to a dark closet for a week? (Bloom's: Evaluate | DOK: 3)
4. What other containers could we use to grow plants? (Bloom's: Create | DOK: 2)

Potential Student Misconceptions

1. Misconception: "Plants eat soil for food."
   Clarification: Plants make their own food using sunlight, air, and water. They get nutrients from soil, but soil is not their food.

2. Misconception: "Plants only need water to grow."
   Clarification: Plants need four things: sunlight, water, air, and nutrients from soil to grow healthy and strong.

3. Misconception: "Plants can only grow in regular pots."
   Clarification: Plants can grow in many different containers as long as the container has drainage and the plant gets what it needs.

Cross-Curricular Ideas

1. Math - Measurement & Graphing: Have students measure the plant's height weekly using paper clips or craft sticks, then create a simple bar graph or picture graph showing the plant's growth over time. Students can practice counting, comparing measurements, and representing data visually.

2. ELA - Plant Growth Journal: Students can draw pictures and dictate or write simple sentences about what they observe each day (e.g., "The plant is getting taller." "I see two new leaves."). Create a class "Plant Growth Story" by compiling observations into a shared book to practice sequencing and descriptive language.

3. Art - Recycled Container Decorating: Before planting, have students decorate their own recycled bottles with markers, stickers, or paint to create personalized planters. This connects environmental stewardship to creative expression and allows students to practice fine motor skills.

4. Social Studies - Community & Environment: Discuss how recycling and reusing bottles helps our community and planet. Take a nature walk to observe where plants grow in the school or neighborhood, and talk about how we can help care for our environment by reusing materials instead of throwing them away.

STEM Career Connection

1. Botanist: A botanist is a scientist who studies plants—how they grow, what they need, and how they help us. Botanists might work in gardens, greenhouses, or laboratories to learn about plants and help keep them healthy. They might discover new plants or figure out how to grow more food for people. Average Annual Salary: $60,000 - $75,000 USD

2. Gardener or Horticulturist: A gardener helps plants grow by giving them water, sunlight, and good soil. Some gardeners work in big gardens or parks to make beautiful spaces, while others grow vegetables and fruits that people eat. They know all about what plants need to be healthy and strong. Average Annual Salary: $35,000 - $50,000 USD

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3. Environmental Engineer: An environmental engineer finds ways to help our planet by creating things like systems for recycling, composting, and reusing materials. They might design special ways to grow plants using recycled containers or create gardens in cities to help clean the air and make communities greener. Average Annual Salary: $65,000 - $85,000 USD

NGSS Connections

- Performance Expectation: K-LS1-1 - Use observations to describe patterns of what plants and animals (including humans) need to survive.
- Disciplinary Core Idea: K-LS1.C - All animals need food in order to live and grow. They obtain their food from plants or from other animals. Plants need water and light to live and grow.
- Crosscutting Concept: Patterns - Patterns in the natural and human designed world can be observed and used as evidence.

Science Vocabulary

* Seedling: A very young plant that just started growing from a seed.
* Germination: When a seed starts to grow into a plant.
* Nutrients: Special things in soil that help plants grow strong.
* Photosynthesis: How plants make their own food using sunlight.
* Container garden: Growing plants in pots or other containers instead of in the ground.

External Resources

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

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