Deciduous Trees

Life Science | Lesson Guide

1st Grade

Photo Description

Trees around a lake have leaves that changed colors to red, orange, and yellow. The wooden walkway goes out over the water. Some trees still have green leaves while others look bare.

Scientific Phenomena

This image represents the Anchoring Phenomenon of seasonal change in deciduous trees during autumn. The trees are responding to shorter daylight hours and cooler temperatures by breaking down chlorophyll (the green pigment that helps make food) in their leaves. As chlorophyll disappears, other pigments like carotenoids (yellows and oranges) and anthocyanins (reds) become visible. Eventually, the trees will drop their leaves to conserve water and energy during winter months when photosynthesis becomes less efficient.

Core Science Concepts

1. Seasonal Changes: Living things respond to changes in their environment throughout the year
2. Plant Adaptations: Trees prepare for winter by changing and dropping their leaves to save energy
3. Observable Patterns: We can observe and predict when trees will change colors each year
4. Living vs. Non-living: Trees are living things that grow, change, and respond to their surroundings

Pedagogical Tip:

Use a simple chart to track one tree outside your classroom window throughout the school year. Have students draw and describe what they observe weekly to build understanding of seasonal patterns.

UDL Suggestions:

Provide multiple ways for students to demonstrate their understanding: drawing pictures, acting out tree changes, singing songs about seasons, or creating leaf rubbings to show different colors and textures.

Zoom In / Zoom Out

1. Zoom In: Inside each leaf, tiny parts called chloroplasts contain green chlorophyll that captures sunlight to make food for the tree. When it gets cold, the chlorophyll breaks apart and other colors show through.

2. Zoom Out: This forest ecosystem is preparing for winter as a whole system. Animals are gathering food, some birds are migrating, and the entire forest community is responding to seasonal changes together.

Discussion Questions

1. What do you notice about the different colored leaves in this picture? (Bloom's: Remember | DOK: 1)
2. Why do you think some trees still have green leaves while others have changed colors? (Bloom's: Analyze | DOK: 2)
3. What do you predict this forest will look like in winter? What makes you think that? (Bloom's: Evaluate | DOK: 3)
4. How might the animals living in this forest prepare for the changes happening to the trees? (Bloom's: Apply | DOK: 2)

Potential Student Misconceptions

1. Misconception: Trees die in winter when they lose their leaves.
   Clarification: Deciduous trees are still alive in winter - they're just resting and saving energy until spring.
2. Misconception: Leaves change colors because they get cold.
   Clarification: Leaves change colors because of less sunlight and the tree preparing for winter, not just cold temperatures.
3. Misconception: All trees lose their leaves in fall.
   Clarification: Only deciduous trees lose their leaves. Evergreen trees (like pine trees) keep their needles all year long.

Cross-Curricular Ideas

1. Math + Science: Create a "Leaf Color Graph" where students collect leaves from outside and sort them by color (red, orange, yellow, green, brown). Then make a simple bar graph showing how many leaves of each color they found. This connects seasonal observation to data collection and comparison.

2. ELA + Science: Read Red Leaf, Yellow Leaf by Lois Ehlert, then have students create their own "color change story" by drawing or painting leaves in different colors and sequencing them to show how a tree changes throughout fall. Students can dictate sentences about what happens to each leaf.

3. Art + Science: Make leaf rubbings and pressed flower art. Students place paper over fallen leaves and rub crayons over them to see the leaf's shape and texture. Display these alongside students' drawings of the same leaves at different seasons to show change over time.

4. Social Studies + Science: Discuss how families prepare for fall and winter (wearing jackets, gathering food, decorating for holidays). Compare human preparation for seasons with how trees prepare by changing leaves—both are adapting to environmental changes.

STEM Career Connection

1. Botanist (Plant Scientist): A botanist is a scientist who studies plants, including how they grow, change colors, and adapt to different seasons. They might work in forests or parks to help keep plants healthy. Botanists learn why leaves change color and how to help trees survive. Average Annual Salary: $63,000 USD

2. Environmental Ranger or Park Ranger: Park rangers work outside in forests and parks, protecting plants and animals. They watch the seasons change, help visitors learn about nature, and keep the forest healthy and safe. Rangers might teach people about why leaves change colors during fall. Average Annual Salary: $42,000 USD

3. Climate Scientist: Climate scientists study how weather and temperature patterns affect living things like trees. They observe when leaves change color each year and use that information to understand how our planet is changing. They help predict what will happen to forests in the future. Average Annual Salary: $71,000 USD

NGSS Connections

- Performance Expectation: 1-LS1-2: Read texts and use media to determine patterns in behavior of parents and offspring that help offspring survive
- Disciplinary Core Idea: 1-LS1.B - Growth and Development of Organisms
- Crosscutting Concept: Patterns

Science Vocabulary

* Deciduous: Trees that lose their leaves every fall and grow new ones in spring
* Seasons: The four parts of the year that have different weather patterns
* Chlorophyll: The green stuff in leaves that helps trees make food from sunlight
* Adaptation: Ways that living things change to survive in their environment
* Pattern: Something that happens the same way over and over again

External Resources

Children's Books:
- Red Leaf, Yellow Leaf by Lois Ehlert
- Why Do Leaves Change Color? by Betsy Maestro
- Leaf Man by Lois Ehlert