Lake Landform

Earth & Space Science | Lesson Guide

1st Grade

Photo Description

This image shows a beautiful lake surrounded by trees with colorful fall leaves. You can see a fallen tree branch in the water, sandy ground near the shore, and trees in the distance that are changing colors from green to red, orange, and brown. The water is calm and mirrors the sky above.

Scientific Phenomena

Anchoring Phenomenon: Why do trees lose their leaves in the fall, and what happens to plants and water during seasons?

This phenomenon occurs because as temperatures drop in autumn, trees receive less daylight. Trees naturally prepare for winter by stopping the production of chlorophyll (the chemical that makes leaves green). Without this green pigment, the beautiful red, orange, and yellow colors that were always in the leaves become visible. Trees then drop their leaves to conserve water and energy during the cold months ahead. The fallen leaves visible in this photo are part of this natural seasonal cycle.

Core Science Concepts

* Seasonal Changes: Trees and plants change throughout the year as temperatures and sunlight shift. Fall is when many trees lose their leaves as they prepare for winter.

* Landforms and Bodies of Water: A lake is a large body of water surrounded by land. Lakes are important habitats for plants, animals, and organisms.

* Weathering and Decomposition: When leaves fall into the water and trees fall over, they begin to break down over time. This natural process returns nutrients to the soil and water.

* Observable Patterns in Nature: Students can observe color changes, leaf loss, and changes in plant appearance—these follow patterns that happen every year.

Pedagogical Tip:

Use this image as a springboard for sensory observations. If possible, take students on a nature walk to a local pond, lake, or even a puddle to observe similar changes firsthand. First graders learn best through direct experience with natural phenomena. Have them collect fallen leaves and observe color patterns, shapes, and textures.

UDL Suggestions:

To support diverse learners: (1) Provide a photo chart showing the same tree in all four seasons so students can see the pattern visually; (2) Allow students to sort real leaves by color, size, and texture (kinesthetic learners); (3) Use repeated vocabulary with picture cards throughout the week; (4) Pair English Language Learners with a "nature buddy" during outdoor observations to model descriptive language.

Zoom In / Zoom Out

Zoom In: Inside the Leaf (Cellular Level)
Under a microscope, we would see that leaves are made of tiny cells. Inside those cells are even smaller structures called chloroplasts that hold chlorophyll—the green color! When fall arrives and it gets colder and darker, the tree stops making new chlorophyll. The green disappears, and we see the yellow, orange, and red colors that were hiding underneath all along. It's like when you erase a green crayon mark and discover the yellow marker underneath!

Zoom Out: The Water Cycle and Ecosystem (Watershed Level)
This lake is part of a much bigger system. Water from rain and melting snow fills this lake. Trees around the lake drink water through their roots and release water vapor into the air (a process called transpiration). When leaves fall into the water, they become food and homes for fish, insects, and tiny organisms we cannot see. These organisms break down the leaves, releasing nutrients that flow through the water system. Everything in and around this lake is connected—the trees, water, animals, and soil all depend on each other. Even the fallen tree branch will eventually feed the lake ecosystem!

Discussion Questions

1. What do you notice about the colors of the leaves in this picture? (Bloom's: Remember | DOK: 1)
2. Why do you think some leaves are still green while others are red and orange? (Bloom's: Analyze | DOK: 2)
3. What might happen to the fallen leaves and the tree branch in the water over the winter months? (Bloom's: Predict | DOK: 3)
4. How do you think animals that live in or near this lake prepare for winter when trees lose their leaves? (Bloom's: Evaluate | DOK: 3)

Potential Student Misconceptions

Misconception 1: "Trees lose their leaves because the leaves die or get sick."
Clarification: Leaves don't die from sickness. Trees actually choose to drop their leaves on purpose! The tree is smart and is getting ready for winter, just like you might put on a warm coat before going outside in the cold. Dropping leaves helps the tree save water and energy when it's cold and dark.

Misconception 2: "All the leaves fall off trees at the same time, and then there are no trees left."
Clarification: Different trees lose their leaves at different times. Some trees, like evergreens (pine and fir trees), keep their leaves all year long! Even after a tree loses its leaves, the tree is still alive and waiting under the ground for spring when new leaves will grow back. The tree doesn't disappear—it's just sleeping.

Misconception 3: "The lake is just water with nothing living in it."
Clarification: Lakes are full of life! Fish, frogs, turtles, insects, and tiny creatures too small to see all live in and around lakes. The fallen leaves and branches aren't just trash—they become homes and food for all these lake animals. The lake is like a whole neighborhood where many creatures live together!

Extension Activities

Activity 1: Seasonal Color Prediction
Show students four photos of the same lake taken in each season (if available, or use illustrations). Have them arrange the photos in order and discuss what changed. Create a class chart titled "Changes We See" with drawings or magazine cutouts showing fall, winter, spring, and summer.

Activity 2: Leaf Collection and Sorting
Take students on a brief outdoor walk to collect fallen leaves (weather permitting). Back in the classroom, sort leaves by color, size, and shape. Press leaves between wax paper and hang them in the window for a beautiful display while discussing why leaves change colors.

Activity 3: Water and Land Exploration
Create a small-scale model lake using a shallow bin filled with water, sand around the edges, twigs, and fallen leaves. Let students manipulate the model, add their own "trees" (small branches), and observe how things change when they simulate rain (pouring water) or wind (blowing gently on the water).

Cross-Curricular Ideas

ELA Connection: Descriptive Writing and Story Creation
Have students use their five senses to describe the photo using sensory words. Create a class "Fall Acrostic" poem using the word FALL, with each line describing something they see (e.g., "Floating leaves drift down slowly"). Students can also dictate or draw a story about where the fallen leaf or branch might go in the lake and what adventures it might have.

Math Connection: Counting, Sorting, and Patterns
During a leaf collection walk, have students count and sort their leaves by color groups (reds, oranges, yellows, browns). Create a bar graph showing "How Many Leaves of Each Color Did We Find?" Identify and extend patterns: "We found 5 red leaves, then 7 orange leaves, then 9 yellow leaves—what comes next?" Students can also measure leaf sizes using non-standard units (paper clips, fingers) or compare quantities ("Are there more red or orange leaves?").

Social Studies Connection: Community and Seasonal Traditions
Discuss how people in the community prepare for fall and winter (similar to how trees do!). Create a class chart of "Things We Do in Fall" (rake leaves, wear jackets, go to harvest festivals). Interview family members about their favorite fall traditions. Connect to gratitude and giving—harvest time is when farmers and communities gather and share food, just like trees share their fallen leaves with the lake ecosystem.

Art Connection: Nature Collage and Observational Drawing
Students create beautiful fall collages using real pressed leaves, fallen twigs, and natural materials from outdoors. Have them create a large mural showing the lake in different seasons, using paint, markers, and natural materials. Students can also make detailed observational drawings of individual leaves, focusing on shape, color, and texture details. Display these works alongside the original photo to celebrate their observations.

STEM Career Connection

Forest Ranger / Park Naturalist
Forest rangers and park naturalists take care of forests, lakes, and outdoor spaces. They watch the trees and water to make sure everything is healthy, help visitors learn about nature, and notice when seasons change. They might count animals, check on trees, or teach people like you about lakes! A forest ranger helps keep nature beautiful and safe for everyone.
Average Annual Salary: $35,000–$45,000

Hydrologist (Water Scientist)
Hydrologists are scientists who study water—where it comes from, where it goes, and how lakes, rivers, and rain work together. They measure how much water is in lakes, check if the water is clean and healthy for animals and plants, and predict what will happen during different seasons. They use special tools and computers to understand all about water!
Average Annual Salary: $82,000–$95,000

Ecologist or Wildlife Biologist
Ecologists study how all the living things in a place—like trees, fish, birds, and tiny insects—work together and depend on each other. They observe animals and plants in their habitats, especially during seasonal changes, and figure out how to keep ecosystems healthy. They might spend time by lakes watching and recording what creatures live there and how they change with the seasons.
Average Annual Salary: $65,000–$78,000

NGSS Connections

Performance Expectation:
K-ESS2-1: Use and share observations of local weather conditions to describe patterns over time.

Disciplinary Core Ideas:
- K-ESS2.D Weather and climate / Patterns and variations in local weather and the ways that clouds and trees respond to changes in weather
- K-LS1.C Organization for matter and energy flow in organisms / Plants get the materials they need to grow chiefly from water and air

Crosscutting Concepts:
- Patterns Seasonal color changes and leaf loss follow predictable patterns each year
- Systems and System Models A lake is a system with living and non-living parts that interact

Science Vocabulary

* Lake: A large body of water that is surrounded by land on all sides.

* Seasonal: Something that happens at a certain time of year, like fall or winter.

* Landform: A natural feature of Earth's surface, such as a lake, mountain, or valley.

* Decompose: When something breaks down into smaller pieces and returns to the soil (like fallen leaves).

* Habitat: A place where plants and animals live and find food and water.

* Observe: To look closely at something and notice details about it.

External Resources

Children's Books:
Why Do Leaves Change Color?* by Betsy Maestro (simple explanation of the science)
Fall Leaves Are Not All the Same* by Loretta Holland (observation and pattern recognition)
Leaf Man* by Lois Ehlert (creative engagement with autumn materials)