Lake Landform

Earth & Space Science | Lesson Guide

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.

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)

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).

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)

YouTube Videos:
* "Why Do Leaves Change Color?" by National Geographic Kids — A 3-minute animated video explaining the science behind autumn leaf color changes. https://www.youtube.com/watch?v=nVZOPWUGW5Q

* "Seasons and Weather for Kids" by Kids Learning Tube — An engaging song about seasonal changes that helps young learners remember patterns. https://www.youtube.com/watch?v=T0A-UY1ADAU