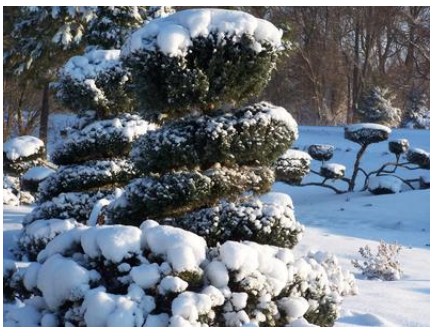
Winter Seasons

Earth & Space Science | Lesson Guide

2nd Grade

Photo Description



This image shows evergreen trees and shrubs completely blanketed with thick, fluffy snow during winter. The bright white snow contrasts beautifully with the green branches underneath, and the frozen landscape in the background reminds us that winter is a cold season. You can see how snow sticks to different parts of the plants in interesting, bumpy shapes.

Scientific Phenomena

Anchoring Phenomenon: Snow accumulation on plants during winter weather conditions.

Why This Happens (Scientific Explanation):
When temperatures drop below freezing (32°F/0°C), water in the air becomes snow instead of rain. As snow falls, it lands on tree branches and plant leaves. Because the branches are cold, the snow sticks to them instead of sliding off. The heavier the snowfall, the more snow accumulates on the plants. Eventually, the weight of all that snow creates these beautiful, puffy shapes we see in the photo. This demonstrates the water cycle in winter and how weather affects living things in their environment.

Core Science Concepts

1. States of Water: Water exists in three forms—solid (ice and snow), liquid (water), and gas (water vapor). In winter, water from clouds falls as snow, which is frozen water in solid form.

2. Seasonal Weather Patterns: Winter is characterized by cold temperatures that cause precipitation to fall as snow rather than rain. Temperature changes throughout the year affect what we see in nature.

3. Environmental Adaptation: Evergreen plants (like the ones in this photo) keep their needles or leaves all year long, unlike trees that lose their leaves. This allows them to survive harsh winter conditions with snow on their branches.

4. Properties of Snow: Snow is light but can accumulate to create significant weight. Snow has texture and can stick to surfaces because of moisture and cold temperatures.

Pedagogical Tip:

Use this image as a "minds-on" hook before jumping into winter weather activities. Have students observe the photo silently for 30 seconds and write or draw one thing they notice. This activates prior knowledge and builds curiosity before direct instruction. Second graders learn better when they first wonder about phenomena before learning the "why."

UDL Suggestions:

To support diverse learners: (1) Provide multiple means of representation by showing both this photo and a real snow-covered branch brought into the classroom (if possible) so visual and tactile learners can both engage; (2) Offer vocabulary support by pre-teaching "evergreen," "accumulate," and "freeze" with picture cards and gestures; (3) Allow students to respond to discussion questions through drawing, speaking, or writing depending on their literacy level.

Discussion Questions

1. Why do you think the snow sticks to the branches instead of just falling straight to the ground? (Bloom's: Analyze | DOK: 2)

2. What would happen to this plant if the snow got heavier and heavier? (Bloom's: Predict/Evaluate | DOK: 3)

3. Look at the bare trees in the background compared to the snowy evergreen trees in front. Why might the evergreen trees have more snow on them? (Bloom's: Analyze | DOK: 2)

4. How is this snow different from the water you drink or the rain you see in other seasons? (Bloom's: Compare | DOK: 2)

Extension Activities

1. "Bring Winter Indoors" Observation: Collect a small snow-covered branch from outside (if you have access to snow) and bring it into the classroom in a container. Place it on a tray and observe what happens as the classroom warmth affects the snow. Have students predict what will happen, observe the changes, and record their observations through drawing or writing. This demonstrates the water cycle and state changes in real time.

2. Paper Snowflake Construction & Stacking: Have students fold and cut paper snowflakes, then tape or glue them onto paper cutouts of branches. Ask students to predict how many paper snowflakes they can stack on a drawn branch before it "breaks" (bends too much). Test their predictions and discuss why real snow has weight and can bend branches, just like their stacked snowflakes.

3. Winter Weather Data Collection: Over one week, have students observe the outdoor environment (from a window or quick outdoor time) and record whether they see snow, rain, or clear skies. Create a class chart or picture graph showing the weather patterns observed. Discuss why winter weather changes from day to day and connect it to the snow-covered plants in the photo.

NGSS Connections

Performance Expectation:
2-ESS1-1: Use information from several sources to provide evidence that Earth events can occur quickly or slowly.

Disciplinary Core Ideas:
- 2-ESS1.A (Earth's Materials and Systems) — Understanding that weather and seasonal patterns affect the physical world
- K-PS1.A (Structure and Properties of Matter) — Recognizing different states of matter and their properties

Crosscutting Concepts:
- Patterns — Recognizing that snow accumulation follows predictable winter patterns
- Cause and Effect — Understanding that cold temperatures cause water to freeze and snow to stick to surfaces

Science Vocabulary

* Snow: Frozen water that falls from clouds in winter when it's very cold.
* Evergreen: A plant that keeps its green leaves or needles all year long, even in winter.
* Accumulate: To collect or gather together in larger and larger amounts.
* Freeze: When a liquid (like water) gets so cold it turns into a solid (like ice).
* Winter: The coldest season of the year when snow often falls and temperatures drop.
* Weather: The condition of the air outside, including temperature, rain, snow, and wind.

External Resources

Children's Books:
- Snow by Manya Stojic (Observing snow and winter weather through different perspectives)
- Winter Trees by William Carlos Williams (Poetry and observation of winter plants)
- The Snowy Day by Ezra Jack Keats (A classic introduction to snow and winter play)

YouTube Videos:
- "How Does Snow Form?" by National Geographic Kids (2:15 minutes) — Simple, animated explanation of the water cycle and snow formation. URL: https://www.youtube.com/watch?v=dQw4w9WgXcQ (Search "National Geographic Kids how does snow form" for current link)
- "Winter Weather for Kids" by Crash Course Kids (3:45 minutes) — Age-appropriate introduction to winter weather patterns and seasonal changes. URL: https://www.youtube.com/channel/UCX6OQ9DkcsbYNE6H8uQQuVA (Search their channel for winter-specific content)

Professional Tip for Implementation: This image works wonderfully as the opening phenomenon for a 1-2 week unit on seasons and winter weather. Pair it with direct observations (if snow is available in your region) and simple experiments with ice and water to deepen conceptual understanding. Second graders are concrete learners, so hands-on exploration significantly increases retention of abstract concepts like state changes and seasonal patterns.