

## 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.

### Zoom In / Zoom Out

#### Zoom In (Microscopic Level):

When snow lands on a tree branch, tiny ice crystals stick together because of water molecules. At a scale too small to see without a microscope, the water molecules in the snow are moving very slowly because they're frozen solid. The branch is also very cold, so the ice crystals "grab onto" the branch and hold tight. Under a microscope, you would see that snowflakes have beautiful, delicate crystal patterns—each one is slightly different! This is because water molecules arrange themselves in special geometric shapes when they freeze.

#### Zoom Out (Ecosystem & Weather Systems Level):

This snowy forest is part of a much larger winter weather system. High above Earth, cold air masses move across entire regions, bringing freezing temperatures and snow clouds. These evergreen trees and shrubs are part of a winter forest ecosystem where many animals (like deer, squirrels, and birds) depend on these plants for shelter and food, even when covered in snow. The snow that falls here also becomes part of the water cycle—it melts in spring, flows into streams and rivers, and eventually travels to lakes and oceans. Winter snow in forests helps regulate Earth's climate and water systems across entire continents.

### 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)

### Potential Student Misconceptions

1. Misconception: "Snow is the same as ice. They're both cold and white, so they must be the same thing."
  - Scientific Clarification: Snow and ice are both frozen water, but they form differently. Snow forms when water vapor in clouds freezes into ice crystals before falling to the ground. Ice forms when liquid water (like a puddle or pond) freezes solid on the surface. Snow is light and fluffy because it's made of crystals with air spaces between them. Ice is denser and harder. You can see the difference in this photo—the snow on the branches is puffy and thick, not solid and slick like ice would be.
2. Misconception: "The snow sticks to the branches because the branches are sticky or wet."
  - Scientific Clarification: The snow sticks because both the snow and the branch are very cold (below freezing). When snowflakes land on a cold branch, they freeze right to it—the water in the snow becomes ice and holds tight to the branch surface. It's not because the branch is sticky; it's because of the extreme cold temperature that makes everything freeze together.
3. Misconception: "All trees look the same in winter, so it doesn't matter that these are evergreens."
  - Scientific Clarification: The trees in the background of this photo have lost all their leaves—they look bare and brown. The green trees in the front (evergreens) still have their needles or leaves. Evergreens keep their green parts all winter long, which is why you can see them so clearly and why snow can accumulate on them. Other trees drop their leaves in fall, so there's less for snow to stick to in winter.

### 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.

### Cross-Curricular Ideas

#### Mathematics:

- Measuring Snow Depth & Weight: Create a simple snow depth chart using unifix cubes or paper strips to measure how deep the snow is on different surfaces. Have students predict how many cubes tall the snow in the photo might be, then compare predictions. Extend by discussing: "If snow falls 1 inch every hour for 5 hours, how many inches will we have?" This builds addition and measurement skills while connecting to the photo's snowy context.

#### English Language Arts:

- Winter Descriptive Writing: Show the photo and have students use their senses to describe it. Provide a word bank of descriptive words (fluffy, sparkly, thick, cold, white, bumpy) and have students write 2-3 sentences: "The snow on the branches looks \_\_\_\_\_. It feels \_\_\_\_\_. I wonder \_\_\_\_\_." This develops descriptive vocabulary and sentence writing while keeping the science phenomenon central.

#### Social Studies:

- Communities & Winter Survival: Discuss how people in different communities around the world experience winter differently. Show the photo and ask: "Do all children see snow like this? Where is it very cold and snowy in winter?" Introduce map work by locating snowy regions (Canada, Alaska, mountains) versus warm regions (Florida, tropical islands). This builds geographic awareness and cultural understanding of seasonal diversity.

#### Art:

- Winter Landscape Painting & Collage: Have students create their own snowy tree using white paint, paper snowflakes, and cotton balls glued onto construction paper. Discuss how the photo uses contrast—white snow against dark green branches and bare trees in the background. Ask: "How can we show contrast in our art?" This develops fine motor skills, color theory understanding, and creative expression while reinforcing the visual concepts from the photo.

### STEM Career Connection

Meteorologist (Weather Scientist)

A meteorologist is a scientist who studies weather and helps predict if it will snow, rain, or be sunny. They use special tools to measure temperature and watch clouds. Meteorologists tell us when big snowstorms are coming so people can stay safe. They also study how snow and cold weather affect plants and animals. If you like learning about snow, storms, and seasons, being a meteorologist might be perfect for you!

- Average Annual Salary: \$97,000 USD

#### Forest Ranger or Park Naturalist

A forest ranger takes care of forests and the plants and animals that live there. In winter, they watch how snow affects trees and plants, just like in this photo. They help protect the forest from damage (like branches breaking under heavy snow) and teach people about nature and seasons. If you love being outside and caring for trees and forests, this job could be for you!

- Average Annual Salary: \$38,000 USD

#### Climate Scientist

A climate scientist studies how Earth's weather and temperature change over time. They look at snow, ice, and cold seasons to understand our planet's climate patterns. Climate scientists help us understand why winters are getting warmer or colder and how that affects the plants and animals in forests like the one in this photo. If you're curious about big changes happening on Earth, this could be an exciting career!

- Average Annual Salary: \$104,000 USD

### 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)

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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.