

## Photo Description



This image shows evergreen trees covered with thick, fluffy snow during winter. The white snow sticks to the dark green branches and needles, creating a beautiful contrast. You can see the trees are still standing tall even with all the heavy snow on top of them.

## Scientific Phenomena

Anchoring Phenomenon: Snow accumulation on evergreen plants during winter

### Why This Is Happening:

When winter arrives, temperatures drop below freezing (32°F or 0°C). Water in the air forms ice crystals instead of rain—this is snow. The snow falls and collects on the branches and needles of evergreen trees because the trees stay green all year long, unlike deciduous trees that lose their leaves. The shape of evergreen branches (especially on conifers like pines and spruces) naturally catches and holds snow. This is a normal seasonal change that happens every winter in cold climates.

## Core Science Concepts

- \* Seasonal Weather Changes: Winter is a season when temperatures become very cold, and water falls as snow instead of rain. Snow only forms when it is cold enough.
- \* Properties of Snow: Snow is frozen water that falls from clouds. It is white, cold, and can pile up on surfaces like branches, ground, and roofs.
- \* Evergreen Trees: Some trees keep their leaves (needles) all year long, even in winter. These are called evergreens. Deciduous trees lose their leaves in fall, but evergreens do not.
- \* Seasonal Plant Adaptations: Evergreen trees have special needles and waxy coatings that help them survive cold, snowy winters. Their branches are shaped to shed heavy snow so they don't break.

### Pedagogical Tip:

For Kindergarteners, focus on observable, sensory-friendly language: "Look at the white, fluffy snow!" rather than abstract concepts. Use real objects like branches and artificial snow in your classroom to let children touch and explore. Kinesthetic experiences help young learners understand seasonal changes better than pictures alone.

### UDL Suggestions:

Multiple Means of Engagement: Bring in branches from outside (safe, clean ones) and let students feel the texture. Allow them to build mini snow scenes with cotton balls and green paper to represent the image. For students who may not have experienced real snow, provide tactile substitutes (shaving cream, cotton, foam) so all learners can connect to the phenomenon.

## Zoom In / Zoom Out

### Zoom In - Microscopic Level:

When we look at snow under a magnifying glass, we see that each snowflake is made of tiny ice crystals arranged in special patterns. These crystals form when water vapor in the air gets so cold that it turns directly into ice without becoming liquid water first. Each snowflake has its own unique six-sided shape, like a tiny frozen puzzle piece. The needles on evergreen trees are covered with a waxy coating that helps water freeze on them, which is why snow sticks so well!

### Zoom Out - Ecosystem & Water Cycle Level:

Snow on evergreen trees is part of the bigger water cycle that keeps our whole planet alive. When snow falls on trees and the ground, it stores water. As spring arrives and temperatures warm up, this snow melts and becomes water that flows into streams, rivers, and underground, feeding plants, animals, and communities far away. Evergreen forests in snowy places act like nature's water storage system! The snow also protects small animals and plant roots from extremely cold temperatures, helping them survive the winter.

## Discussion Questions

1. What do you notice on the branches of these trees? (Bloom's: Remember | DOK: 1)
2. Why do you think snow stays on evergreen trees better than it would on a tree with no leaves? (Bloom's: Analyze | DOK: 2)
3. How is snow different from rain? (Bloom's: Compare | DOK: 2)
4. What happens to snow when the weather gets warmer? (Bloom's: Predict | DOK: 3)

## Potential Student Misconceptions

Misconception 1: "Snow is the same as rain, just colder."

Clarification: Snow and rain are both water, but they form differently. Rain falls as liquid water droplets when it's not very cold. Snow forms when it's so cold that water freezes into ice crystals in the sky before it falls. The ice crystals stick together to make snowflakes. They look and feel completely different!

Misconception 2: "All trees lose their leaves in winter, just like the brown trees in the picture."

Clarification: Some trees, called deciduous trees, drop all their leaves in fall to save energy during cold winter. But evergreen trees are special—they keep their needles all year long! Their needles are tough and waxy, so they don't need to fall off. That's why we can see snow piling up on the green branches.

Misconception 3: "The snow will stay on the branches forever."

Clarification: Snow doesn't last forever. When the weather gets warmer in spring, the snow melts and turns back into water. It drips off the branches and soaks into the ground, or evaporates back into the air. This is part of nature's cycle that happens every year.

## Extension Activities

1. Snow Sensory Exploration: If you live in a snowy climate, take students outside to observe and touch real snow (with proper clothing and safety). Have them notice how cold it is, how it feels, and where it accumulates. If snow is unavailable, use shaving cream or cotton balls indoors as a safe alternative.

2. Evergreen Branch Decorating: Collect safe, clean evergreen branches from outside. Let students decorate them with cotton balls (to represent snow), paper snowflakes, and other winter decorations. Display in the classroom as a winter science center.
3. Sorting Activity - Evergreen vs. Non-Evergreen: Show pictures of different trees. Have students sort them into two groups: "Keeps leaves all year" (evergreen) and "Loses leaves in fall" (deciduous). Discuss why evergreens are better at holding snow.

### Cross-Curricular Ideas

Math Connection - Symmetry & Patterns:

Snowflakes are famous for their symmetrical, six-sided patterns. Create a snowflake symmetry art activity where students fold white paper and cut out designs, then unfold to reveal symmetrical patterns. Count the sides and points on paper snowflakes. Graph favorite snowflake shapes or create a class data chart about "snowflakes with 6 sides" vs. other shapes.

ELA Connection - Descriptive Language & Storytelling:

Read aloud winter picture books, then have students create their own winter stories using sensory words: "The soft, fluffy snow feels cold. The trees look beautiful with white blankets." Create a class book where each student contributes one page with a sentence and illustration about snow and evergreens. Practice rhyming words related to winter (snow/go, cold/gold, freeze/trees).

Art Connection - Winter Scene Creation:

Use mixed media to recreate the snowy evergreen scene. Provide green construction paper for tree shapes, white cotton balls or shaving cream for snow, and let students collage their own winter landscape. Create a classroom winter display with their artwork. Students can also paint with white paint on dark paper to show snow accumulation, or use salt on wet glue to create texture that looks like snow crystals.

Social Studies Connection - How People & Animals Adapt to Winter:

Discuss how people dress differently in winter (warm coats, hats, mittens) to stay warm in snow and cold. Talk about what animals do in winter—some migrate, some hibernate, some grow thicker fur. Show pictures of different homes in snowy places and talk about why roofs are slanted (to help snow slide off). Connect to community helpers like snow plow drivers and how they keep roads safe in winter.

### STEM Career Connection

Forest Ecologist / Botanist:

Forest scientists study plants like the evergreen trees in this photo. They learn why different trees live in different places, how snow and cold weather help trees survive, and how forests stay healthy. These scientists go outside in all seasons—even snowy winters!—to observe trees and plants. They teach other people what they learn.

Average Annual Salary: \$62,000 - \$75,000 USD

Meteorologist / Weather Scientist:

Weather scientists study snow, rain, temperature, and wind. They predict when it will snow and how much snow will fall. They help communities prepare for winter storms and understand climate patterns. Meteorologists use special tools and computers to track weather and explain why snow forms the way it does.

Average Annual Salary: \$65,000 - \$85,000 USD

Park Ranger / Forest Manager:

Park rangers take care of forests and natural areas in winter and all year long. They make sure evergreen trees and other plants stay healthy. They also help keep visitors safe on snowy trails and teach people about winter wildlife. Rangers might clear snow from pathways or monitor tree damage from heavy snow.

Average Annual Salary: \$48,000 - \$68,000 USD

### 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)

Crosscutting Concepts:

- \* Patterns (Snow and cold are patterns we observe every winter)
- \* Cause and Effect (Cold temperatures cause water to become snow)

### Science Vocabulary

- \* Snow: Frozen water that falls from clouds when it is very cold.
- \* Winter: The coldest season of the year when snow often falls.
- \* Evergreen: A plant that stays green all year long and does not lose its leaves or needles in winter.
- \* Freeze: When something gets so cold that water turns into ice.
- \* Needles: The thin, pointy leaves on evergreen trees like pine and spruce trees.
- \* Accumulate: When something piles up or gathers in one place over time.

### External Resources

Children's Books:

Stranger in the Woods\* by Carl R. Sams II and Jean Stoick (features forest animals and winter scenes)

Snow\* by Manya Stojic (explores winter weather and what happens in snow)

Winter is Here\* by Jean McElroy (introduces seasonal changes appropriate for Kindergarten)