

## Photo Description



This image shows evergreen trees and shrubs covered in thick, fluffy white snow on a bright, sunny winter day. You can see the green needles and branches peeking out from underneath the heavy snow blanket. In the background, more snow-covered plants and a frozen landscape stretch across the snowy ground.

## Scientific Phenomena

Anchoring Phenomenon: Snow accumulation on plants during winter.

This phenomenon occurs because water vapor in the air freezes into ice crystals when temperatures drop below 32°F (0°C). These ice crystals collect together to form snowflakes, which fall from clouds and land on trees, shrubs, and the ground. The snow sticks to the evergreen branches because the trees are still "alive" during winter and have sticky, waxy needles. The bright sunlight in the photo shows how snow reflects light, making it appear white and shiny—this is an important observable characteristic that helps First Graders understand why winter landscapes look different from other seasons.

## Core Science Concepts

- \* Seasonal change: Winter is a season when temperatures are very cold, and water freezes into snow instead of falling as rain.
- \* States of matter: Water can be a liquid (rain), solid (ice and snow), or gas (water vapor). Snow is frozen water—a solid state.
- \* Plant adaptation: Evergreen trees keep their needles all winter long, while other trees lose their leaves. The waxy coating on evergreen needles helps them survive cold temperatures.
- \* Weather patterns: Snow is a type of precipitation that happens in winter when it is cold enough for water in clouds to freeze.

### Pedagogical Tip:

Use this image as an anchor to help students distinguish between winter and other seasons. Ask students: "What do you notice that tells us it's winter?" This helps develop observational skills and connects abstract seasonal concepts to concrete, visible evidence they can see and relate to their own experiences.

### UDL Suggestions:

Provide multiple means of engagement by offering a choice of response formats: students could draw what they observe, use physical manipulatives (cotton balls to represent snow), or dictate observations to you. For students with visual processing needs, describe the image aloud in detail, emphasizing the contrast between white snow and green plants. For kinesthetic learners, create a tactile activity using white fabric or cotton to "cover" toy plants.

## Zoom In / Zoom Out

### Zoom In: Snowflake Formation (Microscopic Level)

When we zoom in very close—so close that we need a special magnifying tool called a microscope—we can see that each snowflake is made of tiny, tiny ice crystals. These crystals form when water vapor in the air gets super cold and freezes. Each snowflake has a special six-sided shape, like a tiny geometric puzzle piece! The crystals stick together in the clouds, and many, many of them clump together to make the fluffy snow we see falling. Even though snowflakes look the same from far away, when you look really closely, each one has a completely different, unique pattern—like nature's fingerprints!

### Zoom Out: The Water Cycle and Winter Weather Systems (Planetary Level)

When we zoom out and look at the big picture, we see that snow is part of Earth's water cycle. Water from oceans, lakes, and rivers evaporates into the air as invisible water vapor. When this air moves to cold places (especially high in the sky or during winter), the water vapor cools down and condenses into clouds. If it's cold enough, the water freezes into snow instead of falling as rain. The snow lands on plants and the ground, and eventually it melts back into water that flows into streams and rivers, returning to the oceans. This whole cycle keeps repeating, and winter snow is an important part of how water moves around our planet!

## Discussion Questions

1. What do you see in this picture that tells us it is winter? (Bloom's: Remember | DOK: 1)
2. Why do you think the snow is sticking to the green branches instead of falling off? (Bloom's: Infer | DOK: 2)
3. How is winter different from other times of year you have seen? (Bloom's: Compare | DOK: 2)
4. What do you think will happen to the snow when the sun shines on it for a long time? (Bloom's: Predict | DOK: 2)

## Potential Student Misconceptions

Misconception 1: "Snow comes from the ground freezing."

Clarification: Snow doesn't form from the ground getting cold. Snow forms high up in the clouds when water vapor freezes into ice crystals. The snow then falls down from the sky. The cold ground helps keep the snow from melting once it lands, but the snow itself comes from clouds, not from below.

Misconception 2: "Snow is just cold rain."

Clarification: Snow and rain are both types of precipitation, but they are different. Rain is liquid water that falls from clouds. Snow is frozen water (solid ice crystals) that forms when it is very cold high in the clouds. If it's cold enough all the way to the ground, the snow stays frozen and fluffy. If it's warmer, frozen water turns into rain as it falls.

Misconception 3: "All plants die in winter because they are covered in snow."

Clarification: Some plants, like evergreen trees, are very tough and can survive winter even when covered in snow. The snow actually helps protect them from the super cold wind and air! Other plants lose their leaves to save energy during cold months, but their roots stay alive underground. When spring comes and it gets warm again, these plants wake up and grow new leaves.

## Extension Activities

1. "Winter Walk" Observation Activity: Take students outside or to a window to observe real plants in winter (if available in your climate). Have them use clipboards to draw or mark what they observe: snow on plants, bare branches, evergreen trees still being green, frost, or icicles. This builds observational skills and connects the anchor image to their real world.

2. "Melting Snow" Experiment: Bring clean snow into the classroom (or use ice) in a clear container. Place it on a sunny windowsill and observe how it changes over time. Record observations with drawings and dictated notes. Ask: "Where did the snow go? What happened to it?" This demonstrates phase change and builds understanding of cause and effect.
3. "Winter Plant Sort": Show pictures of different winter plants (evergreens vs. deciduous trees). Have students sort them into "keeps leaves/needles" and "loses leaves" categories. Create a simple chart together. This reinforces the concept that different plants have different adaptations for winter survival.

### Cross-Curricular Ideas

#### Math Connection: Measuring and Comparing Snow Depth

Have students measure the depth of snow in the photo using non-standard units (like blocks, cubes, or craft sticks placed end-to-end). Create a simple bar graph showing how tall the snow is on different parts of the plants. Students can compare: "Is there more snow on the top branch or the bottom? Is the snow taller than my hand? How many blocks tall is the snow?" This builds measurement and data visualization skills.

#### ELA Connection: Winter Descriptive Writing and Sensory Words

Read aloud descriptive winter books like *Owl Babies* by Martin Waddell or *Time for Bed* by Mem Fox. Ask students to use their senses to describe the snowy scene: "What do you think the snow would feel like? What sounds might you hear in a snowy forest? What words describe how the snow looks?" Create a class "Winter Word Wall" with sensory adjectives (fluffy, cold, white, sparkly, quiet) and use these words in simple sentences or picture captions that students dictate or write.

#### Art Connection: Winter Collage with Texture

Students create a winter landscape collage using cotton balls (for fluffy snow), blue paper (for sky), green tissue paper (for evergreen branches), and brown paper (for tree trunks). This hands-on activity helps them understand the texture and layers they see in the photo while developing fine motor skills and artistic expression. Display collages with labels using vocabulary words like "snow," "evergreen," and "winter."

#### Social Studies Connection: Winter Around the World

Show pictures of winter in different places—some with lots of snow (like mountains or far north), some with mild winters (like deserts), and some with warm weather year-round. Discuss: "Do all places on Earth have snowy winters? What do people and animals do in different winter climates?" This introduces students to geography, climate diversity, and how different communities adapt to their environments.

### STEM Career Connection

#### Meteorologist (Weather Scientist)

A meteorologist studies weather and climate. They observe clouds, temperature, and precipitation (like snow and rain) to predict what the weather will be tomorrow. Meteorologists use special tools and computers to understand why snow forms and how it affects the world around us. They might forecast winter storms, warn people about dangerous weather, or study how climate is changing. This job is perfect for curious kids who love watching clouds and weather! Average annual salary: \$97,000 USD

#### Botanist (Plant Scientist)

A botanist studies plants—how they grow, what they need to survive, and how they change with seasons. A botanist might research why evergreen trees keep their needles in winter while other trees lose their leaves, or how plants survive under heavy snow. They work in forests, gardens, laboratories, and universities to understand how plants adapt to cold winters and other challenging conditions. Average annual salary: \$65,000 USD

### Forest Ecologist

A forest ecologist studies how forests work as a system, including all the plants, animals, soil, and weather. They observe forests in winter to see how snow affects the plants and animals living there. Forest ecologists might study how snow protects young plants from extreme cold, or how winter weather changes the forest ecosystem. Their work helps us understand and protect forests for the future. Average annual salary: \$72,000 USD

## NGSS Connections

Performance Expectation: 1-ESS1-1 Use observations to describe patterns of the sun, moon, and stars. (Connections to Patterns and seasonal observation)

Disciplinary Core Ideas:

- 1-ESS1.A Patterns of the sun, moon, and stars can be observed, described, and predicted. (Observable seasonal changes)
- K-PS1.A Matter can be described by observable properties, including color, texture, and state (snow as frozen water)

Crosscutting Concepts:

- Patterns - Seasonal patterns of weather change
- Cause-and-Effect - Cold temperatures cause water to freeze into snow

## Science Vocabulary

- \* Snow: Frozen water that falls from clouds in cold weather; it is white and fluffy.
- \* Winter: The coldest season of the year when it is very cold and snow often falls.
- \* Freeze: When something cold turns from a liquid into a solid (like water turning into ice).
- \* Evergreen: A tree or plant that keeps its green needles or leaves all year long, even in winter.
- \* Temperature: How hot or cold something is.

## External Resources

Children's Books:

- Snow by Manya Stojic (explores snow in different environments)
- In the Snow: Who's Been Here? by Lindsay Barrett George (winter animals and tracks)
- Winter by Gerda Muller (seasonal observation and change)