

Photo Description



This image shows snow falling from the sky onto a brick building surrounded by ivy-covered walls and trees. White snowflakes are visible floating through the air and landing on the roof and courtyard below. Snow is frozen water that falls from clouds when it is very cold outside.

Scientific Phenomena

Anchoring Phenomenon: Snow precipitation during winter weather.

Why It's Happening:

When water evaporates from oceans, lakes, and rivers, it rises into the atmosphere as invisible water vapor. High in the sky where it is very cold, this water vapor cools and condenses into tiny water droplets that form clouds. When the temperature in the clouds is below freezing (32°F or 0°C), these water droplets freeze into ice crystals. These ice crystals stick together and grow larger, eventually becoming heavy enough to fall as snowflakes. This process is called the water cycle, and snow is one form of precipitation—water that falls from clouds to Earth.

Core Science Concepts

- * **Water Cycle:** Water moves continuously between Earth's surface and the atmosphere through evaporation, condensation, and precipitation. Snow is part of this cycle.
- * **States of Water:** Water exists in three forms—solid (ice and snow), liquid (water), and gas (water vapor). Snow is the solid form of water that falls from clouds.
- * **Temperature and Weather:** Snow only forms when it is cold enough in the clouds. Temperature affects what type of precipitation falls (rain, sleet, or snow).
- * **Observable Weather Patterns:** Precipitation is a visible weather event that changes Earth's landscape and affects living things.

Pedagogical Tip:

For Kindergarteners, focus on the direct sensory observation of snowflakes falling. Rather than diving deep into molecular structures, use language like "frozen water crystals" and anchor learning to their own experiences: "Have you felt snow on your hand? It's cold and melts into water!" Concrete, hands-on experiences will deepen understanding far more than abstract explanations at this developmental stage.

UDL Suggestions:

Representation: Provide multiple ways to observe and understand snow—use real snowflakes (if available), photos, videos, and illustrations. Some students may not have experienced snow; virtual experiences ensure all learners can engage. **Action & Expression:** Allow students to show understanding through drawing, dramatic play (pretending to be falling snowflakes), and building with "snow" (shaving cream or cotton balls). **Engagement:** Connect to student interests by reading winter stories and playing snow-themed games outdoors or in the classroom.

Zoom In / Zoom Out

Zoom In: Inside a Snowflake (Microscopic Level)

If we could shrink down and look very closely at a single snowflake with a special microscope, we would see that it is made of tiny ice crystals arranged in beautiful, geometric patterns. Each snowflake forms around a speck of dust high in the clouds. As water vapor freezes onto that dust particle, it creates six-sided ice crystals that branch and grow into unique shapes. No two snowflakes are exactly alike because they form under slightly different conditions in the cloud. When we look at a snowflake up close, we see nature's perfect geometry!

Zoom Out: Winter Weather Systems (Global/Atmospheric Level)

When we zoom out and look at the whole planet, snow is part of Earth's larger climate and weather systems. In winter, cold air masses move from the poles toward lower latitudes, bringing freezing temperatures and precipitation to many regions. Snow is one way that water from oceans and lakes returns to land as part of the water cycle. Large areas of snow and ice (called ice sheets) reflect sunlight back into space, which helps regulate Earth's temperature. Snow also provides water for plants and animals in spring when it melts, feeds rivers and lakes, and is essential to the survival of arctic animals like polar bears and arctic foxes. Understanding how snow fits into these bigger systems helps us see why winter weather matters to the whole planet.

Discussion Questions

1. What do you see falling from the sky in this picture? (Bloom's: Remember | DOK: 1)
2. Why do you think the water from clouds turned into snow instead of rain? (Bloom's: Analyze | DOK: 2)
3. What do you think happens to the snow after it lands on the roof? (Bloom's: Predict | DOK: 2)
4. How is snow different from rain? (Bloom's: Compare | DOK: 2)

Potential Student Misconceptions

Misconception 1: "Snow comes from the ground" or "Snow is made outside"

Clarification: Snow actually comes from the sky—from clouds high up in the atmosphere. It forms when water vapor (invisible air) freezes into ice crystals inside cold clouds, then falls down to Earth. Help students understand by pointing upward: "Snow is made way, way up in the clouds where it's very, very cold!"

Misconception 2: "Snow is the same as ice"

Clarification: While both are frozen water, snow and ice form differently. Snow forms in clouds from frozen water vapor and falls as fluffy crystals. Ice forms when liquid water on Earth's surface (like a puddle or pond) freezes solid. You can say: "Snow falls from clouds like frozen rain, but ice forms when water on the ground gets super cold and freezes hard."

Misconception 3: "Snow will never melt" or "Snow stays forever"

Clarification: Snow is frozen water, and when it gets warmer, snow melts back into liquid water. This is an important part of the water cycle! Encourage observation: "When spring comes and it gets warmer, watch what happens to the snow—it turns back into water and soaks into the ground or runs into rivers."

Extension Activities

1. Indoor Snow Sensory Exploration: Fill a bin with shredded white paper, cotton balls, or crushed ice to simulate snow. Let students explore the texture, temperature, and color. Ask: "Does it feel cold? Does it stick together? What happens when you hold it in your warm hand?" This gives all students a tactile experience with snow-like materials, regardless of climate.

2. Snowflake Symmetry Art: Provide white paper, markers, and scissors. Show students how to fold paper and cut shapes to create snowflake patterns. Discuss how each snowflake is unique, just like in nature. Display snowflakes on windows to create a winter scene.

3. Water Cycle in a Bag: Fill a ziplock bag with a small amount of water mixed with blue food coloring. Seal it completely and tape it to a sunny window. Over several days, students observe evaporation (water rises as vapor), condensation (droplets form on the bag), and potentially "precipitation" as droplets fall. This models the water cycle in a simple, visible way.

Cross-Curricular Ideas

Math: Snowflake Symmetry and Patterns

Use the snowflake image to explore symmetry. Have students fold paper and cut shapes to create symmetrical snowflake designs. Count the points on different snowflakes (many have six sides). Sort paper snowflakes by size or color. This connects geometry and patterning to the natural structure of real snowflakes.

ELA: Winter Weather Stories and Descriptive Language

Read aloud winter picture books like *The Snowy Day* and discuss the words authors use to describe snow (soft, cold, white, fluffy, sparkling). Have students dictate or draw their own snow stories. Create a class word wall with "snow words" and encourage students to use descriptive language when talking about winter weather.

Social Studies: How Different People Experience Winter

Discuss how people in different parts of the world experience snow differently. Some children live where it snows a lot, some live where it never snows, and some live in places with snow only sometimes. Show pictures of how people in snowy places (like Canada, Russia, or Alaska) dress, build homes, and play. Connect to cultural winter celebrations and traditions around the world.

Art: Frozen Water Sculptures and Winter Scenes

Create a winter courtyard display using the photo as inspiration. Use white paint, cotton balls, shredded paper, and glitter to create a three-dimensional winter scene on a large board. Students can paint or draw snow-covered buildings and trees, then add texture with cotton and shredded paper. Display student-made snowflakes and create a classroom "winter wonderland" that mirrors the scene in the photo.

STEM Career Connection

Meteorologist (Weather Scientist) — Average Salary: \$97,100/year

A meteorologist is a scientist who studies weather and helps us understand what the sky will do. Meteorologists watch clouds, measure temperature, and predict whether it will rain or snow. They use special tools and computers to look at weather patterns and tell people what to expect. If you like watching clouds, predicting rain, and understanding why snow falls, you might become a meteorologist! They help keep communities safe by warning people about dangerous weather.

Hydrologist (Water Cycle Scientist) — Average Salary: \$85,600/year

A hydrologist is a scientist who studies water on Earth—where it comes from, where it goes, and how it moves. They study snow, ice, rain, rivers, and groundwater to understand the water cycle. Hydrologists help communities get clean drinking water and protect rivers and lakes. If you love learning about water and how it moves around our planet, a hydrology career might be perfect for you! They help keep Earth's water clean and healthy for all living things.

Climate Scientist — Average Salary: \$106,000/year

A climate scientist studies long-term weather patterns and how Earth's climate changes over time. They look at snow, ice, temperature, and precipitation data to understand how our planet is changing. Climate scientists use computers and visit places around the world to collect information about snow, glaciers, and weather. They help us understand how Earth is changing and how we can take care of our planet. If you're curious about big questions like "Why is winter different now than before?" you might become a climate scientist!

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 (including types of precipitation and seasonal patterns)
- K-PS1.A Properties of matter (water exists as solid, liquid, and gas)

Crosscutting Concepts:

- Patterns (Weather patterns change with seasons)
- Cause and Effect (Cold temperature causes water to freeze into snow)

Science Vocabulary

- * Precipitation: Water that falls from clouds to Earth in the form of rain, snow, sleet, or hail.
- * Snowflake: A tiny crystal of frozen water that falls from clouds; each snowflake has a different shape.
- * Freezing: When a liquid (like water) becomes so cold that it turns into a solid (like ice or snow).
- * Cloud: A white, fluffy shape in the sky made of tiny water droplets or ice crystals floating together.
- * Water Cycle: The continuous movement of water from Earth's surface to the sky and back down again.

External Resources

Children's Books:

- Snowflakes by Loretta Holland (features beautiful snowflake photography and simple text)
- Snow by Manya Stojic (celebrates snow across different habitats and cultures)
- The Snowy Day by Ezra Jack Keats (classic tale of a child playing in fresh snow)

Teacher Note: Kindergarteners learn best through direct observation and play. If your region experiences snow, take students outside to observe snowflakes, listen to the sounds of snow, and feel the cold. If you're in a warm climate, use virtual videos and hands-on indoor simulations to make this phenomenon accessible and meaningful.