

Photo Description



This image shows snow falling on a brick building surrounded by ivy-covered walls and trees. You can see white snowflakes falling from the sky and covering the roof, courtyard, and ground. Snow is frozen water that falls from clouds when it is very cold outside.

Scientific Phenomena

Anchoring Phenomenon: Snowfall (precipitation in frozen form)

Why It Happens: Water on Earth's surface evaporates and rises into the atmosphere as water vapor. When this vapor reaches cold air high in the sky, it condenses into tiny water droplets that form clouds. If the temperature inside the cloud stays below 32°F (0°C), these droplets freeze into ice crystals. Many ice crystals stick together to form snowflakes, which become heavy enough to fall to the ground as snow. This is part of the water cycle—water continuously moves between Earth's surface and the atmosphere.

Core Science Concepts

- * **Water Cycle:** Water moves from Earth's surface (oceans, lakes, rivers) into the air as invisible water vapor, forms clouds, and returns to Earth as precipitation (rain or snow).
- * **Temperature and States of Matter:** Water can be a liquid (rain), solid (snow, ice), or gas (water vapor). Temperature determines which state water is in. When it's cold enough (below freezing), water becomes ice and snow.
- * **Precipitation:** This is any form of water that falls from clouds to Earth's surface, including rain, snow, sleet, and hail. Snow is precipitation that forms when it is cold in the clouds and cold at ground level.
- * **Weather Patterns:** Snow is a seasonal weather event that occurs in winter when temperatures drop. Different places experience snow at different times or not at all, depending on their climate.

Pedagogical Tip:

Use the "predict-observe-explain" strategy with this image. Before showing it, ask students to predict what happens to water in winter. Show the photo and have them observe the snow. Then explain the water cycle together. This builds scientific thinking skills and helps students connect prior knowledge to new phenomena.

UDL Suggestions:

Provide multiple means of representation: Show the image alongside a simple illustrated water cycle diagram. Use physical models (like cotton balls for snow, a spray bottle for rain) so kinesthetic learners can engage. For students who need language support, pre-teach vocabulary with picture cards. Allow students to express understanding through drawing, speaking, or writing.

Zoom In / Zoom Out

Zoom In (Microscopic Level):

Inside each snowflake, water molecules are arranged in a special pattern that creates the beautiful six-sided shape we see. These molecules are so tiny that billions of them fit into one snowflake! When water vapor freezes high in the sky, the molecules slow down and lock together in this geometric pattern. That's why every snowflake has a unique six-sided design—the molecules arrange differently depending on the temperature and humidity in the cloud.

Zoom Out (Planetary System):

Snowfall is part of Earth's larger climate system. When snow covers the ground, it reflects sunlight back into space, which helps keep our planet cool. Snow also stores water as ice until spring, when it melts and feeds rivers, streams, and underground water supplies that people, plants, and animals depend on. In mountainous regions, winter snow provides water for entire communities throughout the year. This photo shows one small moment of snow, but it's part of the grand water cycle that connects oceans, atmosphere, land, and all living things on Earth.

Discussion Questions

1. Why do you think snow is falling here and not rain? (Bloom's: Explain | DOK: 2)
2. What do you think happens to the snow after it lands on the ground? (Bloom's: Predict | DOK: 2)
3. How is snow different from rain? How are they the same? (Bloom's: Compare/Contrast | DOK: 2)
4. If the temperature got warmer, what would happen to the snow on this building? (Bloom's: Analyze | DOK: 3)

Potential Student Misconceptions

Misconception 1: "Snow is just cold rain."

Clarification: Snow and rain are both precipitation, but they form differently. Rain forms when water droplets in warm clouds are too heavy to float and fall as liquid. Snow forms when it is so cold in the cloud that water vapor turns directly into ice crystals without becoming liquid first. Both start as water vapor, but cold temperatures make the difference—snow is frozen, rain is liquid.

Misconception 2: "Snow comes from the ground freezing."

Clarification: Snow doesn't start on the ground. It forms high up in the cold clouds in the sky. Snow is made when water vapor freezes into ice crystals inside clouds, and those crystals become heavy and fall down. The ground doesn't have to be frozen for snow to fall, though snow is more likely to stick and stay on the ground when the ground temperature is below freezing.

Misconception 3: "After snow melts, the water disappears."

Clarification: When snow melts, it becomes liquid water, but the water doesn't vanish. It soaks into the soil, runs into streams and rivers, or evaporates back into the air as water vapor. That water will eventually travel back up into clouds and may fall as snow or rain again. Water is always cycling through Earth—it's never truly "gone."

Extension Activities

1. Snow Observation Chart: Take students outside (if snow is present) or use this photo to observe and record snow for one week. Have them draw and write about what they notice: Is there more or less snow? Did the snow change color? Did puddles form? This builds observational skills and connects to weather patterns.

2. Make a Water Cycle in a Bag: Seal a small amount of water in a clear plastic bag with a marker drawing of the sun, clouds, and mountains. Tape it to a sunny window. Students observe how water "evaporates" (rises to the top of the bag as condensation) and "precipitates" (drips down). This hands-on model makes the water cycle visible and concrete.

3. Comparing Frozen and Liquid Water: Provide ice cubes and cups of water at room temperature. Ask students to predict what will happen if they leave both in the sun for 15 minutes. Observe, measure, and record the results. Discuss why ice melts (temperature causes change of state) and connect to snow melting in spring.

Cross-Curricular Ideas

Math Connection: Create a Snow Measurement Activity. Students measure snowfall using a simple ruler or snow gauge each day for a week. Record measurements on a chart and create a bar graph showing how much snow fell each day. Discuss questions like "Which day had the most snow?" and "How much snow fell in total?" This builds measurement and data representation skills while connecting to the science phenomenon.

ELA Connection: Have students write a "Snow Day" Story or Journal Entry. Prompt them: "What did you do during a snowy day?" or "Write a story about a snowflake's journey from the cloud to the ground." Students can illustrate their writing and share with the class. This develops narrative writing while reinforcing vocabulary about the water cycle and weather.

Social Studies Connection: Explore How Different Communities Experience Winter. Use this photo as a springboard to discuss: "Do all places get snow? Who lives where it snows?" Introduce students to different climates around the world. Show photos or videos of communities that experience heavy snow (Canada, Russia) versus places that rarely see snow (tropical regions). Discuss how people adapt their homes, clothing, and activities to snowy weather.

Art Connection: Create Snowflake Art Projects. Students can fold and cut white paper to make symmetrical snowflake designs, learning about the six-sided geometry of real snowflakes. Alternatively, have them paint or draw snowfall scenes inspired by the photo, experimenting with white paint on blue or gray backgrounds. Display artwork around the classroom to create a winter-themed learning environment.

STEM Career Connection

Meteorologist (Weather Scientist)

Meteorologists study weather and climate. They watch the sky, use special tools to measure temperature and precipitation, and predict whether it will rain, snow, or be sunny. Some meteorologists give weather forecasts on TV, while others study climate change or severe storms. They help keep people safe by warning them about dangerous weather like heavy snowstorms.

Average Annual Salary: \$95,000–\$105,000 USD

Hydrologist (Water Scientist)

Hydrologists study water on Earth—where it comes from, where it goes, and how we can use it safely. They track snowfall in mountains to understand how much water will flow into rivers during spring melt. They also work to protect clean water for drinking and farming. Hydrologists use science to solve important water problems in communities.

Average Annual Salary: \$85,000–\$100,000 USD

Climate Scientist

Climate scientists study long-term weather patterns and how Earth's climate changes over years and decades. They investigate how snow and ice affect global temperatures and sea levels. Climate scientists use computers to model and predict future climate patterns, helping governments and communities prepare for weather changes and protect our planet.

Average Annual Salary: \$90,000–\$110,000 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 (water) are constantly changing through fast and slow processes.
- 2-ESS2.A: Water is found in many places on Earth and can be solid or liquid.

Crosscutting Concepts:

- Patterns: Weather patterns change seasonally; snow occurs in winter in many places.
- Cause and Effect: Cold temperatures cause water to freeze and fall as snow.

Science Vocabulary

- * Precipitation: Water that falls from clouds to Earth, such as rain, snow, sleet, or hail.
- * Snow: Frozen water crystals that form in cold clouds and fall to the ground as white, fluffy flakes.
- * Temperature: How hot or cold something is; when temperature drops below freezing (32°F), water freezes.
- * Water Cycle: The continuous movement of water from Earth's surface into the air and back down again.
- * Evaporation: When liquid water (like from oceans or puddles) turns into an invisible gas called water vapor and rises into the air.
- * Cloud: Tiny water droplets or ice crystals floating high in the sky that form when water vapor cools.

External Resources

Children's Books:

- Come On, Rain! by Karen Hesse (explores water and weather)
- The Snowy Day by Ezra Jack Keats (classic winter/snow picture book)
- Water by Manya Stojic (simple water cycle story with illustrations)