

Photo Description



This image shows snow falling on a brick building surrounded by ivy-covered trees and walls during winter weather. The white snowflakes are visible falling through the air, covering the rooftop and ground below. This scene demonstrates how water falls from clouds to Earth's surface during cold winter months.

Scientific Phenomena

Anchoring Phenomenon: Snowfall during winter weather conditions

Why It's Happening:

Snow forms when water vapor in clouds condenses into ice crystals instead of liquid water droplets. This happens when the air temperature is below 32°F (0°C). As these ice crystals grow heavier in the clouds, they eventually become too heavy to float and fall to the ground as snow. The cold temperatures near the ground keep the snow frozen as it falls, so it reaches Earth as solid precipitation rather than rain.

Core Science Concepts

- * The Water Cycle: Water evaporates from oceans, lakes, and rivers; forms clouds; and returns to Earth as precipitation (rain or snow) before cycling again.
- * States of Matter: Water exists in three states—solid (ice/snow), liquid (water), and gas (water vapor)—and changes between states depending on temperature.
- * Weather Patterns and Seasons: Winter temperatures are cold enough for water to freeze, causing snow instead of rain; seasonal temperature changes affect what type of precipitation falls.
- * Cloud Formation: Water vapor rises, cools in the atmosphere, and condenses around tiny particles to form visible clouds where precipitation develops.

Pedagogical Tip:

Avoid the common misconception that it must be "snowing" for snow to fall—clarify that snow forms in clouds where temperatures are below freezing, even if the ground is warmer. Use a thermometer to show students what 32°F actually feels like, making the concept more concrete.

UDL Suggestions:

Provide multiple means of representation by showing this image alongside a cross-section diagram of cloud formation and the water cycle. Allow students to express their learning through drawing, writing, or verbal explanations. Create a anchor chart with pictures and simple labels that remains visible throughout the unit for reference.

Discussion Questions

- * What do you observe happening in this picture, and what questions does it make you wonder about? (Bloom's: Understand | DOK: 1)
- * Why do you think snow falls in winter but rain falls in spring, even though both come from clouds? (Bloom's: Explain | DOK: 2)
- * If you traced a snowflake backward through the water cycle, where would it have come from before it fell as snow? (Bloom's: Analyze | DOK: 2)
- * How might this snowy landscape change over the next few days or weeks, and what causes those changes? (Bloom's: Evaluate | DOK: 3)

Extension Activities

1. Snow Observation Journal: Have students look outside during or after snow and draw detailed sketches of snowflakes, frost patterns, or snow-covered objects. Ask them to write 3-5 observations about how snow looks, feels (without touching), or changes throughout the day. This develops observational skills and connects to scientific illustration.
2. Water Cycle in a Bag: Create a sealed plastic bag water cycle model by drawing the water cycle stages on a gallon-sized ziplock bag, filling it partially with water mixed with blue food coloring, sealing it completely, and taping it to a sunny window. Students predict and observe evaporation, condensation on the bag, and "precipitation" as water droplets form and "rain" down. This demonstrates the continuous cycle students saw in the snowy scene.
3. Temperature and State Change Experiment: Provide crushed ice, salt, thermometers, and water in cups. Students create a freezing mixture, measure temperature changes, and observe how adding salt lowers the freezing point. They compare this to how atmospheric conditions change states of water, connecting their model to real snow formation in clouds.

NGSS Connections

Performance Expectation: 5-ESS2-1. Develop a model to describe that the atmosphere is made of a thin layer of gases surrounding the Earth, and that wind and water (including ice, snow, and rain) are pulled around the Earth by the sun's energy and the force of Earth's rotation.

Disciplinary Core Ideas:

- 5-ESS2.A Earth's Materials and Systems - The atmosphere is composed of a thin layer of gases and is made of many different gases.
- 5-ESS3.C Human Impacts on Earth Systems - Scientists study weather patterns to predict future conditions.

Crosscutting Concepts:

- Patterns - Weather patterns change seasonally and predictably; precipitation patterns vary by location and season.
- Energy and Matter - Water changes states as energy is added or removed from the system.

Science Vocabulary

- * Precipitation: Water that falls from clouds to Earth's surface in the form of rain, snow, sleet, or hail.
- * Condensation: The process where water vapor in the air cools down and turns into liquid water droplets, which form clouds.

- * Evaporation: The process where liquid water from oceans, lakes, and rivers turns into invisible water vapor gas that rises into the atmosphere.
- * Freezing: The process where liquid water turns into solid ice when the temperature drops below 32°F (0°C).
- * Weather: The conditions in the atmosphere at a particular place and time, including temperature, precipitation, wind, and clouds.
- * Season: One of four time periods in a year (spring, summer, fall, winter) that has typical weather patterns and temperature ranges.

External Resources

Children's Books:

- Snow by Manya Stojic (explores snow in different environments and ecosystems)
- The Snowflake: A Water Cycle Story by Ron Fridell and illustrated by Jeannie Winston Colbert (traces a snowflake through the water cycle)
- Come On, Rain! by Karen Hesse (poetic exploration of weather and precipitation)

YouTube Videos:

- "The Water Cycle" by Crash Course Kids – A clear, engaging 4-minute explanation of evaporation, condensation, and precipitation with age-appropriate visuals. <https://www.youtube.com/watch?v=toBZJVx-nFQ>
- "How Snow Forms" by National Geographic Kids – A 3-minute video showing how temperature and water vapor create snow in clouds, with stunning real footage. <https://www.youtube.com/watch?v=O6xVH0aBJRs>