Water Cycle

Earth & Space Science | Lesson Guide

Kindergarten

Photo Description

This picture shows a bright yellow flower covered in white snow. The flower's green leaves and stems are also covered with snow and ice crystals. Even though flowers usually bloom in warm weather, snow can still fall on them in early spring, creating this beautiful, frosty scene.

Scientific Phenomena

Anchoring Phenomenon: An unexpected late-season snowfall coating spring flowers and buds.

Why This Is Happening (Scientific Explanation for Teachers):
This image captures a common occurrence in temperate climates: a late spring frost or snow event. As air masses shift and cold air moves into regions experiencing early warming, temperatures can drop below freezing after plants have begun their growth cycle. The visible frost and snow represent water vapor in the atmosphere that has condensed and frozen directly onto plant surfaces. This demonstrates the water cycle in action—water changes states from gas (vapor) to solid (ice/frost) without passing through liquid form, a process called deposition. The contrast between the warm-season flower and cold weather illustrates how climate conditions can shift rapidly and how resilient plants must be.

Core Science Concepts

1. States of Water: Water exists in three states—solid (ice, snow), liquid (water), and gas (water vapor). In this image, we see water as both solid (snow and frost) and the plant contains liquid water.

2. Temperature and Change: When air temperature drops below 32°F (0°C), water freezes into ice and snow. The frost covering the plants shows what happens when water vapor freezes in cold air.

3. The Water Cycle: Water moves from Earth's surface into the air (evaporation), forms clouds (condensation), and falls back to Earth as precipitation (snow, rain). This flower scene shows the "precipitation" stage.

4. Seasons and Weather Patterns: Spring weather can be unpredictable. Plants may bloom early, but late freezes can still occur, showing that seasons overlap and weather changes.

Pedagogical Tip:

For Kindergarteners, avoid technical terms like "deposition" and "condensation" in direct instruction. Instead, use sensory language: "The water in the air turned into tiny ice crystals and stuck to the flower—just like when your breath makes fog on a cold window!" This makes the abstract concept concrete and relatable to their lived experiences.

UDL Suggestions:

Multiple Means of Representation: Provide students with three different images showing the same phenomenon—one close-up of frost crystals, one of snow falling, and one of the flower before snow. This scaffolds understanding through visual comparison. Multiple Means of Action & Expression: Allow students to show their understanding through drawing, acting out snowfall, or building a model with cotton balls rather than only verbal explanation. Multiple Means of Engagement: Connect to students' own experiences: "Have you ever seen snow on flowers?" and "What did it feel like?" This personalizes the science.

Discussion Questions

1. "What do you see covering the flower?" (Bloom's: Remember | DOK: 1)
   This activates prior knowledge and encourages observation skills.

2. "Why do you think snow is on top of the flower instead of on the ground?" (Bloom's: Analyze | DOK: 2)
   This pushes students to think about cause and effect—snow falls from the sky and lands on anything below it.

3. "If we brought this flower inside where it's warm, what do you think would happen to the snow?" (Bloom's: Predict | DOK: 2)
   This encourages prediction based on prior knowledge of melting and temperature.

4. "Can you think of other times you've seen water change—like ice melting or puddles disappearing?" (Bloom's: Connect/ Evaluate | DOK: 3)
   This helps students transfer understanding to other contexts and recognize the water cycle in everyday life.

Extension Activities

1. Frost Crystal Observation Walk: On a cold morning, take students outside to observe frost on grass, leaves, or windows (if available). Provide magnifying glasses so they can see the delicate crystal patterns. Ask: "What shapes do you see? What made these crystals?" Return inside to draw or paint frost patterns.

2. Melting Snow Science: Collect clean snow (if available) or use shaved ice in a clear container. Bring it indoors and have students predict what will happen. Observe as it melts and turns to water. Discuss: "Where did the snow go? Is the water cold or warm?" This directly demonstrates the water cycle's phase changes.

3. Flower and Ice Sensory Play: Place fresh flower petals or plastic flowers in water in shallow containers. Freeze overnight (or use ice from a freezer). Set up a discovery station where students can gently touch the ice, observe the flowers inside, and describe what they see and feel. This builds tactile understanding of freezing water around objects.

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) – "Weather is the combination of sunlight, wind, snow or rain, and temperature in a particular place and time."

Crosscutting Concepts:
- Patterns – Students observe patterns in weather and seasonal changes
- Cause and Effect – Cold temperatures cause water to freeze and change form

Science Vocabulary

* Snow: Frozen water that falls from clouds when it is very cold.
* Frost: Tiny ice crystals that form on plants and ground when it gets very cold at night.
* Freeze: When a liquid like water turns hard and solid because it gets very cold.
* Water cycle: The way water moves from Earth to the sky and back again.
* Melt: When ice or snow turns into liquid water because it gets warm.

* Season: A time of year with its own weather, like spring, summer, fall, or winter.

External Resources

Children's Books:
- Snowflakes Fall by Loretta Holland (simple, rhythmic text about snowfall)
- Come On, Rain! by Karen Hesse (explores weather changes and water)
- The Snowy Day by Ezra Jack Keats (classic exploration of snow and seasons)

YouTube Videos:
- "The Water Cycle Song for Kids" by Have Fun Teaching – A simple, catchy song that explains evaporation, condensation, and precipitation. https://www.youtube.com/watch?v=vzUaHZjmegyU
- "What is Snow?" by National Geographic Kids – A 4-minute video showing how snow forms in clouds and falls to Earth. https://www.youtube.com/watch?v=qnDYftSDqfU

Teacher Tip: This image is perfect for a lesson in early spring (late February–March) when unexpected snow or freezes are most likely. Use real observations if your region experiences this phenomenon, or use this photo as an anchor to discuss "What happens when cold and warm seasons mix?"