

## Photo Description



This image shows a bright yellow daffodil flower covered with fresh snow, surrounded by green stems and buds that are also dusted with white snow. A wooden fence appears blurred in the background. The photo captures a moment when winter weather returns unexpectedly during early spring when plants are beginning to grow and bloom.

## Scientific Phenomena

**Anchoring Phenomenon:** Late spring snow or frost occurring during the blooming season.

**Why This Happens (Scientific Explanation):** During spring, warm air masses can be followed by cold air moving in from polar regions, causing temperatures to drop suddenly below freezing. When water vapor in the air condenses and freezes on surfaces below 32°F (0°C), it forms frost or snow. Plants like daffodils bloom based on day length and temperature patterns, so they may flower before all freezing weather has ended. This creates the striking contrast visible in the photo—a delicate flower adapted to warmer conditions suddenly exposed to winter conditions again.

## Core Science Concepts

- \* **Temperature and States of Matter:** Water changes from a gas (invisible water vapor) to a solid (snow and ice) when temperatures drop below 32°F. This demonstrates how the same substance can exist in different forms depending on temperature.
- \* **Seasonal Weather Patterns:** Spring weather is unpredictable and can include freezing temperatures even after warmer days have triggered plant growth. Weather patterns vary year to year, which is different from climate (long-term average weather).
- \* **Plant Adaptation and Life Cycles:** Plants have adapted to survive cold snaps during their growing season. Many spring bulbs can tolerate frost and continue blooming because they evolved in regions with variable spring weather.
- \* **The Water Cycle Connection:** The snow visible on the flower is part of the water cycle—water evaporates, rises into the atmosphere, condenses into clouds, and precipitates as snow or rain based on atmospheric conditions.

### Pedagogical Tip:

Use this image as a "hook" at the start of a lesson on weather variability. Ask students to predict: "Could this flower survive? What might happen to it?" This activates prior knowledge and creates cognitive dissonance (surprise) that motivates deeper learning about temperature, plant survival, and seasonal weather patterns.

### UDL Suggestions:

Provide multiple means of representation by offering a photo gallery of plants in snow from different regions and seasons. Allow students to choose one plant to research and present findings using their preferred modality (written, drawn, spoken, or video). This addresses visual learners while providing choice and engagement pathways.

### Discussion Questions

1. Why do you think snow is still falling in spring when flowers are blooming? (Bloom's: Understand | DOK: 1)
2. What do you predict will happen to this daffodil flower when the temperature rises again? Explain your thinking. (Bloom's: Predict/Analyze | DOK: 2)
3. How is the water that makes snow connected to the water in rain or the water you drink? (Bloom's: Analyze | DOK: 2)
4. If this happens every spring in this location, how might plants evolve or adapt over many years to survive late snow? (Bloom's: Evaluate | DOK: 3)

### Extension Activities

1. "Plant Survival Challenge" Investigation: Provide groups with small potted seedlings or live flowers (like the daffodil in the photo). Place some in a freezer for short periods (supervised) and others at room temperature. Have students observe and record daily changes, measuring growth and documenting any wilting or damage. Discuss why some plants survive and others don't based on their adaptations.
2. Water Cycle in a Bag: Create a sealed plastic bag "water cycle" by adding water, a plant cutting, and sealing it completely. Place it in a sunny window. Students observe condensation forming on the sides (evaporation and condensation) and can relate this to how water becomes snow in the atmosphere. Keep observations for 2-3 weeks with photos and labeled diagrams.
3. Spring Weather Data Collection: Have students track local temperature and precipitation daily for 2-3 weeks during actual spring. Plot data on a graph showing the pattern of warm and cold days. Compare their data to historical spring weather patterns for your region (available from weather services). Discuss: "Is this year typical? When is the last frost date in our area?"

### NGSS Connections

Performance Expectation:

4-ESS2-1: Make observations and measurements to describe patterns of Earth's features. Compare multiple solutions designed to slow or prevent wind or water from changing the shape of land.

Disciplinary Core Ideas:

- 4-ESS2.A - Earth Materials and Systems
- 3-PS0.A - Energy (temperature and heat)

Crosscutting Concepts:

- Patterns - Weather patterns vary seasonally and can be unpredictable
- Stability and Change - Plants experience stability through adaptation but also respond to environmental change

### Science Vocabulary

- \* Precipitation: Water that falls from clouds to Earth's surface in the form of rain, snow, sleet, or hail.
- \* Temperature: A measurement of how hot or cold something is, usually measured in degrees Fahrenheit or Celsius.
- \* Bloom/Blooming: When a flower opens and displays its petals; the flowering stage of a plant's life cycle.
- \* Frost: A thin layer of ice crystals that forms on surfaces when temperature drops below 32°F.

- \* Water Vapor: Water in the form of an invisible gas floating in the air.
- \* Season: One of the four main periods of the year (spring, summer, fall, winter) with different weather patterns and daylight hours.

### External Resources

#### Children's Books:

- Come On, Rain! by Karen Hesse (explores water cycle and seasonal weather)
- The Reason for a Flower by Ruth Heller (plant life cycles and adaptation)
- Snow by Cynthia Rylant (seasonal weather and observation)

#### YouTube Videos:

- "The Water Cycle" - Crash Course Kids (3:17 minutes)  
A clear, animated explanation of evaporation, condensation, and precipitation appropriate for upper elementary.  
[https://www.youtube.com/watch?v=OW\\_Cm-ZdL30](https://www.youtube.com/watch?v=OW_Cm-ZdL30)
- "Spring Flowers and Frost - A Nature's Best Photography Story" (4:22 minutes)  
Real footage of spring plants responding to late frost, with narration explaining why this happens seasonally.  
<https://www.youtube.com/watch?v=FrOFTQQjMi4>

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Implementation Tip: This lesson works best in spring (March–May) when students can potentially observe this phenomenon firsthand or connect it to local weather events. If teaching outside spring months, use the photo as a case study and connect to your region's actual seasonal patterns.