Seasons

Earth & Space Science | Lesson Guide

2nd Grade

Photo Description

Snow covers an old wagon and evergreen trees on a cold winter day. The white snow sits thick on top of the wagon's roof and wheels. Everything looks quiet and still in this snowy scene.

Scientific Phenomena

This image represents the Anchoring Phenomenon of seasonal weather changes and precipitation in the form of snow. Snow forms when water vapor in clouds freezes into ice crystals at temperatures below 32°F (0°C). These ice crystals stick together and fall to the ground as snowflakes. The accumulation we see demonstrates how precipitation can transform landscapes and affect objects in our environment during winter months.

Core Science Concepts

1. States of Matter: Snow is water in its solid state, showing how the same substance (water) can exist in different forms depending on temperature.

2. Weather Patterns: Seasonal changes bring different types of precipitation, with snow occurring during colder months when temperatures drop below freezing.

3. Temperature Effects: Cold air temperatures cause water to freeze and remain frozen, allowing snow to accumulate and stay on surfaces.

4. Seasonal Changes: Winter brings observable changes to our environment, including snow cover that affects how landscapes look and how objects appear.

Pedagogical Tip:

Use concrete, hands-on experiences like bringing snow inside to observe melting, or freezing water in different containers to help students understand state changes.

UDL Suggestions:

Provide multiple ways for students to document observations through drawings, photos, verbal descriptions, or simple charts to accommodate different learning preferences and abilities.

Zoom In / Zoom Out

1. Zoom In: Each snowflake is made of tiny ice crystals that form unique patterns. Water molecules slow down and stick together when it gets very cold, creating the solid ice we see as snow.

2. Zoom Out: This snowy scene is part of Earth's water cycle, where water moves between oceans, clouds, and land. The snow will eventually melt and flow back to rivers and oceans, continuing the endless cycle.

Discussion Questions

1. What do you think will happen to this snow when spring comes? (Bloom's: Predict | DOK: 2)
2. How do you think the wagon would look different in summer compared to winter? (Bloom's: Compare | DOK: 2)
3. Why do you think the snow stays on top of things instead of falling through them? (Bloom's: Analyze | DOK: 3)
4. What other changes do you notice in your neighborhood during winter? (Bloom's: Observe | DOK: 1)

Potential Student Misconceptions

1. Misconception: Snow only happens when it's very, very cold outside.
   Clarification: Snow can form and fall at temperatures just below freezing (32°F), and we can have snow even when it doesn't feel extremely cold.

2. Misconception: Snow and ice are different things entirely.
   Clarification: Snow is made of ice crystals - it's the same substance (frozen water) just in a different form.

3. Misconception: Snow falls because clouds are too heavy.
   Clarification: Snow forms when water vapor in clouds freezes into crystals that become heavy enough to fall due to gravity.

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: K-ESS2.D Weather and Climate
- Crosscutting Concepts: Patterns - Students observe patterns of seasonal weather changes

Science Vocabulary

* Snow: Frozen water that falls from clouds as white flakes or crystals.
* Temperature: How hot or cold something is, measured with a thermometer.
* Freezing: When liquid water gets so cold it turns into solid ice.
* Precipitation: Water that falls from the sky as rain, snow, sleet, or hail.
* Seasonal: Things that happen during certain times of the year like spring, summer, fall, or winter.

External Resources

Children's Books:
- The Snowy Day by Ezra Jack Keats
- Snow is Falling by Franklyn Branley
- The Story of Snow by Mark Cassino

YouTube Videos:
- "How Does Snow Form? | Weather Science for Kids" - Simple explanation of snow formation with animations perfect for young learners: https://www.youtube.com/watch?v=fzhqVUvmhWc

- "Seasons for Kids | What Causes Seasons?" - Educational video explaining how seasons change and affect weather: https://www.youtube.com/watch?v=KUU7IyfR34o