Seasons

Earth & Space Science | Lesson Guide

1st Grade

Photo Description

This picture shows a wagon covered with white snow. The wagon sits in a snowy yard with trees that also have snow on them. Everything looks white and cold because it is winter.

Scientific Phenomena

The anchoring phenomenon here is precipitation in the form of snow and its accumulation on surfaces. Snow forms when water vapor in clouds freezes into ice crystals at temperatures below 32°F (0°C). These crystals fall to Earth and accumulate on objects like the wagon, trees, and ground. The snow creates insulation, which is why it builds up in thick layers on surfaces rather than immediately melting.

Core Science Concepts

1. States of Matter: Water exists in three forms - liquid (rain), solid (snow/ice), and gas (water vapor in clouds)

2. Weather Patterns: Snow is a type of precipitation that occurs when air temperature is below freezing

3. Seasonal Changes: Winter brings colder temperatures that allow snow to form and stay on the ground

4. Insulation Properties: Snow acts as a blanket that can protect plants and objects underneath from even colder air temperatures

> **Pedagogical Tip:**
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> Use concrete objects in your classroom (ice cubes, water, steam from hot water) to help first graders physically observe the three states of matter before discussing snow formation.

> **UDL Suggestions:**
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> Provide multiple ways for students to express their understanding by having them draw, act out, or use body movements to show how water changes from liquid to solid when it gets cold enough.

Zoom In / Zoom Out

1. Zoom In: Each snowflake is made of tiny ice crystals that form unique patterns. Under a magnifying glass, students could see that no two snowflakes look exactly the same because they form under slightly different conditions in the clouds.

2. Zoom Out: This snowy scene is part of the larger water cycle where water evaporates from oceans and lakes, forms clouds, and falls back down as precipitation (rain or snow) depending on temperature.

Discussion Questions

1. What do you think happened to make everything in this picture white? (Bloom's: Analyze | DOK: 2)
2. How do you think the snow got on top of the wagon? (Bloom's: Apply | DOK: 2)
3. What would happen to this snow if the temperature got warmer? (Bloom's: Evaluate | DOK: 3)
4. What other things have you seen that are covered with snow? (Bloom's: Remember | DOK: 1)

Potential Student Misconceptions

1. Misconception: "Snow is not made of water"
   Clarification: Snow is frozen water that forms when water vapor in clouds gets cold enough to freeze into ice crystals.

2. Misconception: "It has to be very, very cold for snow"
   Clarification: Snow can fall when air temperature is at or below 32°F (0°C), which is the same temperature where water freezes.

3. Misconception: "Snow and ice are different things"
   Clarification: Snow is made of ice crystals, so snow IS a form of ice, just in smaller crystal pieces.

Cross-Curricular Ideas

1. Math - Measurement & Graphing: Have students measure the depth of snow in different locations around your school (on the playground, near trees, on open ground). Create a simple bar graph showing where snow is deepest. This connects to measuring length and comparing quantities.

2. ELA - Winter Stories & Descriptive Writing: Read "The Snowy Day" together, then have students draw pictures of snowy scenes and use winter vocabulary words (cold, white, frozen, sparkly) to label their pictures. Students can dictate or write simple sentences about what they see.

3. Art - Texture & Color Exploration: Create snow-covered wagon art using white paint, cotton balls, or shaving cream on dark paper. Students can explore different textures and practice fine motor skills while representing how snow looks and feels.

4. Social Studies - Seasonal Changes & How People Adapt: Discuss how people dress differently in winter and what activities they do in snow. Connect to community helpers like snow plow drivers and how communities prepare for winter weather.

STEM Career Connection

1. Meteorologist (Weather Scientist): A meteorologist studies weather and helps predict if it will snow or rain. They use special tools to measure temperature and look at clouds in the sky. They help people know what to wear and keep them safe during storms. Average Annual Salary: $97,000

2. Snow Plow Driver: A snow plow driver operates big trucks that clear snow off roads so cars can safely travel. They work during winter storms to push snow to the sides of roads. This job is important for keeping our communities safe when it snows. Average Annual Salary: $45,000

3. Climate Scientist: A climate scientist studies patterns of weather and temperature over many years to understand how Earth's climate changes. They look at snow, ice, and weather data to learn about our planet. Their work helps us understand why winters are different from year to year. Average Annual Salary: $104,000

NGSS Connections

- Performance Expectation: K-ESS2-1: Use and share observations of local weather conditions to describe patterns over time
- Disciplinary Core Idea: K-ESS2.D - Weather and Climate
- Crosscutting Concept: Patterns

Science Vocabulary

* Snow: Frozen water that falls from clouds as white flakes
* Temperature: How hot or cold something is
* Freezing: When water gets cold enough to turn into ice
* Precipitation: Water that falls from the sky as rain, snow, or hail
* Winter: The coldest season of the year when snow often falls
* Accumulation: When snow piles up and gets deeper over time

External Resources

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