Weather

Grades 2-4 Subjects: Science & Math Updated in 2024

On Snowy Days

Overview

Here are two lessons perfect for snowy school days! In each lesson the class reads about snow and snowflakes and then ventures outdoors to investigate. Each lesson is quick and easily accomplished and allows students to enjoy the snowy gifts of a Minnesota winter, while addressing multiple academic standards.

Background

To measure the snow depth, select a level area away from buildings, vegetation and other objects that might cause drifting or an unusual area of snow. Have students help select the best sites to take measurements.

Monthly normals for precipitation are listed in the *calendar* below the large monthly photograph. For those months when snowfall is possible, the calendar lists snowfall amounts. Monthly normals are averages that are calculated for a 30-year period. (Daily record snowfall amounts can be found on each date on the calendar.)

The Activity

Warm Up

1. Read the book *The Story of Snow: The Science of Winter's Wonder*.
2. Discuss the book, focusing on snow as a form of precipitation.
3. As a class, brainstorm facts about snow and winter. Record in journals, on chart paper or board.

The Activity

1. Using the Minnesota Weatherguide Environment™ Calendar, show the "Monthly Normals" at the top of each month.
2. Refer to the precipitation, in the form of snowfall. These can be found for January, February, March, April, October, November, and December.
3. Record each number (written as a decimal) on chart paper. Have students record the numbers on graph paper.
3. Using a calculator, have students add all numbers together to determine the total Normal snowfall for the season. Have students display data on a graph.

*The data is representative of normal snowfall for the Twin Cities metro area. If you live in or near another city in a different region in Minnesota that has records available for you, you may use or reference those as comparisons to those found in the *Minnesota Weatherguide Environment™ Calendar.*

Wrap Up & Assessment

Now, review how to use the meter/yard stick as a measuring tool, don coats, bring journals and head outside to measure the depth of snow on the schoolyard. These measurements and the graphs serve as embedded

Time:

1 hr./lesson

Skills:

Listening
Discussing
Describing
Data Collecting
Measuring
Drawing Conclusions

Vocabulary:

snowflake
symmetry
precipitation
monthly normals
states of matter

Materials Needed:

Lesson #1
· Book: *The Story of Snow*
· Calculators
· Meter/Yard Sticks (1 per team of students)
· Journals/Graph paper
· *Minnesota Weatherguide Environment™ Calendar*

Lesson #2
· Book: *Snowflake Bentley*
· Black paper/1 per team of students

assessments and help students respond to the following questions.

Questions

Which month is usually the snowiest?

How much snow fell today?

How much snow do you think we will have tomorrow?

Lesson # 2 Savor the Snowflake

Overview

After reading the book, *Snowflake Bentley*, students will discuss snowflakes and how they develop. Then they will venture outside to observe and collect snowflakes.

Background

Snowflakes are hexagonal (six-sided) crystals of water. The feathery shapes are complicated and their form is influenced by temperature, and perhaps also by how rapidly they are formed. Large snowflakes are formed by the combination of many small crystals. These large flakes usually form at temperatures just below 32°F, the freezing point of water.

Sleet is another form of precipitation where clear particles of ice form from raindrops that freeze before they reach the ground. They will not have 6-sided crystals. Water is the only common substance on Earth that you can find in all three states of matter. (Perhaps, a picture in the calendar will have a scene of lake water with clouds, or mist rising and snow on the shore.)

A sheet of black construction paper can be used to catch and observe snowflakes. To keep crystals from melting quickly, place the paper outdoors or in a freezer before going out to observe the snow.

The Action

1. Read the book *Snowflake Bentley* by Jacqueline Briggs Martin. Be sure to read the facts in the margins of the pages.
2. Discuss the book. Ask the students how they could observe snowflakes.
3. Go outside as snow falls and "catch" snowflakes using a black piece of paper. Make observations with the magnifiers and sketch what they see.
4. Watch the frozen crystals melt to form liquid water when they land on warm surfaces.
5. Don't forget to look up at the clouds in the sky, from which the snowflakes come. Depending on the temperatures the clouds may contain liquid or frozen water.

Wrap Up & Assessment

Discuss the frozen and liquid states of water that students were able to observe.

Questions

· What are snowflakes?

· Where do snowflakes come from?

· How do snowflakes change over time? Sketch the above snowflake on the board. Ask students to compare this flake with the real snowflakes they observed. What is wrong with the drawing? (Students should notice that this snowflake drawing is incorrect because it has 8 points.)

· Snowflake Bentley said, "Of all the forms of water, the tiny six-pointed crystals of ice called snow, that form in such quantities within the clouds during storms, are incomparably the most beautiful and varied." What do the students think of this statement?

Resources

Snowflake Bentley by J.B. Martin

The Story of Snow: The Science of Winter's Wonder by M. Casino and J. Nelson

National Weather Service

online: http://www.weather.gov/climate/index.php?wfo=mpx

Minnesota Weatherguide Environment™ Calendar

online: https://jeffersfoundation.org/programs/calendar-in-the-classroom/

Minnesota Academic Standards

3-D Science Standards
Science Practices:
1. Ask Questions
3. Planning and Carrying Out Investigations
4. Analyzing and Interpreting Data
5. Using Mathematics and Computational Thinking
8. Obtaining, Evaluating and Communicating Information

Crosscutting Concepts:
2. Cause and Effect: mechanism and explanation
3. Scale, Proportion, and Quantity

Disciplinary Core Ideas:
ESS2: Earth's systems
- 2nd Grade: Describe weather conditions expected during a particular season
- 2nd Grade: Use multiple sources to identify where water is found on Earth
- 4th Grade: Ask questions about how water moves through the Earth system

Math Standards

Grade	Strand	Anchor Standard	Code	Benchmark
2	Data Analysis	Data Sciences: Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	2.1.1.1	Collect and use data to consider and decide what data will answer a question. Represent the data as drawings, picture graphs, dot plots…Communicate observations. (MP3, MP5)
3	Data Analysis	Data Sciences: Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	3.1.1.1 3.1.1.4	Notice and describe patterns in data-rich situations or given data sets. Ask statistical questions that can be answered with data. (MP7) Make predictions and recognize that the amount and source of the data impacts the accuracy of predictions. (MP4, MP8)
4	Data Analysis	Data Sciences: Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	4.1.1.3	Make predictions and recognize that how the data was collected impacts the reliability of predictions. (MP1, MP8)