Snowfall Activity 5

Snow Journaling

Objectives and Standards
- To practice observing winter weather, measuring and recording pertinent weather information, and comparing it to media predictions.

NSTA Standards Addressed
Content Standards
A, B, C,D, E, F, G

4-H SET Abilities Addressed
Evaluate
Measure
Use tools
Observe
Organize
Question
Summarize/Relate
Categorize/Order/Classify
Compare

Supplies Needed

- notebook and pen
- Types of Snow handout
- snowfall observation station (window, yard, etc.)
-thermometer
-1 cup measuring cup
-ruler and food scale

Background

Since long before we had weathermen forecasting and presenting weather information, communities have recorded weather data for farming and other purposes. Now that we know more about weather, rain, and snow, we can record information ourselves and compare what we know to what our local weather person has predicted. This activity has youth journal their winter weather to learn more about the variation during the season and about making scientific observations.

CoCoRaHS Extension Ideas

Maintain records of snowfall as a group for a set amount of time, like a week or a month. Keep these records for at least two separate locations (using CoCoRaHS data in your community if available, or measure it yourself). Compare and contrast the amount of snow in each location. Also compare if snow always falls in both locations, or if one location more frequently observes snowfall than another. Take a picture or observe the areas where data was collected, if possible. What geographic similarities do they have that would affect snowfall? What differences?

Activity

1. Youth make a winter weather observation journal, decorating it as they like.
2. During snowfalls, youth record the following for each entry:
    - date, time, amount of snowfall
    - temperature of air, temperature of snow pack on ground
    - kinds of snow crystals observed (see Types of Snow handout)
    - how well the snow packs into snowballs
    - weight of snow
        *scoop snow into measuring cup (do not compact snow), then use ruler to scrape off excess snow so it is even with the lip of the measuring cup
        *weigh the cup on scale with and without snow in the cup.

Discussion

Discuss observations with the group. Is there a correlation between the type of snow crystals observed and the weight of the snow? In how well the snow packs? Discuss snow weight and density with your group, relating it to the above questions. Encourage weather journals to continue, recording temperature and precipitation into the other seasons. Ask them to determine what important measurements should be taken year-round.

TYPES OF SNOW

Snow crystals are born in the clouds when water vapor freezes on a particle of dust, a floating bit of bacteria, or some other solid material. The type of snowflake that is falling can tell you a lot about the weather. In this activity, we'll teach you how to look at the shape of the individual snowflakes, and learn what each shape means.

Supplies Needed:

Dark/black piece of construction paper or felt
Freezer
Magnifying glass

The paper/felt needs to be cold for this activity, so be sure to store it outside in a garage or in the freezer before the activity

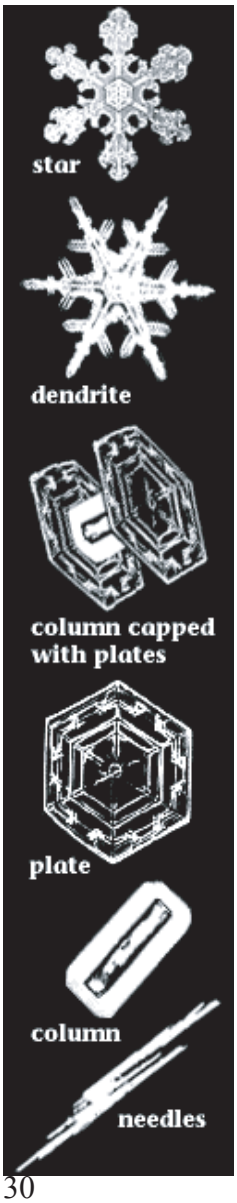
Activity:

Review the types of snowflakes at the bottom of this sheet
Remove paper/felt from the freezer
Bundle up and head outside
Collect either actively falling snow or very softly scoop up a few flakes of recently fallen snow from the ground
Immediately look at the flakes with your magnifying glass, and draw them in your snow observation journal or on a separate sheet of paper

Back inside, compare what you saw with the types of snowflakes and their descriptions on the bottom of this sheet

Types Of Snowflakes

When cloud temperatures are at or below freezing point, and there is enough moisture in the air, ice crystals form around a core particle. As water vapor condenses and freezes, the complex pattern of a snowflake is born, one molecule at a time. A snowflake's hexagonal shape is born at the atomic level, where the first water molecules form initial bonds.Snowflakes can be classified into six basic patterns; needles, columns, plates, columns capped with plates, dendrites, and stars. Each type is the result of different atmospheric and temperature conditions within the cloud.



Star Shape – star crystals are born at temperatures near -15° C, and are among the most common types of snowflakes. They are very delicate, and superstars are rare because large flakes tend to be broken by wind and mid-air collisions. However, under ideal conditions several stars may join together to form a larger superstar snowflake. The largest snowflake on record from Bratsk, Siberia in 1971, and measured 8" x 12," just larger than this sheet of paper!

Dendrite Shape – dendrites are stars with attitude. They are three dimensional star crystals with branches that grow on more than one plane. These branches connect randomly to a central structure. They form under extremely cold temperatures (-20 to -25° C) when high levels of atmospheric moisture are present.

Column capped with plates – Capped columns are composite flakes that form when the snowflake passes through different temperature and moisture zones as it falls to the ground. The columns form first in the higher and dryer regions of the cloud, and then combine with star flakes as they fall through the lower, wetter cloud elevations.

Plate Shape – Plates form in a similar environment as stars when there is very little moisture in the air. They form at temperatures around -10 to -20° C in conditions where there isn't enough moisture available for the snowflake to form the delicate branches of the classic star snowflake.

Column Shape – Columns are produced when the air is dryer. They are generally smaller, have a higher density than star crystals, and form over a wide range of temperatures (15 to -25° C).

Needle Shape – Needles are formed at the upper end of the temperature spectrum, usually when ground temperatures are at or near the freezing point. To grow, these crystals need an air temperature in the range of -5 to -10° C. Needles tend to produce a dense, stiff snow pack which can produce an avalanche.

Please send us your feedback!

As a 4-H Educator, you know what has worked well, what has not, and how we can improve the *Tracking Climate in Your Backyard* curriculum. Please share your feedback about the curriculum. We'd love to receive copies of any reports or newspaper coverage about completed *Tracking Climate in Your Backyard* projects.

Fax or mail your completed feedback to Trisha Smrecak, Museum of the Earth, 1259 Trumansburg Rd., Ithaca, NY, 14850 or fax to: 607-273-6620.

Check the activity completed	Suggestions for improving the activity
Rainfall Activities ☐ Make It Rain ☐ Where Does the Rain Come From? ☐ Stormy Weather	
Snowfall Activities ☐ Confetti Snow Maps ☐ How Much Water? ☐ Edible Education ☐ The Snowflake Game ☐ Snow Journaling	
Temperature Activities ☐ Energetic Weather ☐ Shade of the Old Oak Tree ☐ Temperature Through Time	
Wind Activities ☐ Why Does the Wind Blow? ☐ Make Your Own Wind Dial	
Hydrologic Cycle Activities ☐ The Incredible Journey ☐ Understanding Evapotranspiration ☐ Pinecones: Mother Nature's Weather Forecasters ☐ What is a Watershed?	
Climate Activities ☐ Where is My Backyard? ☐ Soak up the CO_2 ☐ Buckets O' CO_2 : How Your Backyard Can Change the Ocean ☐ Raise the Waters	
CoCoRaHS Participation ☐ Precipitation measurements and other activities	

Please share your suggestions for improving the Tracking Climate in Your Backyard curriculum.

How have you used Tracking Climate in Your Backyard in your community?

Thank you for completing the Tracking Climate in Your Backyard curriculum feedback. We appreciate learning about how you are using the curriculum and receiving your suggestions for improving it.

Organization _____ **Contact Person** _____

Email _____ **Date** _____