Snowfall Activity 2

Light, Fluffy, Wet, Heavy

How much water is in that snow?

Objectives and Standards
- To learn that snow is frozen water and that different snowflakes have different water contents depending on weather conditions

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

4-H SET Abilities Addressed
Predict
Hypothesize
Test
Measure
Observe
Communicate
Question
Interpret/Analyze/Reason
Model/Graph/Use numbers
Compare

Supplies Needed

-3 cups of the same size
-ruler
-marker and paper
-fresh snow
-tape

Background

Different types of weather conditions create different types of precipitation. In the summer, misting, drizzle, or giant raindrops can fall. Similarly, depending on the amount of water vapor in the air during winter, different types of snow falls. Some snowflakes have a higher content of water than others. You may have already learned this while trying to make snowballs in the winter. Some snow (with higher water content) sticks together better for snowballs and snowmen, than other snow. This activity explores how much water is in the snow after a recent snowfall in your community.

CoCoRaHS Extension Ideas

While recording your new snowfall in the winter, compare the newly fallen snow to the underlying, older snow. The older snow has had time to compress, and in some cases may even be almost icy. Each day for one week after a significant snowfall, measure the change in water content of the snow by repeating the experiment. Be sure to record temperature for each day, as that might change your results. Discuss what you see, and what contributions weather has had on your results. Would the results differ if the weather was significantly different? How?

Activity

1. Break into three groups.
2. Name groups and have each label the top of their cups (or a sheet of paper taped onto the cup) with the group names.
3. Bundle up and go outside after a recent snowfall.
4. Fill cups to the brim with snow, being careful NOT to pack the snow down in the cup.
5. Use the ruler to remove excess snow so that the level of snow is even with the lip of the cup. Again, be careful not to pack the snow into the cup.
6. Bring cups inside and set them in a sunny windowsill or near a heater to encourage quick melting. You may wish to speed up the process with a hair dryer, but be sure to use caution with electricity around water.
7. Have groups predict how much water will be left in their cup after it is melted.
8. When completely melted, have groups mark how much water is left in the cup by marking a line (or marking with tape) directly on the cup.
9. Repeat the activity by packing snow in the cup, and again by filling the cup with crushed ice. Predict how these results will vary from the first cup of unpacked snow, and then see how the results vary by the markings on the cups. You may wish to graph the results for the discussion.

Discussion

Density is an important part of understanding snow. Snow has less water content in the same space as liquid water. It weighs less, and there is a lot of space between the crystals of snow filled with air. When the groups did not pack the snow into their cup, there was a significantly lower level of water than there was snow. When the groups packed the snow, some of the space between the snow crystals was filled, and crystals were forced together and broken into smaller pieces. This raised the density of the snow and thereby increased the water content. Therefore, there was more water in the cup when the snow melted. Finally, crushed ice is very dense, so when it melted, the water left in the cup was even higher than either of the other melted snow experiments.

This helps us to understand how glaciers are formed. Initially, the snow that falls is a lot like our first experiment; unpacked and fluffy snow in a cold environment. Over time, more snow falls on top, allowing the snow to compact and become more dense. Over time, the compaction is compounded to create the icy glaciers capping our poles and storing a large supply of our freshwater resources today.

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** _____