



ACTIVITY: Snow & Temperature Data Collection

🕒 30 MINUTES

Objective

Snow is important for ground water recharge, drinking water availability, and ecosystem function. Students will investigate, through experimentation, different properties of water (e.g. solid, liquid), while developing an understanding of the importance of snow to water resources in their community. Students will learn to safely conduct scientific experiments through the collection of snow depth and temperature measurements on the school playground.

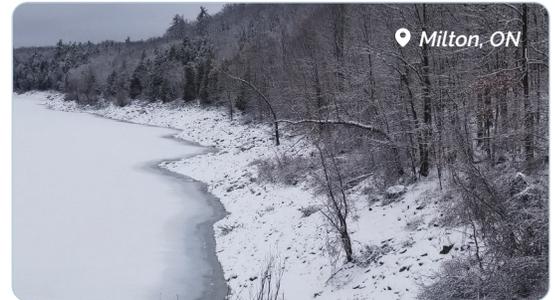


Figure 1: Observing the different properties of water in its solid (snow), and liquid (water) forms.

Materials



Metre stick or ruler
(depending on how much snow there is on the ground)



Thermometer



Computer/tablet/smartphone with internet connection to submit observations using the [Online Reporting Tool](#)¹.

Alternate: Use the provided worksheets² to record measurements outside, then enter observations into the [Online Reporting Tool](#)¹ back inside the classroom.

Activity

On a weekly basis from mid-November to mid-May, collect and submit your snow observations. Depending on the age group, this can be done together as a class or in small groups.

01. Provide each group a metre stick, thermometer, and tablet or paper/pencil/clipboard to record measurements. Each class, group, or individual will work together to collect and record their snow observations.
02. If in small groups, assign group members with specific tasks: (i) Scribes (to record and enter the measurements on paper/online), (ii) Temperature Observers (iii) Cloud Cover Observers, (iv) Snow depth Measurers, and (v) Snowball Observers.

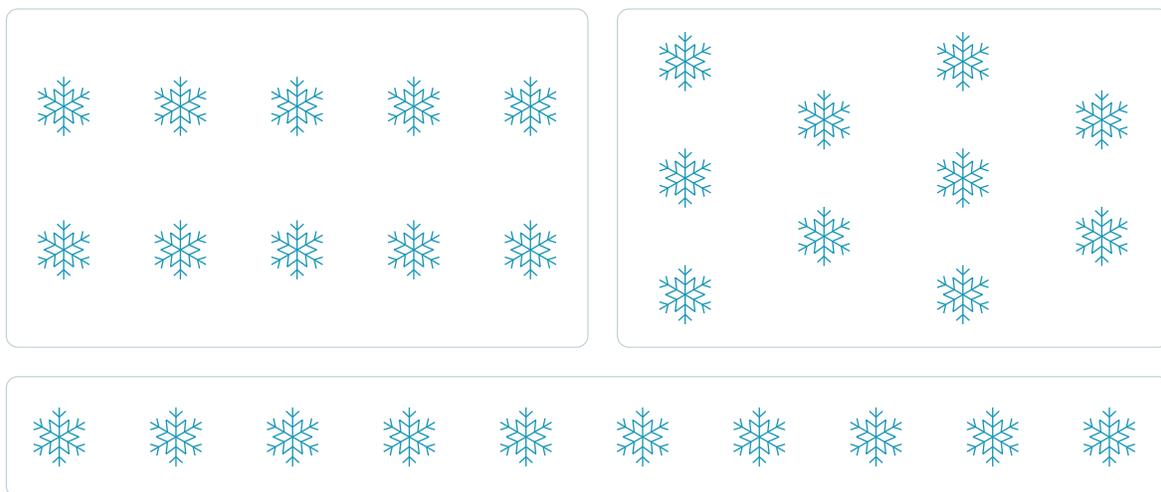
¹ Online Reporting Tool: sknowledge.ca/share

² Worksheet resources: sknowledge.ca/worksheet

03. Get ready to head outside. Discuss the importance of dressing appropriately for the outdoors (i.e. frost bite on cold days, hypothermia, having a change of clothes, staying warm).

It's important to take measurements in different locations throughout the field to capture the snow variability. Spread groups (and observations) across the field in areas that are undisturbed by foot traffic, snowbanks etc. and away from structures such as fences and buildings. Consider the shape of your field, and distribute your observations spatially based on the suggested locations (**Figure 2**) to capture snow variability.

Figure 2: Suggested observation locations. ❄️ - represents a unique location in the field



Each class will collectively collect at least 10 sets of measurements dispersed throughout the field each week. If the class has been split up into groups, aim to have each group collect at least 2 sets of measurements at different locations on the field.

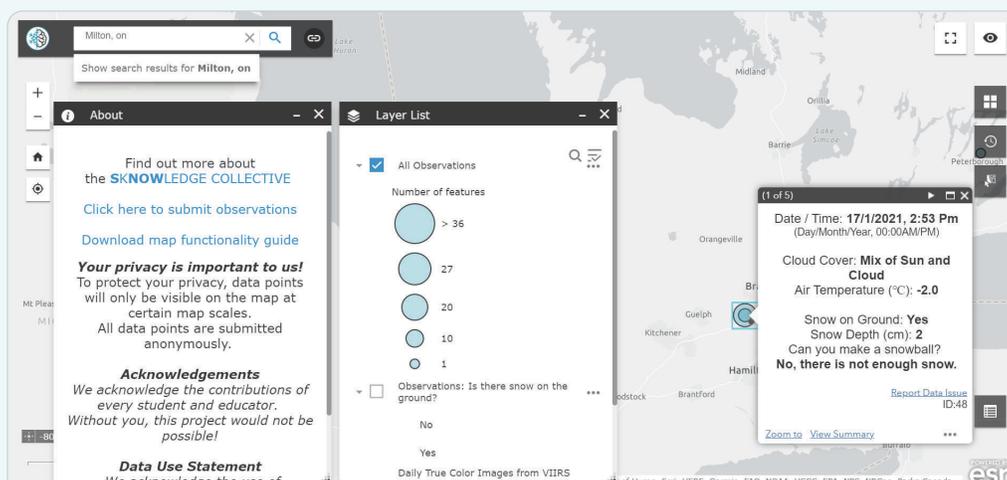
04. Record the **time** and **date** students are taking the measurement.
05. Record the **location** students are taking the measurement (i.e. nearest school, postal code, or address).
06. Record the **air temperature outside in degrees Celsius (°C)**. Hold the thermometer out of direct sunlight (you can create a shadow using your body), dangle using a string or rope to ensure it is recording air temperature and not your body temperature. Wait a few minutes once outside before taking the temperature reading to allow the thermometer to acclimatize to the outside temperatures. Thinking back to the water cycle, we can use temperature to understand the transformation as snow (water in a solid state) melts into water (liquid state).
07. Look directly above you. Record the **cloud cover outside** at the time of your measurement.

8. Record if you see **snow on the ground** in the area directly where you are recording your measurement. If the answer is NO → **step 11** If the answer is YES → **step 9**.
9. Record the **snow depth in centimetres (cm)**. Place the ruler or metre stick perpendicular to the ground. Ensure the bottom of the metre stick is placed with the 0 cm side down and touches bare ground. Record the snow depth (cm) at eye level, by crouching down to the snow surface to take the measurement. If there is not enough snow to record a measurement, such as a dusting of snow, record 0 cm and indicate "Trace amounts of snow" in your field notes in **step 11**. It is as important to report observations when there is no snow on the ground, as it is to report when there is snow on the ground.
10. Try to **make a snowball**. This measurement is used as a proxy for snow wetness. This can be used to determine the amount of water stored in the snowpack. What do you notice as you make the snowball? Select 1 of the 7 options below to describe the snow conditions using the ability to make a snowball as a proxy:
 - A. No, there is not enough snow.
 - B. No, the snow is too frozen / icy.
 - C. No, the snow is too dry / fluffy.
 - D. Somewhat, parts of the snowball stick together, others fall apart (the snow is moist).
 - E. Yes, the snow makes a perfect snowball!
 - F. Yes, the snow is very wet. Some water is pressed out when making a snowball.
 - G. Yes, the snow melts in my hands & my hands are soaked.
11. Record any field notes that are related to your measurement. Include things like if it was raining the day before, there was a big snow fall, texture of the snow, how wet the snow is.
12. Head back into the classroom, and submit observations at sknowledge.ca/share



INTERACTIVE MAP

Explore your observations with the interactive map: sknowledge.ca/explore



Sample Reflection Questions

Question	Responses
Identify some safety hazards you might encounter when conducting scientific experiments outside.	<ul style="list-style-type: none"> • Importance of wearing warm clothes (hats, mitts, boots, jacket) outside to prevent frost bite, hypothermia • Ice – slip/fall • Be prepared. Have extra equipment in case of equipment failure/breakage.
What is the difference between climate and weather?	<ul style="list-style-type: none"> • Climate is the long-term trends (or averages) of weather at a location (for example: the amount of snow has declined over the last 5 years) • Weather is the specific event observed at any given time (for example: today it snowed 5cm).
Why does snow accumulate in some areas and not others?	<ul style="list-style-type: none"> • Wind redistribution, sunlight exposure causing melt, time of day, temperature, snowplows, rain on snow causing melt, walking on snow → compressing it, vegetation
Why is snow important for water resources?	<ul style="list-style-type: none"> • Snow melt recharges rivers, lakes, ground water • Snow melt is a source of drinking water • Ecosystem benefits (e.g. species habitat)



SUPPORTING RESOURCES

- For more information, please see the *S^knowledge* Backgrounder: sknowledge.ca/files/theme/Resource_SkNOWLEDGECO_Backgrounder.pdf

 **MORE INFO**
sknowledge.ca



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Located in Canada?

In need of metre sticks and thermometers? Request a kit with all the materials you'll need to get started! Visit: sknowledge.ca/toolkit-request

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