



Big Freeze Post-visit

Classroom Activities

Brief Synopsis

Students will observe and keep a record of natural events that have occurred or are occurring, which indicate a seasonal change (e.g. first snowfall, tree leaves budding/changing color, insects appear). Students will also survey others to determine what

Ages: Designed for 5th–8th grade

Time Considerations:

Activity 1: 30 minutes/week

Activity 2: 1 hour

Materials:

Activity 1:

- Wall area where students can post observations
- Large sheet of paper to record phenology
- Pencils or pens

Activity 2:

- Notebook paper
- Pencils or pens

Vocabulary:

Phenology, Nature, Phenomenon, Season, Climate, Weather

Outcomes:

1. Students will use careful observations to identify seasonal changes in their local community.
2. Students will understand how animals and plants respond to changes in climate.
3. Students will understand the importance of monitoring phenology.
4. Students will observe that people measure seasons in different ways.

Minnesota Academic Standards:

Science: 7.I.A, 7.IV.C, 8.III.A

Language Arts: 4.I.C, 4.II.C, 4.II.D, 4.III.A, 5.I.C, 5.II.C, 5.III.A, 6.II.C, 6.III.A, 7.I.C, 7.II.C, 7.III.A, 8.II.B, 8.II.C, 8.III.A

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Background:

The first activity will take place over an extended period of time and require access to an area (whiteboard, large sheet of paper, bulletin board, etc) where students can record phenology they have seen. The second activity will require students to interview individuals such as family and friends and record their responses, which they will then share with the class.

Activity 1: Phenomenal Phenology!

Phenology (*fin-noll-oh-gee*) is a branch of science that studies the cycles of reoccurring natural phenomena. The events that occur in nature help observers determine which season of the year is approaching. Civilizations have been recording phenology for hundreds of years, often using natural events to determine when certain festivals will occur. Scientists now record and study phenology to help them analyze when events take place, especially in relationship to changes in climate and seasons.

Procedure:

1. Ask your students, “How do you know that the seasons are changing?” Students may offer variety of answers, including: changing leaf colors, snow, certain animals appear, the grass turns green, warming temperatures, etc. Explain that studying these seasonal changes in nature is called “phenology.”
2. Have the students brainstorm a list of signs that each of the four seasons are arriving (try to find at least 12 signs for each season). These should include changes in animals, plants, and weather patterns. Have the students compile a master list of the signs they’ve come up with.
3. Each week students should watch for any of the phenology on the list. If they see one, have them write down the date it was first observed on the master list. Include some extra space under each season for students to add new observations of signs that are not on the list yet.
4. Spend some time each week reviewing the list in class. Ask each student who recorded an observation to share more about it, including where they observed it, what the conditions were like, and any other information you think might be useful.
5. Have the students discuss why it’s important that we study phenology. Some good questions include:
 - What can we learn about the environment by studying phenology?
 - How might ancient peoples (e.g. Native Americans, Egyptians, etc) have used phenology in their cultures?
 - How could a change in climate affect phenology?

Activity 2: Signs of the Seasons

While many different natural events signal a seasonal change, people each have their own events that tell them when a certain season has begun. These indicators may be physical (an individual considers it autumn once the sugar maple tree's leaves turn color), or more personal (a family member may say, "winter starts the day after Thanksgiving."). Each person sees the year differently and students will survey individuals to find out what events they associate with each of the seasons.

Procedures:

1. Students will interview people they know (family members, relatives, friends, co-workers, etc) and write down the answers they give. Students should ask, "What are some signs that you associate with a each of the seasons?" They should also ask the person they're interviewing why they relate that event with that particular season.
2. In class, discuss some of the responses students received.
 - Which signs were the most commonly mentioned?
 - What were the most unique responses that students got?
 - What were some of the reasons that people associated certain events with specific seasons?

Teacher Tips

- Find pictures of the animals and plants to add to the phenology board to help students identify what they are looking for.
- If your school allows, find library or hallway space to display your students' reports and observations, so each of your students can help educate the entire school.
- Your class can register to participate in Project BudBurst, a national network that lets schools report their phenology observations. Your school's information is then used to help compile a national database that will be used to monitor environmental and climate change. *(The website address is included in the additional resources.)*



Additional Resources

http://www.windows.ucar.edu/citizen_science/budburst/
Project BudBurst's website.

<http://www.learner.org/jnorth/>
Journey North: Global study of seasonal change and wildlife migration. Includes fall and spring phenology checklists, areas to report your observations, and partner classrooms with whom to compare your phenology data with.

<http://www.usanpn.org/>
USA National Phenology Network website. Information for teachers on phenology and citizen science.