



## *Signs of the Seasons: A Maine Phenology Project*

<http://umaine.edu/signs-of-the-seasons/>

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### **Festival Dates: Comparing Celebrations of the Past and Present** (can be paired with “Phenology Snapshots” activity)

**Authors:** Beth Bisson<sup>1</sup>, Medea Steinman<sup>2</sup>, Esperanza Stancioff<sup>2,1</sup>, and Abraham J. Miller-Rushing<sup>3</sup>

<sup>1</sup>Maine Sea Grant

<sup>2</sup>University of Maine Cooperative Extension

<sup>3</sup>National Park Service, Acadia National Park and Schoodic Education and Research Center

**Grade level:** 6-12

**Themes:** Phenology, climate change

**Activity type:** Historical research, evidence-based thinking, and supporting claims with evidence

**Setting:** Classroom, outdoors, meeting space

#### **QUESTIONS**

When do natural and human events happen in your community?

Is the timing of some events changing?

If you think so, how do you know? Can you find evidence to support your claim?

#### **OVERVIEW**

Students conduct an investigation using past and present source materials to compare the timing of seasonal festivals important to people in their communities. They learn to make use of library, news media and Internet-based resources to conduct research, develop stories and arrive at answers about the seasonal rhythms of their own human community and how those may have shifted in response to changes in the timing of phenological events. Optionally, students also learn to conduct interviews and to tap the potentially rich resources of information within families and homes. Where such resources aren't available, or in cases where events are no longer held, students may turn to the photographic record, past and present, to compare the timing of festivals and plant phenology (see Phenology Snapshots).

Students are encouraged to infer meaning from the comparisons (e.g., with respect to climate change), engage in speculation, and learn to articulate and support claims and conclusions. Alternatively, they have the opportunity to share what they learn through other creative means, such as visual collage, story-telling, publishing interviews in local media or giving presentations at school. If a festival is no longer held, perhaps they could take the lead in reviving one. This can be used as a basis for classroom discussion, leading students to learn about their communities and explore lines of inquiry, reflection and creative expression.

## **EDUCATION STANDARDS**

### **Maine Learning Results (*Science and Technology*)**

#### ***A1 Unifying Themes – Systems***

**3-5.** Students explain interactions between parts that make up whole man-made and natural things.

**6-8.** Students describe and apply principles of systems in man-made things, natural things, and processes.

**9-Diploma.** Students apply an understanding of systems to explain and analyze man-made and natural phenomena.

#### ***A3 Unifying Themes – Constancy and Change***

**3-5 a.** Recognize patterns of change including steady, repetitive, irregular, or apparently unpredictable change.

**6-8.** Students describe how patterns of change vary in physical, biological, and technological systems.

#### ***B1 Skills and Traits of Scientific Inquiry***

**3-5 a.** Pose investigable questions and seek answers from reliable sources of scientific information and from their own investigations.

**6-8.** Students plan, conduct, analyze data from, and communicate results of investigations, including simple experiments.

#### ***C1 The Scientific and Technological Enterprise – Understandings of Inquiry***

**3-5 a.** Describe how scientists answer questions by developing explanations based on observations, evidence, and knowledge of the natural world.

**9-diploma.** Students describe key aspects of scientific investigations: that they are guided by *scientific principles* and knowledge, that they are performed to test ideas, and that they are communicated and defended publicly.

#### ***E2 The Living Environment – Ecosystems***

**3-5.** Students describe ways organisms depend upon, interact within, and change the living and non-living environment as well as ways the environment affects organisms.

**6-8.** Students examine how the characteristics of the physical, non-living (abiotic) environment, the types and behaviors of living (biotic) organisms, and the flow of matter and energy affect organisms and the ecosystem of which they are part.

## LEARNING OBJECTIVES

- Participants understand that the timing of phenological events can change, particularly as a result of changes in climate
- Participants investigate how this may have affected their communities by engaging in local research

*Expectations and Misconceptions: It's important to mention to students that they probably will not find changes in the timing of all events. They may not find changes in the timing of any events. The goal is to know which have changed, which haven't, and why.*

*Guard against the notion that, "If I see changes in timing, that's climate change. If I don't see them, then the climate is not changing." Remind them that the climate is changing, that some things are impacted more than others, and that things are impacted differently.*

## MATERIALS

- Access to historical and present-day news media and photographic records--either family, town, library or other
- Photocopier
- Optional: camera, hand lenses, binoculars, materials needed to observe a particular phenophase

## TIME NEEDED

- One-two hours (or as needed) for historical research, plus travel time if research involves a field trip
- One-two hours (or as needed – can be completed outside of class) for attending festivals and interviewing people in the community, or for photographing present-day phenological events
- One-two 30-40 minute class periods to develop presentation about any conclusions or findings
- One 30-40 minute class period for presentation(s) and group discussion

## ACTIVITY PROCEDURE

1. Ask students to establish a science notebook or journal to be used in the course of this (and other projects, if desired). Talk about basic information that should be included in a science-minded journal. This depends on the activities and research but might include things like dates, weather information, careful observations of species, phases, behavior, predictions and hypotheses, drawings, samples (pressed leaves or flowers) or notes about process and limitations.
2. Students visit the local library or an historical collection to look through source materials (newspapers, magazines, photo collections, etc.) to find dates and/or photos of local or regional annual festivals related to phenology (apple festivals, lilac festivals, maple sugar festivals, etc.). Provide examples to get them thinking about seasonal phenology-related events that have been important to people in their

community (e.g., apple, pumpkin, or lilac festivals, maple sugar festivals; “farm weeks” when students were let of school to help with particular harvests, smelt or alewife harvests, etc.). *Note: some libraries or historical collections have staff or volunteers who are willing to collect materials in advance and visit classrooms. You may want to investigate this possibility if bus travel is not possible.*

3. Ask students to make a copy of an historical article or photograph. These can come from family collections, too. They just need to be dated.
4. Ask the students to make predictions about whether or how the timing of these historical events or festivals have changed over time. Are they earlier or later? The same time of year? Do they think there have been any environmental or human/social changes that have influenced this? Ask the students to write down their predictions in their science notebooks for future reference.
5. Then, students scan current newspapers, magazines, or websites to find announcements or articles with the present-day dates for this same event (or a similar one), if it is still happening.
6. If the same festival isn't happening, then compare historical festival dates with a current photo or newspaper article that shows/lists when the same plants (or fruits) are flowering (or ripe) in the current year (or when fish runs take place). Students may enjoy taking these current-day photos themselves.
7. If the same or similar festivals are still happening, discuss, as a group, how to conduct research to find the information they are looking for and reach conclusions about current vs. historical timing of these phenological events. Talk about how to evaluate the credibility of sources (and how to credit sources), especially if they want to search the Internet. Establish a schedule for completing the project, and review methods for recording their findings in science notebooks or journals, so they can use it later to compare with their predictions. The project could also be conducted in small groups.
8. If any of these present-day seasonal events are imminent, ask students to attend, or consider attending as a group. Take pictures and/or conduct informal interviews with community members, particularly elders, who have been involved with the festivals for many years, and who may have a good memory (or records) of how or whether festival dates have changed over time. (For information about conducting interviews see **Resources** below.)
9. Guide the students in a discussion about what their research has turned up. Coach them on how to assemble the pieces of evidence they collected to make a clear presentation of their findings (or lack of findings), and how to evaluate whether or not their evidence supports their predictions. Schedule a time for each group to give their presentation.
10. When the presentations occur, make sure there is ample time for questions, discussion, and reflection.

## REFLECTION/FORMATIVE ASSESSMENT IDEAS

*Reflection:* Ask participants to describe their investigation and reflect on what worked well and what they could do differently next time. Ask them to talk about any changes that have occurred in the timing of the festivals they researched. Can they speculate about possible climate-related causes for these changes? How much can they infer, and what more evidence/information would they need to make any claims about climate change causes?

*Formative assessment:* Collect the students' science notebooks or journals to see how well they recorded their initial predictions and the data they collected through their species observations. Were they able to make connections between what they saw and their original predictions? Do they understand the process of collecting evidence that either supports or does not support their predictions? Save examples of student work for reference next time you try this activity. Work that shows a range from solid understanding to common misconceptions is particularly helpful.

## EXTENSION IDEAS

Consider having the students present their stories or photographs publicly, at the local library, nature center, education and research center (i.e., associated with a national park), town meeting where a relevant discussion is on the agenda, and consider drawing media attention to the event. If students find that an historic seasonal festival no longer takes place, ask them to research the reasons for that. If the phenological event still occurs, do any of the students have an interest in trying to revive the festival? Can you help them lead such an effort?

## RESOURCES

Signs of the Seasons (<http://umaine.edu/signs-of-the-seasons>)

USA National Phenology Network (<http://www.usanpn.org>)

### For information about conducting interviews:

[http://www.folklife.si.edu/education\\_exhibits/resources/guide/introduction.aspx](http://www.folklife.si.edu/education_exhibits/resources/guide/introduction.aspx)

or

<http://vitalventure.gmri.org/watershed-experiences/community-connections>.

### Readings:

*Phylogenetic patterns of species loss in Thoreau's woods are driven by climate change.*  
(<http://www.pnas.org/content/early/2008/10/24/0806446105.abstract>)

### For assistance contact:

Esperanza Stancioff, Climate Change Educator  
University of Maine Cooperative Extension/Maine Sea Grant  
(207) 832-0343; 1-800-244-2104; [esp@maine.edu](mailto:esp@maine.edu)

Beth Bisson, Assistant Director for Outreach and Education  
Maine Sea Grant College Program  
207-581-1440; [beth.bisson@maine.edu](mailto:beth.bisson@maine.edu)

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