

Overview

In this lesson, students begin their exploration of lake ice-out in Maine, focusing on the specific example of multiple cancellations of the Sebago Lake Rotary Fishing Derby due to unsafe ice conditions. Students share their personal connections to winter lake ice and learn some basics about ice safety.

Estimated Time

45 minutes (1 class period)

Target Student Learning Outcomes

Climate and Changing Ecosystems

- Changes in Maine's ecosystems are local instances of global patterns of change.

Data and Scientific Inquiry (This is the work that scientists do!)

- Using data to understand a phenomenon involves being able to read and make sense of data representations (tables, graphs, maps, etc) and models.

Standards

NGSS

- Science & Engineering Practices
 - 4. Analyzing and Interpreting Data
- Crosscutting Concepts
 - 7. Stability and Change

Vocabulary

Ice-out day

Preparation

- Read this entire guide to familiarize yourself with the flow of the lesson.
- Do the online activities as a student so you will be prepared to help students if they get stuck.
- Prepare to share the [Glossary](#).

Facilitating the Lesson

Introduce the lesson.

Provide students with a brief (~ 5 minute) introduction to the lesson and the goals for the day. Here is a example script you might follow:

"Frozen lakes are a big part of winter fun in Maine for things like ice skating, ice hockey, and ice fishing. What activities do you like to do outside in the winter? Do they involve lakes? Have you ever seen or explored a frozen lake? What stories do you have about lakes (or ponds) in the winter time?"

"Whatever your story, share it with a classmate. Turn to your neighbor and take turns sharing your personal experiences with winter lake ice." Students turn to their neighbor and share their personal experiences with winter recreational activities like ice fishing, ice skating, skiing, snowboarding, etc. as well as prior knowledge about what climate factors might influence when lake ice forms and melts. [Give students time to share their stories with each other.]

"What did your stories have in common? What was different?" Allow groups to share what they discussed. Encourage a wide range of voices to be heard.

"Today, you're going to work online [with a partner or in a small group]. Your goals for today are to:

- Understand that lakes play an important role in many Maine communities, providing valuable fish and wildlife habitat, year-round recreational opportunities, and drinking water.
- Familiarize yourself with Sebago Lake and the annual ice fishing tournament that will be the focus of the rest of the module.
- Learn basic ice safety guidelines and the concept of lake ice-out day.
- Begin thinking about patterns in cancellations of the Sebago Lake Rotary Ice Fishing Derby and what might be happening.

When you get to your computers, go to the LabVenture website and open [Lake Ice-Out Lesson 1: On Thin Ice](#).

Make sure you read all the instructions carefully before you start clicking through the activity. There will be some questions on the screen for you to answer. Some are just questions to think about or discuss with your partner [or group] and others require you to provide an answer. There will also be new vocabulary words. Words that are red are defined in the Glossary for this lesson.

I'll be walking around the room to help you if you get stuck. When you get to the page that says 'Stop,' wait for instructions from me before moving on."

Have students complete the online activities.

- It is recommended that students work in pairs or small groups to complete the online activities. Because this lesson is the first in the module, you may also wish to do some portions as a whole class, particularly the initial orientation to the locations of lakes in Maine.
- While students are working, walk around the room to troubleshoot and answer questions. Below is an outline of the work students will be doing in each of the online activities. Big ideas are listed for each activity. Suggestions for stopping points and discussion prompts for key moments of reflection and synthesis of learning are also provided.

1. Lakes of Maine

Students explore a map showing the locations of 20 major lakes in Maine. They use their geography skills to locate different lakes on the map, including Sebago Lake, which will be featured throughout the rest of the lesson and entire lake ice-out unit.

Big Ideas:

- Lakes play an important role in many Maine communities, as a source of drinking water, shipping, and recreation.
- Sebago Lake supplies drinking water to the city of Portland (and surrounding communities) and hosts the Sebago Lake Rotary Fishing Ice Derby annually. However, in recent years, there have been several cancellations due to unsafe ice conditions.

Facilitation Suggestions

- Help students orient themselves to the map, reminding them of the four cardinal directions and where they live in Maine. Introduce the terms “latitude” and “longitude” if students are unfamiliar to help them determine which lakes are furthest north, south, east, and west.
- Encourage students to click on lake names in the table or in the map legend to find them on the map or to use the Full Screen viewing option to make the map and table larger and easier to read.
- Encourage students to zoom in on the map to locate other ponds and lakes they may be familiar with. Emphasize just how many ponds and lakes there are in Maine, and how many communities surround them.

2. Sebago Lake Ice Fishing Derby cancelled due to warm temps, thin ice

Students read the WGME news article, *Sebago Lake Ice Fishing Derby cancelled due to warm temps, thin ice*, and write answers to the questions that follow.

Big Ideas:

- The Sebago Lake Ice Fishing Derby has faced cancellations due to unsafe ice conditions from unusually warm winter temperatures.
- Ice fishing derbies play an important role in maintaining the health of lake habitats in Maine by removing over abundant species like togue, or lake trout.
- Ice fishing derbies offer fishermen large prizes and financially support local communities and charity organizations.

Facilitation Suggestions

- As students read, encourage them to take notes about any new/unfamiliar vocabulary they encounter, something new they learned from the article, and questions they still have about what they read. If reading is difficult for your students, consider reading the article aloud to your class or having strong readers volunteer to read sections aloud.
- Ask students if they have any experience with ice fishing or have participated in an ice fishing derby. Discuss responses to the questions after the article as a class before having students move on to the next page.
- Emphasize the importance of removing over-abundant species like togue (lake trout) from lakes to help maintain a healthy habitat for other native fish.
- Consider providing a more recent, or more locally relevant, news article in addition to the one explored here.

3. Ice Safety

Students learn about how thick ice actually has to be in order to be safe for a variety of activities, including ice fishing.

Big Ideas:

- Ice needs to be very thick, at least 4-6 inches, in order to hold an ice fishing tournament.

Facilitation Suggestions:

- You might want to project this page at the front of the room for the whole class to go over together as a continuation of the discussion about the article..

4. Derby in Distress

The Sebago Lake Rotary Ice Fishing Derby has been canceled several times since the tournament debuted in 2001, all due to unsafe ice conditions. Students consider the number of times the derby has been canceled and consider what might be happening.

Big Ideas:

- Patterns in derby cancellations may be indicative of environmental changes around Sebago Lake.

Facilitation Suggestions:

- Encourage students to look for patterns and to think about what might cause unsafe ice conditions. Let students know that there is no right or wrong answer at this point—they are simply making a hypothesis about what they think might be happening before they use data to learn more in the next lessons.

5. End of Lesson

Students Print or Share their work. Responses to the questions embedded in the online lesson will be useful for students to keep as notes for the lesson and to refer back to when completing future activities. This particular lesson does not have a separate Student Sheet, so you may want to collect responses from the online lesson to review for assessment.

Facilitation Suggestions:

- When students reach the page titled End of Lesson, have them click the Show All Answers button:

A rectangular button with a light blue gradient and rounded corners, containing the text "Show All Answers" in white.

- Have students Print or Share their responses.

A blue rectangular button with rounded corners, containing the text "Print" in white.

Clicking Print will open the Print dialog box and allow students to print a hard copy of their responses. They may also be able to print to PDF if your settings are configured to allow this.

A blue rectangular button with rounded corners, containing the text "Share" in white.

Clicking Share will open a dialog box with a link that students can copy and paste into an email or document. This link can be used to re-open their answer sheet in a browser any time.

- Once their work has been printed or their link has been safely emailed or saved in a document, students can click Close to exit the lesson.

Wrap-up the lesson.

Close out the lesson by reminding students of where they started the day and previewing what's next. Here is a sample script you might follow:

"Today we learned about Sebago Lake and how its ice fishing derby has been canceled several times because of unsafe ice conditions. We also learned what it means for ice to be "safe" and started thinking about what might be happening around Sebago Lake that has resulted in so many derby cancellations. In the next lesson, we'll look at winter temperature data for Sebago Lake to see what's happening and if there are any patterns or trends that may help explain what's happening to the ice."