You don’t need to have an evaporator to demonstrate how maple syrup is made and highlight the evaporation process. The simple process can be fun as well as educational. Remember, the magic formula is 40:1 (40 gallons of sap to produce 1 gallon of syrup).

**MATERIALS:**
- hot plate or stove
- 3.2 ounce jug of pure New Hampshire maple syrup
- 1 gallon jug of drinking water
- 1 measuring cup
- 1 eight quart pot to boil water
- disposable wooden sticks or plastic spoons (3 per student)
- several drops of vegetable oil or a teaspoon of butter

**PROCEDURE:**
1. remove approximately 3.2 ounces of water from the gallon jug.
2. Add 3.2 ounces of pure maple syrup to the water in the plastic jug (be as accurate as possible to maintain the 40:1 ratio). Shake the jug to thoroughly mix the water and syrup. You have now created “sap” with 2.1% sugar content.
3. Provide students with a tasting sample. Ask students to make observations on color, taste and smell. These observations can be compared to the syrup created after step 4.
4. The newly created “maple sap” should be placed into a container suitable for boiling, one that can hold at least two gallons to allow room for boiling. Make sure the container has been suitably cleaned. A smaller boiling container can be used if you continuously add more “sap” to the boiling pot from time to time. It is best to add only a small amount at a time so that the boiling is not interrupted. IMPORTANT: add a few drops of vegetable oil or a tiny dab of butter to the boiling sap to keep the foam down. Once the maple “sap” reaches a boil, it should be allowed to boil continuously until the quantity of solution is reduced to maple syrup having used almost all of the “sap” solution. The process of boiling away the water to produce maple syrup will take about 3 hours, so plan accordingly.

**NOTE:** set up the boiling station away from papers, wallpaper and other items which may be adversely effected by excessive steam. It should also be located in a safe spot where it can be monitored by an adult and away from students.

**NOTE:** The point at which the “sap” becomes syrup can be determined by several methods. The easiest (less scientific) may be to measure where 3.2 ounces reaches in your boiling pot before you start. When the boiled liquid reaches that level, you most likely have syrup. Or, take a candy thermometer and stop boiling at a temperature of 240°F, or when the maple syrup contains 67% sugar.

5. Once again, provide students with a tasting sample so that they can make observations on color, taste and smell. Have them compare these observations to those made of the sap. What changed? Also, discuss what happened to the “sap” solution and why it changed into maple syrup.

You can read more about maple sugaring at [New Hampshire Agriculture in the Classroom](https://www.agclassroom.org/nh).

---

**Contact us to:**
- Find an online version of this guide with clickable links.
- Discuss curriculum materials
- Receive our monthly newsletter
- Learn about upcoming educator workshops
- School-to-Farm Field Trip Information
- Borrow materials from our resource library

www.agclassroom.org/nh  email: nhactc@nhfarmbureau.org

---

**Annual Agricultural Literacy Program**

**2019 Educator Resource Guide**

Dear Friends and Educators,

The mission of New Hampshire Agriculture in the Classroom is to help students increase their understanding and appreciation of the role that agriculture plays in their daily lives. We strive to achieve this through teacher workshops, school to farm field trips, a monthly newsletter and more.

As part of our efforts, we offer an Annual Literacy Program where we select an agriculturally accurate book, then encourage volunteers to visit schools throughout the state where they read the book and share related information with the students. Following the presentation, the book is donated to the school for continued enjoyment and learning. We also provide lesson ideas to help supplement the school visit.

Teachers are encouraged to utilize these resources to round out the lessons with activities based in science, language arts, social studies, etc. Upon completion of the program, we ask that both teachers and volunteers complete a brief survey to evaluate our effectiveness.

A hard copy is enclosed or you may complete it online at [https://form.jotform.com/nhactc/AgLit2019](https://form.jotform.com/nhactc/AgLit2019).

The book selected for the 2019 program is *Maple Syrup from the Sugarhouse* by Laurie Knowlton Lazzaro. This book follows Kelsey, her family and her friends as they collect sap and turn it into maple syrup. A heartwarming story infused with informative descriptions is a delight for the reader.

This year, we are thrilled to have support from Meadow View Sugarhouse, Hubbard Farms, Butternut Farm, Brookdale Fruit Farm, Northeast Earth Mechanics, and Spring Ledge Farm. Please visit their websites for additional information about their work.

We hope that you find this material useful and that your students enjoy learning about maple sugaring. If you are interested in integrating other agricultural topics or programs into your curriculum, please don't hesitate to contact us at (603) 224-1934, email nhactc@nhfarmbureau.org or visit our website at www.agclassroom.org/nh.

Sincerely,

Debbi Cox
State Coordinator

---

**Maple Tidbits**

A sugar maple tree should be at least 10" in diameter before it is tapped (about 40 years old)

A covered bucket is attached to the tap or spile to collect the sap

Maple syrup is roughly 2% sugar and 98% water.

Maple sap starts flowing in the tree when nighttime temperatures are below freezing and daytime temperatures are warmer in the spring.

To tap a tree, a sugarmaker drills a 7/16" hole in the tree and inserts a tap or a spile

It generally takes 40 gallons of sap to make one gallon of maple syrup

If there are a lot of trees to be tapped, sugarmakers will attach plastic tubing to the tap instead of a bucket - sap is pulled out of the tree by gravity or a vacuum system and collected in a tank.

The grade of syrup depends on when during the season the sap was collected and boiling conditions

Sap put into pans in an evaporator and heated over a wood fire to about 219° to remove the water

Maple syrup is 67% sugar. The maple sugaring season runs for about 6 weeks in February and March.
**Tapping into Maple Tradition Curriculum**

New Hampshire Agriculture in the Classroom has assembled a maple sugaring curriculum with lessons, activities and other resources for all kinds of K-12 classrooms. Find lessons, activities, resources, video and more. Learn about the Tucker Mountain Challenge classroom maple syrup contest and the maple equipment grant programs at [https://www.agclassroom.org/nh/resources/maple.cfm](https://www.agclassroom.org/nh/resources/maple.cfm). Check out some of the lessons below.

**Tapping Into Maple Tradition:** (grades 2-6) Oral and written communication, mathematical representations plus physical and conceptual models to describe and explain scientific concepts and ideas. Use inquiry strategies to investigate and understand the natural world. Younger students will learn to use the process approach to writing coherently and using appropriate conventions.

- **Pancakes (grades 1–2) or grades 3–5:** Describe physical properties of materials and observe physical and chemical changes as they learn about the ingredients in pancakes and how maple syrup is harvested from trees.

- **Be A Sugar Maker:** (grades K-2) Role-play the sugar making process with the option to expand into the water cycle. Tapping for sap is a wonderful accompaniment to this activity.

- **Looking Back, Thinking Forward** (grades 3–6): Learn about the maple sugaring process - the equipment and its changes over time, climate, and technology. How has it changed through history and what might it look like in the future?

**Maple Sugaring Sequence**

Next to each picture, write the number to show the order of steps for making maple syrup. Or, you can color the pictures, cut them out and then put them in the right order.

1. **boil the sap in an evaporator to create syrup**
2. **the tree sap runs into buckets when the nights are below freezing and the days are warmer**
3. **identify the sugar maple trees**
4. **put the syrup into a bottle**
5. **tap the tree and hang a bucket**

**Graph Maple Sugaring in New Hampshire**

Graphing is an essential skill for students. Why not make it more interesting by having students learn and practice with New Hampshire maple sugaring data? Use this data provided by the National Agricultural Statistics Service to create a variety of graphs. Also a great opportunity for working on percentages! Check out our samples for some ideas.

New Hampshire Agriculture in the Classroom has assembled a maple sugaring curriculum with lessons, activities and other resources for all kinds of K-12 classrooms. Find lessons, activities, resources, video and more. Learn about the Tucker Mountain Challenge classroom maple syrup contest and the maple equipment grant programs at [https://www.agclassroom.org/nh/resources/maple.cfm](https://www.agclassroom.org/nh/resources/maple.cfm). Check out some of the lessons below.

- **Tapping Into Maple Tradition:** (grades 2-6) Oral and written communication, mathematical representations plus physical and conceptual models to describe and explain scientific concepts and ideas. Use inquiry strategies to investigate and understand the natural world. Younger students will learn to use the process approach to writing coherently and using appropriate conventions.

- **Pancakes (grades 1–2) or grades 3–5:** Describe physical properties of materials and observe physical and chemical changes as they learn about the ingredients in pancakes and how maple syrup is harvested from trees.

- **Be A Sugar Maker:** (grades K-2) Role-play the sugar making process with the option to expand into the water cycle. Tapping for sap is a wonderful accompaniment to this activity.

- **Looking Back, Thinking Forward** (grades 3–6): Learn about the maple sugaring process - the equipment and its changes over time, climate, and technology. How has it changed through history and what might it look like in the future?

**Online Resources**

- **New Hampshire Maple Producers Association:** [https://nhmapleproducers.com](https://nhmapleproducers.com)  Locate a sugarhouse in your area, find information on Maple Month and more.


- **Smartboard Presentation** includes history, tree identification, tapping trees, nutrition and more [https://www.dropbox.com/s/vratyaaef5nhe6e/All%20About%20Maple%20Smart%20Board%20Presentation.notebook](https://www.dropbox.com/s/vratyaaef5nhe6e/All%20About%20Maple%20Smart%20Board%20Presentation.notebook)


- **The Canadian Homeschooler** offers a variety of resources such as printables, activities and videos. [https://thecanadianhomeschooler.com/maple-syrup/](https://thecanadianhomeschooler.com/maple-syrup/)