



Exploring Maple Syrup

LESSON DESCRIPTION

Students will understand how maple syrup is made, and use their senses to analyze its qualities.

GRADE LEVELS

Pre-K through 5

OBJECTIVES

Students will:

1. Listen and read the book *Sugar on Snow* by Nan Parson Rossiter for literacy response involving comprehension on the process of making maple syrup.
2. Discuss the characteristics of maple syrup including taste, smell, and appearance using their senses.
3. Apply interdisciplinary problem solving skill by demonstrating an understanding of the steps in the maple syrup process.
4. Use traditional structures for conveying information such as chronological order, cause and effect, and similarity and difference to understand the sugar making process and its characteristics.

LENGTH

1.25 hours over 3 procedures

MATERIALS AND SUPPLIES

Sugar on Snow by Nan Parson Rossiter

7 sequencing cards – available to print on agclassroom.org/ny/programs/maple.htm

1 Dixie Cup per student

1 bottle of Pure NYS Maple Syrup

1 copy for each student of the Maple Taste Test worksheet

VOCABULARY

Sap - The watery fluid in a plant that carries food and other substances, and can get sticky as it dries.

Sugarbush - A forest where Sugar Maple trees are used to make maple syrup

Syrup - A sweet, thick sticky liquid made by boiling down sap

Tapping - The process of drilling into the trunk of a maple tree and placing a spout (tap) where the sap will run out into a bucket

BACKGROUND

The Sugar Maple is the official state tree of New York, and is very popular for its yellow and orange leaves in fall. While the process of gathering and processing maple sap into syrup is

not a large component of the New York state economy, it is an interesting (and tasty!) part of it. New York produces more syrup than any state except Vermont.

Maple sugar became an important commodity for the early settlers of the United States. They used it to trade until the prices and taxes on cane sugar went down. Maple trees are a unique example among the trees that we collect food from. Instead of picking fruit from its branches, we collect the sweet sap from its trunk.

Traditionally, maple syrup was harvested by tapping a tree through the bark and into the xylem (the channels through which the sap runs), then letting the sap run into a bucket; more advanced methods have superseded this. Once trees have a diameter of ten inches at chest height and are at least forty years old, holes are bored into them and hollow tubes, called spiles, are inserted. These drip sap into buckets or into plastic pipes. Modern use of plastic tubing with a partial vacuum has increased production. A new hole must be drilled each year, due to the natural healing process of the tree, called walling-off.

In the late winter, when nights are still frosty but the days are warming, sugarmakers tap into Sugar Maple or Black Maple trees, and gather the sap. Production is concentrated in February, March, and April, depending on local weather conditions. The change in temperature causes the sap to move through the tree.

The sap is fed automatically from the storage tank, through a valve, into a corrugated (wavy) pan, where it is boiled until it forms a sweet syrup. Boiling down the sap reduces water content (since the heated water rises out of the sap as steam) and creates syrup, cream, or candy, depending on the temperature and length of time it is cooked. The process is slow, and it takes approximately forty gallons of sap to make one gallon of syrup.

PROCEDURES

Activity 1:

Read the book *Sugar on Snow* by Nan Parson Rossiter to the class, noting important the important information about the process of sugaring in the narrative. Such as:

- The time of the year (March, a hint of spring in the air, noticing the first robin)
- Importance of temperature ("Three days ago, after we had those two warm days in a row. Nice days like that with the freezing-cold nights in between are just what maples need to get their sap rising.")
- The family's selected collection method compared to other producers that may use vacuum lines, gravity fed collection, or even bags to collect sap
- Identification of animals and the ecosystem in this family's sugarbush
- Amount of sap needed to make one gallon of syrup (40 gallons of sap)
- You may also note that Seth and Ethan are riding triple on the tractor with their father, and mention that this is not common practice on today's farms and it is dangerous.

Activity 2:

1. Print the sequencing cards from agclassroom.org/ny/programs/maple.htm
2. Ask for seven student volunteers lining them up in the front of the class.
3. Explain that in a moment you are going to hand each standing student a picture. The picture will describe one step in the production of maple syrup. Hand each student their card, and have them read the text aloud. (Ensure when handing out the cards that they are not in order.)
4. Tell the students that these pictures are not in the correct order, and you need their help to arrange the pictures in order of what happens first to what happens last.
5. Ask the sitting students what step they believe is first in the production of maple syrup, asking that student to move to the front of the line. (Or ask one of the sitting students to come up and gently move their peer to the correct spot.)
6. Once they believe they have identified the correct order, start at the beginning of the line and review the placements. If the students have placed a card in the wrong order, ask them the reason why they placed it there – review highlights from the book to jog their memory.
7. When the students are in the correct order, review the process once more.

Correct Card Order

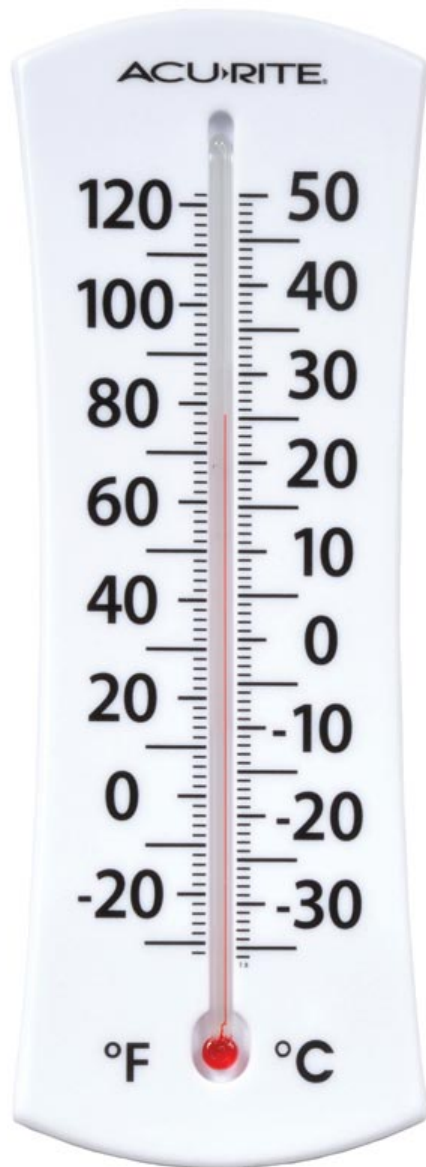
1. The temperature is freezing at night and warm during the day.
2. Find the right trees to tap by measuring them with your arms.
3. Drill, tap, and hang pails or run plastic tubing on each tree.
4. Gather the sap from the buckets into a collection tank.
5. Build a fire to boil the water out of the sap and into syrup.
6. Filter the syrup and pour it into bottles.
7. Put real syrup on your favorite foods.

Activity 3:

1. Pour a small sample of maple syrup into the Dixie Cups ahead of time, one for each student.
2. Explain to the students that they will be using their senses observe, smell, and taste real maple syrup and record their observations on provided worksheet.
3. Distribute one cup to each student at their desks, instructing them not to start until instructions are provided.
4. Ask the students to look at the syrup and smell the syrup. Either lead a discussion about their observations, or have them write their thoughts on the worksheet (teacher's discretion). Finally, ask the students to slowly sip the syrup.
5. Lead a discussion on their thoughts about the syrup.
6. Optional: Provide your students samples of different pure maple syrup grades to taste, and also a corn syrup (*Aunt Jemima*, *Log Cabin*, etc. brands). Have them compare and contrast appearance, smell, taste, and ingredients.

Videos, Smart Board Lessons, & Worksheets

To illustrate the syrup production techniques from this lesson through exceptional grade appropriate videos, worksheets, and Smart Board resources please visit our website: agclassroom.org/ny/programs/maple.htm



The
temperature
is freezing at
night and
warm during
the day.

Find the right
trees to tap
by measuring
them with
your arms.





Drill, tap, and hang pails or run plastic tubing on each tree.



Gather the sap from the buckets into a collection tank.



Build a fire
to boil the
water out
of the sap
and into
syrup.



Filter the
syrup and
pour it into
bottles.



Put real syrup on your
favorite foods.



Maple Taste Test

Using your sense, tell us about the maple syrup you were given.

1. Does the maple syrup have a scent? (Circle one)

Yes

No

2. What does it smell like?

3. What color or colors is the syrup?

4. What does the syrup taste like? (Circle one)

Sweet

Sour

Salty

Bitter

5. Which food is syrup most like? (Circle one)

Milk

Honey

Orange Juice

6. In two sentences, explain how maple syrup and the food you chose in question 5 are alike.
