MAPLE SYRUPING
LESSON PLAN

WOLF RIDGE℠
ENVIRONMENTAL LEARNING CENTER

MAPLE SYRUPING

Class Description: A Cultural History Class

Maple syruping is a seasonal activity that supplements Ojibwe Heritage Class as we go from snowshoeing to basket making. Wolf Ridge taps approximately 40 sugar maple trees and conducts a small-scale demonstration sugar operation. Students will have the opportunity to participant in/visit Wolf Ridge's sugar operation. Depending on the time of the season and weather students will discuss connections between syruping and Ojibwe people, tap a tree, collect sap, conduct a taste test, and discuss the boiling of the sap.

Total time: 15 to 50 minutes outdoors
Audience: 6-20 students, all ages
Activity level: moderate
Travel: 500 ft
Total uphill travel: none

GUIDING QUESTION

What is the maple syruping tradition all about?

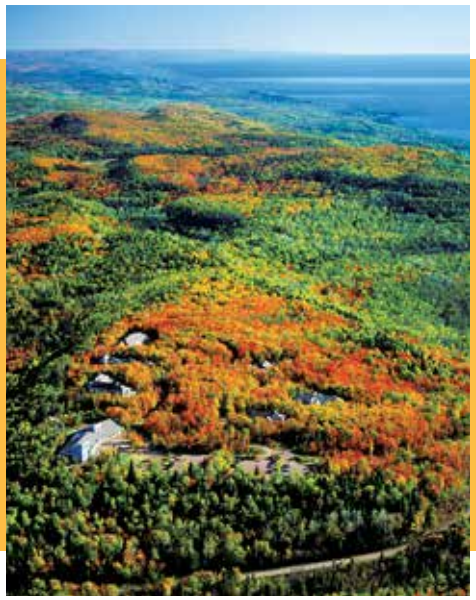
CONCEPTS

1. "Knowing the land" increases your survivability.
2. Maple trees play an important role in several different ecosystems - food, forest, and money.
3. The basic principles of maple syruping have remained the same since its discovery; gather and concentrate.

OUTCOMES

Upon completion of Maple Syruping class students will be able to:

- Explain the connection between Native Americans and modern day tapping.
- List at least three attributes of sugar maple trees.
- Explain the process to get sap from a maple tree to the end product of maple syrup.
- Participate in some of the aspects of maple syruping.



MAPLE SYRUPING

Revised March 2020

Equipment

- 5/16" bit and brace
- taps (spiles)
- hammer
- yellow & orange flagging tape
- collecting bucket/bag
- master clipboard
- permanent marker
- taste bottle A and B
- various sample taps and collecting vessels
- storage trash cans
- evaporating unit

Appendices

- Glossary
- Optional Activities
  1. Ininatig's Gift of Sugar - Ojibwe maple tapping origin story
  2. Algonquin maple tapping origin story
  3. Nanaboozhoo and the Maple Trees
  4. Tree Factory Skit
- References
  1. The Sugar Maple - poem
  2. Maple Syrup Time - song
- Sources
- Spiral Learning Sheet
- Planning Outline

Set-up (15 min.)

- Classroom/class prep description
- Safety Management

I. Introduction (5 min.)

II. When did maple syruping start? (10 min.)

A. Tell about the Ojibwe Native Story
B. Historical Overview

III. What is it like to collect sap? (10 min.)

IV. What do we need to know about maple trees? (5 min.)

A. Diversity
B. Habitat
C. Importance
D. Physiology

V. How do we tap a tree? (10 min.)

VI. How do we make sap in syrup? (5 min.)

VII. Which syrup do we like better? (5 min.)

VIII. What did we notice? (5 min.)

A. Review
B. Stewardship Action

Clean-up (5 min.)

INSTRUCTOR NOTE:
Use maple syruping as a seasonal activity as we transition out of Ojibwe Snowshoe into Ojibwe Heritage.

Set-up (10 min.)

Classroom/class prep description

All of the equipment for maple syruping is located at the evaporator shelter/sugar shack. The two blue bins contain all the equipment for tapping a tree, recording the newly tapped tree, assigning trees for collecting, and the taste test.

Safety Management

Adhere to and be familiar with all general safety practices designated by Wolf Ridge. Be aware of any student's special needs (medical, etc.) and adjust the activities as needed to maintain safety.

- First aid kits are located in buildings.
- When in use, the boiler will be roped off to prevent students from leaning on and melting clothes and burning themselves.

I. Introduction (5 min.)

Assess Learner Understanding
Ask the students if they have ever been to a sugar brush or tapped trees before. Students who have participated in sugaring may be able to explain some of the process. Ask the students why we are visiting Wolf Ridge's demonstration sugaring operation as part of Ojibwe Heritage class.

II. When did maple syruping start? (10 min.)

A. Tell about the Ojibwe Native Story

Different Native groups have different stories about the origin of maple tapping. The story that the Ojibwe people tell is that of Ininatig, the Man Tree. In the story a family is starving. All their stored food had been eaten and the hunting was poor. The ice was still on the lake by their home site. It was beginning to turn black which meant it was starting to melt but it still had a long way to go. While the family was sitting there looking at the lake they heard all sorts of things; the wind creaking branches, a woodpecker drilling trees in

search of insects, a crow cawing in the distance. They also heard a voice in the woods. The family looked around for people but didn't see anyone. They heard the voice a second time and introducted himself as Ininatig, the Man Tree. Ininatig said he would teach them how to make food from the maple tree. He told the people to cut his bark and collect the clear liquid that came out. He said it would taste a tiny bit sweet but when they cooked it a long time it would get thick and even sweeter. The Man Tree also told them if they cooked it even longer and then stirred it in a hollow log it would turn to sugar. So the family followed his instructors and did not starve. They also shared this knowledge with others and passed it down through the generations. Ininatig's gift of maple syrup and sugar taught the Ojibwe to give thanks to trees.

Assessment Concept 1** - **"Knowing the land" increases your survivability.
Concept 3 - The basic principles of maple syruping have remained the same since its discovery; gather and concentrate. *What did you notice about the story? What knowledge is hidden or expressed? (Partner Speaks)*

INSTRUCTOR NOTE:
See Optional Activities in the appendix for Native American stories on tapping.

B. Historical Overview

Native Americans were the first known people to tap trees. Their survival depended on intimate knowledge of the plants and animals that they lived among. Keen observation of their surroundings was important and led to many discoveries. The Ojibwe probably first got the idea from observing squirrels "tapping" maples. It is not known how long the activity of tapping trees has existed. Ojibwe people called the sugar maple "grandfather tree" or "man tree" and they placed a pinch of tobacco at the base of each tree before tapping. Native stories provide traditional views origin of maple tapping, Originally a v-shaped gash in conjunction with some sort of stick was used to collect the sap in a vessel below.

Immigrating Europeans learned the process from the Native Americans. Although the technology has advanced the underlying principles of maple sugaring have remained the same; gather and concentrate. The changes have mainly occurred with the materials used. The first taps were made of hollowed out sticks, then metals and plastics were used. Collecting buckets followed the same path; birch bark-wood-metal-plastic-tubing.

INSTRUCTOR NOTE:
Show examples of various taps and collecting containers located in the blue storage bins.

Assessment Concept 1 - "Knowing the land" increases your survivability.

III. What is it like to collect sap?

If you have morning class, students will collect sap from trees marked with yellow flagging. Afternoon classes will collect from trees with orange flagging. Take the clipboard from the bin and give each student the name of a tree from which to collect sap. Each tree's name will be marked on the color flagging and also the color square on each collecting bucket or bag. Students will spend some time searching for their tree. Once the students have found their tree, they can bring the bucket/bag to the boiling station and empty it into the collecting barrel or evaporator if we are boiling.

Encourage the students to taste the sap. What do you notice? Does it taste sweet or just like water? Is the amount of sap in the buckets all the same? Sap is only 2-3% sugar (sucrose) depending on the weather, soil, time of season, and the tree's genetics. We boil it to increase the concentration of sugar by removing water through evaporation. When enough water has been removed such that the solution boils at 7.1°F above boiling point, we have syrup. Syrup can also be measured by density using a hydrometer. It takes between 40-60 gallons of sap to produce 1 gallon of syrup.

INSTRUCTOR NOTE:
Remind the students not to jerk the bag off the spile or slam the bag on the spile when replacing it on the tree or they will break the spile in half. ***"Please be gentle."***

Assessment (Concept 3): The basic principles of maple syruping have remained the same since its discovery; gather and concentrate. *Participate in some of the aspects of maple syruping. (Embedded assessment) Make sure all students have a chance to contribute.*

WHY DO THE MAPLES ON THE RIDGE LOOK SO BAD?

Good root health is important for healthy maple trees. On the ridge, the top soil is relatively thin. In the winter of 2002-03 low snowfall caused a deepening of the frost line leading to root damage. Wolf Ridge is located in the northern part of sugar maple range. In 2001 Wolf Ridge experienced a significant tent caterpillar infestation. An ice storm in March 2009 trimmed many weakened branches and trees. These are some of the factors contributing to our thinning maples.

INSTRUCTOR NOTE:

The Tree Factory Skit (located in the Appendix) is an optional activity that would be appropriate to do at this time.

IV. What do we need to know about maple trees?

A. Diversity

In North America there are 13 native maple species. We can find 4 of these in northeastern Minnesota; sugar maple, red maple, mountain maple and the non-naturally occuring silver maple. The sugar maple, *Acer saccharum*, is the most productive maple to tap (along with black maple, *Acer nigrum*) because they have the highest sugar content. Maple trees are one of three families that can be identified by opposite branching. The other two are ashes - thick twigged, with chocolate chip shaped buds and dogwoods - slender buds. The ridge at Wolf Ridge is covered with sugar maple.

B. Habitat

Maple trees can grow in a variety of habitats but they do not like very dry or very wet conditions. They do like moist, deep and well-drained soils. Sugar maples are shade tolerant. They can grow in pure stands or mixed forests. The approximate range of sugar maples is east from western Minnesota to the Atlantic coast and from southern Ontario and Quebec south to southern Kentucky.

C. Importance

Sugar maples are important to forests because of ability to be highly effective nutrient pumps. Because of their large leaf production they draw nutrients from deep within the soil to the forest canopy. In other deciduous tree species these nutrients return to the tree before leaf drop, however in sugar maples the nutrients stay in the leaves and then drop to the forest floor where they quickly decompose to release the nutrients again.

Maple syrup and other maple products are an original North American product that was an important spring food source and flavoring for Native Americans and settlers. It has also been and still is a cash crop for farmers.

D. Physiology

Maple trees belong to the angiosperm (a flowering plant; having its seed inclosed in an ovary) group of plants. They are deciduous. During the summer, through photosynthesis, the tree produces carbohydrates which are stored mainly as a starch. In the fall, as daylight decreases and temperatures drop, leaves fall off the trees and sap moves down the phloem for storage in the roots. In winter, some of the carbohydrates are converted to sucrose and dissolved into the sap. When spring arrives the sap moves through the tree to provide energy for the developing leaf buds. Although the concept - sap rises - is generally true this is greatly simplified and is much more complex especially in early spring. The best flows occur with nights below freezing and days in the 40's. This produces a positive tree sap pressure (about 20 psi) and as long as this is greater than the atmospheric pressure sap will flow. A tree that is healthy and has a large crown will produce more sap. Sugar maples can live over 200 years and grow in excess of 100 feet tall and 30 inches in diameter. They are highly reproductive. An acre plot contained 5.3 million seeds with 14,000 seedlings surviving to their 3rd year. Maple trees are expected to reach tap-able size in 40 to 60 years depending on conditions. As of 2020 our maple trees are around 80 years old.

Assessment (Concept 2): Maple trees play an important role in several different ecosystems - food, forest, and money. *List at least three attributes of sugar maple trees. Large group review. Have people share big ideas.*

Knowing how maple trees 'work' helps us know how and when to to tap them.

V. How do we tap a tree?

Tap a tree with the entire group. Select a tree that is at least 10 inches diameter at chest height. Another tap can be added for each 6 inch increase in diameter. A single tap may produce 5-15 gallons of sap.

Use a 5/16" bit and brace to drill a 1 1/2" - 2" deep hole into the sapwood (xylem) of the tree at a 10° angle off horizontal. Clean out the sawdust with a small twig. Place a spile (tap) into the hole and gently hammer so the spile is snug. Be careful not to over pound since you could damage the tree by splitting the bark. Hang the collecting bucket/bag. Tie the appropriate color flagging around the tree. Name the tree, and write its name on the flagging, the bucket and the master clipboard.

INSTRUCTOR NOTE: *Morning classes should add the maple syruping activity at the end of class when the sap is more likely to be running.*

When tapping ask your students what they notice about the process?, the tree?, etc. What does the name they chose for the tree reflect?

VI. How do we make maple syrup?

After an adequate quantity of syrup has been gathered in relation to the evaporating pan size, the boiling can begin. At Wolf Ridge we usually start boiling after we have collected about 60 gallons (2 trash cans.) The sap should be kept cool and boiled as soon as possible to avoid spoilage. Stainless steel pans and those with a large surface area are preferred for boiling. Other materials and those with less surface area may taint the flavor and quality of the syrup.

Once the quantity of sap reaches about an inch in Wolf Ridge's evaporator, it is removed to a smaller pan over a more controllable heat source for finishing. The sap is then boiled until until it reaches 7.1°F above boiling point. The syrup is ready to eat or can be stored for use later. Syrup should be canned at temperatures between 180° and 200°. Syrup that is too thick will form sugar crystals in storage and thin syrup can spoil.

Wolf Ridge's evaporator was purchased from Leader. It is their Continuous Flow Half-pint model.

It takes approximately 1 cord of wood to produce 25 gallons of syrup.

Assessment (Concept 3): The basic principles of maple syruping have remained the same since its discovery; gather and concentrate*. Explain the process to get sap from a maple tree to the end product of maple syrup by using direct paraphrasing - explain to a partner as if partner was your grandma.*

VII. Which syrup do we like better?

Challenge the students to a taste test. Ask the students what do you notice about the two kinds. How do they compare? Can they tell the real maple syrup from the artificial stuff? Which do they like better? Drop a dot of each on their index fingers (away from the platform.) Ask them to taste each while reserving their opinions until everyone has had a chance to taste both. Bottle A contains the artificial maple syrup. Bottle B has the real maple syrup from trees on the Northshore. According to the USDA in 2018 the average price/gal of maple syrup was $45.85.(2020)

Federal regulations require that products labeled maple syrup be at least 66% sugar sucrose. That sucrose is usually corn syrup. They may contain only 2% real maple syrup and the rest is flavoring. The U.S. Government grades syrups by color which is based on percent of light transmittance. Light colored syrup is a higher grade by government standards and has a milder flavor.

VIII. What did we notice?

A. Review

The Native Americans were the first to discover sap from maple trees could be boiled down into syrup or sugar. Syrup is made by boiling maple sap that is 2-3% sugar until it is thick. The process and tools have changed little since its discovery. It was an important spring food source for Native Americans and still is an important food/flavoring and cash crop. Maple trees are important nutrient pumps in their habitats.

B. Stewardship Action

Keep a food tradition alive by visiting a maple syruping operation, buying real maple syrup, or tapping and making maple syrup yourself using sustainable practices.

Clean Up (5 min.)

Take a few minutes to tidy up the equipment for the next group. Let David Stieler or Lori know if the taste test bottles need to be cleaned or re-filled.

Appendices

Glossary

evaporator - a large shallow pan in which the sap is boiled to concentrate it into syrup.

ininaatig (e-nee-NAH-tig) – the Ojibwe word for the sugar maple tree; "inina" means "man," and "tig" means tree.

sap - the physiological liquid containing sucrose and other compounds that substains the tree's life.

sugar bush - the trees in a given area that are tapped for sap.

sugar sand - the impurities that are in maple syrup including Ca, K, Mg, Mn, P, Fe, malic acid and other amino acids.

taps - device used to allow sap to drip into a collecting container. Also called spouts or spiles.

ziwagamizigun (zee-wahga-mee-zee-GUN) – Ojibwe word for maple syrup.

zizibahquat (zee-zee BAH-quat) – Ojibwe word for sugar.

Optional Activities

1. *Ininatig's ("the Man Tree") Gift of Sugar*

- Ojibwe maple tapping origin legend from *Ininatig's Gift of Sugar, Traditional Native Sugarmaking*

It was the end of a long, cold winter, and a family was starving. The hunting had not been good that year, and all the stored food had been eaten. There were no grocery stores then. As the family looked out at the lake near their camp, they noticed that the ice was changing color, from white to black. This meant that the ice was thin and would break apart in a few weeks. Spring was coming. They would find food then, if only they could stay alive that long.

Gazing at the lake, the family heard the trees creaking in wind behind them. They heard a woodpecker tapping on a tree, looking for insects. Above the noise of the trees, the father thought he heard someone speak. He turned but saw no one. He thought that hunger must be making him hear things.

All of a sudden the mother heard a noise. She asked her husband, "Did you say something?"

"No, I didn't," he said.

They both turned when they heard someone say, "I will teach you a way to make food so that you will never have to starve." They whole family was surprised and frightened. Trees don't talk to human beings! Yet, it was true. They had all heard it. Ininatig – the man tree – had spoken.

He told the family to cut his skin, not too deep, but just enough. He told them to collect the liquid that flowed from the cut. It would be clear as water and cold and just a little sweet. He told them to boil the liquid until it became a dark, thick, sweet syrup. They could eat this food, or they could boil it more until it became even thicker. If they poured the syrup into a trough and stirred it back and forth, it would turn into sugar.

The family did exactly as they were taught. They made maple syrup and sugar. Now they had enough food to keep them strong until the ice on the lake broke and there would be fish. The man tree had saved their lives.

Ininatig's gift taught the family to thank the trees each spring. From that day on, the family and all the others who learned about this food never forgot. Every spring the people hold a thanksgiving for the maple trees.

2. Iroquois Maple Tapping Origin Story

One day in early spring, Woksis, an Iroquois chief came home from a long day of hunting and stuck his tomahawk in one of the trees outside his longhouse, as he did every night. Now being that maple trees are very abundant in his area, this happened to be a maple.

The next morning Woksis woke and left for another hunt, taking his tomahawk from the tree. It just happened that there was a bowl sitting at the base of this tree, directly under the gash made by the chief's tomahawk. As the warm spring sun shone on the maple tree, the sap began to run out of the gash, down the trunk, and dripped into the bowl. As evening approached, Woksis's daughter began to prepare dinner. She needed a pail of water to boil dinner in though. As she walked past the tree on her way down to the creek, she noticed the bowl full of "water" sitting by the tree. Rather than walk all the way to the creek, she decided to use this "water." As the dinner boiled, the "water" boiled away, and by the time dinner was done, the "water", which was actually maple sap, had boiled down to the first maple syrup. With a little experimenting, Woksis and his daughter discovered how and when to make this new all natural sweetener. From that point on, maple syrup became an important part of the First People's diet.

3. Nanaboozhoo and the Maple Trees

as told by Joseph Bruchac, *Native American Stories*

Along time ago, when the world was new, Gitchee Manitou (the great spirit of the Ojibwe) made things so that life was very easy for the people. There was plenty of game and the weather was always good and the maple trees were filled with thick sweet syrup. Whenever anyone wanted to get syrup from the trees, all they had to do was break off a twig and collect it as it dripped out.

One day, Nanaboozhoo went walking around. "I think I'll go see how my friends the Anishinabeg are doing," he said. So he went to a village of Indian people. But there was no one around. So Nanaboozhoo looked for the people. They were not fishing in the streams or the lake. They were not working in the fields hoeing their crops. They were not gathering berries. Finally he found them. They were in the grove of maple trees near the village. They were all just lying on their backs with their mouths open, letting the maple syrup drip into their mouths.

"This will not do," Nanaboozhoo said. "My people are all going to be fat and lazy if they keep on living this way."

So Nanaboozhoo went down to the river. He took with him a big basket he had made of birch bark. With this basket he brought back many buckets of water. He went to the top of the maple trees and poured the water in so that it thinned out the syrup. Now thick maple syrup no longer dripped out of the broken twigs, Now what came out was thin and watery and just barely sweet to the taste.

"This is how it will be from now on," Nanaboozhoo said. "No longer will syrup drip from the maple trees. Now there will be only this watery sap. When people want to make maple syrup they will have to gather many buckets full of sap in a birch bark basket like mine. They will have to gather wood and make fires so they can heat stones to drop into the baskets. They will have to boil the water with the heated stones for a long time to make even a little maple syrup. Then my people will no longer grow fat and lazy. Then they will appreciate this maple syrup Gitchee Manitou made available to them. Not only that, this sap will drip only from the trees at a certain time of the year. Then it will not keep people from hunting and fishing and gathering and hoeing in the fields. This is how it is going to be," Nanaboozhoo said.

And that is how it is to this day.

4. Tree Factory Skit

This activity demonstrates the structure and workings of a tree using students as its different components. Playing the role of Mother Nature, the instructor asks for volunteers and directs the activity. As each new component of the tree is added, Mother Nature calls out the changing of the seasons.

spring: The tree factory comes to life. Each component makes it appropriate sounds and actions.
summer: The factory in in full swing; all parts are loud and vigorous.
fall: The factory slows and quiets down.
winter: The factory stops all sounds and actions.

Heartwood (1 person)
ACTION: Stand on a chair in the middle of the room.
SOUND: none

Roots (2 people)
ACTION: Sit at heartwood's feet and pump knees up and down.
SOUND: Slurping noises.

Xylem (2 people)
ACTION: Join hands facing heartwood. Crouch while making sound and raise up.
SOUND: Musical "xylem" climbing note.

Cambium (4 people)
ACTION: Join hands facing inward. Wiggle butts.
SOUND: Chant "We make new cells."

Phloem (6 people)
ACTION: Join hands facing inward. Start on tip toes and lower to floor.
SOUND: Musical "phloem" descending note.

Bark (anyone left)
ACTION: Join hands and face away from the phloem to protect the tree. Act tough.
SOUND: Bark like a doggie.

References

- *Ininatig's Gift of Sugar, Traditional Native Sugarmaking* by Laura Waterman Wittstock, Lerner Publications Company, Minneapolis,1993
- *Minnesota's Natural History An Ecological Perspective* by John R. Tester, Regents of U of MN, 1995
- *North American Maple Syrup Producers Manual* produced by Ohio State U. Extension Bulletin 856, 1996
- *Nutcracker Sweets* by Bernd Heinrich in Natural History 2/91
- *Sweet Maple: Life, Lore & Recipes from the Sugarbush* by James M. Lawrence & Rux Martin, Chapters Publishing & Vermont Life Magazine, VT 1993

1. *The Sugar Maple* by Kim Kurki, ***Your Big Backyard*** magazine, March 2007

The Sugar Maple hides a treat.
Beneath its bark is something sweet.
When nights of frost met days of sun,
The thawing sap begins to run.

You drill a hole; insert a spout,
the sparkling liquid trickles out.
Collect the pails and boil it down.
For thick, sweet syrup of golden brown.

2. *Maple Syrup Time* by Pete Seeger

First you get the buckets ready, clean the pans and gather firewood,
Late in the winter, it's maple syrup time.
You need warm and sunny days but still a cold and freezing nighttime
For just a few weeks, maple syrup time.
We boil and boil and boil and boil it all day long,
Till ninety sev'n percent of water evaporates just like this song
And when what is left is syrupy don't leave it too long -
Watch out for burning! Maple syrup time.

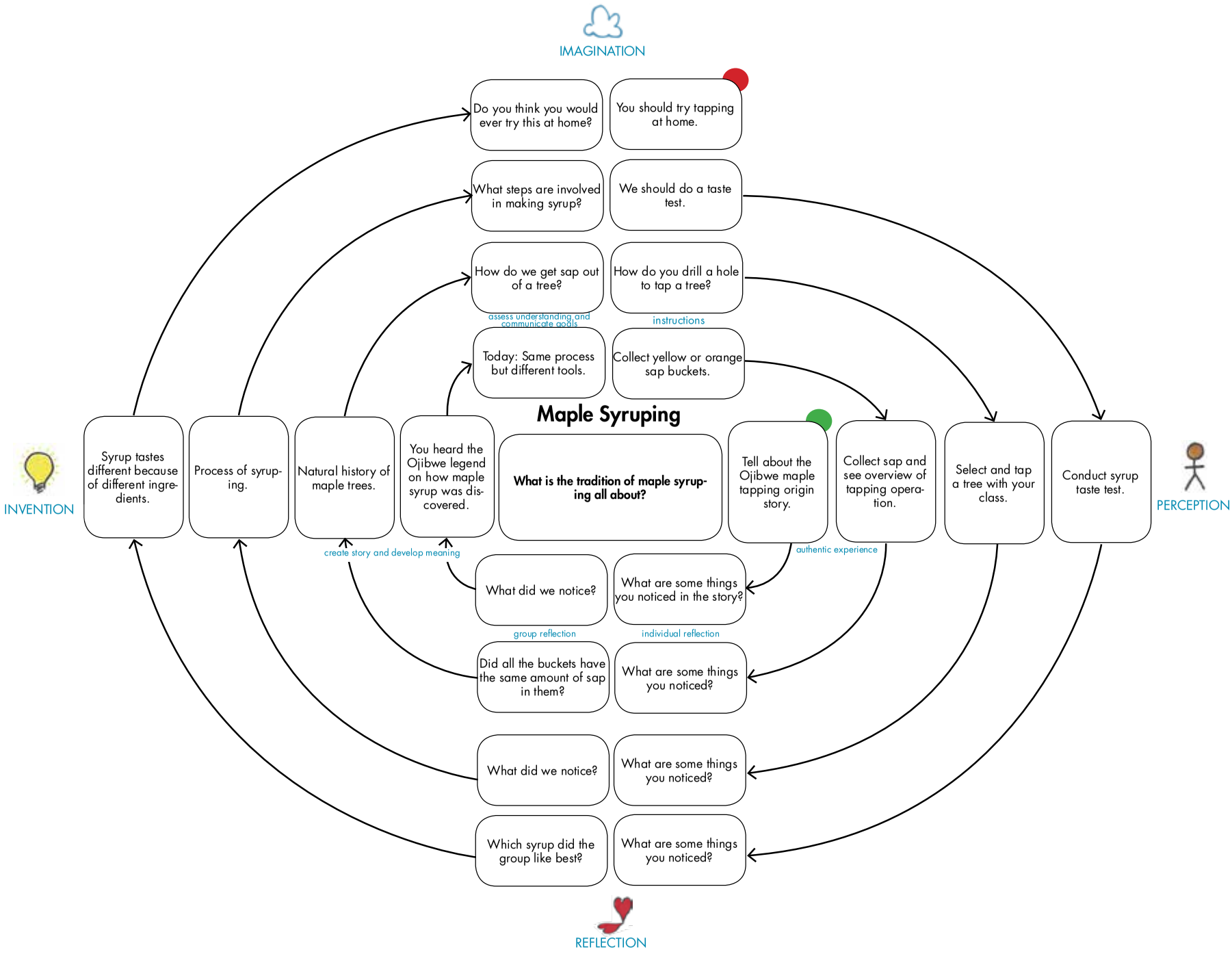
I know it's not the quickest system but each year I can't resist it.
Get out the buckets, and tap the trees in time -
Making it is half the fun, and satisfaction when it's done.
Keep up the fire! Maple syrup time.
My grandpa says perhaps it's just a waste of time.
Ah! but no more than this attempt to make a happy little rhyme,
So pat your feet or swing your tail, but keep in good time.
Keep up the fire! Maple syrup time.

I'll send this song around the world with love to ev'ry boy and girl,
Hoping they don't mind a little advice in rhyme.
As in life or revolution, rarely is there a quick solution,
Anything worthwhile takes a little time.
We boil and boil and boil and boil it all day long.
When what is left is syrupy, don't leave it on the flame too long.
But seize the minute, build a new world, sing an old song.
Keep up the fire! Maple syrup time.

(The group Moxy Fruvous sang their version of the *Maple Syrup Time* on the audio. They have another verse before the first and two more verses in the middle of Pete's second verse. I have not been able to get words for the Moxy Fruvous version.)

Sources

- check with your local extension agent
- Roth Sugar Bush 10976 Co Hwy EE, WI 54727 (715) 289-3820
- LeMann's Supply Catalog
- Readings:
  from *The Story of the Trapp Family Singers* by Maria Augusta von Trapp, page 229 starting at "The sap is running" to "$360" on page 230. Page 230 from "Cold weather....to....few days." Page 233 from "When the sugar"....skip next sentence to ...."lovely time."
  from *The Little House in the Big Woods* by Laura Ingalls Wilder, page 118 starting at "In the morning.... to...."Oh, Charles!" on page 128.


IMAGINATION
Do you think you would ever try this at home?
You should try tapping at home.
What steps are involved in making syrup?
We should do a taste test.
How do we get sap out of a tree?
How do you drill a hole to tap a tree?
assess understanding and communicate goals
instructions
Today: Same process but different tools.
Collect yellow or orange sap buckets.
Maple Syruping
INVENTION
Syrup tastes different because of different ingredients.
Process of syruping.
Natural history of maple trees.
You heard the Ojibwe legend on how maple syrup was discovered.
What is the tradition of maple syruping all about?
Tell about the Ojibwe maple tapping origin story.
Collect sap and see overview of tapping operation.
Select and tap a tree with your class.
Conduct syrup taste test.
PERCEPTION
create story and develop meaning
authentic experience
What did we notice?
What are some things you noticed in the story?
group reflection
individual reflection
Did all the buckets have the same amount of sap in them?
What are some things you noticed?
What did we notice?
What are some things you noticed?
Which syrup did the group like best?
What are some things you noticed?
REFLECTION

PLANNING OUTLINE: Maple Syruping

GUIDING QUESTIONS

What is the tradition of maple syruping all about?

What do I know about this group that could influence how they learn and how I teach?
What could I find out from them?

I. Introduction (5 min.)

II. When did maple syruping start? (10 min.)

Key things to remember -
Questions to ask -
Assessment routines -

Relating to my learners

III. What is it like to collect sap? (10 min.)

Key things to remember -
Questions to ask -
Assessment routines -

Relating to my learners -

IV. What do we need to know about maple trees? (5 min.)

Key things to remember -
Questions to ask -
Assessment routines -

Relating to my learners -

V. How do we tap a tree? (10 min.)

Key things to remember -
Questions to ask -
Assessment routines -

Relating to my learners -

VI. How do we make sap into syrup? (5 min.)

Key things to remember -

Questions to ask -

Assessment routines -
Relating to my learners -

VII. Which syrup do we like better? (5 min.)

Key things to remember -

Questions to ask -

Assessment routines -
Relating to my learners -

VIII. What did we notice? (5 min.)