



Maple Sugaring

Subject Area: Social Sciences

Core Curriculum Content Standards: 3.4, 5.1, 5.2, 5.4, 5.5, 5.7, 5.10

Cross-Content Workplace Readiness Progress Indicators: 2, 3, 5

Session Description

Students will experience the process of maple sugaring from identifying a Sugar Maple to boiling down sap. The session focus includes the physiology of trees and changes in the technology of maple sugaring from the time of Native Americans through the Colonial period to the present day. Students will use bow and drill fire kits, help create spiles from sumac branches, tap a tree using an auger, and transport sap using colonial yokes.

Objectives

1. Students will identify the parts of a tree and explain how they function to create and transport sap.
2. Students will use, compare, contrast, and evaluate the maple sugaring technology of Native Americans, Colonists, and Modern Americans.
3. Students will show their appreciation of trees by explaining their resource value.

Materials

“Make a Tree” Guide maple branch oak branch tree silhouettes bow & drill Kits
boiling stones bark/log trough bark cone saw sumac branch iron poker augers
hand drills yokes/buckets metal spile & hook plastic spile & hook tasting sap
hydrometer thermometer syrup dixie cups various laminated pictures

Procedure

1. Find out what the students know about maple sugaring. It is the process of making syrup or sugar from maple sap. Do the students know why trees have sap? Play *Make a Tree* (see laminated guide sheet) to demonstrate the parts of a tree and their functions. Use the turkey baster to demonstrate how sap is drawn up through a tree by fluctuating temperatures in early spring. Show students the tree cookie and have them identify the heartwood. A maple tree would have far less heartwood and more sapwood than this example. Point out that maples are tapped not only because they have the sweetest sap, but also because they have the most sap.
3. Ask the students if they can identify a maple tree. Show them the maple branch, leaf, and tree silhouettes and help them to identify the distinguishing features of a sugar maple: untoothed,

five-lobed leaves with u-shaped sinuses, opposite branching, and an overall egg shape to the tree.

4. Who were the first people to make maple sugar and syrup? Tell the story of *Manabozho and the Maple Tree* or Chief Woksis and his wife. What culture did the story come from? What facts does the story contain about maple sugaring? Show the picture of the Native American method of tapping the tree as well as the model in the pavilion.

5. How did the Native Americans start the fire to boil the sap? Demonstrate the use of the bow and drill fire kits and have the students use them to create smoke. While the students are working, place a stone in the fire. Show the students how boiling stones were used to evaporate water from shallow logs of sap by carefully picking the stone up with two sticks and placing it into the log trough of water.

5. Demonstrate how Colonial people altered the Native American's use of a stick to collect sap by whittling a sumac spile with the kids. Allow one student to saw off a three-inch piece of sumac. Show students how to hollow out the inside by poking out the pith of the spile with a hot iron poker. Show students the model of the early colonial method of tapping in the pavilion.

6. Bringing the yokes and buckets with you, take the students to the dead standing tree behind the carriage house. Have the students practice drilling holes in the fallen tree using the colonial augers and hand drills. Then, choose one or two students to drill one hole in the standing tree and hammer in the metal spile. Why are metal spiles and buckets an improvement over wooden ones?

7. Bringing the two colonial yokes with you, tour the tapped maple trees. Have students look at and describe the sap in the first bucket. Why is it clear? Allow the students to partially empty some of each full bucket into the buckets being carried by the yoke. Give each student a chance to transport the sap using the yoke. What other methods of transportation did the colonial people use?

8. At the "modern" station, ask students why plastic spiles and tubing might be more efficient than using metal spiles and buckets. Give each student a dixie cup and a taste of maple sap.

9. Have students transport the sap they have collected to the evaporator. Allow a student to empty sap into the loading pan of the evaporator. Explain how the evaporator works and the methods for telling when the syrup is finished. Have two students measure the temperature and density of the sap using the candy thermometer and the hydrometer.

10. Fill two dixie cups, one with real maple syrup and one with fake maple syrup. Give each student two toothpicks to use to taste the syrups and guess which is the real one. Discuss the advantages/disadvantages of using maple sugar verses cane sugar and why most of us do not use maple sugar today.

Conclusion

Have each child share something they learned about maple trees or maple sugaring that they did not already know. Why is it important to protect trees? What other resources did Native Americans and Colonial people get from trees? What resources do we get from trees today?

Classroom Extensions

Have the students tap several of the same type of tree or several different types of trees in their school yard. They can then collect and graph data of each tree's output of sap and syrup, as well as have fun tasting and creating the variety of saps and syrups.

Bibliography

Maple Sugaring Training Manual. Museum of the Hudson Highlands.

Lawrence, James M. and Martin, Rux. (1993.) *Sweet Maple: Life, lore, and recipes from the sugarbush*.

Vermont: Chapters, Publishing Ltd.