

# Tree Tapping

<b>Subject:</b> Math & Science	<b>Grade:</b> 3-6	<b>Duration:</b> 1-2 hours
<b>Lesson Overview</b>	This lesson plan explores how we know when a maple tree is mature enough for tapping to collect sweet water. Attention to a tree's indicators will be observed, such as circumference and texture of bark, as well as exploring the different ways of 'knowing' when determining if maple trees are mature enough to tap.	

## Curriculum Ties (in addition to satisfying multiple core competencies):

### ADST Core Competencies:

- Engage in problem-solving connected to place, story, and local Indigenous perspectives.
- Apply mathematical understanding through inquiry and experiential learning.

### Math

- Engage in problem-solving experiences that are [connected](#) to place, story, cultural practices, and perspectives relevant to local First Peoples communities, the local community, and other cultures.
- Develop, demonstrate, and apply mathematical understanding through play, inquiry, and problem solving.

### Science:

- Develop understanding of local ecosystems and human impact.
- Explore Indigenous knowledge systems related to sustainability and land stewardship.

## Content Objectives

- Using our physical bodies or other non-standard units of measurement, this

activity explores how to determine when a tree is mature enough to be tapped.

- Estimate, measure, and record length, perimeter, area, mass, time and temperature using standard and non-standard units.
- Build a connection to First People’s Principles and knowledge of the land.

## Materials & Equipment Needed

<p>Consumables:</p> <ul style="list-style-type: none"> <li>• String</li> <li>• Pictures of cross sections of trees</li> <li>• Cups</li> <li>• Droppers</li> <li>• Sweet water (or plain water as representation of sweet water)</li> <li>• Teaspoons</li> </ul>	<p>Non-Consumables:</p> <ul style="list-style-type: none"> <li>• Scissors, rulers, outdoor access</li> <li>• Optional: Book: "Keepers of the Earth - Nanaboozho and the Maple Tree"</li> </ul>
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## Lesson & Activity

Lesson Stages	Learning Activities
<p><b>Introduction</b></p>	<ul style="list-style-type: none"> <li>• Depending on the age of the students, you can start by reading: “Keepers of the Earth - Nanaboozo and the Maple Tree”</li> <li>• Watch some introductory videos <a href="#">Ziinzibaakwadgummig - The Sugar Bush - NCCIE</a> to explore how maple trees are identified and what the process is for harvesting sweet water, using both traditional and modern techniques.</li> </ul>

	<p>Facilitate a short class discussion:</p> <ul style="list-style-type: none"> <li>● What do you notice? What do you wonder?</li> <li>● Why is storytelling important when learning about natural resources?</li> </ul>
<p><b>Activity</b></p>	<ul style="list-style-type: none"> <li>● Take the students outside (this can be on school property) to explore both tree hugging (the Indigenous ways) and diameter measurement (the Settler ways).</li> <li>● How do we know if a tree is mature enough to tap? Hugging the Trees:             <ul style="list-style-type: none"> <li>○ This is the way that Indigenous Peoples believe one hug length can mean one tap.</li> </ul> </li> <li>● Measuring the Trees:             <ul style="list-style-type: none"> <li>○ Settler knowledge uses a diameter of 30 cm to tell if a tree can be tapped.</li> </ul> </li> <li>● Have students choose a tree to work with and build a connection with their tree. Older grades can try to learn everything about their tree.</li> <li>● Have students measure trees using tree hugging and items like string before returning to the classroom and figuring out the measurement.</li> <li>● You can also look at cross sections of a tree - either real or printed, or digital. Count the rings to understand its age. Students might be amazed to learn how old the tree needs to be in order to tap it.             <ul style="list-style-type: none"> <li>○ Here is a good resource for cross sections: <a href="#">Cross section of a tree</a></li> </ul> </li> <li>● IF POSSIBLE - Find a maple tree that can be tapped. Watch some</li> </ul>

	<p>videos to see various techniques used both historically and in modern times. Using guidance tap a tree.</p> <ul style="list-style-type: none"> <li>● Videos: <ul style="list-style-type: none"> <li>○ <a href="#">Maple Sap Dripping Into A Maple Syrup Bucket</a></li> </ul> </li> <li>● Counting drops of sweet water: <ul style="list-style-type: none"> <li>○ Forty drops of sweet water yields one drop of maple syrup.</li> </ul> </li> <li>● Students can count forty drops in one cup and then place one drop in a separate cup. Teachers should consider what this tells us about the process of making maple syrup. Students should begin to realize how long the process to make maple syrup is.</li> <li>● Explore how many drops are in one teaspoon. Ask students how many drops of sweet water are needed to make one teaspoon of maple syrup? <ul style="list-style-type: none"> <li>○ What if we wanted to make 10ml, 15ml, 20 ml etc. of maple syrup? Ask students to determine how many ml of sweet water are needed for each measurement. You can extend the level of math required for your specific grade range.</li> </ul> </li> </ul>
<p><b>Closure</b></p>	<p>Facilitate a closing discussion with prompts:</p> <ul style="list-style-type: none"> <li>● What surprised you about how we measure trees?</li> <li>● Which method felt more meaningful or accurate to you—hugging or measuring? Why?</li> <li>● What actions can we take to help trees grow old enough to tap?</li> <li>● Why is it important to protect these traditions and trees?</li> </ul>
<p><b>Step Ups &amp; Step Downs</b></p>	<ul style="list-style-type: none"> <li>● For grades 5-6: Use proportional reasoning to calculate the volume of sweet water required to support Canada’s maple syrup industry <a href="#">Measuring Sweet Water and Maple Syrup</a></li> </ul>

	<ul style="list-style-type: none"><li>• For grade 5+: Explore the structure of a maple tree and the impacts of climate change: <a href="#">Maple Syrup and Climate Change</a></li></ul>
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## Additional Resources

- [Maple Syrup: An Everything You Need to Know Lesson Plan](#)
- [Ziinzibaakwadgummig - The Sugar Bush - NCCIE](#)
- [Tree Tapping - NCCIE](#)