



Explore January: How to Tap a Tree

Learn about how to tap a sugar maple tree to collect sap that will get turned into syrup!

Have you ever wondered where maple syrup comes from? Well, that sticky, sugary syrup that we put on our pancakes comes from trees! **Sugar maple** trees are the best tree to collect sap from because of their high sugar content. You may have some sugar maple trees right in your backyard or at your favorite park. Sap is collected from the trees through a process called tapping, and then all the sap is collected from the buckets, then boiled down to make maple syrup. By boiling the sap, the water evaporates, and the liquid becomes thicker, darker in color, and sweeter. A *lot* of sap is needed to produce maple syrup. If you collect 40 gallons of sap, by the time it is boiled down and ready to use, only one gallon of syrup will have been produced!



Sap directly from the tree. [Source.](#)



Boiling sap to make syrup. [Source.](#)



Final product: maple syrup. [Source.](#)

Sap collecting is no easy task. Before collection can begin, the proper materials are needed, along with the most important part...the sugar maple trees! Generally, when sap is collected it is taken from a large patch of sugar maples that are growing close together, this is called a **sugar bush**. Specific environmental conditions are also needed for efficient sap flow. To generate ideal sap flow, the temperature will need to be above 32 degrees Fahrenheit during the daytime and below 32 degrees Fahrenheit at nighttime.

So, how is a tree tapped?



Tapped maple trees in a sugar bush. [Source.](#)

When a tree is ready to be tapped, it will have a circumference of 10 to 12 inches. Larger trees that have a circumference between 20 and 25 inches can be tapped twice. When choosing a spot to tap, it is important to be on the south side of the tree to avoid direct sunlight. Ideally, there will also be a thick root below and a thick branch directly above the spot where the tree will be tapped. From there, the tap will go into the tree at about waist height.

The materials that are needed to tap a tree include:

- Bit and brace (or electric drill)
- Tap and hook
- Hammer
- Bucket and lid

The **bit and brace** are used to drill a hole about 1½ inches deep into the tree, alternatively an electric drill can be used. This process does not harm the tree because after the maple sugaring season is over and the tap is removed, the tree will form woody scar tissue over the hole.

Once the hole is drilled, the **hook** is placed on the smaller tapered end of the **tap** and the tap and hook are held up to the drilled hole. The hook is used to hold the bucket, and the tap is used to funnel the sap from the inside of the tree into the bucket.

The **hammer** is then used to completely push the tap into the initial drill hole.

Then the **lid** is placed on the **bucket** and it is hung on the hook. The bucket is accompanied by a lid to protect the sap and keep out any rainwater and animals or bugs that are attracted to the sugary sap.



Bit and brace.



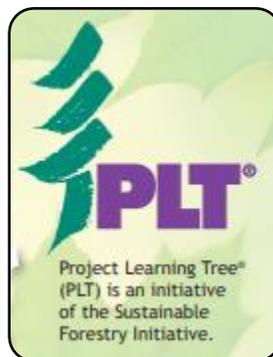
Hammer. Source.



Tap and hook inserted.



Collection bucket with lid.



Watch how to tap a tree [here](#)! Also, look for the Duke Farms Resources.

[Click here](#) for an activity from Project Learning Tree. “How Big is Your Tree” is an activity that allows for exploration and discovery within mathematics.

[Click here](#) to learn how to measure the circumference of a tree and practice measuring! Are your trees large enough to tap based on the information above?

Extensions

NJ DOE Mathematical Student Learning Standards and the Common Core Standards include measurement at various grade levels and identify the use of real - world problems as a target. Finding the circumference of a tree would be a way to secure math objectives by creating a memorable and fun activity for your students.

- Grade 7 » Geometry » Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.
- Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.

For more ideas of interdisciplinary and environmental education connections contact Kate Reilly, Manager of Education, Duke Farms. kreilly@dukefarms.org.