HAYES FARM
TRAVELLING GARDEN TOOL KIT

MAPLE SYRUP!

GRADES 3 - 5

Today we will learn about

The purpose of sap in trees

What conditions make sap run

How sap is turned into syrup

What other things we can do with sap

An indigenous story about the maple syrup harvest

Maple syrup and identity

Why do trees have sap?

Sap stores energy in the form of liquid sugars.

Those are the same sugars that are produced through *photosynthesis, which is when* green plants use sunlight, water and carbon dioxide and turn them into water, oxygen and simple sugars.

Sap flows through the tree by channels called xylem and phloem. Sounds like *flo-um.*

- *Xylem* is the dead tissue that carries water and minerals from the roots to all other parts of the tree.
- *Phloem* is the living tissue that carries food and other organic nutrients from leaves to all other parts of the tree.

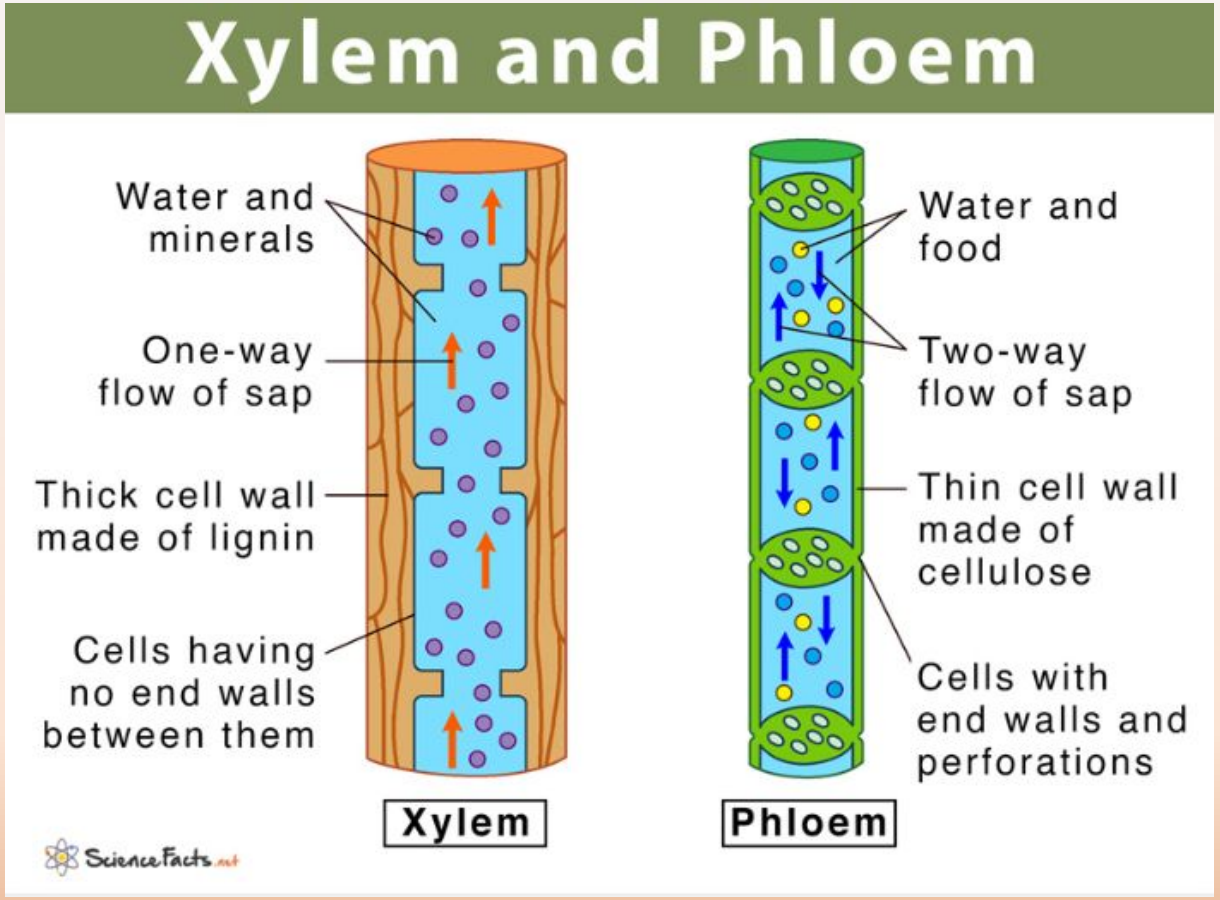
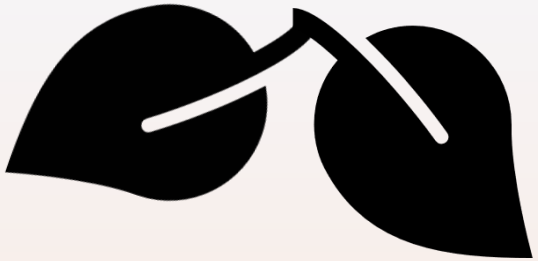


Photo: ScienceFacts.net

What time of year do we harvest sap?

Why would the tree need food then?



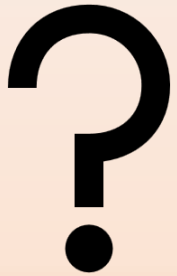
Exactly! We harvest sap in the late winter or very early spring.
This is the time when trees need energy to push out their new leaves.
Sap is food that the tree has made for itself.

Sap starts to run when the tree gets the signal that spring is coming.
This means warmer days, but still cool nights.
We might think that more sunlight would be helpful, but it is really the temperatures that matter the most.

There can be quite a lot of variation each year about when the sap starts to run.

How do we get syrup?

There is a big transformation between the clear sap which looks like water and the golden, brown maple syrup that we all know.



Does anyone know some of the steps that we take to get syrup?

Getting taps set up and collecting

1. Drill a small hole into the bark
2. Insert a tap/ spout which is often called a *spile*.
3. Hang a sap bucket on the spile to collect the sap.
4. These buckets aren't big and need to be emptied into larger containers each morning.

Photo: Carol Muncer at Hayes Farm

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Wait! Would drilling a hole in the tree hurt it?

Fortunately, no! Trees are very good at healing from wounds to their bark. If a tree branch came off in a storm it would not kill the tree. The tree would simply send a signal to make new bark grow over the wound.

We only use one hole per tree each year. If we put too many holes it may be too hard for the tree to recover.

Cleaning and boiling off

4. When enough syrup is collected we will use some cheesecloth to strain out any twigs, bugs, dirt…

5. Then we start boiling!

People used to use wood fires, but sometimes we use propane fires too.

You can choose to boil off a lot of the water outside and then finish the process in the house.

Sometimes we get ice storms or rain and we can't have a fire outside.

Photos: Carol Muncer at Hayes Farm

People that sell maple syrup generally use a big piece of equipment called an evaporator, because they have too much sap to boil off in pots.

Photo: Malars Maple Syrup, Ontario

We are so close now…

When the syrup gets to 104 ’C it is done :)

A very long candy thermometer or digital thermometer can be used to check the temperature.

We need to be very careful with maple syrup because it will stick to our skin and make a serious burn. No taste testing hot syrup!

We need to really practice stove safety and we don’t pour the syrup until it is cool.

Photo: Carol Muncer

Patience pays off…

Cool the syrup, filter it once more and then transfer it into bottles.

The sugar in the syrup will help it to last a long time, but it is still best to store bottles in a dark place.

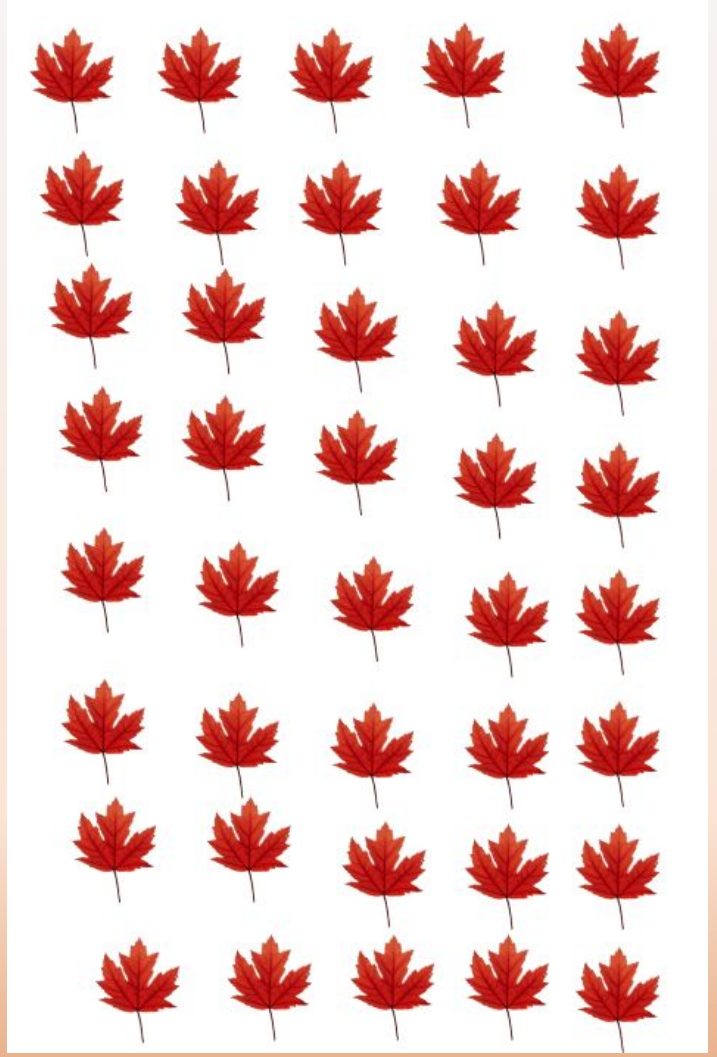
Opened bottles can evaporate and get sugar crystals in them.

Photo: Carol Muncer

Wow, boiling sap down can take a long time!

Let’s imagine each leaf is one litre of sap.

For every 40 L of Maple sap we get 1 L of Maple syrup.



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What other things can we do with sap?

We can continue to cook the water out of the sap and turn it into:

Maple butter

Maple sugar

Maple taffy (cooled on snow)

Maple candy

Photo: McLaghlan Family Maple Syrup

Do all trees have sap?

Yes, we can take sap from any tree.

Hardwood trees tend to have a thinner sap that flows easily.

Softwood trees like spruce, pine and fir have a very thick sap that is sometimes called *resin* or pitch. Spruce gum is an example of this.

Let's recall that the ratio of Maple sap to syrup is 40:1

The ratio of Birch sap to syrup is 80:1!

You can consume sap like a sweetener without boiling it into syrup. Some people prepare drinks with the sap.

Photo: Excellence NB
Produced in St. Quentin, N.B

An indigenous syrup story

Cecilia is our indigenous knowledge specialist. She told us this story at our maple workshop in April 2024…

A long time ago, Glooskap had given the people a beautiful gift, maple syrup. They would always be able to get this sweet nutrition straight from the tree.

They really needed this after a long, hard winter with not much food to eat.

The people were blessed.

Photo: Brady Cross/ Cross the River Creative (cropped)

Glooskap statue at Wékopekwitk, Mi'kma'ki

Many years passed and one day Glooskap came into a village to see the people.

He looked around, but didn't see anyone.

There were no people getting gardens ready for spring.

There were no people minding the fishing nets.

There were no people doing chores.

Where were all the people Glooskap wondered?

At the edge of the community, Glooskap found them all in the forest and He was not pleased!

The people were laying on their backs under the maple trees and they were letting the sweet, syrup fall straight into their mouths!

They would stay here all day and never do any of their work.

Photo: Library of Congress, US

Glooskap knew that people needed to know how to live on the land and work together.

He knew they might be tempted not to do their work if the Maple syrup always flowed.

He left the sap for the trees, but added water so that from now on the people would need to give many days of work to get the precious syrup.

That is how we still make syrup today.

Sap Sucking Squirrels!


Photo: Hannah Leitheiser

In the book Braiding Sweetgrass, the author Robin Wall Kimmerer who is an indigenous woman from the Potowatami Nation writes in the story *Maple Sugar Moon* about how –

Long ago, indigenous people watched squirrels chew at bark and then drink the sap.

They also used hollowed out logs (*troughs*)to pour sap into and each morning they would wake up and take the ice off of the top. The water in the sap froze, but not the sugars.

In doing this, they did not need to cook the sap down as much, but they still got a lovely, sugary, sap/ syrup mix.

Sometimes hot rocks were added to the troughs to help more water *evaporate* off.

WE ♥ 

Maple syrup and identity

- Indigenous communities have a long syrup making history. They shared this knowledge gift with the settlers.
- People from other countries may not know maple syrup because Maple trees only grow in colder climates. In warmer countries people often chew on sugar cane as a treat instead.
- Canadians use the Maple leaf on our flag!
- Many people in New Brunswick feel a lot of enjoyment and pride when they have maple syrup. Going to the maple sugar camp is very exciting sign of spring. Sugar camp is a place to connect with family and community in a relaxing way.
- Canada makes 71% of all of the maple syrup in the world.

Vocabulary

Evaporation Is when a liquid turns into a gas. Ex. Water that is heated becomes steam and enters to air.

Identity is a belief, behaviour, or characteristic of a person or a group of people. A shared identity makes people feel that they belong in a group.

Phloem is the living tissue that carries food and other organic nutrients from leaves to all other parts of the tree.

Photosynthesis happens when green plants use sunlight, water and carbon dioxide and turn them into water, oxygen and simple sugars.

Resin is a very thick type of sap that hardens quickly when exposed to air. Ex. Spruce gum or Pine pitch.

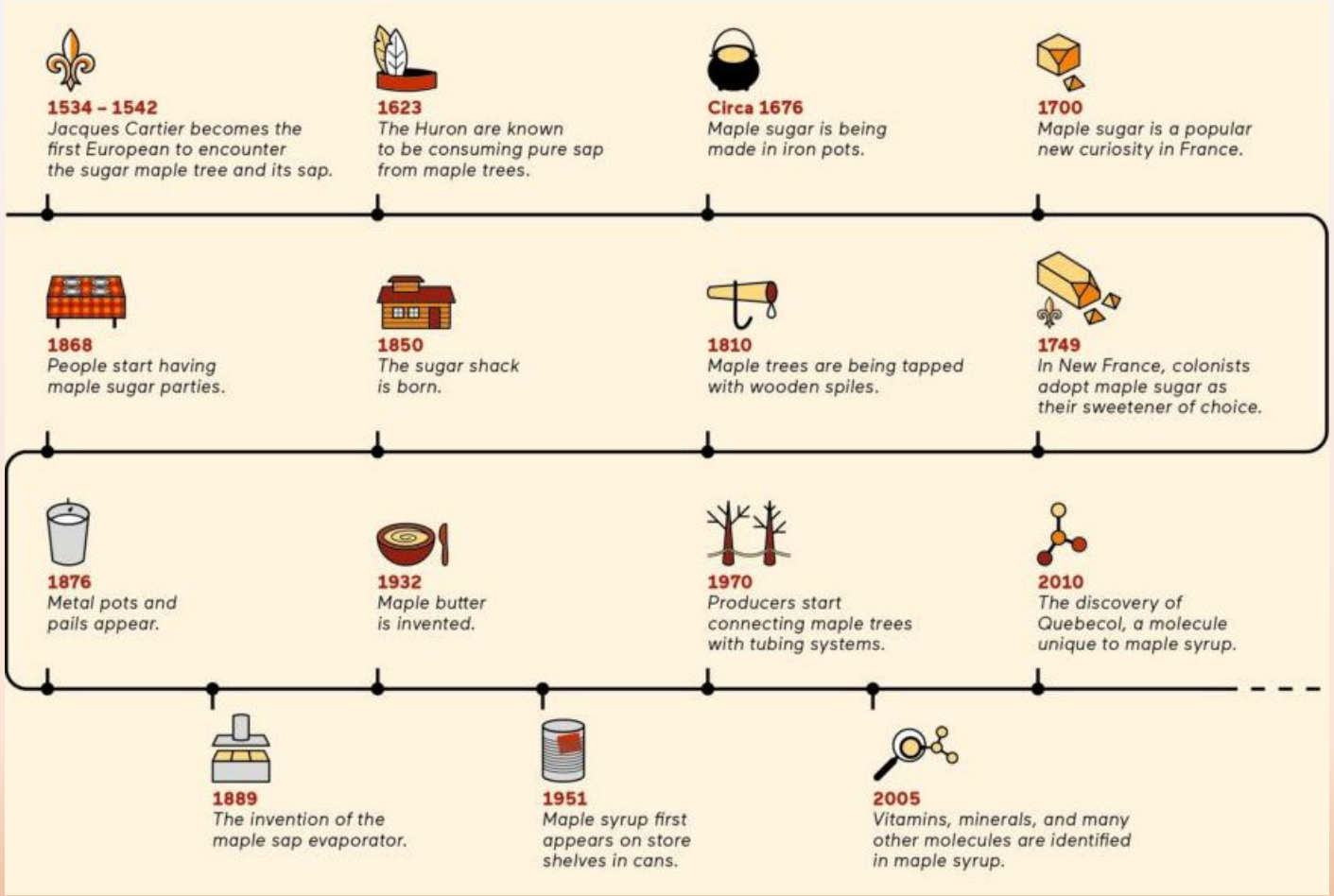
Spile is a spout that is inserted into hole in a tree's bark to allow sap to flow freely.

Sugar maple camp is a traditional place for boiling down collected syrup.

Trough is a long, hollowed out container that is usually made of wood. Ex. The pigs all ate out of one long trough.

Xylem is the dead tissue that carries water and minerals from the roots to all other parts of the tree.

Additional Resource



https://www.maplefromcanada.com/about/history/

There is likely a lot of information missing on the indigenous side of syrup production, but this gives you a general idea of the settler history of production.

Technology has actually stayed fairly simple and developed relatively slowly with maple syrup production.

It is one of the few processes in our world that doesn't rely that much on computerization.

We look forward to seeing you on the farm!

NB Community Harvest Gardens inc.

Hayes Farm


https://youtu.be/8LswRRSfUFo
DIGGING DEEPER
WITH JEAN-MARTIN FORTIER