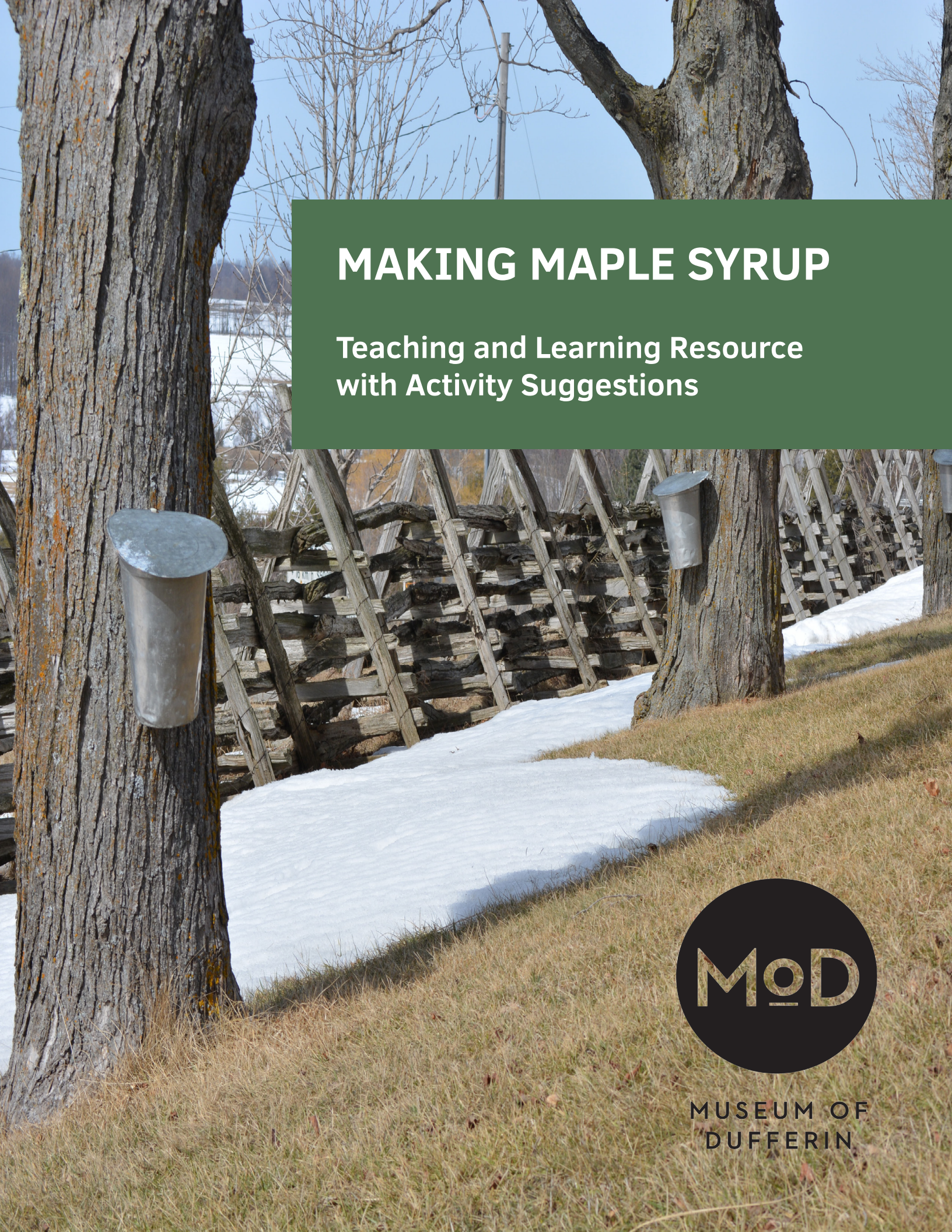
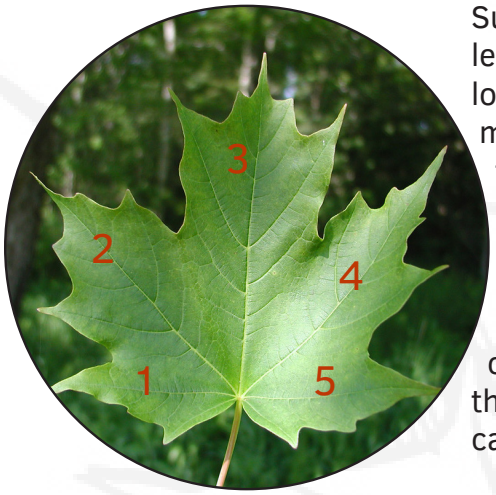


MAKING MAPLE SYRUP

Teaching and Learning Resource with Activity Suggestions

MUSEUM OF DUFFERIN

IDENTIFY THE SUGAR MAPLE



Sugar maple leaves have five lobes (three large main lobes and two smaller lobes). The points on the leaves are called teeth and the curves between the teeth are called notches.

The twigs on a sugar maple tree are brown to brownish-red and pointed. New buds and branches form opposite to one another.

The bark of the sugar maple is greyish-brown. It has ridges or furrows in the bark. The bark colour changes as the tree ages and grows.

The scientific or Latin name for the sugar maple tree is *acer saccharum*. The word *acer* means “sharp”. This is because of the points on the leaves. *saccharum* means “sugar”. These maples earned the name because they have higher levels of sugar in their sap than to other maples.

The sugar maple is also called “rock maple” or “hard maple” because of its heavy, hard and strong wood.

There are more than one hundred species of maple in the world. Thirteen species of maple are native to North America, ten are native to Canada. The most common species in Canada are sugar maple, black maple, red maple, Manitoba maple, and silver maple.

Think About It:

How can the sugar maple be identified in the winter or early spring?

How do higher levels of sugar in the sap help maple syrup producers?

THE SUGARING SEASON BEGINS

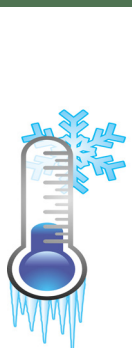
A tree can be tapped for sap when it is about 80 cm around the trunk.

Maple syrup producers begin tapping trees when the temperature is below freezing at night and above freezing during the day. This happens during the springtime as snow and ice begin to melt.

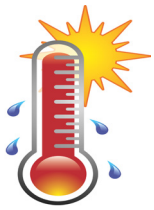
Pioneers looked for signs that it was sugaring time: "The snow on the roof would melt and trickle down the eve spouts…we might hear the settling of the snow drifts as drops of water filtered through…The maples with deeply-ribbed and darkly-coloured bark seemed to produce the most sap, so a few of the largest trees were tapped in two places, usually on the south side where the warmth of the sun more than compensated for any chilling breeze from the north." (Walter C. Torrance, *A Land Called Amaranth*, pg.258)

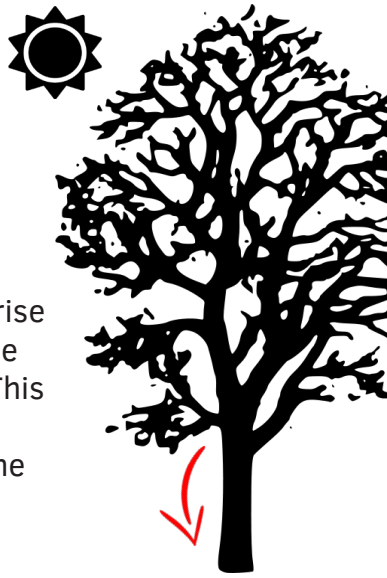
The basic tools needed for harvesting sap are: a drill with a bit that matches the size of the tap (spile or spout), a hammer, sap container (bucket) with a lid, and a larger collection and storage container.

Between 22-40 litres of sap can come from one tap in a season. Larger trees can give up to four litres of sap per tap each day! This doesn't hurt the tree, as long as there are not too many taps in the tree.



When it is cold at night, the sap rises up in the tree.





As temperatures rise during the day, the sap flows down. This is when the most sap will fall into the bucket.

Think About It:

What is freezing temperature in Celsius?

What would make the maple sap harvest season long or short?

SUGAR BUSH EQUIPMENT

The tools and equipment used to harvest maple sap today are much different than what was used in the past. For example, most maple syrup producers no longer use spiles and buckets. Instead, they use a system of taps connected by tubes. This delivers the sap right to the tanks.

On the right are pictures of old spiles from the Museum's collection. Do you know what materials each spile is made of? Which spiles are the oldest and which are the newest?

The oldest spiles in the Museum's collection are handmade, carved out of wood. The oldest wooden spiles are often large in size, like the one pictured on the left. They were likely inspired by the simple spiles used by Indigenous Peoples, who were the first to discover that sap could be harvested from trees. The spiles were longer because they carried the sap further to a bucket on the ground. Spiles became shorter when it was discovered that a bucket could be hung from the spile.

One of the reasons maple sap has been harvested for so long, dating back to Indigenous Peoples, is that it can be done with simple tools and materials. Indigenous Peoples and Settlers could tap a tree by making a gash with an axe or using a hand drill (like the one on the right).

Centuries ago, people realized that if the tapping is done with care, a maple tree will heal itself. The log section on the right shows how the tree was tapped four times in the same area, in different years. Each time, it scarred over and continued to grow.

HARVESTING SAP

Europeans that came to settle in Dufferin County cleared trees for the homestead and a farm crops, but usually left some land forested for collecting wood, and hunting and gathering, including maple sap.

"After Father had smoothed the bark with the axe, he would bore a hole about 2.5cm in depth and tap in the iron spile. Hanging the bucket in place, we would pause for a moment and listen to the pleasant ping, ping, ping, as the drops of sap hit the tin at the bottom of the bucket. It was the promise of a good season to come…When the sap ran all night, the buckets would be full by morning. Usually we took two pails and gathered it on foot…It was a slow job. If the snow was soft, we plunged to our knees with every step and the pails seemed to get heavier minute by minute. If we tried to gather the sap by putting a barrel on the sled-like stoneboat pulled by a horse, we usually had problems. The ground had many hollows and the shrubs jerked the low stoneboat splashing the sap over the rim of the barrel and threatening to dump the whole load into the snow…The maple sap was much like rainwater in appearance and taste with just a trace of sweetness." (Walter C. Torrence, *A Land Called Amaranth*, pg. 259)

Think About It:

What did settlers hunt and gather from their forested lands?

Why did they collect wood?

It takes 40 buckets of sap...

...to make 1 bucket worth of maple syrup

“SUGARIN’ OFF”

When sap is collected from the sap buckets it is mostly water with only a little bit of sugar. To turn it into thick, golden and yummy maple syrup, most of the water must be removed. To do this, the sap is put into a kettle or tray and heated up until the water begins to steam (evaporate).

Some settlers did not have a formal sugar shack where they would boil sap, but instead made an encampment in the bush. Building a support frame from poles and branches, “the iron kettles were suspended by chains…and two huge logs of green elm were rolled against the kettles on either side,and a large block of wood placed at each end. We used the dry limbs scattered about the bush for fuel and with a couple of cedar rails for kindling, a jar of matches and some old newspapers, we were ready for business.” (Walter C. Torrence, *A Land Called Amaranth*, pg. 259)

The boiling took a long time, but soon the sap began to thicken and change colour. “When the syrup was nearly thick enough and low in the kettles, it had to be watched very carefully. We would take a small quantity in the dipper, set it on the snow for a minute, then sample its quality.” (Walter C. Torrence, *A Land Called Amaranth*, pg. 259)

Museum of Dufferin Collection, P-1146 DD

Many Settlers continued to let the sap “cook down” until it turned into maple sugar. They formed the maple sugar into moulds, then wrapped it in paper when it cooled. This was easier to transport and lasted longer than maple syrup. Below is a hand-carved sugar mould from the museum’s collection that would make a swan shape.

Museum of Dufferin Collection, A203-030-1-1S

According to the 1861 Agricultural Census, over 45,360kg (100,000 pounds) of maple sugar was produced in Dufferin County in 1860.

MAKING THE GRADE

Maple syrup is graded according to its colour and flavor, which go hand-in-hand. (Lighter syrup is usually made early in the season and darker syrup later in the season.) The method and amount of time the sap boils also affects colour and flavor. Lighter grades are used to make maple sugar and candy, where darker syrup is used for cooking and baking.

In Ontario there are two maple syrup grades (Grade No. 1 and Processing Grade) and four colour classes (Golden/Light, Amber/Medium, Dark and Very Dark).

Golden
delicate taste

Amber
rich taste

Dark
robust taste

Nutrition Facts
Valeur nutritive

Per 4 tbsp (60 mL)
par 4 c. à soupe (60 mL)

Amount Teneur	% Daily Value % valeur quotidienne
Calories / Calories 220	
Fat / Lipides 0 g	**0 %**
Sodium / Sodium 10 mg	**0 %**
Potassium / Potassium 180 mg	**5 %**
Carbohydrate / Glucides 54 g	**18 %**
Sugars / Sucres 48 g	
Protein / Protéines 0 g	
Calcium / Calcium	4 %

Not a significant source of saturated fat, trans fat, cholesterol, fibre, vitamin A, vitamin C or iron.

Source négligeable de lipides saturés. lipides trans, cholestérol, fibres, vitamine A, vitamine C et fer.

It was a tradition to hold a “sugaring off” party at the end of the maple syrup season. People gathered for music, games and dance and, of course, to eat maple syrup – often as maple taffy on snow as pictured below.

Maple syrup is a natural sweetner, but it should still be enjoyed in moderation. A serving size is a 1/4 cup, four tablespoons or 60mL. It contains nutrients and minerals such as manganese, riboflavin, thamin, potassium, calcium, and copper.

ACTIVITY SUGGESTIONS

Science and Nature Activities:

- Go on a tree identification hunt. This is easiest when the leaves are on the trees.
- Identify the parts of the tree or anatomy of a cross-section of a tree (e.g. heartwood, sapwood)
- Test out some maple syrup recipies. Try different colour classes to see how robust the taste will be.
- Conduct a taste test experiment. Can your taste buds tell the difference between real and fake maple syrup? Or explore all taste sensations (e.g. sour) and the parts of the tongue associated with these sensations.

Art Activities:

- Design your own maple syrup bottle or bottle label.
- Design you own sugar mould (either draw it, sculpt it out of modelling clay, or carve it from linoblock, styrofoam or soap).
- Depict maple trees during the four seasons.
- Find an assortment of leaves and make leaf rubbing art.
- Make words in the form of “drip letters” - letters that look like they are dripping.

Math Activities:

- Show and/or count to 40 in different ways (e.g. by 5s and 10s).
- Measure and record the circumference of a variety of trees. Challenge students to find different ways to measure (i.e. with rope/string). Use these numbers to estimate the age of the tree (roughly every 2.5cm equals one year of growth).
- Estimate the height of trees. This can be scaled for different ages. Check online for different ways to do this.
- Practice estimating and measuring liquids in different amounts.
- Track and chart temperature readings. Create a chart to show daily changes.
- Syrup sales word problems (e.g. Tom sells 1L bottles of maple syrup for $20 and Jenny sells 500mL bottles for $10. If Tom sells five bottles, and Jenny sells eight bottles, how much money did they each make? Who sold more maple syrup?)

Language Arts Activities:

- Maple syrup vocabulary, spelling practice (e.g. spile, bucket, boil).
- Maple syrup process - put the process in order.
- Maple syrup storybooks: