

Kinsmen Fanshawe Sugar Bush

VISIT THE KINSMEN FANSHAWE SUGAR BUSH MAPLE FESTIVAL

Operated by the Kinsmen Club of Greater London



March is the time of year to get outside and enjoy the "*tapping of the trees*" at the Kinsmen Fanshawe Sugar Bush. Come join us! Help mark the passing of winter and the coming of spring with tours and activities. Continue a North American native tradition learned by the early European settlers, and then passed down through the generations to us. Experience the tastes and smells of the maple syrup season with the Kinsmen Club of Greater London.

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21201-c Lakeside Drive Thames Centre
519-461-1073 www.kinsmenfanshawesugarbush.com



Kinsmen Fanshawe Sugar Bush

A Teacher's Guide to the Kinsmen Fanshawe Sugar Bush

School _____ Date _____ Time _____

Contact _____ # Attending _____ Cost _____

Please make cheque payable to the Kinsmen Club of Greater London

Call 519-461-1073 for more info www.kinsmenfanshawesugarbush.com

Things to take: Camera, tape measures, tree identification book, stopwatch, containers for samples

Student activities before the trip:

Make a list of things students will expect to see at the sugar bush.

Plot a route on a local map from the school to the sugar bush.

Research a list of the species of trees that are likely to be found in a sugar bush.

Each student should select two of the following activities to research during the visit and prepare a page that provides space for recording the information.

Student activities in the sugar bush:

Sounds in the sugar bush and in the sugar shack.

Smells in the sugar bush and the sugar shack.

Birds and animals observed in the sugar bush.

Number of and the dress of the workers in the sugar bush and the sugar shack.

Tools and machines used in collecting and evaporating the sap.

Things that are done by hand in the making of maple syrup.

Things that show how the trees in the sugar bush are cared for.

Ways that people work together in the sugar bush.

Diameter of trees in the sugar bush.

Student activities following visit to the sugar bush:

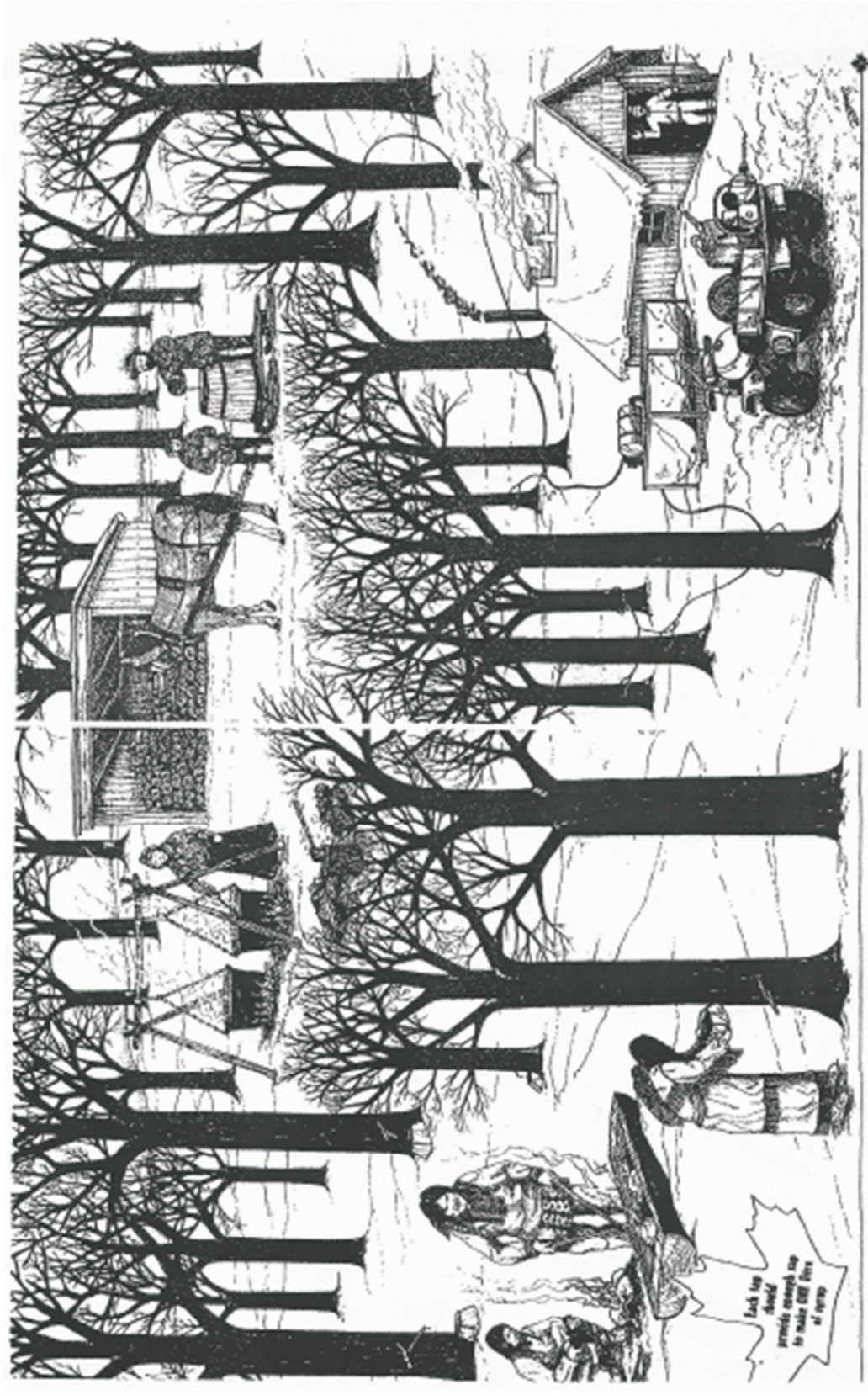
Write a description of what the sugar bush might be like in another season.

Make a model of a sugar shack and include as many pieces of equipment as you can.

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Background Information

The sugar maple tree is unique to the southeastern part of Canada and the northeastern part of the United States. From the earliest human settlements in North America, the making of maple syrup and maple sugar by tapping the sugar maple has symbolised the coming of spring. The sap, a slightly sweet clear liquid, begins to flow in the trunk of the tree when cool nights (approximately -3°C) are followed by warm sunny days (approximately 3°C to 5°C). The sugar in this sap is produced by the action of sunlight on the chlorophyll in the large maple leaves during the previous summer.

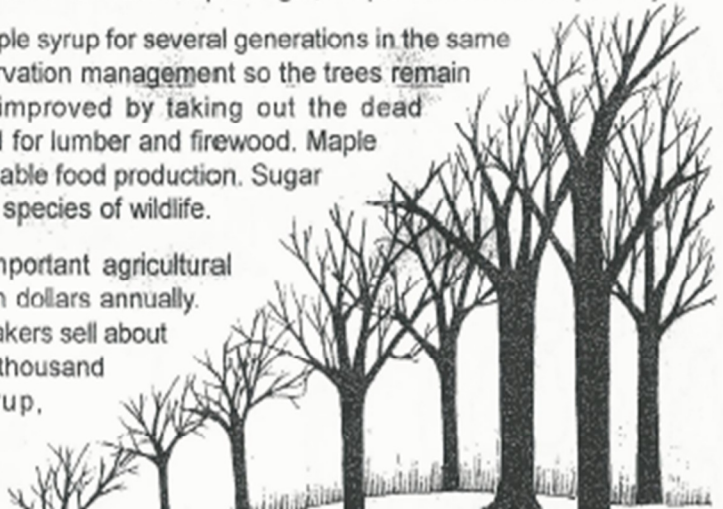
To collect the sap, the sugar maker drills an 11 mm hole approximately 7 cm into the trunk. A spile is placed in the hole to direct the sap into a bucket or tubing system. The sap flows best on still, sunny days. Taking a small amount of sap does not damage the tree. Some sap is still collected in pails and carried to the sugar house in tanks on sleighs and wagons. Other maple syrup producers use plastic tubing and a vacuum pump to bring the sap from the trees to a storage tank near the sugar house.



To make maple syrup, the sap is boiled down in an evaporator in the sugar house. It requires an average of 40 litres of sap to make one litre of syrup. Often a finishing pan is used in the sugar house to bring the boiling temperature of the syrup to 3.9°C above the temperature at which water boils. At this boiling temperature the maple syrup is at least 66% sugar (sugar makers call this 66° Brix). The hot maple syrup is put through a filter to remove the small particles of sugar sand before it is put in glass, metal or plastic containers. The first sap usually has the highest sugar content of the season (about 3%) and produces a very light coloured syrup with the distinctive maple flavour. This will be graded as Canada #1, Extra Light. As the snow melts and the days get longer and warmer the syrup usually gets darker in colour and the syrup has a stronger maple flavour. As soon as the buds on the trees begin to open, the sap is no longer suitable for making syrup. The maple syrup season lasts from three to six weeks. Maple syrup can be boiled down further to make maple sugar, maple butter and maple taffy.

Many families have been producing maple syrup for several generations in the same sugar bush. Sugar makers practice conservation management so the trees remain strong and healthy. Woodlots can be improved by taking out the dead and diseased trees. These trees are used for lumber and firewood. Maple syrup making is a good example of sustainable food production. Sugar bushes provide food and shelter for many species of wildlife.

Maple syrup and maple sugar are important agricultural products in Ontario, worth about ten million dollars annually. Each year the approximately 2000 sugar makers sell about one million litres of maple syrup and forty thousand kilograms of maple sugar. Maple syrup, maple sugar, and maple taffy are sold around the world.



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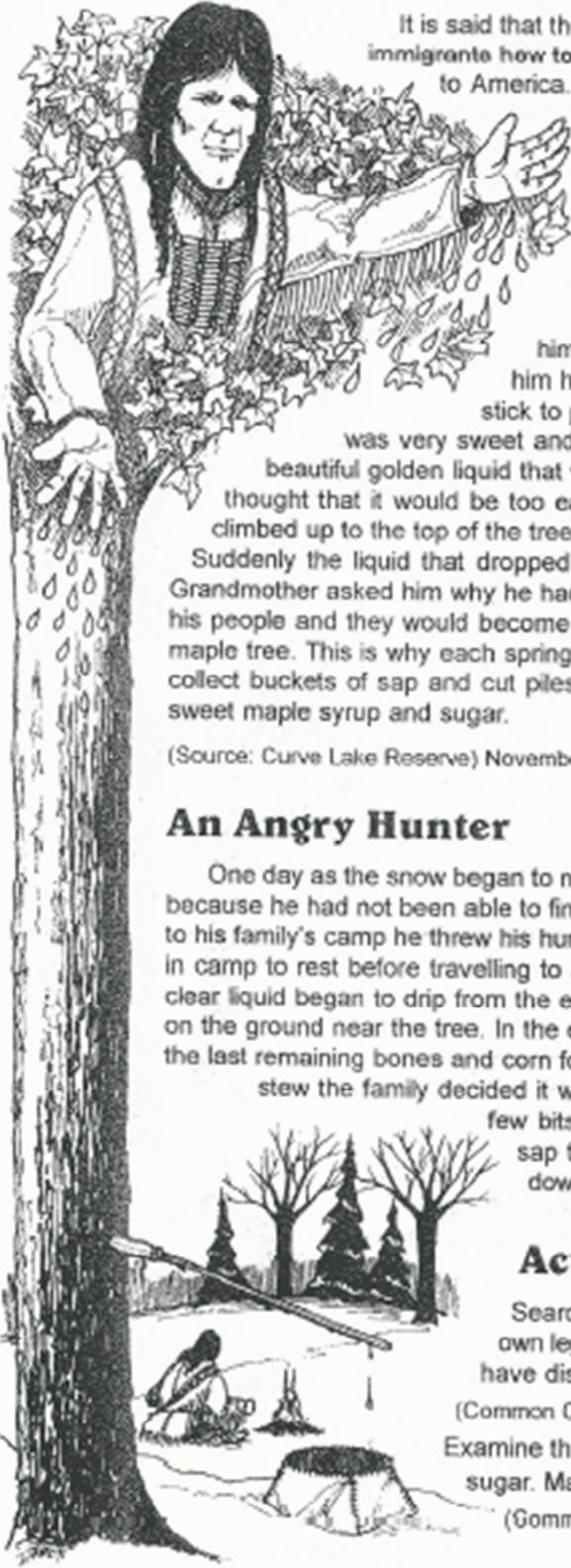
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Discovering Maple Syrup

It is said that the First Nations people taught the British and European immigrants how to make maple syrup and maple sugar when they came to America. The First Nations people made maple sugar so they could store and carry it easily. Here are two legends as to how the First Nations people discovered the sweet taste from the maple tree.



Grandmother's Story

Many moons ago Nanabush's old grandmother took him into the forest in the spring of the year. She showed him how to make a hole in a maple tree and shape a short stick to place in the hole. The liquid that dropped onto his lips was very sweet and good. For a long time Nanabush thought about this beautiful golden liquid that was like the nectar in the summer flowers. Nanabush thought that it would be too easy for his people to gather this maple nectar so he climbed up to the top of the tree and scattered water over all of the trees in the forest. Suddenly the liquid that dropped from the stick in the tree was not nearly as sweet. Grandmother asked him why he had done this. He explained that it would be too easy for his people and they would become lazy if he told them about this sweet nectar from the maple tree. This is why each spring the First Nations people had to go into the bush and collect buckets of sap and cut piles of wood to heat stones to boil the sap to make the sweet maple syrup and sugar.

(Source: Curve Lake Reserve) November 18, 1996

An Angry Hunter

One day as the snow began to melt, Running Deer, a great hunter, became very angry because he had not been able to find enough fresh meat for his lodge. When he returned to his family's camp he threw his hunting spear into a nearby tree. The next day he stayed in camp to rest before travelling to a far off valley in search of game. In the afternoon a clear liquid began to drip from the end of his spear into a birch bark bowl that was sitting on the ground near the tree. In the evening his wife used the clear water-like liquid to boil the last remaining bones and corn for a stew. It gave off a delicious smell. As they ate the stew the family decided it was the best meal they had ever eaten in spite of the few bits of meat in it. Thus they learned to collect the clear sap that runs from the maple tree in the spring and boil it down to make sweet maple sugar they could carry all year.

Activities

Search in the library for other native legends. Write your own legend or story as to how you think the first person might have discovered how to make a sweet syrup from the sap.

(Common Curriculum Outcomes 1a, 1d, L6, L13)

Examine the centre fold of the First Nations family making maple sugar. Make a 3-D model of a First Nations sugar making site.

(Common Curriculum Outcomes 3a, A2T, M1D)

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A Taste of Spring

Students are to bring four different kinds of "syrup" including one marked "Pure Maple Syrup". Prepare enough samples of each type of syrup in small cups so there is one for each group. Each group will investigate the following aspects of each sample: smell, texture (thickness), colour, consistency (how easily it pours), taste.

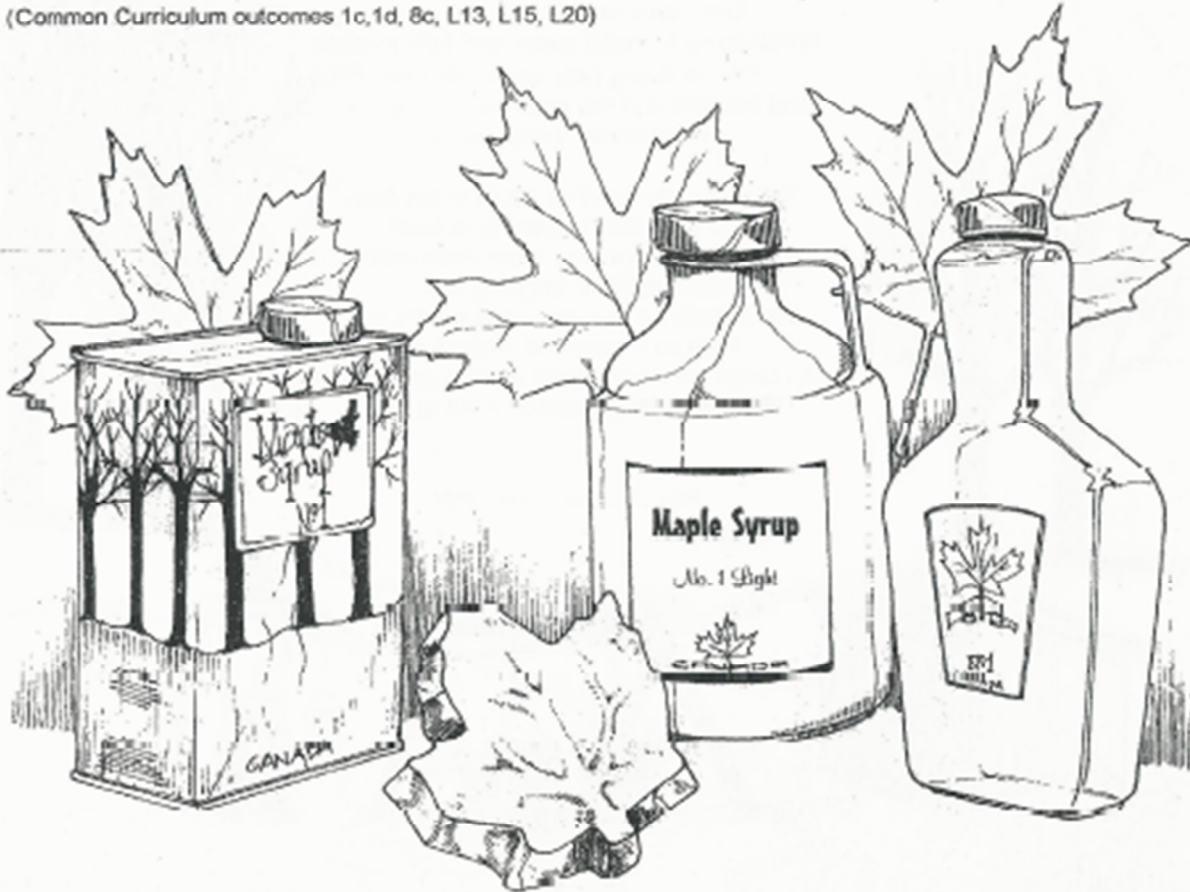
Activities

Make a table to compare the smell, texture, colour, consistency and taste of the samples. Share the results of your investigation with other groups.

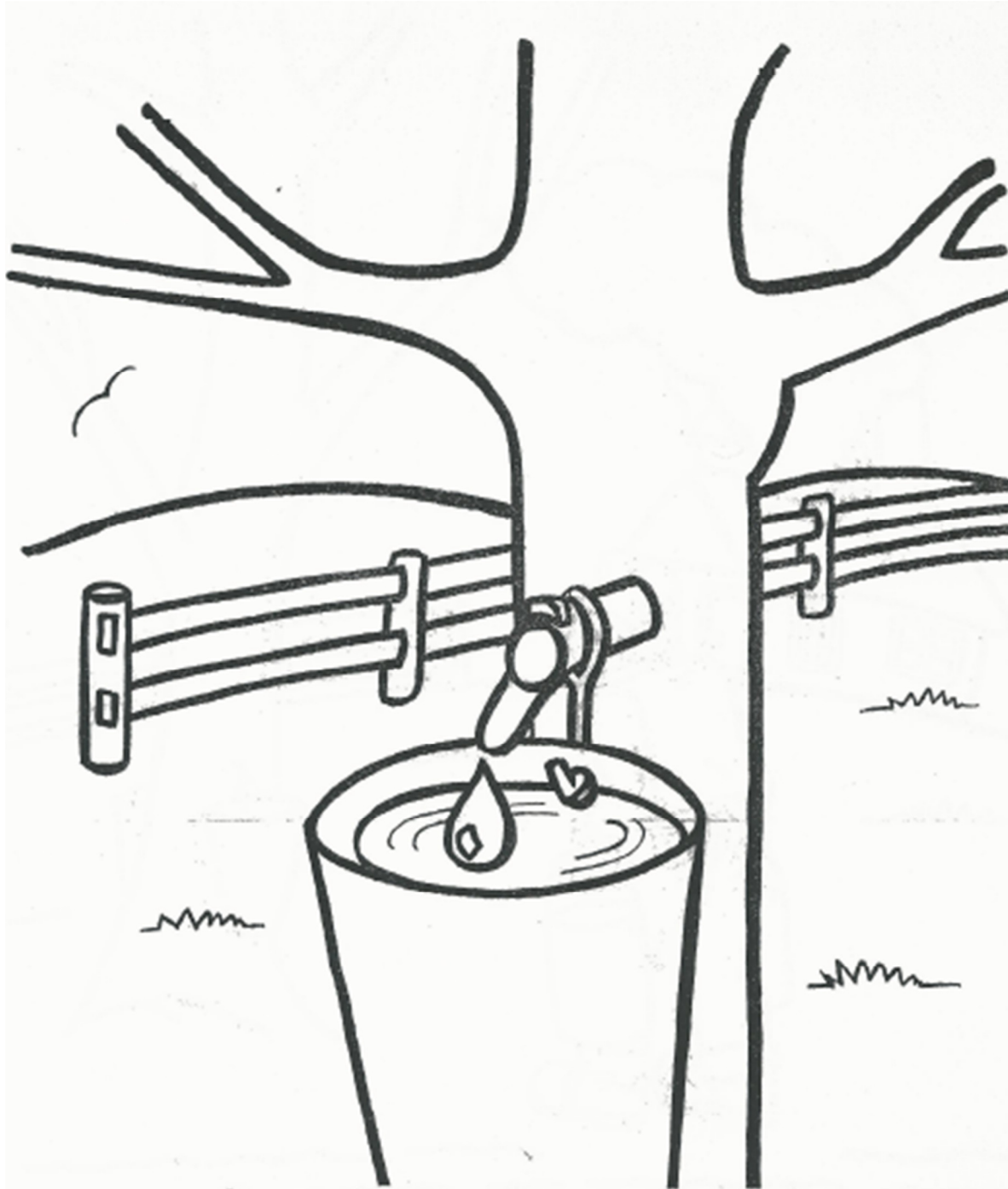
(Common Curriculum outcomes 2B, M29, M37)

What words can be used to describe the taste of maple syrup in comparison to the other syrups? Use these words to write a poem about maple syrup or to prepare the design of a label for a container for selling Maple Syrup or one of its products.

(Common Curriculum outcomes 1c, 1d, 8c, L13, L15, L20)



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HERE IS A DROP OF SAP.
DID YOU KNOW SAP LOOKS
JUST LIKE WATER?!

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Design a Sugar Bush Pipeline

Many maple syrup producers use a pipeline system to collect the sap. Look at the pipeline in the centre fold picture. Maple producers carefully plan efficient pipeline systems.

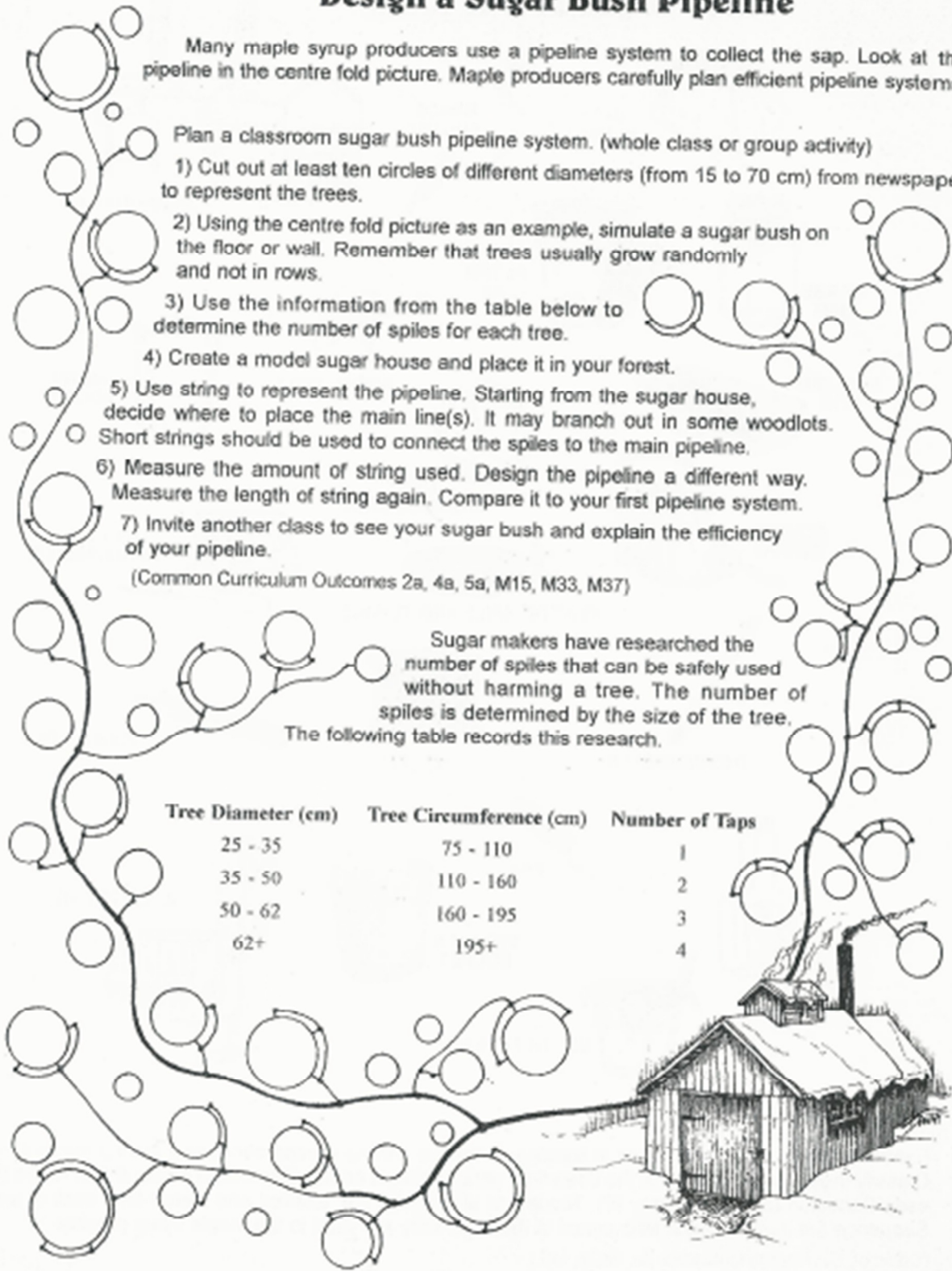
Plan a classroom sugar bush pipeline system. (whole class or group activity)

- 1) Cut out at least ten circles of different diameters (from 15 to 70 cm) from newspaper to represent the trees.
- 2) Using the centre fold picture as an example, simulate a sugar bush on the floor or wall. Remember that trees usually grow randomly and not in rows.
- 3) Use the information from the table below to determine the number of spiles for each tree.
- 4) Create a model sugar house and place it in your forest.
- 5) Use string to represent the pipeline. Starting from the sugar house, decide where to place the main line(s). It may branch out in some woodlots. Short strings should be used to connect the spiles to the main pipeline.
- 6) Measure the amount of string used. Design the pipeline a different way. Measure the length of string again. Compare it to your first pipeline system.
- 7) Invite another class to see your sugar bush and explain the efficiency of your pipeline.

(Common Curriculum Outcomes 2a, 4a, 5a, M15, M33, M37)

Sugar makers have researched the number of spiles that can be safely used without harming a tree. The number of spiles is determined by the size of the tree. The following table records this research.

Tree Diameter (cm)	Tree Circumference (cm)	Number of Taps
25 - 35	75 - 110	1
35 - 50	110 - 160	2
50 - 62	160 - 195	3
62+	195+	4



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Let's Organize Our Tools

Activities

Examine the items that are used in tapping, collecting, boiling (evaporating) and storing maple syrup. Classify these items into one of the three time periods shown on the diagram on pages 8 & 9: Native (N), early Canadian (E), present day (P). These can also be cut out, shuffled and sorted on a desk or table. Sequence the items in each time period in the order they are used in the maple syrup process.

(Common Curriculum Outcomes 2a, 3a,3c, M5)



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Let's Record It

Sap begins to flow up the trunk of the maple trees in the spring when the day temperature is above freezing (3°C to 5°C) and the night temperature is below freezing for at least four days in a row. The sap runs best on still, sunny days.

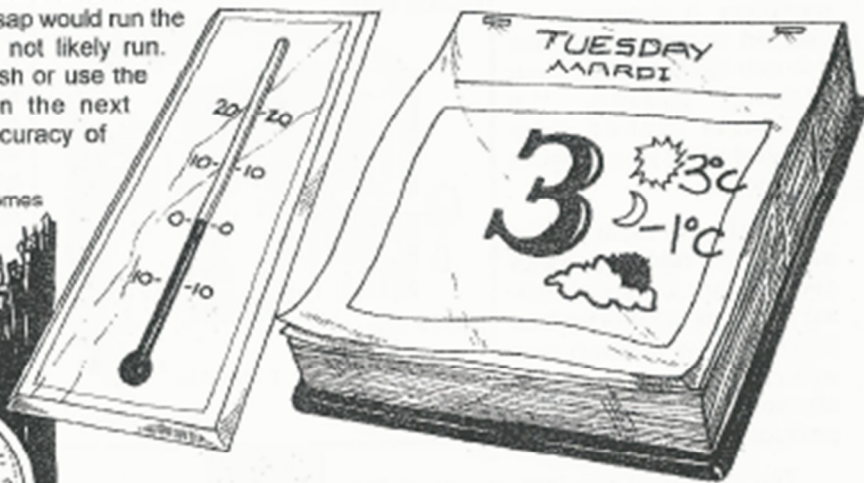
Activities

Begin in early March to keep a record of the temperature in your community at the end of the school day and when you get up in the morning. Also record the weather conditions for each day. Make a graph of the temperatures you have recorded.

(Common Curriculum Outcomes 3a, M9, M24, M32)

From your own temperature and weather records predict when the sap would run the best and when it would not likely run. Contact a local sugar bush or use the information collected in the next activity to check the accuracy of your predictions.

(Common Curriculum Outcomes M1, M9, M25, M30)



Ask permission to tap a maple tree in your community. Borrow, purchase or make a spile. Use an 11 mm bit to drill a hole that slopes slightly upward about 7 cm into the tree at chest height. Place the spile in the hole and mount a bucket or plastic pail to collect the sap. It is best to design a cover over the bucket to protect it from rain, leaves and twigs. If it is a large tree you may wish to put in more than one spile.

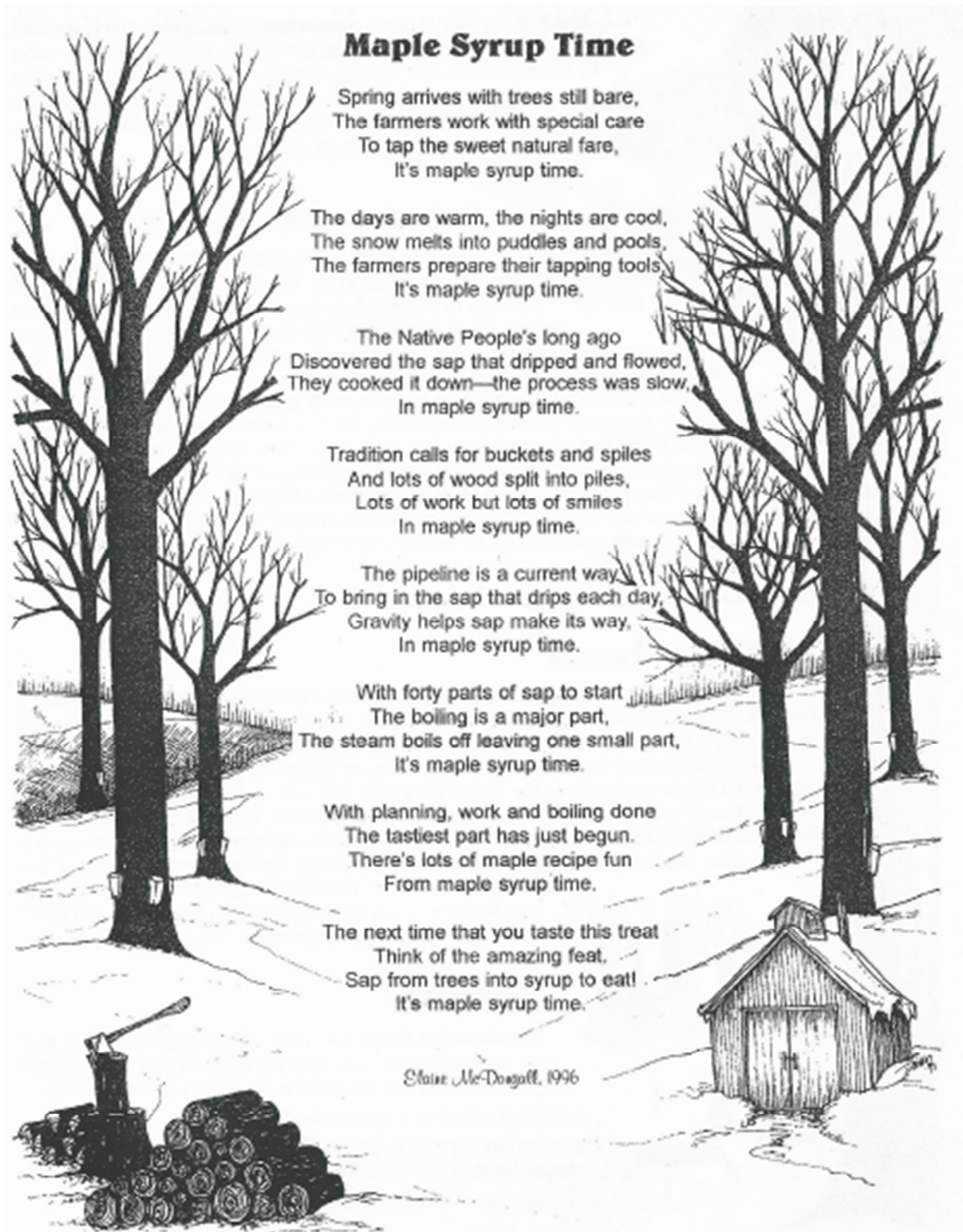
(Common Curriculum Outcomes 3a, M6, M9)

Compare the rate of flow of the sap by timing the drips using a stop watch. Count the number of drops for 30 seconds at several different times of the day over several days. Keep a record of the time and number of the drops. Make a graph of the number of drips during these sample times. Determine the time of day when the most sap drips into the bucket. Keep a record of the amount of sap collected each day. Compare this record to the predictions you made based on the temperature and weather conditions in the previous activity.

(Common Curriculum Outcomes 3b, M25, M29, M32)



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Maple Syrup Time

Spring arrives with trees still bare,
The farmers work with special care
To tap the sweet natural fare,
It's maple syrup time.

The days are warm, the nights are cool,
The snow melts into puddles and pools,
The farmers prepare their tapping tools,
It's maple syrup time.

The Native People's long ago
Discovered the sap that dripped and flowed,
They cooked it down—the process was slow,
In maple syrup time.

Tradition calls for buckets and spiles
And lots of wood split into piles,
Lots of work but lots of smiles
In maple syrup time.

The pipeline is a current way
To bring in the sap that drips each day,
Gravity helps sap make its way,
In maple syrup time.

With forty parts of sap to start
The boiling is a major part,
The steam boils off leaving one small part,
It's maple syrup time.

With planning, work and boiling done
The tastiest part has just begun.
There's lots of maple recipe fun
From maple syrup time.

The next time that you taste this treat
Think of the amazing feat,
Sap from trees into syrup to eat!
It's maple syrup time.

Staise McDougall, 1996

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The Inside Story

The **outer bark** is the tree's skin. It protects the tree from injury and disease. Each species of tree has its own special bark pattern.

The second layer is the **inner bark**. It is used to transport food to all parts of the tree. The inner bark is green and made of live cells. These cells are full of sugars which move throughout the tree to give it nourishment. The sugars are made in the leaves by the process of photosynthesis.

The third layer is the **cambium**. A microscope is needed to see it because it is only two cells thick. Each growing season, the cambium makes new sapwood which forms rings in the wood.

The fourth layer is the **sapwood**. It has thick-walled cells that are like the plumbing system or veins of the tree that allow the minerals and water to go up and down. The sapwood is the new wood produced each year.

The centre of the tree is called the **heartwood**. It provides support for the tree. The heartwood is often darker in colour than sapwood.



Activities

Using rolled paper or cardboard make a model of a tree trunk that shows all of the various layers. Use a bark rubbing or a drawing of the bark pattern for the outer layer. Insert a piece of drinking straw to show how a spile would be put into the trunk of a sugar maple tree to get sap in the spring.

(Common Curriculum Outcomes 3a, M2, M16)

Find a dead tree branch in the surrounding neighbourhood. Use a wood saw to cut a thin slice of the branch about 1-2 cm thick. Examine the interior parts of the slice and compare them to the diagram and description. Find each layer? How many rings can you count? This will indicate the age of the branch.

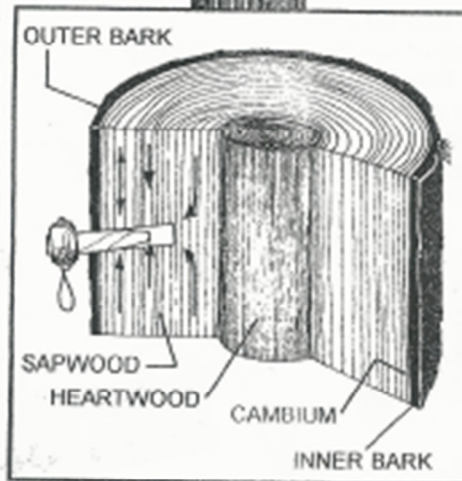
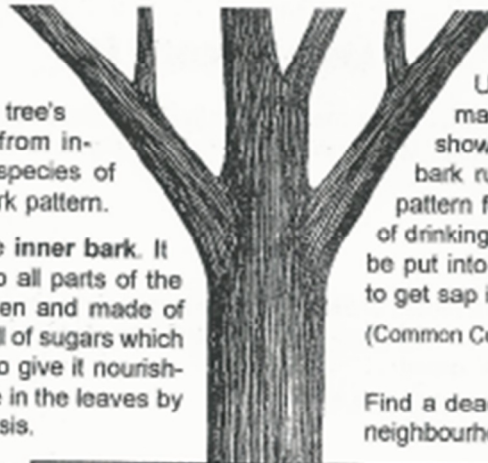
(Common Curriculum Outcomes 3a, M15, M26)

The maple leaf is one of Canada's national symbols. Brainstorm where this symbol is used. Write about why you think the maple leaf was chosen.

(Common Curriculum Outcomes 1c, 8b, P23)

Research the ways trees can be identified without the typical shape and fall colour of the leaves. Consider some of the following: size of the tree, texture and pattern of the bark, shape of the seed keys, position of the buds and the silhouette of the tree. Use this information to locate a sugar maple tree in your community. You may wish to get some advice from an arborist in your community.

(Common Curriculum Outcomes 2a, M33, M34)



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Sugar Weather

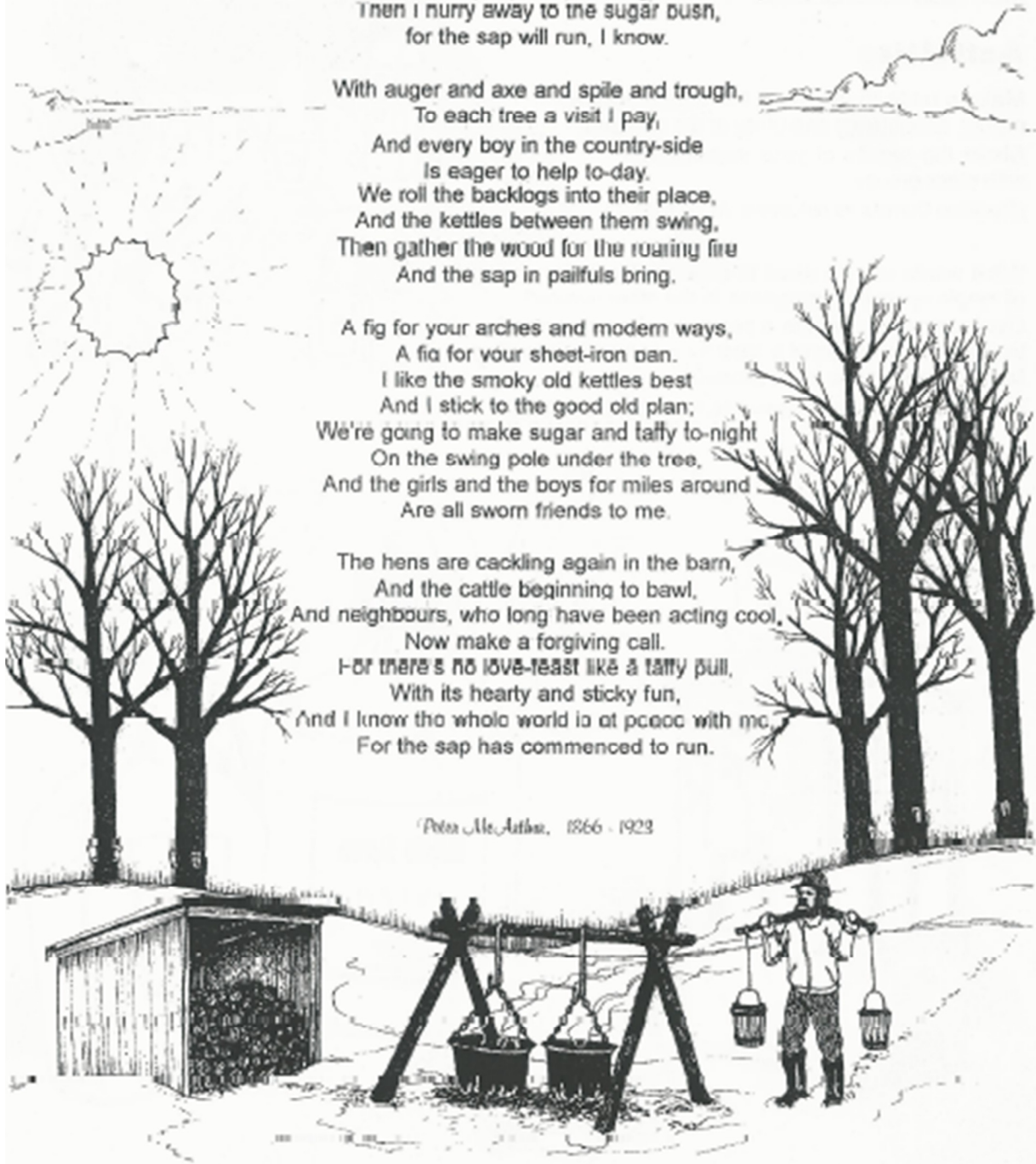
When snow-balls pack on the horses' hoofs
And the wind from the south blows warm,
When the cattle stand where the sunbeams beat
And the noon has a dreamy charm,
When icicles crash from the dripping eaves
and the furrows peep black through the snow,
Then I hurry away to the sugar bush,
for the sap will run, I know.

With auger and axe and spile and trough,
To each tree a visit I pay,
And every boy in the country-side
Is eager to help to-day.
We roll the backlogs into their place,
And the kettles between them swing,
Then gather the wood for the roaring fire
And the sap in pailfuls bring.

A fig for your arches and modern ways,
A fig for your sheet-iron pan.
I like the smoky old kettles best
And I stick to the good old plan;
We're going to make sugar and taffy to-night
On the swing pole under the tree,
And the girls and the boys for miles around
Are all sworn friends to me.

The hens are cackling again in the barn,
And the cattle beginning to bawl,
And neighbours, who long have been acting cool,
Now make a forgiving call.
For there's no love-feast like a taffy pull,
With its hearty and sticky fun,
And I know the whole world is at peace with me,
For the sap has commenced to run.

(Peter McArthur, 1866 - 1923)



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CAN YOU FIND THESE WORDS?



- | | | | |
|---------|--------|------------|----------|
| SPECIAL | SPRING | CANDY | MAPLE |
| TREE | SYRUP | EVAPORATOR | TAP |
| LEAF | EAT | WISCONSIN | SUGAR |
| SAP | PURE | BOIL | PANCAKES |
| TAPPING | SPILE | TASTE | BUCKET |



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WHEN THE BUCKETS ARE FULL.
IT'S TIME TO START GATHERING.

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Kin Canada

Kinsmen Club of Greater London

The Kinsmen Club of Greater London takes great pride in presenting this teacher's package to you. Your comments and suggestions are greatly appreciated.

Please send them to:

kinsmenfanshawesugarbush@primus.ca



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