Mathematics

The Maple Syrup Farmer

The Farmer needs a supply of Maple Sugar Trees that are at least 30 cm in diameter. Sap runs when the daytime temperature is above 0 degrees Celsius and the night time temperature is below 0 degrees Celsius. Sap starts to flow in March and runs for 4 – 6 weeks with 10 – 20 days of heavy flow. It ends when the nights are warm and the trees start to bud. Spiles need to be tapped into the tree around the end of February. A 1 cm hole drilled upwards, for the spile should be 60 cm to 120 cm above the ground, with a depth of 3.75 cm.

If the tree is 30 to 45 cm in diameter it will take 1 tap.
If the tree is 48 to 63 cm in diameter it will take 2 taps.
If the tree is above 65 cm in diameter it will take 3 taps.
Collect the sap each day in a large plastic garbage can, on a very strong sled with an ATV or other means of pulling the sled. Sap bucket becomes very heavy so you may need to make several trips.
You need 45 Litres of sap to produce 1 Litre of maple syrup.
Each tap will yield 1 Litre of syrup per season.

After the sap is gathered each day it is boiled to 104 degrees Celsius in pots or pans using wood from the bush. As the water evaporates the sap is changed into syrup. A hydrometer measures the density of syrup liquid to the density of water. When it gets to the proper Brix Scale (min. 66% in Ontario) the syrup is filtered to remove impurities and put into containers. All equipment should be cleaned using 1 part bleach to 99 parts water. Triple rinse with clean water to avoid flavouring your syrup.
wwwwildblueberries.net/maple history.html – Canadian Maple Syrup
the maplestore.com www.williamsfarm.ca

Bucket Method

Bucket Plastic	$6.00 each	Covers	$3.00 each
Spiles	$1.50 each	Large Pot	$50.00
Drill Bit 1 cm	$16.00	Filter	$16.00
Thermometer	$30.00	Hydrometer	$20.00
Large Garbage Can	$30.00	Glass Bottle 1L	$1.40 each

Tubing Method

Tubing 150 metres	$64.00	Spile and Tee	.70 each
Drill Bit 1 cm	$16.00	2 Garbage Cans	$60.00
Evaporating Pan	$1765.00	Sugar Pan	$296.00
Thermometer	$30.00	Hydrometer	$20.00
Filter	$16.00	Glass Bottle 1L	$1.40 each

Sales

1 L Maple Syrup	$25.00

Suggested Questions

Grade 1

Fold paper in four sections.
Use both sides giving room to answer 8 questions.

Draw 5 maple trees when they are ready to produce sap. (no leaves)
Draw 7 spiles.
Draw 4 buckets for sap.
Draw 1 long plastic hose.

Draw 8 jugs of maple syrup.
Draw 2 drills.
Draw 3 filter bags.
Draw 6 logs for the fire.

Grade 2

Show the above work using numbers and pictures.

Grade 3

Show the above work using pictures, numbers and words to explain your answer. Total the cost of any equipment and the sale of any Syrup.

Grades 4 – 8

How much would it cost you to start a Maple Syrup Farm of 100 taps if you used the Bucket Method? The Tubing Method using 2 rolls of tubing?
If you had 100 taps using the Bucket Method how much money would you receive from your sale of syrup?
If you had 100 taps using the Bucket Method would you make a profit the first year? Explain with numbers and words.
If you had 100 taps using the Tubing Method would you make a profit the first year? Explain with numbers and words.
How many taps would you need using the Tubing Method to make a $1000.00 profit the first year? Explain with numbers and words.
If you had 500 taps using the Tubing Method what is your profit or loss in the third year of operation? Remember you will need more tubing and more spiles etc. Explain with numbers and words.