Maple syrup is an annual crop. It is made each year. The sugar content of sap is about 2% so it takes considerable effort and energy to concentrate the sap into the attractive sweet maple syrup. It is essential that a vast amount of water be removed from the sap to increase the sugar content to 66%. The common practice is to boil the water out of the sap in a shallow pan with lots of surface area exposed to the fire. A benefit of this boiling is that it helps create the color and flavor of maple syrup. For many families it is a tradition to tour a local sugarhouse each spring during the maple season.

Unscramble the words below shown in bold above then use The second box to put them in alphabetical order.

1. asincree __________
2. tibneef __________
3. tranocentce__________
4. crapteci __________
5. tasv ______
6. tecnont__________
7. civtaettra__________
8. naulan__________
9. wallsho__________
10. rout ______
11. tassileen__________
12. bradeelocsni__________
13. tearec__________
14. racefus__________
15. drattinoi__________
Maple Words

Name ______________

Across
1. Sap is collected _____
3. Sap is usually collected with plastic tubing or in a _____
6. Maple produces ______ sap into holding tanks
7. Many maple producers sell maple products at a farmers ______
9. Two ______ make all the worlds maple syrup USA and Canada

Down
2. On maple weekend maple producers _____ the public to visit the sugarhouse
4. Syrup is often made into other great products like maple candy and maple _____

5. Spring is known as the maple _____
7. Maple syrup is made in the ______ of February, March and April
8. A _____ tree is home to sugarbush wildlife
10. ______ is known as the maple season
Maple Words

Circle the words on the list as you find them in the puzzle

Branch  Dollar  Froze
Blossom  Sap House  Cool
Annual  Cream  North
Market  New York  Noise
Dry  Maple  Serve
Income  Ice  Steam
Time  Tap  Woods
Kitchen  Sap  Pan
Visitor  Limb  Nation

New York Agriculture in the Classroom
www.agclassroom.org/ny
Match the letters to the numbers to complete the secret message!

Give a _______ _______ _______ _______ _______.

Fill a _______ _______ _______ up with _______.

_______ it down and it gets _______ _______ _______.

_______ _______ _______ _______ _______.

_______ _______ _______ _______ _______ _______ _______.

_______ _______ _______ _______ _______ _______.

_______ _______ _______ _______ _______ _______.

maple syrup, a golden treat

ANSWER: Give a maple tree a tap. Fill a bucket up with sap. Roll it down and it gets sweet.
Maple Production -
Tree Parts

A Tap hole is drilled into the trunk of the tree. The tree trunk has several parts serving a variety of functions. The Bark provides a tough outer covering for the woody trunk of the tree.

The Phloem is just inside the bark and it conducts sugar produced in the leaves down to the roots.

The Cambium is the living layer from which the trunk of the tree grows.

Xylem conducts water and minerals from the roots up to the leaves.

The Heartwood is older, inactive xylem that provides structural support to the trunk.

Question from the picture and description

Fill in the blank:
A taphole cuts through the bark, phloem, _________________ and Xylem.
A typical sugar maple tree will begin producing seed when it is 30 years old or more. Seed develops from maple flowers that bloom in spring. The seed matures through the summer and falls to the ground in September and October. The seed lays dormant in the soil until spring when it grows into a seedling. In the first couple years it grows a single stem called a whip. Once the whip begins to develop side branches it becomes known as a sapling. The sapling gradually grows into a mature seed bearing tree that can be tapped for maple sap.

Questions from the story and picture:
From the descriptions given above fill in the blanks in the life cycle chart with the correct titles:
Seed, Seedling, Whip, Sapling, Mature Tree
The leaf of a maple tree produces the sugar that makes maple syrup sweet. A maple leaf is made up of several important parts. The leaf blade is the broad portion of the leaf which provides the surface for photosynthesis. The blade is made up of 3 or 5 lobes. A sinus is the valley between lobes. The Margin is the outer edge of the leaf blade. The petiole attaches the leaf blade to the tree and extends into the midrib. The midrib and veins provide structure to the leaf blade. They also send sugar back to the tree and receive water and minerals from the tree through the petiole.

Questions from the story and picture:
1. Sugar is made in the leaf _______.
2. The outer edge of the leaf is called the _______.
3. The petiole, midrib and veins conduct ________, water and _____ between the leaf and the tree
At the end of November in 1790, while in the city of Philadelphia, Thomas Jefferson purchased a fifty pound bag of pure maple sugar. The sugar was to be used to sweeten tea, a very common beverage in that time. He did not want to purchase white sugar as it had to be bought from the British who were producing it with slave labor. A gallon of maple syrup can make about 8 pounds of maple sugar so a 50 pound bag of maple sugar would have been made from over 6 gallons of maple syrup.

Questions from the story and picture:
1. What year did Thomas Jefferson purchase the bag of maple sugar? ______
2. In what city did Thomas Jefferson purchase the bag of maple sugar? ______
3. In what beverage did Thomas Jefferson plan to use the maple sugar? ______
4. 50 pounds of maple sugar would be made from about ____ gallons of maple syrup.
Once a maple tree is mature, 30 years or more old, it produces some seeds each year. However the number of seeds produced in a year changes dramatically depending on the weather and climate. Thomas Jefferson obtained some sugar maple seeds around 1790 and had them sent to his farm called Monticello located in Charlottesville Virginia. He attempted to start a sugar maple plantation by having the seeds planted on this farm but the planting was a complete failure. None of the seeds grew into trees.

Questions from the story and picture:
1. In what state was Thomas Jefferson’s farm? __________
2. Maple trees always produce the same number of seeds. True or False
3. Thomas Jefferson sent the seeds to his farm to start a maple __________
Thomas Jefferson was so excited about the idea of producing sugar from maple trees that he sent letters to many other important people about this idea. Letters about maple sugar were written to George Washington, the first U.S. President, James Madison, the fourth U.S. president, Thomas Mann Randolph, Congressman and Governor of Virginia, and Dr. Benjamin Rush, a fellow signer of the Declaration of Independence. Due to limitations of the time Jefferson could not talk on the phone, go on TV, or on the radio or Internet to talk about maple syrup. He could only write letters or talk face to face.

Questions from the story and picture:

1. What was Thomas Jefferson so excited about that he would write letters to such important people? _____________
2. List one kind of communication that could not be used to promote maple sugar. ______________
3. List one kind of communication that Jefferson could not use. ________
One of the main uses for sugar in the 1790’s was to sweeten tea which was a very common beverage at that time. To prove that maple sugar could be used to sweeten tea just as well as cane sugar a “scientific tea party” was held by Thomas Jefferson's friends Dr. Benjamin Rush and Alexander Hamilton with the aid of “several ladies”. Each sipped cups of hyson tea sweetened with equal amounts of cane and maple sugar. All agreed the sugar from the maple was as sweet as cane sugar.

Questions from the story and picture:

1. In this story maple sugar was being compared with ________ sugar.
2. What was a very common beverage in the 1790’s? ________
3. Jefferson’s friends were Dr. Benjamin Rush and __________ ________.
4. Maple sugar was just as sweet as cane sugar in the tea party test.
   True or False
When planting sugar maple seeds failed at Thomas Jefferson’s farm Monticello, he tried planting sapling sugar maple trees. In 1791 sixty sugar maple trees were ordered from a nursery on Long Island and planted in November. This planting also completely failed. In 1792 eighty more were planted but only eight survived into 1794. A couple of these survived for many years. Though sugar maple is an ideal tree for producing maple sugar, other species of maples would probably have grown better in the climate at Monticello. Most species of maple can be used to produce sugar.

Questions from the story and picture:
1. Monticello was a great place to grow sugar maple trees. True or False
2. How many sugar maple trees lived from the 1791 planting? _______
3. Sugar maple trees are the best to plant no matter what the climate. True or False
Maple Math Links
Add your way to lots of maple information on the internet

Find a sugarbush open on maple weekend

Name ____________

184 322 658 109 252 988 604 699
1. +803 2. +144 3. +612 4. +263 5. +914 6. +875 7. +562 8. +467

534 786 812 123 656 469 123

A maple science website

578 437 333 560 813 101 237 416

118 297 114 665 388 295 543
Maple Regions of New York State

Maple producers in New York State have come together to form the New York State Maple Producers Association. A producers association is an organization of persons having a common interest, in this case, the production and sales of maple syrup and related maple products. This Association is broken into seven sub-regions as represented in the map to the right. Maple producers who are members of the association get together in their regions on a regular basis for providing education, marketing opportunities and sharing experience.

In which county do you live? _________________
In which of the seven regions do you live? _____________
What region is the furthest from where you live? ____________
Which of the seven regions do you think has the most people living in it? ______________
Which of the seven regions has the least number of counties in it? _______________
How many counties are in the maple region where you live? _________________
What uses the space in the maple sugarhouse?
The sugarhouse floor plan is divided into 100 equal squares. Determine how much of the sugarhouse space is used by the different items.

Evaporator has __ squares, this represents ___/100 or ___ as a decimal

Finishing pan has __ squares, this represents ___/100 or ___ as a decimal

Sales display has __ squares, this represents ___/100 or ___ as a decimal

Wood pile has __ squares, this represents ___/100 or ___ as a decimal

Counter and sinks has __ squares, this represents ___/100 or ___ as a decimal

Save for last: How much of the space is empty? ___/100 or ___ as a decimal
<table>
<thead>
<tr>
<th>Say the word</th>
<th>Write the word</th>
<th>Use the word</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Season</td>
<td>_____________</td>
<td>Maple syrup is made during one <strong>season</strong> each year.</td>
</tr>
<tr>
<td>2. Annual</td>
<td>_____________</td>
<td>It is an <strong>annual</strong> crop.</td>
</tr>
<tr>
<td>3. People</td>
<td>_____________</td>
<td><strong>People</strong> can order maple products online.</td>
</tr>
<tr>
<td>4. Bucket</td>
<td>_____________</td>
<td>Maple sap is collected from the tree with tubing or a <strong>bucket</strong>.</td>
</tr>
<tr>
<td>5. Chimney</td>
<td>_____________</td>
<td>The smoke made when cooking maple syrup goes up the <strong>chimney</strong>.</td>
</tr>
<tr>
<td>6. Icicle</td>
<td>_____________</td>
<td>On a cold morning you can see an <strong>icicle</strong> hanging from a maple spout.</td>
</tr>
<tr>
<td>7. Income</td>
<td>_____________</td>
<td>Maple syrup is sold so farmers can have some <strong>income</strong>.</td>
</tr>
<tr>
<td>8. Freeze</td>
<td>_____________</td>
<td>Sap will only run after a <strong>freeze</strong> in the sugarbush.</td>
</tr>
<tr>
<td>9. Kitchen</td>
<td>_____________</td>
<td>Maple sugar, candy and cream are often made in the <strong>kitchen</strong>.</td>
</tr>
<tr>
<td>10. Inches</td>
<td>_____________</td>
<td>The tap hole, a hole drilled in the tree to collect sap is 1.5 <strong>inches</strong> deep.</td>
</tr>
<tr>
<td>11. Month</td>
<td>_____________</td>
<td>The maple season usually starts in the <strong>month</strong> of February or March.</td>
</tr>
<tr>
<td>12. Cream</td>
<td>_____________</td>
<td>Maple <strong>cream</strong> is made by cooking syrup more, cooling it, then stirring.</td>
</tr>
<tr>
<td>13. Visitor</td>
<td>_____________</td>
<td>A <strong>visitor</strong> to a maple sugarhouse can see maple sap made into syrup.</td>
</tr>
<tr>
<td>14. Dollar</td>
<td>_____________</td>
<td>A <strong>dollar</strong> can buy some great tasting maple sugar candy</td>
</tr>
<tr>
<td>15. Order</td>
<td>_____________</td>
<td>People can <strong>order</strong> maple products online.</td>
</tr>
</tbody>
</table>
Maple Production - Word Search

Name ______________________

Ash
Sugar Maple
Beech
Oak
Birch
Bass Wood
Red Maple
Aspen
Spruce
Pine
Hemlock
Larch
Red Pine
White Pine
Balsam Fir
Hidden objects: ice cream cone, toothbrush, nail, tennis shoe, pencil, paper clip, fish, hockey stick, bell, hammer
Maple Production in History -
Hidden Objects

Hidden objects: ice cream cone, toothbrush, nail, tennis shoe, pencil, paper clip, fish, hockey stick, bell, hammer
Maple Syrup Measuring
Convert the measuring units as indicated

One barrel of maple syrup holds 40 gallons

One gallon of syrup weighs 11 pounds

One barrel of maple syrup weighs _____ pounds
Two barrels of maple syrup weighs _____ pounds
Five barrels of maple syrup weighs _____ pounds
Ten barrels of maple syrup weighs _____ pounds
Two gallons of maple syrup weighs _____ pounds
Six gallons of maple syrup weighs _____ pounds
Nine gallons of maple syrup weighs _____ pounds
Two quarts of maple syrup weighs _____ pounds
One quart of maple syrup weighs _____ pounds
Six quarts of maple syrup weighs _____ pounds
Thirty two quarts of maple syrup = _____ gallons
Three gallons of maple syrup = ______ quarts
Twelve gallons of maple syrup = ______ quarts
Twelve quarts of maple syrup = ______ gallons
One barrel of maple syrup = _______ quarts

If one pound of maple syrup is worth $3 then one barrel of maple syrup would have a value of $_______
Maple Math – Maple Leaf Maple Syrup
Bottle Ordering Decimals

Place in order the decimal numbers on the maple leaf maple syrup bottles from the largest to smallest, then use the letters to answer the questions below.

Maple syrup can only be made from a _________