



TAPPING INTO MAPLE TRADITION

Lesson Title: Be A Sugar Maker

Submitted By: New Hampshire Agriculture in the Classroom

School or Affiliation: used with permission from Shelburne Farms

Email: nhaitc@nhfarmbureau.org

Grade Level:

- Early Elementary (K – 2nd)
- Upper Elementary (3rd – 5th)
- Middle School (6th – 8th)
- High School (9th – 12th)

What National Agriculture Literacy Outcomes does your lesson address?

<http://www.agclassroom.org/get/doc/NALObooklet.pdf>

T1.K-2acd

T2.K-2e

T4.K-2b

T5.K-2cde

What Common Core Standards does your lesson address?

CCSS.ELA-LITERACY.RL.K.7

CCSS.ELA-LITERACY.RL.1.7

CCSS.ELA-LITERACY.RL.2.7

CCSS.ELA-LITERACY.SL.K.1

CCSS.ELA-LITERACY.SL.1.1

CCSS.ELA-LITERACY.SL.2.1

K-ESS2-1

K-ESS2-2

1-LS1-1

2-ESS2-3

Brief description of your lesson plan:

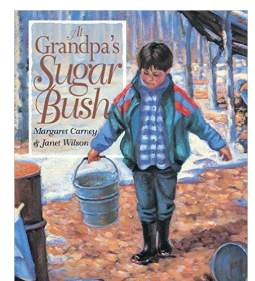
Children will role-play the maple sugaring process as they become sugar makers. They will have the chance to experiment with taplines, funnels and water. Engage students in learning how humans can use the water cycle to their benefit. Also, how sap, consisting mainly of water, can be changed into sweet syrup by heating the sap to evaporate most of the water.

Time:

1 to 2 hours, depending upon how in-depth you want to go into role-playing and discussion

Materials:

- The book “At Grandpa’s Sugar Bush” by Margaret Carney
- The Sugaring Tool cards pictures



- Firewood
- Empty match box
- Simulated “fire” (for example, crumpled up red and orange tissue paper)
- Heavy gloves (students need to pretend that the pan and the arch get very hot!)
- Buckets – to catch the finished syrup as it is poured off the pan
- Ladles – used to test whether the sap is “sheeting”. As water evaporates from the sap, the sap thickens. To test the thickness, sugar makers dip a special ladle into the sap and watch how the sap slides off. If it comes slowly off the edge of the ladle in one thin “sheet”, then the sap is close to being syrup.
- Ruler – there needs to be 1.5 to 2 inches of sap in the evaporating pan or it will burn
- Slotted spoon – used to remove foam that naturally occurs during the boiling process. It will also remove any bugs that have snuck into the sap
- Thermometer (pretend or broken is fine) – to test whether sap has become syrup. Sap turns into syrup when its temperature reaches roughly 219°F
- A tall plastic cup and stick to represent the hydrometer. The hydrometer is an instrument used to measure the density of syrup. If you add a little syrup to the hydrometer cup and the stick in the hydrometer floats, the syrup is dense enough to pour off the pan. Sap becomes syrup when it is boiled down to 66% sugar.
- Empty syrup containers
- Hammers
- Tree taps
- “Sugaring Tool Cards”
- A cardboard box approximately 4 feet X 3 feet X 4 inches to make an evaporator pan. Cover the box in aluminum foil or paint it silver. To make the evaporator pan more authentic, cut the flaps off the box before covering with foil and use the two longer flaps as dividers in the pan.
- A cardboard box approximately 4 feet C 3 feet X 3 feet to make the fire arch. Paint the box black and cut a door in the front. Place your evaporator pan on top of the fire arch
- Corks, packing peanuts or some other material to represent sap. It won’t flow like liquid sap, but children love collecting and “pouring” these sap substitutes
- Tree stump drilled with holes, extra taps, small buckets, kid-sized hammers

Vocabulary:

Sugarbush – woods where sugar maple trees are predominant

Sugar house – a cabin-like building where maple syrup is produced

Evaporate - turn from liquid into vapor or gas

Concentration – a lot of something mixed in with something else, like sugar in water

Background:

See attached document

Interest Approach – Engagement:

Ask the class who likes pancakes. If so, do they put anything on their pancakes to make them tastier?

Does anyone know how maple syrup is made?

**Procedures:**

1. Read *At Grandpa's Sugar Bush* by Margaret Carney or a similar story. Ask if any children have been to a sugar house. Do any of their families sugar?
2. You can have students help set up the sugar house, or you can do it. See the picture for set up.
3. Explain what is set up in the classroom – a sugar house! There is an evaporator pan with the fire arch under it, the wood, clothing and tools to be a sugar marker.
4. Before getting started, play the Keep In Mind game using the sugaring tools laid out on a table or floor. Cover them with a cloth. Explain that there are tools under the cloth that sugar markers use to make maple syrup. Some will look familiar, many will not. The cloth will come off and each child is to look closely and take a mental picture of all the tools. The cloth goes back on and the fun begins! How many of the tools can the children identify? List and keep count of the items as they are mentioned. Once they've exhausted their memories, remove the cloth once again and go through the list to identify the tools and how they are used.
5. Ask children what they think are the steps for making maple syrup. Help them create a sugar making story that they can act out. Then encourage the children to role-play making maple syrup.
6. While the children are role-playing, station yourself by an old tree stump that has tap holes drilled into it. Have children practice tapping a tree by using a small hammer to insert old taps (or spiles) into the hold on the stump and hang small buckets on the taps.
7. Process and reflect on the experience with the children by engaging in a conversation guided by the discussion questions.

Discussion Questions

- How do you make maple syrup?
- What are the steps, in order?
- What happens to the sap when it's heated up in the evaporator?
- Do you like maple syrup? What is your favorite way to eat maple syrup? (syrup, candy, cotton candy, maple sugar, maple BBQ sauce, etc.)
- Can you think of any other foods that come from trees?

Did you know? (Ag Facts):

1. It takes roughly 40 gallons of sap to make 1 gallon of maple syrup
2. About 80% of the world's maple syrup supply comes from Canada.
3. Tubing and pumps have replaced most of the traditional buckets and taps throughout North America.
4. Most trees yield 5 to 15 gallons of sap per season.
5. Maple syrup is at least 66% sugar (sucrose).
6. It can take a tree 40 years before it is large enough to be tapped (12" around).

Enriching Activities:

- Set up your water play table with tubing line, funnels, plastic cups (see photo)
- Use the Sugaring Tool Cards as sequence cards to match to actual tools, or as prompts for writing stories
- Maple syrup taste testing – have samples of real maple syrup and several samples of imitation maple syrup. If you check the labels of many commercial brands, you'll find that they actually have no maple syrup in them but rather corn syrup, high fructose corn syrup, caramel coloring and maple flavors. Using coffee stirrer sticks or small spoons, have each child sample a small taste of each. Graph their responses: Which sample was their favorite? Which samples did they think were genuine maple syrup?
- Take a field trip to see a real sugar house in action, or have a sugar maker visit your classroom and bring along some of their tools to join in the activities.



Sources/Credits:

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