

U.M.D. Outdoor Program
Maple Sugarbush Lesson Plan
1 Hour Lesson
Group Sizes will be 16 or less

This lesson plan is designed to focus on students in approximately 4th grade. When dealing with older or younger participants, you will need to change the approach a bit. With younger children, talk even less and do more (even though this is key for any age level). Older participants can handle broader concepts and relationships and will have more in-depth questions.

School groups typically have parents and teachers helping. Use them to your advantage when conducting this lesson. Invite them to help with discipline and get them involved in the lesson too.

Goals

1. Gain an understanding of identification and natural history of maple trees
2. Explore what happens in the forest during spring.
3. Discover components of traditional collection and processing of maple sap. Including customs and cultural significance.
4. Participate in hands-on processes of collecting sap.

Objectives

The learner will:

- find a sugar maple tree using identification techniques learned
- demonstrate the process for tapping and collecting sap using a brace, hammer, spile, and sap-sak
- describe the process of sap flowing from roots to buds and why it is associated with spring
- describe the procedure for turning sap into syrup
- hear and see historical methods for collecting and processing sap

Materials

- 1 or 2 brace and bit combinations
- 1 or 2 hammers
- 2 spiles
- 2 sap-saks or buckets with lids (make sure spiles and collecting devices are compatible)
- enlarged, laminated historical photos of sap collecting and processing
- Naniboujou story (if you don't have it memorized)
- Small Dixie cups for all participants
- Bottle of real maple syrup for tasting
- Bottle of other syrup for demonstration
- Laminated visual aid for demonstrating 32:1 ratio

Content

I. Logistics

Get the key for the storage shed from Beth or Tim.

Organize all of your equipment in the shed prior to your lesson. If you are teaching immediately after another instructor, coordinate with them the switch over of equipment.

Busses and groups will arrive near the parking meters and kiosk by Rock Pond (Bagley Nature Area). Instructors need to be ready and waiting at least 10 minutes before the group is scheduled to arrive. If it is a large group, one person needs to walk over to meet the bus and work with the teacher to divide up the group quickly and efficiently. The sooner you get groups separated out, the less likely chaos becomes a problem.

Teaching Tip: Have each group come up with a name for themselves that relates to nature. This adds some fun and later on may help with some friendly competition.

NOTE: Some groups may need to be met on campus and walked over to the sugarbush. It is your responsibility to work with the teachers to ensure the safety of the children. Crossing and walking along streets are high hazard sites. Keep everyone together and stop before crossing. Also, make the journey fun: look for signs of spring or “walk like me”.

When multiple instructors are leading groups at the same time, have a plan for using different teaching sites (ie. don't have all instructors start off using the “learning tree”).

The teacher/group leader will likely have a check for payment to participate. Take it and give it to Beth Peterson by the end of the day.

II. Introduction

Here is where the quality of your lesson gets its start. Explain who you are and establish behavioral ground rules. For example, the presenter is always in front, students wanting to speak raise their hand and wait to be called on. Enlist specific assistance from the adults (ex. “Mrs. Brown will you help by ensuring that everyone stays together and listens when others are talking?”). If you don't set rules early, you end up creating them as you go and you will lose control.

Try to learn names, if you can. This helps greatly in discipline. Most groups will come with name-tags on the children.

Explain to the group what will be happening today and why we are outside. Involve the students in finding out what we will learn (use questions or a game).

Before moving on, finish with a brief discussion of how we should act toward the forest. An example might be “We will be visitors to the forest today and it is important for us to show respect for the inhabitants. How can we show respect for the forest? Yes, by not breaking branches or injuring any of the wildlife.”

III. Identification

“We’re here to learn about maple syrup. Where does maple syrup come from?” Pull out a bottle of Aunt Jemima’s brand or other non-real syrup brand. “Where does this syrup come from? Corn! Real maple syrup comes from maple trees. We need to learn how to find a maple tree.”

Another option for starting out: Use the Chief Woksis story to discuss how maple syrup came to be. He found his tree by accident. But we need to learn how to find a maple tree. How do we do this?

Find a tree to start with (some instructors may want to use the “learning tree”). Explore the skills of identifying a tree without any leaves. “How can we identify trees without any leaves?” Students will have a variety of responses. Start with branching pattern, then go to bud shape and color. Make sure everyone can get a hands-on view of the branching patterns and how the buds look. “We are looking for a sugar maple.”

Teaching tip: use the kids body parts to simulate ‘opposite’ and ‘alternate’. Stick both arms out - this is opposite. One arm and the leg on the other side is alternate pattern. Check for understanding: call out “everyone do opposite branching” or “everyone do alternate branching”.

Get to a small sugar maple. Work together to identify it using branching, buds, and color. Have everyone touching and describing color, shape, and texture. Repeat key words like “opposite branching”. Once they see it is a maple, is it big enough to tap? “NO.” “Why?” Need to make sure a tree is big enough and healthy enough.

Select 2 people to go find a big sugar maple (bigger than 10 inches in diameter). As a group confirm the identification: “Does it have opposite branching?”, “Are the buds small and pointy or big and fat?”. If the tree is wrong, help them along and do not embarrass the student for being wrong. Move on to another tree. Some students may need additional help, let other children help in the hunt.

IV. Spring Natural History of Sugar Maples

Once you’ve found a large enough tree, gather everyone close in a semi-circle. Discuss the process of leaves making sugar water (food) in the summer and sending it down to the roots in the fall, then the sugar water going back up the trunk to nourish the buds in the spring. Days above freezing and nights below freezing are when this flow of sap happens.

Teaching Tip: With younger kids you can play act this out a bit. Fingers (sap) are

stored in the feet (roots), then slowly move up the body until fingers outstretched feeding the buds. Quiz the students on what happens in the fall and spring.

V. Tree Wounds

The sap is somewhat like the blood of the tree. So, a good analogy is to talk about the students blood. When you get a hole/cut in your arm, you bleed. If a tree gets a hole/cut, it bleeds - sap. Does it hurt the tree? Yes, just a tiny bit. Like a person who eventually gets a scab over a hole/cut, a tree also scabs over. Look for healed wounds on the tree.

VI. Tapping

Now it is time to tap into the tree. Show the tools that we have today (brace and bit). Is this how it was always done? Nope. Show the laminated picture of native woman and the slices in the tree. Discuss how that was done.

Get input on the proper angle to put on the bit. "Remember, the hole must act like a faucet for sap to flow out. What direction do faucets in your house flow?" Show them how to use the brace (round handle in belly, crank clockwise).

Take half the group, and line them up (ie. "I need these fourth graders to line up behind Johnny"). Instructor has bit started. "Everyone gets 5 cranks on the brace." (or whatever number of cranks might be appropriate). Have everyone in the group count the cranks to keep them involved. If necessary, you finish up.

If it is a good day and the sap is really running, let them taste the sap with their finger.

Putting the spile in. Show the spile and explain what it is for. You could go back to the old picture to discuss other types of spiles. "Everyone say spile." Have one student put the spile in and another hammer it in. (these are kids from that first group who drilled the hole)

"How do we collect this now?" Talk a pair of kids through putting the sap-sak together. Put on the spile. Is this the only way to collect? What would have been used 150 years ago? Birch bark buckets (makuks) or wooden buckets. See one of the pictures.

Send the other half of students off (within a boundary area) to find a tree. You or another adult bring the brace and bit over. They do the rest.

VII. Sap to syrup

Go to a tree that has sap that has collected. Optional: distribute cups (rule: cannot crush cup or toss it) and have the children taste the sap. "What does it taste like?" "How is this different than syrup? What needs to be added to make syrup? (nothing) We need to take away water. How do we do that?"

Go to the old cast iron kettle. Discuss boiling and turning sap to syrup. Explain how much sap it takes to make syrup. One good way to explain this is to ask: "How much sap would it take to fill Johnny's shoe/boot with syrup? It would take everyone else's shoe/boot (if there are 16 people in your group) filled with sap." Or you can also use the laminated diagram to show the 32:1 ratio.

VIII. Story

Was this always this way? Tell the Naniboujou and the Maple Trees story and/or the Chief Woksis story. If you are comfortable, you can try to direct the children in acting out the story. Instructor narrate and talk/guide the kids through it.

IX. Tasting

Everyone gets to taste real maple syrup. Optional: if snow is clean, they can try snow cones. Using the Dixie cup they already have, put a little (about a tablespoon) syrup in each (for snow cones, put snow in first).

All cups get put into the instructor's garbage bag. If you don't like the syrup, pour it out onto the ground.

X. Conclusion/Review

While children are snacking, review the activity. Ask questions that assess whether they learned the concepts. Examples might be: What kind of branching do maple trees have? How much sap does it take to make 1 gallon of syrup? ...

Thank the children and walk them back to the parking area. Make sure they do not go onto Rock Pond and go slowly down the hill below the "learning tree".

Finish with thanking the teacher.

Do not leave until the children are loaded in the bus to leave. If the bus is late, do some activities to keep them together: area clean-up, initiatives, ... You can have a clean-up competition.

XI. Wrap-up

- Return all equipment to the shed in its proper place.
- Bring shed key and check to Beth
- Touch bases with the sugarbush coordinator on how the lesson went (this is very important)