

Winter in the Forest Lessons and Activities

In this Section Grade Levels Objectives

Keep Your Eyes Peeled! , Page 2	PreK-5	Introduce students to the Troy Community Forest and its winter treasures through exploration and critical thinking.
Meet a Tree , Page 3	PreK-12	Use all senses other than sight to make close-up observations of a tree growing in the forest. Discuss and observe specific tree characteristics.
Tree Identification , Page 4	PreK-12	Demonstrate how to identify a leafless, winter sugar maple. Discuss and examine identifiable characteristics using tree keys. Identify trees in the forest.
Build a Habitat , Page 5	3-12	Talk about the qualities of a good winter animal habitat. Based on the group discussion, build a winter habitat with natural materials.
Hibernating Bug Hunt , Page 6	PreK-5	Discuss winter hibernation and adaptations, focusing on insects as an example. Search for hibernating bugs in the forest.
Animal Tracking , Page 7	K-12	Demonstrate winter animal tracking methods. Practice tracking and participate in critical thinking exercises.
Fireside Conversation on Forest Dynamics , Page 8	6-12	Share in a conversation about energy cycles in a forest. Also talk about winter plant and animal adaptations and their relationships with energy.
Family Maple Sugaring , Page 9	PreK-12, Families	Learn how to identify a winter sugar maple and tap for sap in the Troy Community Forest or in your backyard! Boil sap and taste fresh maple syrup!

Suggested Nature Games and Recipes:

Tree Tag: See Appendix 1, Page 30
Stalking: See Appendix I, Page 30

Snow Ice Cream: See Appendix II, Page 35
Snow Cones: See Appendix II, Page 35

Keep Your Eyes Peeled!

This activity will require advance preparation. Teachers will need to visit the site and place bandanas near interesting spots prior to the lesson. Examples include different tree species, Animal tracks, habitats, snow, reed canary grass, and other plants.

The objective of this game is to introduce students to the Troy Community Forest in a fun, exploratory manner. Have kids venture out on their own or in small groups to find 10 different colored bandanas marking points of interest.

Ask students to think about and share with one another why these particular places may be marked. What is happening here? Why is this cool?

Gather together as a large group to discuss findings. How many bandanas did students find? What did students find at each bandana? This game allows for many perspectives to be shared!

Recommendations:

- > If marking an animal track or track mold, highlight the spot with a frame of sticks.
- > While students are hunting, have adults follow students and keep a log of kids' discoveries and thoughts. Our first participants split into groups of four or five, with one accompanying adult.
- > Meet again in the gathering space to share findings: kids, then adults/teachers.
- > If time allows, or if kids are especially excited about this game, try switching roles with students: have students hide the 10 bandanas and adults/teachers search and share their findings.
- > Adapt this game for all four seasons!

Variation: Forest Puzzle

This activity will require some extra preparation. You may wish to take current photos of the area you and your students will be exploring. Laminate photos or place them in plastic baggies.

Replace colored bandanas with laminated pictures of specific places and/or objects in the forest. Each group should start with a picture card different from the others. Using only the picture card in hand, groups will try to locate the place or object they see. At each place or object found, a new photo will be waiting to lead group to the next destination. Try to put the pieces of the puzzle together as you explore the forest!

Grade levels: PreK-5

Wisconsin Model Academic Standards Addressed:

Agricultural Education: E.4.1; Environmental Education: A.4.1, A.4.4, A.8.4; Science: C.4.2, C.4.6, C.8.1, C.8.2, C.8.3, C.8.4, C.8.7, C.8.10, F.4.1, F.4.4; English Language Arts: C.4.3, C.8.3

Activity Time: 15-20 minutes

Supplies:

- Colored Bandanas
- Clipboards
- Activity Log Sheets
*See Appendix VI, Page 45-46
- Pencils

Variation:

- Laminated Picture Cards (Multiples/Sets based on number of groups)

Vocabulary:

1. Troy Community Forest: Our community forest outdoor classroom was established in October 2007 through partnerships with Mendota Mental Health Institute, the SPRITE program, and Ziegler Design Associates. This project was funded by a generous grant from the Wisconsin Environmental Education Board.



Grade levels: PreK-12

Wisconsin Model Academic Standards Addressed:

Agricultural Education: E.4.1; Environmental Education: A.4.1, A.4.2, A.4.3, A.4.4; Science C.4.2, C.4.6, C.8.1, F.4.1, F.4.2

Activity Time: 10-15 minutes

Supplies:

- Blindfolds
- LEAF Tree ID Cards
- Field Guides

Vocabulary:

1. Sugar Maple: Scientific name: *Acer saccharum* Troy Community Forest is defined by its abundance of Sugar Maples. This species can be identified by its five-lobed, pointed, **palmate** leaf; double-winged **samara** (fruit, with two seeds inside); and gray-brown, rough bark. We tapped two trees in March 2008 to collect sap to boil maple syrup!

2. White Ash: Scientific name: *Fraxinus americana*

This tree species has rough, diamond-patterned bark and **compound, pinnate** leaves with **ovate leaflets**.

3. Tamarack or Eastern Larch: Scientific name: *Larix laricina* The tall tamarack is identified by “potato chip” bark – large, rough chips of bark along the trunk. Its needles grow in short, numerous **bundles**.

4. Spruce spp.: Scientific name: *Picea* These trees have smoother, chipping bark and single needles, rather than pairs or bundles.

5. Common Hackberry: Scientific name: *Celtis occidentalis* This tree species is identified by its smooth bark, interrupted with coarse ridges. It has **alternate, serrated ovate** leaves. Its fruit is a dark berry.

Helpful & Inspiring

Resources:

1. *Sharing Nature with Children* by Joseph Cornell
2. *Winter Tree Finder* by Mary Theilgaard Watts and Tom Watts
3. *LEAF*, UW-Stevens Point

A Year in the Forest

Meet a Tree

This activity is adapted from Joseph Cornell, *Sharing Nature With Children*, (Nevada City: DAWN Publications), 1998.

Organize students into pairs. Have one student in each pair blindfold the other and direct him/her to a tree. Blindfolded student should become familiar with tree and its location using all their senses other than sight. Tree characteristics to make note of include bark, leaves, branches, knots, roots, size, texture, and smell. Encourage students to also take notice of neighboring objects and plant life that may help distinguish a particular tree from another. Students should then return to where they started, and blindfolded student removes blindfold and tries to find the tree he/she just met. Students switch roles and repeat the process.

Share strategies for meeting each tree. Imagine and discuss how each tree might look different in summer. Would you recognize the tree you just met?

Recommendations:

-> Use *LEAF* Tree ID Cards and field guides to aid in identifying tree species, and to help guide you to distinguishing characteristics. For younger students, we recommend making your own set of identification cards or booklets. You may wish to refer to page 26 for ideas.

Record Your Observations: _____ Date: _____



Tree Identification

Using a winter tree guide, demonstrate how to identify trees when their leaves are absent using the sugar maple as an example. With partners, assign students to identify other trees, including tamarack, hackberry, ash, and spruce.

Recommendations:

-> For older students looking for a greater challenge, try using a key, such as *Winter Tree Finder* by Mary Theilgaard Watts and Tom Watts. You may also wish to use *LEAF* Tree ID cards. For younger students, we recommend making your own set of identification cards or booklets. Please refer to page 26 for ideas.

->Take photos, make sketches, and jot down notes regarding the species you observe.



Record Your Observations: _____ Date: _____

Grade levels: PreK-12

Wisconsin Model Academic Standards Addressed:

Agricultural Education: E.4.1; Environmental Education: A.4.1, A.4.2, A.4.3, A.4.4; Science C.4.1, C.4.2, C.4.6, C.8.1, C.8.2, C.8.3, C.8.4, F.8.6, F.8.7, F.12.10

Activity Time: 20-30 minutes

Supplies:

- Field Guides
- LEAF* Tree ID Cards

Vocabulary:

1. Sugar Maple: Scientific name: *Acer saccharum* Troy Community Forest is defined by its abundance of Sugar Maples. This species can be identified by its five-lobed, pointed, **palmate** leaf; double-winged **samara** (fruit, with two seeds inside); and gray-brown, rough bark. We tapped three trees in March 2008 to collect sap to boil maple syrup!

2. White Ash: Scientific name: *Fraxinus americana*

This tree species has rough, diamond-patterned bark and **compound, pinnate** leaves with **ovate leaflets**.

3. Tamarack or Eastern Larch: Scientific name: *Larix laricina* The tall tamarack is identified by “potato chip” bark – large, rough chips of bark along the trunk. Its needles grow in short, numerous **bundles**.

4. Spruce spp.: Scientific name: *Picea*

These trees have smoother, chipping bark and single needles, rather than pairs or bundles.

5. Common Hackberry: Scientific name: *Celtis occidentalis*

This tree species is identified by its smooth bark, interrupted with coarse ridges. It has **alternate, serrated ovate** leaves. Its fruit is a dark berry.

Helpful & Inspiring

Resources:

1. *LEAF*, UW-Stevens Point
2. *Winter Tree Finder* by Mary Theilgaard Watts and Tom Watts

Grade levels: 3-12

Wisconsin Model Academic Standards Addressed:

Environmental Education: B.4.4, B.4.6, B.8.6, B.12.2; Science F.4.1, F.4.3, F.4.4, F.8.6, F.8.7, F.12.7, F.12.10; English Language Arts: C.4.3, C.8.3; Art & Design Education: A.4.1, A.8.1, C.4.8, C.8.7, E.4.4, E.8.4

Activity Time: 10-15 minutes

Supplies:

Natural Construction Materials, including:

- Sticks
- Reeds
- Logs
- Snow
- Leaves

Vocabulary:

1. Habitat: The place where an animal or plant lives. This place must provide food, water, and shelter. Small-scale examples include nest, log, tree, and burrow. Large-scale examples include forest, wetland, garden, and lake.

2. Adaptation: A plant or animal's adjustment to its surrounding environmental conditions.

3. Ecosystem: The encompassing environment, plants, and animals that live and grow together.

4. Transition Zone: The place where two **ecosystems** meet. The Troy Community Forest meets the reed canary grass meadow at a **transition zone**.

5. Reed Canary Grass: An invasive grass species, growing tall west of the Troy Community Forest.

6. Invasive Species: A non-native species with an advantage over native species; grows to dominate an **ecosystem**.



Build a Habitat

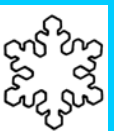
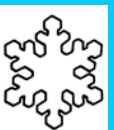
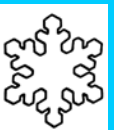
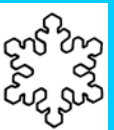
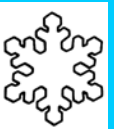
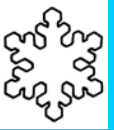
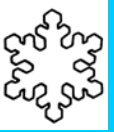
This activity may require teacher, student, or class research to encourage discussions of winter adaptations, habitats, and ecosystems.

Discuss winter adaptations of plants and animals in their forest habitat and ecosystem. Brainstorm habitats and ecosystems at Troy Gardens and in Wisconsin.

Use natural materials to construct human-sized habitats in the forest understory or near the transition zone (reed canary grass meadow). Decide to construct one habitat as a large group, or, resembling competition among organisms, multiple habitats in smaller groups. Ask students to consider important qualities for building a good habitat.

Plan Your Habitat in the box below:

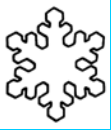
1. Brainstorm materials and considerations
2. Sketch design





Hibernating Bug Hunt

May require teacher, student, or class research to encourage discussions of insect hibernation and adaptations.



As a group, discuss insect hibernation and adaptations. Use flashlights and hands to explore out-of-sight insect hibernation locations. Examples include: under leaf litter, in tree stumps, in tree crevices, in and under logs. Prepare students to hunt for more hibernating insects independently, in pairs, or in small groups. Encourage students to share their findings: Where did you find hibernating insects? What did the insects look like? What kinds of insects are they? How do they hibernate? What type of environment do they choose for hibernation?



If it is a warm, sunny day, teach students to search for snow fleas. To do so, keep eyes peeled for tiny insects at the base of trees. Concentrate on the warmer southern side of the trees. Watch for these insects to jump three to four inches off the ground! (Snow flea information adapted from Susan Milord's *The Kids Nature Book*.)

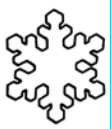


Variation: Scavenger Hunt

Explain checklists and teach students how to hunt for hibernating insects (and snow fleas if a sunny day). Distribute equipment and allow students to hunt in pairs or small groups. Gather and share findings in gathering space.



Record Your Observations: _____ Date: _____





Grade levels: PreK–5

Wisconsin Model Academic Standards Addressed:

Environmental Education:
A.4.1, A.4.2, A.4.3, A.4.4,
A.8.4, A.8.5, B.4.6, B.12.2;
Science: C.4.4, C.8.1, C.8.2,
C.8.3, C.8.4, C.8.7, C.8.10,
F.4.1, F.4.3, F.4.4, F.8.6,
F.8.7; English Language Arts:
C.4.3, C.8.3

Activity Time: 10-15 minutes

Supplies:

- Identification Booklet
- Flashlights 
- Magnifying Glasses 
- Field Notebook
- Pencil

For Scavenger Hunt, Add:

- Laminated checklists
- Vis-à-vis* Overhead
Projection Markers

Vocabulary:

- 1. Adaptation:** A plant or animal's adjustment to its surrounding environmental conditions.
- 2. Hibernate:** A plant or animal's inactive or resting state during the winter season.
- 3. Insect:** Small, invertebrate animal with a segmented body.
- 4. Larvae:** The immature, first stage of a developing insect.

Helpful & Inspiring

Resources:

1. *The Kids Nature Book* by Susan Milord

Grade levels: K-12

Wisconsin Model Academic Standards Addressed:

Environmental Education:
A.8.4, A.8.5

Activity Time: 20-40 minutes

Supplies:

- Survey Flags
- Field Guides
- Question Note Cards
- Pencils

Vocabulary:

1. Tracking: The art of searching for, studying, following, interpreting, and identifying animal tracks.

2. Track: A paw print, or other form of animal evidence, left behind in snow or mud, for example.

3. Scat: A scientific term for animal feces. One can track scat, or use scat as supplemental information for identification when tracking footprints or movements.

Helpful & Inspiring

Resources:

1. "OA Guide to Animal Tracking" by Rick Curtis
2. *A Field Guide to Animal Tracking* by Olaus J. Murie and Mark Elbroch

Animal Tracking

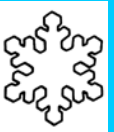
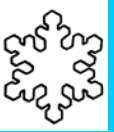
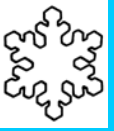
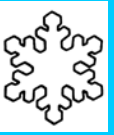
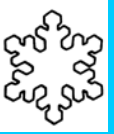
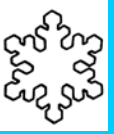
May require teacher, student, or class research to encourage discussions.

Introduce or brainstorm methods of tracking animals in the winter. Give groups of students several survey flags and a question note card. Each group will be asked to find an area of animal activity and attempt to answer the questions about what the animal was doing. Questions might include the following: Where did it come from? Where did it go? Was it hungry? Was it thirsty? Is it watching you right now? Is it male or female? How long ago did it leave these tracks? The flags can be used to show areas of interest, including each track in a section of an animal's journey. Each group will present their story about their animal's activity.

Record Your Observations:

Date: _____

Draw a track or set of tracks:



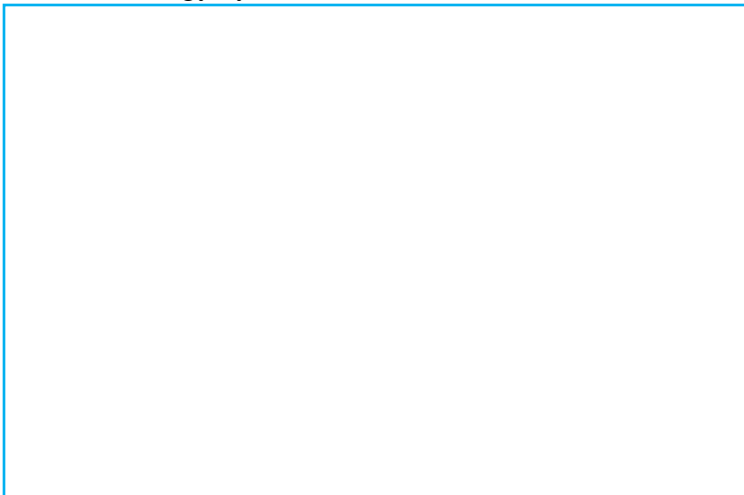
Fireside Conversation on Forest Dynamics

May require teacher, student, or class research to encourage discussions.

Discuss the cycle of energy in a forest from the sun to a tree's wood to the heat from the fire. Introduce concepts of winter adaptations of plants and animals (hibernation, dropping leaves, decreased activity levels, food storage, etc.). Present topics with the aid of discussion note cards or a large pad of paper. Bring discussions back to the classroom using these aids and the space below!

Take Note of Discussion Points and Energy Cycle:

Draw an energy cycle:



Grade levels: 6-12

Wisconsin Model Academic Standards Addressed:

Environmental Education:
B.8.1, B.12.1; Science E.12.1;
English Language Arts: C.4.3,
C.8.3

Lesson Time: 5-10 minutes

Supplies:

- Discussion Note Cards
- Large Paper
- Markers

Vocabulary:

- 1. Energy:** The potential for movement, to do work. Energy is provided from one source to another.
- 2. Hibernate:** A plant or animal's inactive or resting state during the winter season.
- 3. Adaptation:** A plant or animal's adjustment to its surrounding environmental conditions.
- 4. Photosynthesis:** The process of changing energy from sunlight into chemical energy plants can use.
- 5. Chlorophyll:** A pigment (coloring) found in most plants. Chlorophyll absorbs energy to facilitate photosynthesis.

Grade levels: PreK-12, Families

Wisconsin Model Academic Standards Addressed:

Agricultural Education: E.4.1

Lesson Time: 60 minutes

Supplies:

- Drill with 3/8 or 5/16 drill bit
- Thin, Metal Pokers or Chopsticks
- Elderberry Spiles; one for each tree, extras to give to participants
- Hammer
- Clean Milk Jugs; one for each tree
- Rope
- Prepared Fire
- Grill Platform
- Large, Flat Pan
- Candy Thermometer
- Smaller Pan and Containers
- Cotton Cloth or Coffee Filter
- Spoons
- Prepared Maple Syrup for tasting

Vocabulary:

1. Sugar Maple: Scientific name: *Acer saccharum* Troy Community Forest is defined by its abundance of Sugar Maples. This species can be identified by its five-lobed, pointed, **palmate** leaf; double-winged **samara** (fruit, with two seeds inside); and gray-brown, rough bark. We tapped two trees in March 2008 to collect sap to boil maple syrup!

2. Energy: The potential for movement, to do work. Energy is provided from one source to another.

3. Spile: A “sap spout.”

4. Pith: The soft tissue inside the branch.

5. Sugaring: Creating maple syrup from sap.

6. Tapping: Entering the trunk of a [maple] tree to collect sap.

Helpful & Inspiring

Resources:

1. “Backyard Maple Sugaring,” Wehr Nature Center
2. *Maple Moon*, by Connie Brummel Crook
3. “Maple Man,” by Pat Wiley

A Year in the Forest

Family Maple Sugaring

Invite families to meet around a fire in the gathering space. As families are arriving, play music with a guitar or other instruments, perhaps homemade, and encourage singing and hand motions where appropriate. We sang nature songs accompanied by guitar.

If the group is large, divide it into smaller groups, each to be lead by a “Sugaring Naturalist.” Sixty participants joined us for our first annual maple sugaring event. Two naturalists lead groups through the forest, introducing participants to tapped sugar maple trees. We discussed how to identify a sugar maple in winter, how to tap, materials necessary for tapping, and the best time of the year to tap. During discussion we answered participants’ questions. This activity is a great learning experience, and much simpler than it might seem! Our method of tapping is meant to be an example for backyard tapping, using simple methods and recyclable household items, such as milk or orange juice containers for collecting sap.

Follow the instructions below for backyard sugar maple tapping. (Information from “Backyard Maple Sugaring,” Wehr Nature Center)

1. Choose trees to tap. Identify sugar maple trees and determine if the tree is “tapable”. It is safe to tap a tree that you can hug. Ask an adult to hug a tree. If the participant’s hands overlap, the tree is too small to tap; tapping may damage the tree while it is young and small. If the participant’s hands just meet, the tree is “tapable”! Any tree larger than a hug is also “tapable”!
2. At chest height, drill an inclined (~40 degrees) hole into the trunk about two to three inches in length. Tap on the south side of the tree; the warmth from the sun will help the sap to flow.
3. Insert a fitting elderberry spile. Invite kids to remove the pith of the spile with metal pokers or chopsticks prior to fitting it into the hole.
4. Sap will begin to flow down and out the end of the spile, into a milk jug attached around the trunk with a long piece of rope. Allow the spile to meet the lip of the jug and collect the sap throughout the morning and afternoon.
5. Boil the sap in a flat pan until the temperature reaches 217-218 degrees.
6. Enjoy a spoonful of maple syrup! You may use prepared syrup for tasting. Unless you have many trees to tap, you will discover that the sugaring event will produce little maple syrup. We recommend having some on hand so everyone gets a chance to taste.
7. Take time to share the history and folklore of maple sugaring with storytelling and reading while snacking.

