

# Sherburne's Amazing Trees

Grade: Grade 1 or 2

Group Size: One Class

Time: 1-1/2hours

Season: Any

## **Summary:**

Students conduct a field investigation about tree characteristics based upon their own questions. Through observing, collecting, and recording field data, they investigate the oak savanna and its physical traits and behaviors. They use their observations and data to answer their questions and build their knowledge about how science works and about the amazing Sherburne oak savanna habitat.

## **Performance Objectives:**

After completing this activity, students will be able to...

- Define the word “characteristic” as a typical feature of trees such as: bark, trunk, branches. Guided by an adult, students will generate a grade 2 level list of trees observed by: type, growth habit, and characteristics.
- List two characteristics of at least four trees observed.
- Explain how those two characteristics allow a tree to survive in the oak savanna habitat.
- Name one way that characteristics help people understand trees.
- Enjoy observing oak savanna trees and wildlife.

## **Materials Needed:**

- Clipboards
- Tree characteristics table
- Pencils
- Optional as available: Soil thermometer, wind meter, hand lens, measuring tape

## **Background Information:**

The purpose of this investigation is for students to identify tree characteristics that help them then cluster trees into larger groupings like deciduous or coniferous. During this field investigation, students have the opportunity to search, observe, and collect data about trees in the current season and note their characteristics. Students also have the opportunity to ask and answer their own questions about Sherburne trees and their characteristics.

Knowing tree characteristics is also helpful to us as we organize the earth's 100,000+ species of trees, including coniferous and deciduous trees, into various groupings so we can study and understand them more easily. There are tree species yet undiscovered. Kingdom, Phylum, Class, Order, Family, Genus, and Species are the names of some basic groupings scientists use to separate plants, animals, fungi, and other living things. They use increasingly specific traits to separate species. Trees can be identified and grouped based upon common physical and growth characteristics. The chart below lists some of the trees students typically observe at Sherburne NWR and some of the characteristics they will notice, including bark pattern and texture, leaf shape/size/texture/arrangement, height and width, and much more. Introduce *circumference* and use tape measure to measure circumference of one or more trees.

**Common Tree Species near the Oak Savanna Learning Center:**

Tree	Bark	Leaf	Illustration/photo
Northern Pin Oak	Rather smooth, divided by shallow fissures into irregular ridges and plates; grayish to dark brown, inner bark reddish.	Simple, alternate on stem, length 3" to 6"; somewhat oblong or oval; usually has seven lobes, each one bristle-pointed and separated by rounded openings cut nearly to the midrib, giving the leaf a very deeply cut or lacy appearance.	
Black Cherry	On young trunk smooth and bright, reddish brown, marked by conspicuous narrow, white horizontal lines, has bitter almond taste; on older trunks, thin, dark brown, rough, and broken into thick, irregular plates.	Simple, alternate on stem, length 2" to 6", oval or pointedly lance shaped with finely toothed margins; thick, shiny above, paler below; yellow to yellowish red in autumn.	
Bur Oak	Thick, deeply furrowed on surface with irregular plate-like broken scales often slightly tinged with red.	Simple, alternate on stem, length 6" to 12"; crowded at ends of twigs; has pair of deep indentations near base and wavy notches on broad middle and upper portions.	

Red Oak	On young stems, smooth, dark gray to dark brown; on older trees, thick and brown, broken by shallow fissures into regular, flat, smooth-surfaced vertical plates.	Simple, alternate on stem, length 5" to 9"; divided into seven to nine lobes.	
Aspen	Smooth, gray or yellowish green; furrowed and dark brown at base of old trees.	Simple, alternate on stem, length 2" to 4"; coarse toothed.	
Box Elder	Smooth and green on young branches; thin, gray to light brown, deeply divided on old trees.	Opposite on stem, length 5" to 8", pinnately compound with three leaflets (rarely five to seven) that are smooth, lustrous green with irregularly toothed margins (often three lobed).	
Hackberry	Grayish brown, much roughened with prominent, short, corky ridges.	Simple, alternate on stem, length 2" to 4"; has long narrow, tapering points and sharply toothed margins; uneven at base; prominent veins; hairy on upper side.	
<b>Source:</b> <a href="http://dnr.state.mn.us/trees_shrubs/deciduous/index.html">http://dnr.state.mn.us/trees_shrubs/deciduous/index.html</a>			

While exploring trees, students may make other related observations of what is growing on trees, including lichen, galls, and burls.

- **Lichen:** Lichen are organisms composed of fungus and green or blue-green alga growing together. It is a symbiotic relationship, where the fungus obtains water and minerals in the air for the algae while the algae provide carbohydrates and vitamins. Lichens come in many forms- they may be flat, leafy, branched or hair-like, and they come in a variety of colors from white, gray, green, yellow, and black! They are not harmful or parasitic to trees and they grow rapidly in full sunlight, which is why we often find them on dead trees. Lichens have been linked to good air quality; they will not grow in smoky or polluted air.



<http://www.extension.umn.edu/garden/yard-garden/trees-shrubs/lichens-on-trees/>

- **Galls:** Galls found on plants or trees are abnormal outgrowth of plant tissues, similar to warts on animals. They can be caused by a number of different factors, including parasites like fungi and bacteria, or insects and mites.



- **Burls:** A burl is an abnormal tree growth that occurs when the tree is undergoing stress. It may be caused by injury, virus, or fungus. Insect infestation and mold infestation are the most common causes of this condition. It is often found in the form of a rounded outgrowth on a tree trunk or branch and filled with small knots.

#### **Procedure:**

1. **Sherburne Volunteer:** Welcome students, teachers, and chaperones to the Oak Savanna Learning Center. Explain to students that they will have the opportunity to investigate the trees of Sherburne National Wildlife Refuge outside by touching, observing, even smelling. Review characteristics of a naturalist: calm and quiet, respectful, full of wonder, likes to ask questions, has fun outside, etc.
2. **Teacher:** To start the investigation, ask students what they already know about the characteristics of trees in oak savannas. Explain characteristics as attributes or qualities that help you tell one tree apart from other trees. Begin a KWHL chart on the white board and record student answers under the K (Know) column. Some helpful prompting questions might include: What kinds of trees grow here? What are their characteristics? What do they look like? Where do they grow? How large do they grow?
3. **Teacher:** Ask the students what they would like to find out about trees of Sherburne today. What do they wonder about them? The teacher can record their questions in the W (Wonder) column. If needed, remind students that questions could start with the following words: what, where, how, do. A few possible questions they might think up are: What kinds of trees will we see? What kinds of characteristics do they have? What do they look like? Tell students that when we go outside, we are going to see which trees we can find and which characteristics we can observe.
4. **Teacher:** What kinds of tools should they bring outside to conduct the investigation? Tools can be recorded under the H column (for How will we find out the answers?). Provide students with the Tree Characteristic Checklist found at the end of this lesson plan.
5. **Sherburne Volunteer:** Show students any equipment that will be taken outside and how to use it properly. Distribute equipment to chaperones to provide to their small groups. Possible equipment includes clipboards, rulers, and photos of trees found in the oak savanna. **Optional:** Thermometer, wind meter, hand lens, measuring tape. \*Please note that if the weather is wet so notebooks could become soggy, they should be left inside. Results can be recorded on dry paper.
6. **Sherburne Volunteer:** Before heading out, review the rules of respect for the trail – just the same as at school, plus special trail rules (such as no picking plants, follow the leader, be respectful to animals, stay on the trail, etc.). Also ask, “What should we do if we actually get to see one of these animals?” (Be quiet and still, sit down, watch, wait, wonder.)

7. Sherburne Volunteer and Teacher: Take a walk to search for trees and to observe their characteristics. Possibilities include Bur Oak, Red Oak, Aspen, Box Elder, Black Cherry, and Hackberry.
8. Sherburne Volunteer and Teacher: Search for trees in the oak savanna near the Oak Savanna Learning Center (in the 'schoolhouse woods' or nearby). Record information on bark, tree shape; if weather permits, make sketches; note whether the tree is living or dead and its value to wildlife, then take the weather information. Touch and smell the soil and note its color or smudge a small pinch of soil on the journal paper.
9. Sherburne Volunteer and Teacher: Return to the Oak Savanna classroom. To wrap up, share discoveries, review checklists, and answer the questions students generated for the investigation. Ask students what they discovered about characteristics like bark, leaves, and shape of tree. Does the tree have value to wildlife? How might observing tree characteristics help us as people? How do they think the trees (and lichen, galls, or burls) we observed might be important to the refuge and people?
10. Sherburne Volunteer: Collect materials and tools and thank them all for coming!

**Extensions:**

1. Back at school begin a study of lichen, burls, and galls on the school grounds or nearby.
2. Compare trees at Sherburne NWR with trees at school.
3. Talk with students about wildlife use as habitat in both locations.
4. Question: Ask if they noticed burned parts of trees. What is this evidence of? Is fire good or not good in an oak savanna? Now you may introduce the concept of prescribed burns to enhance habitat at Sherburne NWR. See <http://www.sctimes.com/story/sports/outdoors/2015/03/27/fire-part-habitat-restoration-sherburne-nwr/70509038/> for more information about fire at Sherburne NWR.



# Characteristics of Sherburne's Amazing Trees

Name: \_\_\_\_\_ Date: \_\_\_\_\_

<b>Characteristics</b> (Leaves? Height? Branches? Near water? On a hill? )	<b>Bark</b> (Rough? Smooth? Color?)	<b>Living/dead/not            sure?</b>	<b>Wildlife Use/Surprises</b> (Animal homes? Animal food? Lichen? Galls?)
<b>Weather</b>			
Temperature	Wind Speed/ Direction	Sky	Words to describe today's weather:

**2009 Minnesota Academic Standards in Science**

<b>Grade</b>	<b>Strand</b>	<b>Substrand</b>	<b>Standard</b>	<b>Code</b>	<b>Benchmark</b>
<b>1</b>	1. The Nature of Science and Engineering	1. The Practice of Science	1. Scientists work as individuals and in groups to investigate the natural world, emphasizing evidence and communicating with others.	1.1.1.1.1	When asked "How do You Know?", students support their answer with observations. <i>For example:</i> Use observations to tell why a squirrel is a living thing.
<b>1</b>	1. The Nature of Science and Engineering	1. The Practice of Science	1. Scientists work as individuals and in groups to investigate the natural world, emphasizing evidence and communicating with others.	1.1.1.1.2	Recognize that describing things as accurately as possible is important in science because it enables people to compare their observations with those of others.
<b>1</b>	1. The Nature of Science and Engineering	3. Interactions Among Science, Engineering, Technology and Society	2. Men and women throughout the history of all cultures, including Minnesota American Indian tribes and communities, have been involved in engineering design and scientific inquiry.	1.1.3.2.1	Recognize that tools are used by people, including scientists and engineers, to gather information and solve problems. <i>For example:</i> Magnifier, snowplow, calculator.

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2	1. The Nature of Science and Engineering	1. The Practice of Science	2. Scientific inquiry is a set of interrelated processes incorporating multiple approaches that are used to pose questions about the natural world and investigate phenomena.	2.1.1.2.1	Raise questions about the natural world and seek answers by making careful observations, noting what happens when you interact with an object, and sharing the answers with others.
2	3. Earth Science	2. Interdependence within the Earth system	2. Weather can be described in measurable quantities and changes from day to day and with the seasons.	2.3.2.2.1	Measure, record and describe weather conditions using common tools. For example: Temperature, precipitation, sunrise/sunset, and wind speed/direction
2	4. Life Science	1. Structure and Function of Living Systems	1. Living things are diverse with many different observable characteristics.	2.4.1.1.1	Describe and sort plants into groups in many ways, according to their physical characteristics and behaviors.
2	4. Life Science	2. Interdependence Among Living Systems	1. Natural systems have many components that interact to maintain the system	2.4.2.1.1	Recognize that plants need space, water, nutrients and air, and that they fulfill these needs in different ways.

**Writing Benchmarks K-5 (Common Core Writing Standards K–5) Grade 2**

**6.3.3** Write narratives and other creative texts in which they recount a well-elaborated event or short sequence of events, include details to describe actions, thoughts, and feelings, use temporal words to signal event order, and provide a sense of closure.