

Field Enhancement 1: I Can Be a Forester

NUTSHELL

In this park, schoolyard, or school forest with a cluster of trees lesson, students get a taste of what foresters do. First, they learn about the many roles of foresters. Then, students collect data from a forest plot and discuss how this information is useful.

ENDURING UNDERSTANDINGS

- Forest management is the use of techniques (e.g., planting, harvesting) to promote, conserve, or alter forests to meet desired outcomes.
- Management starts with planning. Wisconsin foresters prepare forest management plans based on landowner goals and objectives, capabilities of the forest site, and tools available (e.g., planting, harvesting, using prescribed fire).
- Forest research and management involves professionals with backgrounds in many fields, including forestry, biology, wildlife, soils, water, land management, urban planning, engineering, sociology, geography, technology, environmental education, and chemistry.

ESSENTIAL QUESTION

- What information should we collect from the forest to help us decide what to do?

OBJECTIVES

Upon completion of this lesson, students will be able to:

- Give examples of information that can be collected from a forest sample plot.
- Explain that many professionals use information from forests.

SUBJECT AREAS

Arts, Language Arts, Science, Social Studies

LESSON/ACTIVITY TIME

Total Lesson Time: 60 minutes

- Introduction.....10 minutes
- Activity40 minutes
- Conclusion.....10 minutes

STANDARDS CONNECTIONS

Standards for this lesson can be viewed online at the LEAF website (www.leafprogram.org).

CLASSROOM LESSON CONNECTIONS

This lesson ties closely with **Classroom Lesson 1, To Be a Tree**, and **Classroom Lesson 5, Decisions, Decisions**.

BACKGROUND INFORMATION

Foresters work with landowners to help them meet their goals for their property. This involves gathering information about the **forest** and planning the steps needed to meet the goals. How does a forester know what to do? Foresters are trained to identify trees and the conditions they need to grow. Foresters get information about a forest by sampling it. While sampling, foresters walk through the forest, stopping in several places to collect information. At these stops, or sample points, foresters take note of the quantity, size, species, and health of the trees present. In some cases, they gather additional information as well. This information helps foresters make decisions about which management techniques to prescribe. Foresters

go to college to learn the things they need to know for their job. Foresters can work for a state or federal government agency (like the Wisconsin Department of Natural Resources or the USDA Forest Service), for a paper or lumber company, or for a private forestry consulting firm.

SAFETY PRECAUTIONS


Visit the teaching site ahead of time to locate any hazards such as hanging branches, protruding tree roots, holes, poison ivy, or stinging nettle. Encourage students to walk, not run, at all times when in a forested area.

TEACHER PREPARATION


Visit the teaching site in advance and choose a location for a 40-foot, circular sample plot. Ideally, the plot will contain at least three different tree species of varying sizes. Trees that produce seeds and dead trees will also be useful in student observations.

MATERIALS LIST

For Each Student

- Copy of Student Pages  1A-B, *I Am a Forester*
- Pencil
- Clipboard or notebook to use as a writing surface

For the Class

- Copy of Teacher Pages  1A-F, *Forester Pictures A-F*
- Yarn, string, or twine (20 feet)
- Eight flags, stakes, or cones for marking the boundary of the sample plot

**“Solitary trees, if they grow
at all, grow strong.”**

★ *Winston Churchill* ★

VOCABULARY TERMS

Clearcutting: Cutting all trees in a given area at the same time.

Coniferous: A tree that bears cones and has needles.

Crown: The part of a tree with live branches and leaves.

Deciduous: A tree that sheds all of its leaves annually.

Forest: An ecosystem that is characterized by a dominance of tree cover and contains a variety of other organisms (e.g., other plants, animals).

Forest Management: Doing things (e.g., planting, harvesting) to a forest to meet human goals.

Forester: A person who plants and takes care of trees and forests.

Logger: A person who cuts trees to sell to sawmills and other wood-using businesses.

Plot: A small area of forest to be studied.

Select Cut: Choosing and cutting a portion of the trees in an area.

Stand: A group of trees in a given area.

Wildlife Biologist: A person who researches wildlife and their habitats and takes action to improve those habitats.

Management Techniques

Certain species of trees, such as aspen, regenerate by sprouting from roots. In Wisconsin, you frequently come across an entire **stand** of aspen. The underground root system of aspen connects all the trees in a stand together.

Clearcutting such an area stimulates the roots to send up new sprouts. If you returned to such an area a year or two later, you would have a hard time walking through it because the new growth would be so thick.

In some cases, foresters prescribe a **select cut**. This means the forester selects each tree to be cut and marks it with paint. Then a logger cuts only the marked trees.

By selecting certain trees, foresters can choose to have damaged or diseased trees taken out. They can take out a tree with a large crown, allowing more sunlight to reach the forest floor. They can choose to leave standing dead trees that make good homes for wildlife, and they can lower the overall density of trees. This makes more nutrients, space, and sunlight available for the remaining trees.



NOTE: Some people may think that cutting trees is always bad. To help students balance this point of view, explain the benefits we get from harvesting trees. Think about all the products made from trees that we use every day: paper, cardboard, furniture, and many others. The forest products industry is the second largest industry in the state of Wisconsin. It employs more than 99,000 people. In addition, harvesting and other management techniques can help maintain or improve the quality of our forests.

Sometimes foresters choose to use fire to help manage a stand of trees. Indeed, an accidental forest fire can cause a lot of damage. But when carefully planned and managed, controlled burning actually helps certain types of forests regenerate. Jack pine cones, for example, need extreme heat in order to open up and allow new seeds to drop. Using a controlled fire in a stand of mature jack pines helps new seeds germinate.

Planting is another important management technique. Foresters plant new trees to be sure that the resource will be available in the future. Depending on the objectives of the landowner, sometimes foresters plant all the same species of trees and sometimes they plant a mixture. Foresters are not the only ones who plant trees, though. Individual landowners, citizen groups, and students also help to ensure the future of Wisconsin's forests.

**“The best time to plant a tree
is twenty years ago.
The second best time is now.”**

★ *Chinese Proverb* ★

PROCEDURE


Introduction - What Does a Forester Do?

1. Ask students to raise their hand if they know a forester or have seen one before. Then ask them to tell you what they think a forester does. (*Answers will vary; accept all of their ideas at this point.*) Explain to your students that foresters take care of our forests, but that involves many different tasks.
2. Tell them you have some pictures of foresters on the job. Hold up Teacher Page 🐛1A, **Forester Picture A**, which is a picture of a forester talking with a landowner. Sometimes a forester will talk with a landowner about how the forester can help the landowner maintain or improve the forest on his or her land.
3. Next, hold up Teacher Page 🐛1B, **Forester Picture B**, which shows a forester looking at a map. Ask your students what they think the forester is doing in this picture. (*Looking at a map.*) Foresters look at maps frequently to help them find their way through the trees without getting lost.
4. Now, hold up Teacher Page 🐛1C, **Forester Picture C**, which is a picture of a forester measuring a tree. Ask your students what they think he is doing. (*Measuring the tree.*) Explain that foresters measure trees in order to find out how much lumber they would produce if they were cut down.
5. The next picture, Teacher Page 🐛1D, **Forester Picture D**, shows a forester working in the field with technology. After the forester has spoken with the landowner and measured several of the trees, he or she uses that information to write a management plan for the forest. A management plan tells the landowner what needs to be done in the future to take care of the forest. These techniques include planting and harvesting trees.
6. Sometimes the forester decides that some trees need to be harvested, as on Teacher Page 🐛1E, **Forester Picture E**. In this case, he or she might go into the forest and mark those trees with paint. Hold up the picture of a forester marking a tree with paint. Cutting trees down can actually help the forest grow better if it is done carefully. For example, taking out some trees allows more sunlight to reach the forest floor, which helps new plants and trees to grow.
7. Finally, hold up Teacher Page 🐛1F, **Forester Picture F**, which is a picture of the forester standing next to logging equipment. Ask your students what they think is happening in this picture. (*They are harvesting trees.*) After a forester marks the trees that need to get cut, a **logger** harvests the trees. Many times the forester stops by during this process to make sure that everything goes as planned.
8. Ask your students if they want to see what it is like to be a forester. Tell them they will set up a sample area and collect information about the trees there. This area will be called a **plot**.

“The best friend on earth
of man is the tree.
When we use the tree
respectfully and economically,
we have one of the greatest
resources on the earth.”

★ Frank Lloyd Wright ★

Activity - Plot Sampling

1. Take students outside to the center of the area that will become their sample plot. Ask for three volunteers to help you set up the boundaries of the plot. Ask one student to stand by a tree in the center of the area that will become his/her plot. Have the students hold one end of a 20-foot piece of string. Ask the other two students to work together to straighten the string out in one direction. Once the string is straight, place a flag at the other end of the string to mark the boundary. Repeat this process seven more times in different directions to mark the boundary of the circular plot. Distribute the flags evenly around the circle so students will be able to see the boundary clearly. You may choose to have a different set of volunteers help with each flag.
2. Pass out a copy of Student Pages  **1A-B, I Am a Forester**, a clipboard, and a pencil to each student. Guide students through the data collection. First, ask each student to try to find three different types of leaves in the plot and to draw a picture of each type on the Student Page. (Remember that needles are just a different kind of leaf.) You may only find one or two types of leaves in the plot. In this case, have students draw only one or two leaves on their Student Page.
3. Next, ask students to look for three different types of seeds in the plot and to draw a picture of each on their Student Page. Again, you may only find one or two types of seeds in the plot. In this case, have students draw only one or two seeds on their Student Page.
4. Now, ask students to take a step back and look at the overall crown shape of the trees in the plot. Challenge them to find three different crown shapes and draw pictures of those shapes on their Student Page. For example, even if one type of tree dominates the plot, you may still find three different crown shapes.
5. After students finish all their drawings, divide them into groups of three. Have students work in groups to complete the remainder of the Student Page together. Ask the groups to look around on the ground in the plot and to notice how many seeds they can find. Then have them mark the box on their Student Page that most closely matches their observations. If necessary, help them decide which box to mark. If you don't see any seeds at all, mark the first box None. If you mark Few, that means you see anywhere from one to a few dozen seeds. Mark Many if you see so many seeds on the ground that it would take a long time to count them.
6. Next, have the groups walk around the plot and count seedlings. Foresters call trees seedlings as soon as they come out of the ground, up until they are one inch in diameter. If students can't close their thumb and index finger around a tree, it is too big to count. As students walk around the plot, have them make a mark in the seedling box on their Student Page for every seedling they find. Then ask them to count the marks and to write the total number of seedlings on the line in the box.
7. Now, have groups walk around the plot again and make marks as they count the number of standing dead trees they see. Afterward, ask them to count the marks in the standing dead trees box and write the total number of standing dead trees on the line in the box.
8. Tell students it is time to make observations about the mature living trees in the plot. Begin by reminding students about the difference between broadleaf and coniferous trees. (*Broadleaf trees have broad flat leaves. Coniferous trees bear cones.*) Have students stop at up to six mature trees and circle the appropriate image for broadleaf or coniferous and its corresponding tree size (small, medium, or big) on their worksheet.

Conclusion - Summary Discussion

1. After completing Student Pages *1A-B, I Am a Forester*, gather students together and conclude the activity with a discussion. For review, ask students to tell you what kinds of information they collected during the activity. (*Leaf shapes, seed shapes, crown shapes, how many seeds, how many seedlings, how many standing dead trees, the types, sizes, and health of mature trees.*)
2. Ask students what they think a **wildlife biologist** studies. (*Wild animals.*) Wildlife biologists use information like we collected today to see if a forest could provide for a particular animal's needs. For instance, animals such as turkeys and squirrels eat nuts and acorns. A habitat needs to have plenty of seeds in order for these animals to live there. Ask if they think that turkeys or squirrels could find enough seeds on our plot. (*Yes, if it had many seeds.*) By taking sample plots all over the state, a wildlife biologist could see how much habitat is available for wildlife in different areas. In addition, standing dead trees make good homes for many types of wildlife. Wildlife biologists like to know if standing dead trees are available for animals.
3. We counted the seedlings on our plot and we recorded the health of the mature trees. Knowing this information gives foresters an idea of how the forest will look in the future.
4. Ask students to remember how they drew pictures of different leaves, seeds, and crown shapes. Foresters also record how many different types of trees they see.
5. Sometimes, foresters visit the same sample plots again in five to ten years. By recording the same information again, they can see how the forest changes over time.



SUMMATIVE ASSESSMENT

Give students each a blank piece of paper and ask them to fold it in half. On one-half of the paper, ask students to list as many examples as they can of information that can be collected from a forest sample plot. Ask students to list on the other side of the paper as many reasons as possible why that information is important.

**“The best friend on earth
of man is the tree.
When we use the tree
respectfully and economically,
we have one of the greatest
resources on the earth.”**

★ Frank Lloyd Wright ★

FORESTER PICTURE A



Photo Credit: Wisconsin DNR

FORESTER PICTURE B



Photo Credit: Wisconsin DNR

FORESTER PICTURE C



Photo Credit: Wisconsin DNR

FORESTER PICTURE D



Photo Credit: Wisconsin DNR

Teacher Page 🍌 1D

FORESTER PICTURE E



FORESTER PICTURE F



Photo Credit: Wisconsin DNR

I AM A FORESTER

Find and draw 3 different types of **LEAVES**.

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Find and draw 3 different types of **SEEDS**.

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Find and draw 3 different types of **CROWN SHAPES**.

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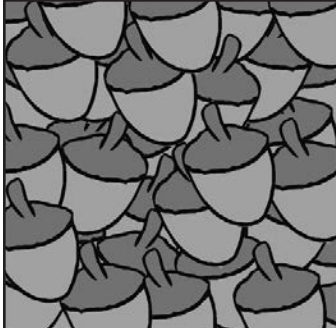
I AM A FORESTER

How many **SEEDS** are on the ground in your plot: none, few, or many?

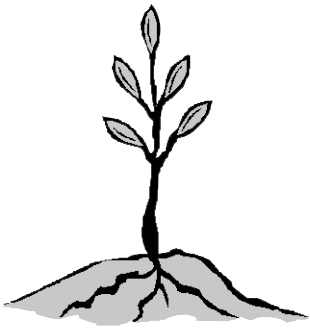
None



Few

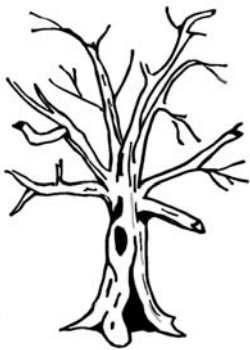


Many

































How many **SEEDLINGS** are in your plot?

Total _____



How many **STANDING DEAD TREES** are in your plot?

Total _____

Mature Tree	Broadleaf	Coniferous	Small	Medium	Big
1					
2					
3					
4					
5					
6					
Totals					