In this 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.

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.

Certain species, 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.
Many times, however, a clearcut is not the best answer for a stand of trees. In some cases, foresters prescribe a select cut. This means the forester hand-selects each tree to be cut and marks it with paint. Then a logger cuts only the marked trees. When walking past such a stand, you might not even notice that it was logged.
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 cutting 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, fire 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.

PROCEDURE
INTRODUCTION
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, the 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, the picture of 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, the 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, shows a forester sitting at a computer. 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 cut, as on Teacher Page 1E. 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, the 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.

**ACTIVITY 1**

1. Take your 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 their plot. Have him or her 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 the students will be able to see the boundary clearly. You may choose to have a different set of volunteers help with each flag.

**ACTIVITY 2**

1. Pass out Student Pages 1A-B, *I Am a Forester*, clipboards, and writing utensils. Guide students through the data collection. First, ask each student to try to find three different types of leaves and draw a picture of each on their 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 your students draw only one or two leaves on their Student Page.

2. Next ask your students to look for three different types of seeds in your plot and draw a picture of each on their Student Page. Again, you may only find one or two types of seeds in your plot. In this case, have your students draw only one or two seeds on their Student Page.

3. Now ask your students to take a step back and look at the overall crown shape of the trees in your 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 your plot, you may still find three different crown shapes.

4. After your students finish all their drawings, divide them into groups of three to five. Have your students work in groups to complete the remainder of the Student Page. Ask the groups to look around on the ground in your plot and notice how many seeds they can find. Then have them circle the box on their Student Page that most closely matches their observations. If necessary, help them decide which box to circle. If you don’t see any seeds at all, circle 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.
5. Next have your groups walk around your 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 your students walk around the plot, have them make a mark on their Student Page for every seedling that they find. Then ask them to count the marks and write down the total number of seedlings in the box.

6. Now have groups walk around the plot again and mark the number of standing dead trees they see. Afterwards, ask them to count the marks and write the total number of standing dead trees in the box.

7. It is finally time to make observations about the mature living trees in your plot. Begin by reminding your students about the difference between deciduous and coniferous trees. Deciduous trees shed their leaves every year. Coniferous trees bear cones. Your groups will stop at each mature tree and make note of the following information.

- Decide if the tree is deciduous or coniferous and circle the appropriate picture.
- Look at the pictures depicting the size of the tree and pick the size that most closely matches the tree you are looking at.

Be careful to visit each tree only once.

CONCLUSION

1. After completing the Student Pages 1A-B, I Am a Forester, gather students together and conclude the activity with a discussion. For review, ask your 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 type of mature trees, their size, and their health.)

2. Then 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 each student a blank piece of paper and ask them to fold it in half. On one half of the paper, ask the students to list as many examples as they can of information that can be collected from a forest sample plot. On the other side of the paper ask your students to list as many reasons as possible why that information is important.
Field Enhancement 1: I Can Be a Forester
I AM A FORESTER

Find and draw 3 different types of leaves.

Find and draw 3 different types of seeds.

Find and draw 3 different crown shapes.
1B

**I AM A FORESTER**

**How many seeds are on the ground in your plot?**

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</table>

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

Total _____

**How many standing dead trees are in your plot?**

Total _____

<table>
<thead>
<tr>
<th>Tree</th>
<th>Deciduous</th>
<th>Coniferous</th>
<th>Small</th>
<th>Medium</th>
<th>Big</th>
</tr>
</thead>
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<td><img src="image4.png" alt="Medium" /></td>
<td><img src="image5.png" alt="Big" /></td>
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<tr>
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<td><img src="image2.png" alt="Coniferous" /></td>
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<td><img src="image2.png" alt="Coniferous" /></td>
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<td><img src="image5.png" alt="Big" /></td>
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<tr>
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