



Lesson 10 – Managing For the Future



In a Nutshell

Ideas we have today about managing our forests for the future are very different than those of the past. Students will take part in a sustainability model, do a multiple-use management role-play, and learn about how they can make a difference in their own backyard.

Concepts

- Managing for sustainability can apply to forestry.
- Many forests today are managed for multiple use.
- Most Wisconsin citizens live in “urban forests.”

Objectives

After completing this lesson, students will be able to:

- Define sustainable forestry and give a working example.
- Define what it means to manage for multiple use and list at least three uses.
- Explain what an “urban forest” is and why they are important.

State Standards

ELA	SS	EE
C.4.3	A.4.4	B.4.3
D.4.1	B.4.10	B.4.8
		C.4.2
		C.4.3
		C.4.4
		D.4.1
		D.4.2

Total Estimated Time

2 hours and 35 minutes

Vocabulary

Criteria – standards on which a decision is based

Insulation – a material that prevents the transfer of energy

Menominee – a Native American tribe native to Wisconsin

Multiple use – able to be used for many things

Pollutants – something that makes the air, water, etc. dirty

Renewable resource – a resource that can be replaced by a natural cycle

Runoff – the portion of rain, snow, etc. that reaches streams or other bodies of water

Sovereign – one that exercises authority in a certain area

Sustainable – able to be kept up at the same pace

Urban – in or close to a city

Urban forest – the trees within an urban area

Materials

M&M’s or other small candies (be aware of chocolate allergies)

Bowl

Paper

Crayons, colored pencils

String and tape (if doing web activity)

Overhead of Menominee Reservation from space (Insert 10.1)

Task cards A, B, and C for your students (insert 10.3)

Overhead of Map A (Insert 10.4)

Teacher Preparation

Read over the background information and the activities. Prepare the bowl of candy for the sustainability simulation.



Make overheads of Map A, the Menominee Reservation from space, and the Menominee Tribal Enterprises logo. Make copies of Task Cards A and B for the whole class and at least five copies of Task Card C.

Background Information

Today, 16 million of Wisconsin's 35 million acres are forested. That's 46% of the state! It is important that these forests be well-managed if all land and life in the state is to benefit. Of this forested land, 57% of it is privately owned. (5% is state-owned, 10% is federal, 15% is owned by counties and municipalities, and the rest is tribal and industry-owned.) What does this mean? It means that it is not up to the government or county foresters to see that most of our forested land is taken care of. It is up to the individual citizens of Wisconsin who own it. What an individual does with his or her own land can have major effects on many other people.

When many people think of managing lands today, they think of sustainability. Sustainability means "meeting the needs of the present without compromising the ability of future generations to meet their own needs." This idea can apply to forestry as well as many other habitats and activities. Sustainable forestry is defined as "the practice of managing dynamic forest ecosystems to provide ecological, economic, social, and cultural benefits for present and future generations." There are several lumber producers that are seeking sustainable management certification. Organizations such as the Forest Stewardship Council, Sustainable

Forestry Initiative, American Tree Farm, and International Standards Organization 1400 are some that have certification systems with which they assess companies.

The first official sustainable commercial operation in the country was the Menominee Reservation Forest in northeast Wisconsin. The reservation itself was established in 1854, at which time there were 1.3 billion board feet of lumber on the reservation. Today there are 1.7 billion board feet of even better quality lumber. It is part of the Menominee culture and tradition to be in balance with the natural world. This is the idea upon which Menominee Tribal Enterprises manages the forest. It is indeed a unique place. The reservation is actually visible on satellite images as a dark square surrounded by lighter areas which are farm fields of surrounding counties.

Multiple use is another buzzword in forestry today. What does it mean to manage for multiple use? Multiple use management means that a forest is not managed for one thing only, such as wood production, but for many different values and uses. These may include lumber, wildlife habitat, aesthetics, water quality, hunting, camping, etc. Sometimes one use may conflict with another, while others tend to go hand in hand.

Finally, it is important for people to realize that forests don't just refer to large tracts or undisturbed land covered with trees. Eighty percent of Wisconsin residents live in what is known as the urban forest. An urban forest is the trees and other plants within and surrounding





towns, villages, or cities. Trees are very important in cities. They provide shade, trap carbon dioxide and other pollutants, reduce flooding, pollution, and sedimentation in lakes and rivers, cool cities on hot days through evaporation, and provide insulation during the winter. Research has even shown that the presence of trees reduces the level of violent behavior in residents of the urban forest. Even if you don't live in a big forest or even near a large forested area, you and your students are probably part of an urban forest ecosystem!

Introduction

Use the following simulation to explain the concept of sustainability to your students. It will definitely get their attention! Put twenty M&M's in a bowl and put it on a table in the front of the classroom. Call four students up to the front. Tell them that when you say go, they may take as many M&M's as they want, but they must pick up one at a time and put it in their hand that's not doing the grabbing before they get another one. Say go and time them for five seconds. At the end of five seconds say stop and count the number of M&M's left. For every two M&M's left, add one to the bowl. Repeat this with a new group. Each group only gets one five-second chance. Be sure to keep track on a piece of paper how many M&M's there are at the beginning of each round. Keep track on a piece of paper. When at least four groups have come up, put the numbers on the board.

Activity 10.1 - Managing For Sustainability (45 min)

Ask your students what they notice about the numbers of M&M's at the beginning of each round. There will most likely be fewer and fewer at the

beginning of each round. Explain to your students that you counted the M&M's at the end of each five-second round. You put in one M&M for every two left, so if there were ten left you put in five. If there were eight left you put in how many? Four. So, if people kept taking at the rate that they were, how many M&M's do you think you would have at the end of ten rounds? Zero. Now, what if during the first round when you started with twenty M&M's you didn't take any out of the bowl. How many M&M's would you have at the beginning of the next round? Thirty!

This activity shows what happened to the forests of Wisconsin. People came to Wisconsin and thought they could cut as many of the trees down as they wanted. They didn't think they would ever run out. What happened? They ran out. What could you have done up here when you were taking M&M's to keep from running out? Let your students brainstorm. They should figure out that if they just take some, the bowl of M&M's would continue to grow and will last for the class a lot longer. This is what it means to be sustainable. Ask if any of them have heard the word sustainable or sustainability before. Do any of them know what it means? Sustainable means "meeting the needs of the present without compromising the ability of future generations to meet their own needs." In other words, if we go back to our M&M example, the first group should not take so many M&M's that the next group can't get as many.

So, if the first group never took any M&M's, could you get unlimited candy? Again, let your students think about it. No, eventually we wouldn't have any more space left in the candy bowl. Plus,



is that any fun to get no M&M's? Of course not.

Now, let's think about how this could be compared to forests. Taking all of the M&M's all at once was like cutting all of the trees in Wisconsin at once in the late 1800's and early 1900's. What would have happened if no trees were cut down? Would we keep getting more and more? Give your students time to think about this. No. Why not? Well, first of all, at a certain point there would be no more space for trees. Second, don't people need wood? Definitely! We use wood to make a lot of the things we need. So, what would be the solution? Let your students brainstorm until they come up with the idea of taking only some of the trees at any one time.

If only some of the trees are taken, will more trees eventually grow back? Yes. A resource we use that can replenish itself is called a renewable resource. Trees are a renewable resource. This means that if they are harvested wisely, more will continue to grow.

Who remembers what the word sustainable means? Be sure your students understand what it means for something to be sustainable. What do you think sustainable development means with forests? Give your students time to brainstorm what this could mean. Sustainable forestry means taking care of a forested area so that it meets people's needs today but will still be able to meet them in the future. Have your students start thinking about some things that they use forests for. Write them down on the board. Choose one to focus on. For example, you could focus on wood products. Ask your students

what it means for wood production to be sustainable. It means that people can use wood from the forests today, but not so much or so quickly that there will not be time for new trees to grow for future generations. What would sustainable forestry mean for camping and recreation? It would mean that people could enjoy camping in the forests today, but that they could not leave such an impact that future generations would not be able to camp there. If they littered and hiked off the trail and damaged plants, that forest would be ruined for future generations who wanted to camp there.

Let's go back to our M&M model. What kind of difference would there have been if, instead of four of you up here picking out M&M's, there were 100 of you? What would have happened? Would there have been enough for all of you to have eaten your fill? No, you'd need a bigger bowl. Let's apply that to the forest. Back in 1900, there were about 2 million people living in Wisconsin. By 1998 there were over 5 million! That's a big difference! We need wood for that many more people. Can we have bigger forests? How would we create bigger forests? Where would we get the extra land? Do you think there will be as much land available with so many more people needing places to live? How will our population size affect our forests?

Have your students look at an overhead of the Menominee Reservation from space (Insert 10.1). Ask them what they think that big dark patch is. Have them come up with some ideas and share them with the class. Explain to them that this patch is the forest on the Menominee



Reservation in Wisconsin. It is so different from all other forests that you can see it from outer space! In fact, satellites use the forest edges to focus their cameras since the edges are so distinct!

The Menominee Indian Tribe of Wisconsin is a federally recognized sovereign nation. This means that they make their own laws. The reservation where many Menominee live was established in 1854. A sawmill was established that very same year. What is so amazing about this forest is that over the first 140 years since the reservation was established, more than 2½ billion board feet of lumber have been harvested. That means that the standing timber has been cut twice over. Today, however, the amount of standing timber is greater than in 1854. How did that happen?

The Menominee provide an excellent example of sustainable forestry practices. Trees to be cut are carefully selected so that wood can be obtained but so that the rest of the forest will not be hurt. The logging practices are taken care of by Menominee Tribal Enterprises. It is a business branch of the Menominee tribe. Show your students the Menominee Tribal Enterprises logo (Insert 10.2). It represents a balance between the three things that you see. What do you see in these three pictures? The environment, the community, and the economy.

Have your students create a logo for a logging company of their own. Have them explain why they designed their specific logo. What does it stand for?

Menominee Tribal Enterprises has received certifications from various

groups which declare them to have sustainable forest practices. It's like having a stamp of approval that their products came from a sustainably managed forest.

Activity 10.2 – Managing For Multiple Use (1 hour)

Take a look at all of the uses of the forest that you brainstormed in Activity 1. Are you missing any? Give your students some suggestions and add them to the list if necessary. Have your students pick one thing that they value the forest for (wood products, recreation, hiking, camping, photography, wildlife observation, etc.). Have them illustrate it on a piece of paper. The following discussion may be done in a number of ways. Students can pair up with each other, students can come up in front of the class, or you could make a web on the board with string connecting the pictures. The point is to have students determine which uses of the forest are compatible with one another and which are not. (If you use the web on the board idea, you might want to use green string between those that are compatible and red between those that are not.) Discuss why certain uses are not compatible with one another.

Forests serve many different functions, too. Some of them we don't even think about. Did you know that forests help keep our water clean? Plants and trees help hold soil in place. When many trees are cut at once, a lot of the soil can be washed into rivers and streams causing them to become polluted. Nutrients in the soil that get into the water systems can cause there to be less dissolved oxygen, something that is needed by fish. Finally, when forests are



cleared from river and stream banks, there is less shade and so water temperatures rise. This can be harmful to some kinds of fish.

No matter where you live in Wisconsin, there are forests somewhere near you. Tell your students that they are going to take part in a simulation game concerning land use. What is a simulation? A simulation is when you pretend to be in a certain situation. We will be acting out, or role-playing, that we are in charge of an area of forest near us.

Hand out Task Card A (Insert 10.3) and the map of the area (Insert 10.4) and have your students take turns reading it out loud. When they have finished, develop a list on the board of ways they could use the land. You may want to give them some ideas. Tell them to use their imagination. They can come up with anything. Don't stop until you have about 15 to 20 different choices on the board. Next, have the students classify the ideas on the board. Which of these uses are similar? Are some more closely related than others? How? Group similar uses and then have the students label all of the categories. Some possibilities include recreation, housing, commercial, industrial, etc.

Now, have groups of students draw out of a hat to see what category they will represent. Explain to your students that they will be role-playing. This means that they will be acting like another person that may have ideas and preferences different than their own. Just because you say during this exercise that you want to build a skyscraper on this land does not mean you really would

want to do that in real life. You're just acting! Try to be convincing in your role.

Pass out Task Card B and give your students about 10 minutes to fill it out. Explain that Task Card B asks for ideas of what their group would do with the land. They should list these and then give the possible consequences associated with them. You may want to go through an example from each category together.

After about 10 minutes, pass out Task Card C. Tell the groups that they have 20 minutes to decide what their group wants to do with the land and develop a short presentation that they will give to the Board of County Supervisors. A visual display of what they want to do will be necessary.

When 10 minutes of planning time have passed, have each group select one of their members to be a County Board Supervisor. Take these selected students to their own corner of the room and talk to them about what their new role will be. They are responsible for listening to the presentations and deciding which one is best. Make sure they know that they are no longer supporting the group that they came from. They must decide which is the best decision based on what the teams present. Right now they must develop the criteria, or what they will look for, to evaluate the proposals. What are the kinds of things they should take into account. Discuss this with them for a moment to get them on the right track.

Remind the groups how much time they have left to prepare their visual displays



and presentations. At the agreed-upon time, have the County Board members sit at the front of the room. Remind everyone that his or her group will only have 3 minutes. Appoint a timekeeper. Have him/her give the presenters a one-minute-left warning. After the presentations, the board may ask questions to any of the groups. This should take about 5-10 minutes at most. When the board has enough information, they can go into a hall or a corner of the room and make their decision. While the board is meeting, develop a list of criteria the rest of the students think should be used to judge the proposals. Again, what are the kinds of things they should take into account. Discuss this with them for a moment to get them on the right track. When the board returns, have them list the criteria they used in making their decision, and then have them announce their decision.

Conduct a wrap-up discussion with your students. Why is land-use important? Why can it sometimes be an emotional topic? Why is land use such a complex issue? What did you find yourself considering during the presentations? Did any of your considerations conflict or did yours conflict with somebody else's? What did you think about the criteria used? What would you have used that was different? What else would you have wanted to know about the land before you made any of these decisions (water quality, wildlife present, etc.)? How could you become involved in land-use decisions?

Activity 10.3 – Managing Your Own Backyard (30 min)

When you hear the word “forest,” what do you think of? Close your eyes and

imagine a forest. Make a list of your students’ ideas on the board.

Do you live in a forest? You might be surprised at the answer to that question. Eighty percent of Wisconsin’s population lives in what is called the “urban forest.” The word urban means in or close to a city.

When we think of forests, we usually think of many trees crowded together, wild animals, and not very many people. Explain that the trees around your school and around your home are part of the urban forest. This means that your school, your house, your pet, your teacher, your friends, and most importantly, YOU, are part of the urban forest ecosystem!

You just learned the many good things that forests do...prevent soil erosion, help keep fish healthy, provide shade, etc. Do you think trees could be helpful to people in a city? What about people in a neighborhood such as your own? Give your students a chance to brainstorm what good trees could do for their own community. You might want to have your students illustrate one thing they think of and then present them to the class. You could also come up with a class list of things your students would miss with no trees. Share the following list of tree benefits with your class. Perhaps you could divide them into groups and have each group illustrate one of these benefits:

1. Shade – Trees provide shade on hot summer days. They might provide a comfortable place for you to sit. They can also save you and your family money. Trees that shade houses can save you money in air conditioning bills.



2. **Insulation** – Just as trees can keep your house cooler in the summer, they can also keep it warmer in the winter. Trees provide insulation. They can save your family money in heating bills because they help to trap heat around your home.
3. **Beauty** – Many people simply like the looks of trees. They can add a lot of color to neighborhoods, especially in the fall.
4. **Recreation** – Do you use trees when you play? Lots of people like to spend time in nearby parks hiking among the trees, tree climbing, picnicking, camping, etc. Trees provide people a place to meet and do things, provide a sense of community, and muffle noise pollution.
5. **Absorb Pollutants** – Trees absorb carbon dioxide and other pollutants found in the air. One tree can absorb 26 pounds of carbon dioxide in a year!
6. **Windbreaks** – Trees create a windbreak during storms. They help shelter your house and can keep strong winds from causing damage.
7. **Less Runoff** – Trees can soften the blow from a downpour. They allow rain to soak gradually into the ground, and they help anchor the soil so that it doesn't get washed away. There are many benefits to this – reducing flooding, sedimentation in rivers and lakes (when the soil runs off into the water, polluting it), and the need to build bigger sewer systems. More soil moisture helps to recharge local aquifers, giving us more of the water we need.
8. **Energy Efficient** – Trees store sunlight in the form of energy rather than heat.

9. **Cools Neighborhood** – Trees bring up water through a process called transpiration and then the water evaporates from the leaves, cooling the area.
10. **Behavior** – Studies have shown that trees make people healthier. People living near trees are less likely to be violent. Also, patients who can see trees from their hospital room have been shown to recover faster than those with no trees visible.

Did you know that trees served so many purposes? They are pretty good to have around. So, what can you do? Well, for starters, you could plant a tree! Give all of your students the tree-planting guide from the Wisconsin DNR (Insert 10.5). Check out your local nursery to find out what grows well in your area, or contact your local DNR Forester.

Conclusion

Sustainable management, managing for multiple use, and managing urban forests are just a few of the trends and issues concerning today's forests. How are the problems and issues we deal with today different than forestry problems of the past? Are there things we're dealing with today that people didn't have to think about in the 1800's? It will soon be up to you to determine the future of Wisconsin's forests!

Extensions

- Have your students research current issues in forestry and share them with the class.
- Ask your students to look for another example of sustainable development or multiple use management.



- Conduct an urban forestry project right on your school grounds. Identify the trees that are there and learn about them. Maybe you could get permission to hang up informative signs about them. Educate others about how to take care of the urban forest.
- Do some journaling activities with your own urban forest. If you are lucky enough to have a school forest or forested land around your school, that would be a great place to do this. Nature journals are something your students can create and hang onto for a long time. You can make them out of recycled materials like paper with writing on only one side, paper grocery bags, etc.
- Map trees on their home block or on the block that their school is on.
- Learn how to identify the trees in a forest near you. Learn at least three interesting facts about each of the trees you identify.
- Learn the correct way to plant and care for a tree (Insert 10.5).

Evaluation

- The following questions can be used to guide an evaluative discussion with your students:
 - What does sustainability mean?
 - What is sustainable forestry?
 - Name different uses and values of the forest. Which are compatible? Which are not? Why?
 - How do the Menominee practice sustainable forestry?
 - How do forests help us?
 - What is an urban forest?
- Assess the students' logging company logos and the accompanying explanation.

Resources

- Forest Trees of Wisconsin: How to Know Them. Madison, Wisconsin: Department of Natural Resources, 1989. (Free from WI DNR)
- Growing Greener Cities: Environmental Education Guide. Washington DC: American Forests; 1992.
- Logging In: A Closer Look at Our School Grounds – Reproducible Student Activities. St. Paul: Minnesota Arbor Month Partnership; 1997.
- Sustainable Forestry: Commitment Future – A Teacher's Activity and Resource Guide for Grades 6-12. Madison, Wisconsin: Wisconsin Department of Natural Resources, 1996.
- Urban Forestry: Laboratory Exercises for Elementary, Middle, and High School Students
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Natural Resources; 2000.

Wisconsin Forests Forever: An
Advertising Supplement to the Wausau
Daily Herald.



Insert 10.1



Menominee Tribal Enterprises – The Menominee Forest Management Tradition: History, Principles and Practices; 1997



Insert 10.2



Menominee Tribal Enterprises - The Menominee Forest Management Tradition: History, Principles and Practices; 1997



Insert 10.3

Task Card A

Congratulations! You are now the proud owners of a 800-acre piece of land just outside of your town! One acre is the size of 1.2 football fields; so try to imagine 960 football fields all bunched together. That's how much land you now own. That's a lot of land. Your land isn't grass or turf like a football field, though. It's a forest!

Take a look at the map that your teacher gave you. This is the land that you now own. As you can see, there is a river running through it. This river is about 12 feet deep at the deepest point. It's a fantastic habitat for fish and other aquatic critters. The river is surrounded by forested land. The forest is very diverse. That means that it has a lot of different kinds of trees and plants living there.

There is one road from your town that leads to your new area of land. It is a two-lane road with a speed limit of 40 miles per hour. Surrounding your land are a few houses. The land used to belong to the owners of one of the houses. They used it mainly for camping and hunting. They have not used it in awhile and there is not much evidence of their use.

Your town's Land Use Board is responsible for land zoning in your county. This means that, however you decide to use this land, it will have to be approved by the Land Use Board. Start thinking about what you could do with this 100-acres of land. Think of all the possibilities! Make a list with the rest of your class of all the things that could be done.



Task Card B

Your task is to examine each of the possible land uses in your category. On the chart below, it asks your group to list different ideas of what you could do with the land within your category. It then asks you to think about good things and bad things that might come out of that choice.

Category of Land Use: _____

Land Use	Good consequences	Bad Consequences



Task Card C

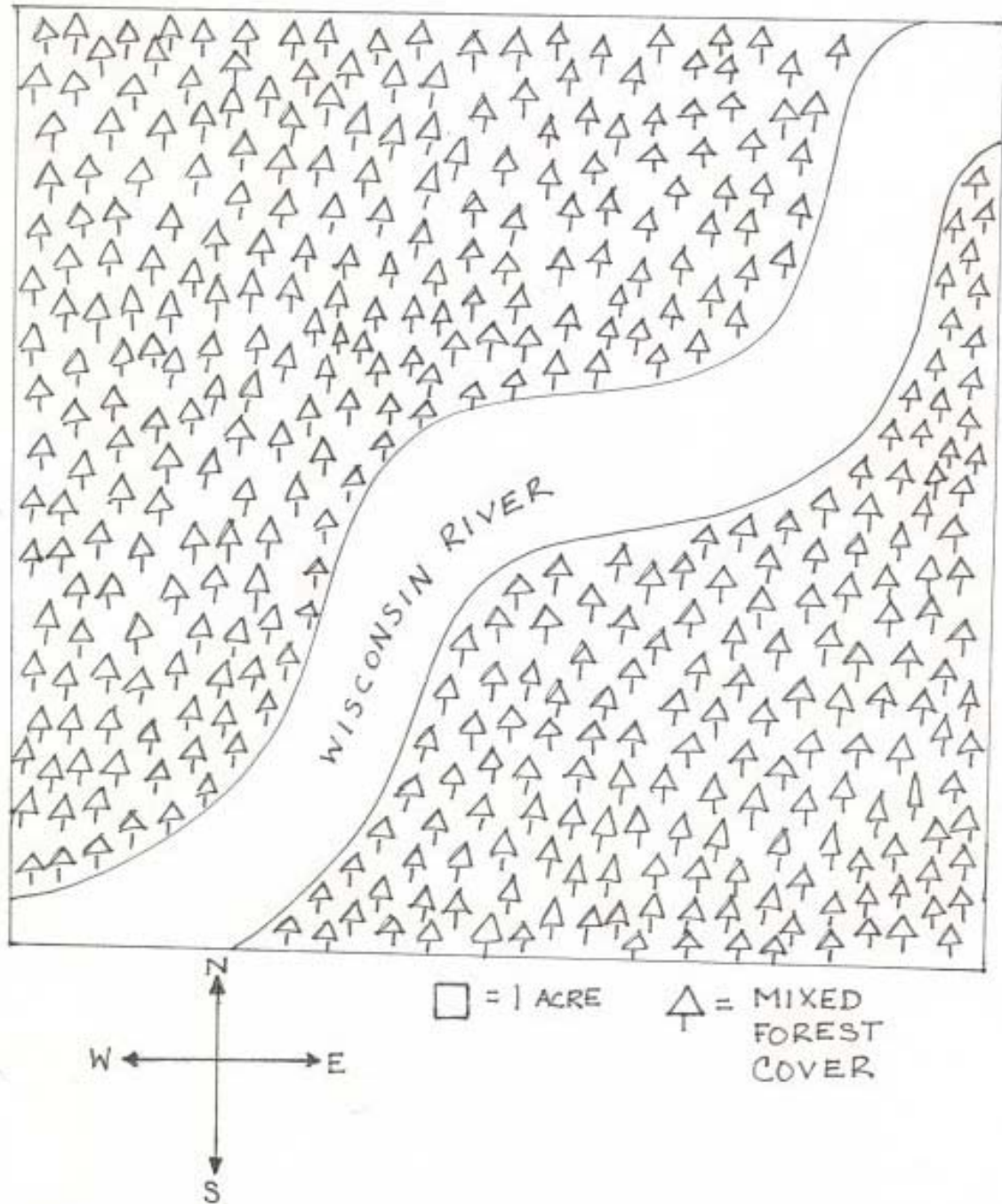
Your group must now select the best land use for the area in your category. You have 20 minutes to choose and create a presentation for the Land Use Board to convince them it's the right idea. You must have visuals to support your idea and work together as a team.

Things To Include In Your Presentation:

1. What land use category you are representing?
2. What you plan to do with the land?
3. Why do you think this is the best idea?
4. How will this choice be good for the area? (Think of people, jobs, the environment, money, etc.)
5. Does this choice have any negative effects and how will you deal with them?



Insert 10.4





Insert 10.5

How To Plant A Tree

Taken from the Wisconsin DNR Website <http://www.dnr.state.wi.us>

Procedures

- Dig a wide hole. The diameter of the hole should be two to three times the diameter of the root ball. The hole should be shaped like a shallow bowl, not a vertical column. Roots grow primarily near the surface. Loosening the soil as far as possible away from the trunk will make it easier for the roots to grow and establish.
- Don't plant too deep. The root collar (where the trunk and roots meet) should be even with the final grade.
- Leave the soil beneath the root ball undisturbed. The hole should be dug only as deep as the root system otherwise the ball will settle and the root collar will be too deep.
- Use existing soil to backfill. The soil removed from the hole should be loosened and broken up and then back filled around the root ball. Don't add other material to this fill.
- If your tree is balled and burlaped (B&B), cut the burlap and twine. They should be cut off or rolled down exposing the top half of the soil ball after the tree has been set in the hole.
- B&B trees normally don't need to be staked. In an active school yard staking may be needed. But, remember, remove the stakes after one year. Also, if you stake, don't keep the staking wire too tight.
- Mulch your tree. A wood chip mulch is essential to keep the soil moist and cool, reduce weed competition and protect the trunk from weed whip and lawn mower injury.
- Don't forget to water your tree. Deep water regularly throughout the first growing season. Allow water to run slowly, soaking the soil, once or twice a week. Don't overwater.
- Have fun!