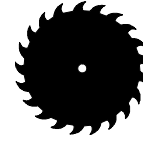


# Lesson Five



## Forest Utility



### CONCEPTS

1. Humans rely on forest products for a variety of everyday uses.
2. The forests of Wisconsin provide an indispensable source of employment.
3. Wisconsin's forests provide an important source of material for a variety of industries.

### OBJECTIVES

Students will be able to:  
List and categorize everyday items that come from trees.

1. Differentiate all of the industries affected by the production of one forest product.
2. Calculate the percentage of Wisconsin's workforce by industry and analyze which jobs are forest related.
3. Visually represent the economic output of land-based industries.

### TEACHING SITE

Indoor classroom conducive to group work and class discussion.

### MATERIALS

Chalkboard and chalk, list of Wisconsin forest products found in the activity portion of the lesson, Copies of Jobs in Wisconsin Worksheet.  
Calculators for each two students.

### LESSON TIME

One 50-minute class period.

### NUTSHELL

In this lesson students will discuss how forest products are used in their everyday lives. Students will examine the economic impact of the forestry industry in Wisconsin in relation to employment and economic output and compare it to other Wisconsin industries.

### TEACHER PREPARATION

Review the calculations of percentage as listed in the lesson. Make enough copies of the **Jobs in Wisconsin Worksheet** for students to work in pairs.

### BACKGROUND INFORMATION

As we look to our past for answers on how to manage our forests, sustainability becomes an extremely important goal for the future. Our forested landscapes need to provide a sustained production of a variety of goods and services. From our forests we provide jobs, timber products, fish and wildlife habitat, high quality of water and recreational opportunities, hunting, trapping, range values, visually attractive landscapes, landscape and community protection, and to an increasing extent, a sink for the atmospheric 'greenhouse gas', CO<sub>2</sub>.

The value of some of these products, like lumber and jobs, can easily be measured monetarily, while others, like high quality water and aesthetics, are harder to quantify. In this lesson, we will concentrate our study on the economics of our forests from a forest product and job standpoint. There are many things that we do not normally think of as being a wood product. For example, cellulose is mixed with other chemicals to make film, sponges, and molded plastic. Product engineers continue to find additional uses for forest product byproducts, such as sawdust and chips, designing new construction materials that make use of smaller dimensions of wood.

As an economic industry in Wisconsin, there are approximately 1,800 forest product companies that employ 98,000 people with a total payroll of 3.2 million dollars. These companies produce a total of 19.7 billion dollars of products annually. The forest product industry is the #1 employer in 28 counties, the second largest employer in an additional 9 counties, and the #3 employer in 5 more counties. That's 42 out of the 72 counties found in Wisconsin. To sum it up monetarily, forestry is an important industry in Wisconsin.

## ACTIVITIES

1. Tell your students that a rich landowner is giving away large tracts of forested land to anyone who can find a “use” for the land. Ask your students in what ways they might use this piece of property. Guide their answers so they might include: *harvesting trees for lumber, wildlife habitat, hunting, camping, hiking, or preserving for future generations, etc.* Tell your students that our forests have many uses. Ask your students what is meant by the economic value of the land. Ask if they think it is easy to determine what the property is worth in dollars. Ask what they would base their price on. Discuss with them that it would be fairly easy to estimate the value of the timber for lumber. Ask if it would be easy to put a price on the value of the land for hiking, hunting, preservation, etc. Tell your students that the value of the property can’t always be put in terms of dollars and cents.



2. Tell your students that during the next few lessons they will be looking at the different values of Wisconsin forests. In this lesson, we will be looking primarily at those uses of a forest on which it is easy to place a dollar value. Ask your students to brainstorm a list of products made from trees. List these items on the board or on a large piece of butcher paper. Remind your students that there are products other than wood that come from a forest. Trees are used for their tannins, resins, syrups, fruits, nuts, cambium, bark, and leaves. Tannins are the oils found throughout different parts of the tree. These oils are used for nail polish, shoe polish, hair spray, and the production of clothes and some plastic products. Cambium is the soft material

under a tree’s bark and is used for many different products including cork for wine bottles and tack boards. Trees also produce resins and syrups that help to store nutrients and protect trees from insects. Many of these are very useful, such as rubber and maple syrup. Once your students have exhausted their list, add the following items to the list. Tell them that each of these items have ingredients coming from trees.

Book or magazine  
Coffee filter  
Milk carton  
Playing cards  
Bottle cork  
Shoe polish  
Nail polish  
Wooden chair

Muffin mix  
Apple  
Real maple syrup  
Candy bar with almonds  
Rubber gloves  
Baby food  
Cinnamon sticks  
Toothpicks

Birdhouse  
Mineral spirits  
Hair spray  
Vanilla  
Rayon clothing  
Cellophane  
Film  
Hard hat

3. Tell your students that all of these products from trees have an economic value. You can buy them at the store for money. Use the wooden chair as an example. Ask your students what economic impact do they think a \$150 wooden chair has. Ask them to trace how many different people received money from the time the chair was part of a growing tree to when it was sitting in someone’s house. Invite your students up to the chalk or dry erase board to draw a diagram that connects where money would have changed hands. As they go along, use the trail of money listed below to remind them of any money transactions that they have forgotten.

## THE MONEY TRAIL

- 
- the forester who marked the tree,
  - the owner of the tree,
  - the logger who cut down the tree,
  - the trucking company that delivered the tree to the mill,
  - the truck driver,
  - the log grader at the mill,
  - the person who moved the log from the pile to the saw,
  - the person who sawed the log at the mill,
  - the person who stacked the lumber in the drying kiln,
  - the person who graded the board,
  - the person who loaded the lumber on the truck to the furniture factory,
  - the trucking company that hauled the lumber to the furniture factory,
  - the trucker who drove the truck,
  - the loading dock help at the furniture factory,
  - the person who cut and shaped the chair parts,
  - the person who sanded the chair parts,
  - the person who assembled the chair,
  - the person who varnished the chair,
  - the person who packaged the chair for shipping,
  - the person who took care of the sales of chairs to furniture stores,
  - the person who loaded the chair on the truck,
  - the trucking company,
  - the trucker,
  - the person who unloaded the chair at the furniture store warehouse,
  - the person who unpacked the chair and put it on the furniture showroom,
  - the furniture sales person,
  - the furniture store owners,
  - and now its in your home.

4. Now that the chair is finally in someone's home, ask your students if they think there are still more economic impacts. *At each of the points above, you can attach additional connections such as fuel, office help, electricity, etc.* Tell your students that the forest industry is tied to many other industries. Each of these industries provides jobs for thousands of workers. Pose the question, how important do you think forest related industries are to providing employment for people in Wisconsin? Tell the students that they will be analyzing some information published by the state of Wisconsin to determine this answer.

Divide the class into working pairs. See that each pair has a calculator to use. Hand out the Forest Economic Impact Worksheet. Tell the students that they will be calculating the percentage of the Wisconsin workforce that is employed in the major industries in Wisconsin. Show them how to do the calculations by using the first several as examples. *To do this you will divide the number of jobs in a particular industry (J) by the total number of jobs in Wisconsin (T). This will produce a decimal number. Take this number times 100 and this value is the percent of the workforce employed by a particular industry.*

**$J / T \times 100 = \% \text{ of total workforce}$**

J = the number of people employed in a given industry

T = the total number of people employed in Wisconsin

5. Once your students have finished their calculations, ask them what exactly does a percent of the workforce mean. Use dairy as an example. Ask them to explain what 6% of the workforce working in dairy means. *That in a group of 100 people, 6 are employed in the dairy industry.* Ask them which of the industries listed are directly related to the forest industry. *Timber production, paper and allied products.* How many jobs out of one hundred jobs are related to these two industries? *Three out of every 100 jobs.* Refer back to the drawing of the money trail on the board. Ask what other industries are also related to the forest product industry. *Government (DNR employees), retail trade, tourism, transportation, hunting, fishing, wildlife watching, public education (college professors of forestry), printing, and furniture.* Ask your students how significant they feel our forest industry is to each of these additional industries. Take each industry at a time and have students relate how they are connected. Once you have looked at each of these industries, ask how many of the students' parents or relatives work in one of these industries.
6. Now that the class has looked at employment in Wisconsin, you are going to have them look at the economic output from the sales of goods related to Wisconsin forestry. Start by asking the students, "Why does someone seek employment?" *So they have money to live, to buy the things they need and want.* Remind the students that not only do our forest industries provide jobs, they also provide products that we all need. Tell the students that they will be comparing the total dollar amount of products produced annually from various land-based industries. Ask them what you mean by land based industries. *Those that produce products that come from the land.*



Direct your student's attention to the bottom of the worksheet. Again working in the same pairs, ask the students to create a bar graph that shows the dollar output from each industry. To do this, ask them to place their dollar amounts along the Y-axis (vertical) and the different industries along the X-axis (horizontal). You will need to probably help them with the graduations for the Y-axis. There are 10 spaces on the Y-axis. If you divide the largest number of dollars (\$40 billion) by 10, each graduation is 4 billion. Give the group several minutes to complete the graph.

7. Upon completion of the graphing, ask the students how important they feel forestry is to the state of Wisconsin. They will no doubt list jobs and products. Ask them, "but what about the state of Wisconsin itself?" Tell them that the sale of products and the incomes from jobs generate income to the state through income and sales taxes. In this way, forestry helps pay for education, health care, roads, and all the other services provided by the state. Forestry in National Forests also supports education in the counties where the forests are located by donating a percentage of each timber sale.

## CONCLUSION

Recap the economic impact of forestry on the Wisconsin economy. Share the following figures:

- The number of forest product industries companies in Wisconsin is 1,800.
- The number of employees within these companies is 97,805.
- The total payroll of these companies is \$3,223,243,543.
- The total shipment value of these products is \$19,738,300,000.
- Primary and secondary forest industry is the #1 employer in 28 counties, the #2 employer in 9 counties, and the #3 in 5 counties. There are 72 counties in Wisconsin.

Tell the students that today we have looked at the economic value of our forests for forest products. It has been somewhat easy to assign a dollar value to these products. In our next lesson, we will be looking at the other values of a forest that are not as easy to put a dollar amount upon.

## STUDENT LOG BOOK

Ask the students as a homework assignment to go home and research how their family may be connected to the forest industry. Tell them that this may be as a direct employee, as an employee of a related company such as a furniture store, or as a consumer.

## WEB LINKS

There is a huge list of tree products on this site—<http://www.forestinfo.org/CoolFacts/fromtree.htm>

Forest Product Laboratory in Madison, WI— [www.fpl.fs.fed.us/](http://www.fpl.fs.fed.us/)

Consolidated Paper Co.—<http://www.consolidatedpapers.com>

Wisconsin Paper Council— <http://www.wipapercouncil.org>

## REFERENCES

Smith, W. Brad and Hahn, Jerold T. 1989. Wisconsin's Forest Statistics, 1987: An inventory update. General Technical Report, NC-130. St. Paul, MN. US Department of Agriculture Forest Service. North Central Forest Experiment Station.

Lindbeis, Richard and Hovind, James H. 1985. Wisconsin's Forest: An assessment. DNR Bureau of Forestry.

Vander Zouwen, William J. 1998. Preserving Wisconsin's Outdoor Legacy.

Wisconsin Blue Book 1997-98 and 1999-2000.

Wisconsin Department of Natural Resources. 1998. A Look at Wisconsin's Forests. PUB-FR-122.

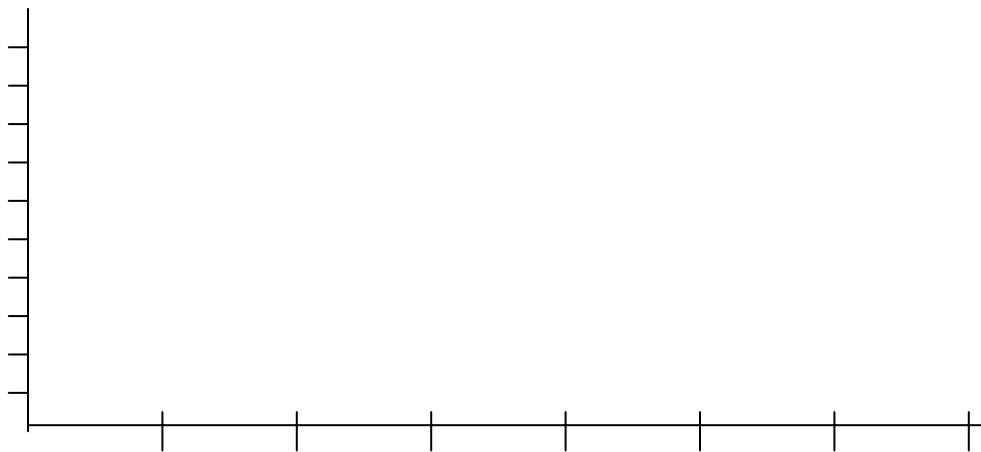
**JOBS IN WISCONSIN** 1996 statistics from Wisconsin Blue Book

<u>Employees</u>	<u>Industry Group</u>	<u>% of Total Workforce</u>
531,000	Agriculture	_____
466,000	Retail trade	_____
383,000	Government	_____
190,000	Dairy	_____
182,000	Tourism	_____
138,000	Finance, insurance and real estate	_____
121,000	Transportation and public utilities	_____
97,000	Industrial machinery and equipment	_____
93,000	Hunting, fishing, and wildlife watching	_____
63,000	Public education instructional staff	_____
49,000	Printing and publishing	_____
48,000	Timber production	_____
46,000	Paper and allied products	_____
29,000	Transportation equipment	_____
14,000	Furniture and fixtures	_____
417,000	Other professions	_____
2,917,600	Total people employed in Wisconsin	<u>100%</u>

**J / T X 100 = % of total workforce**  
**J** = the number of people employed in a given industry  
**T** = the total number of people employed in Wisconsin

**Dollar Output**

40 billion	Agriculture
19.7 billion	Reconstituted wood products
17 billion	Dairy
13.2 billion	Tourism
9.7 billion	Timber production
6.8 billion	Hunting, fishing, and wildlife watching
0.2 billion	Cranberries



# Answer Key

## JOBS IN WISCONSIN *1996 statistics from Wisconsin Blue Book*

<u>Employees</u>	<u>Industry Group</u>	<u>% of Total Workforce</u>
531,000 (J)	Agriculture	<u>18.2%</u>
466,000 (J)	Retail trade	<u>16.0</u>
383,000 (J)	Government	<u>13.1</u>
190,000 (J)	Dairy	<u>6.5</u>
182,000 (J)	Tourism	<u>6.2</u>
138,000 (J)	Finance, insurance and real estate	<u>4.7</u>
121,000 (J)	Transportation and public utilities	<u>4.1</u>
97,000 (J)	Industrial machinery and equipment	<u>3.3</u>
93,000 (J)	Hunting, fishing, and wildlife watching	<u>3.2</u>
63,000 (J)	Public education instructional staff	<u>2.2</u>
49,000 (J)	Printing and publishing	<u>1.7</u>
48,000 (J)	Timber production	<u>1.6</u>
46,000 (J)	Paper and allied products	<u>1.6</u>
29,000 (J)	Transportation equipment	<u>1.0</u>
14,000 (J)	Furniture and fixtures	<u>0.5</u>
417,000 (J)	Other professions	<u>14.3</u>
2,917,600 (T)	Total people employed in Wisconsin	<u>100%</u>

**$J / T \times 100 = \% \text{ of total workforce}$**

J = the number of people employed in a given industry

T = the total number of people employed in Wisconsin

## Dollar Output

40 billion	Agriculture
19.7 billion	Reconstituted wood products
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