



## HIGH SCHOOL LESSON – THAT'S MADE FROM TREES

Companion to Video Managing Forests for Multi-Use

### WOOD YOU BELIEVE? FOREST PRODUCTS IN OUR DAILY LIVES

*That's Made from Trees*

**Developed By:**

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**Target Grade Level: 9-12**

Appropriate for 6-8

Appropriate for 4-5 if educators provide alternate research resources

Suggested resources for K-4 included

**Science Categories**

Forestry, Properties of Wood, Wood Products, Sustainability

**Time Frame** 4-5 class periods

- Introduction: 10-45 minutes
- Activity 1: 1-2 class periods
- Activity 2: 2 class periods
- Conclusion: 30 minutes





## MATERIALS

### For the class:

- Managing Forests for Multi-Use video
  - At a minimum, start at 8:05 Scott Lyon, Forest Products Team Leader, Wisconsin DNR through 13:14.
- (optional) LEAF Wood ID Blocks  
<https://www.uwsp.edu/wcee/wcee/kits/wood-identification-blocks-kit/>

### For each student:

- That's Made from Trees – Infographic Rubric
  - 1 copy for each student
- Online book (free download): Wood in Sport Equipment – Heritage, Present, Perspective, via one of the two links below.
  - <https://www.swst.org/wp/wp-content/uploads/2022/05/Wood-in-sport-equipment-heritage-present-perspective.pdf>
  - <https://www.swst.org/wp/publications/other-publications/books/> or find on SWST – International Society of Wood Science and Technology website under Publications (other publications, books)
- Online resource (free): The Wood Database – Wood Filter.
  - <https://www.wood-database.com/wood-filter/>
- Online resource (free): Wood Handbook – Wood as an Engineering Material, Chapter 2 Characteristics and Availability of Commercially Important Woods from the Forest Products Lab.
  - [https://www.fpl.fs.usda.gov/documnts/fplgtr/fplgtr282/chapter\\_02\\_fpl\\_gtr282.pdf](https://www.fpl.fs.usda.gov/documnts/fplgtr/fplgtr282/chapter_02_fpl_gtr282.pdf)

### For students researching forest products related to music:

- Online article (free): What Makes a Good Tonewood for Musical Instruments? via link below or search by title. Students researching musical instruments need access.
  - <https://extension.psu.edu/what-makes-a-good-tonewood-for-musical-instruments>
- Online blog post (free): Tonewoods – An Introduction, via link below or search by title at Millers website. Students researching musical instruments need access.
  - <https://millersmusic.co.uk/blogs/blog/tonewoods-an-introduction>

### Key Words

- Veneer, heartwood, sapwood, texture, grain, coarse grain, fine grain, warping

### Learning Objectives

Students will be able to:

- Track a forest product from its origin to finished product
- Examine the properties and purpose of different types of wood used in recreational activities
- Identify a career associated with the production of recreational forest products
- Research ecological change and its impact on recreational forest products



## Activity Summary

Students will trace the journey of a forest product used in recreational activities from its growth in the forest, to processing, to a finished product. Students will highlight a career related to the production of their forest product and ecological changes that could impact production of their forest product in the future.

## Vocabulary

- Veneer – real wood that has been cut or peeled into very thin sheets; hardwood veneer is more common than softwood veneer
- Heartwood: dense inner part of a tree trunk; hardest timber comes from heartwood
- Sapwood: soft, outer layers between the heartwood and the bark of the tree
- Texture/Grain: The arrangements of wood fibers
- Coarse grain: Wood with open growth rings with uneven texture – a more irregular look
- Fine grain: wood with tighter growth rings with even texture – a more even look
- Warping: when wood is bent out of shape; usually due to wetness or heat

## Background Information

The forest products industry is an important part of Wisconsin's economy and recognized for leadership in sustainability and strong stewardship. The forest products industry provides over 58,000 direct jobs in Wisconsin and supports over 70,000 additional jobs in the state.

For additional information on how forests support Wisconsin's economy, download Forest Economy fact sheets for the State of Wisconsin or your county from the Forestry and the Wisconsin Economy DNR webpage at: <https://dnr.wisconsin.gov/topic/forestbusinesses/factsheets>.

## Learning Procedure

### Introduction: Segment from *Managing Forests for Multi-Use*

- If you have ample time, show the full video.
  - Ask students to share what they learned from the video.
- If you are pressed for time, watch the following segment that describes a variety of wood products.
  - 8:06-12:48; Scott Lyon, Forest Products Team Leader – Wisconsin DNR
  - Ask students to share what they learned from the video.

## Activity 1: That's Made from Trees – Research

As a class read aloud Chapter 10, *Wooden Skis: An emblematic Item of Norway's Cultural Heritage*, from the free online book, *Wood in Sport Equipment – Heritage, Present, Perspective* (pages 47-51, pdf pages 57-61, link in list of lesson materials). As you read the chapter discuss the history of skiing in Norway, the types of wood that were used to make skis and how the types of wood used to make skis changed over time. Also discuss why wood is no longer commonly used to make skis but how wood is still being utilized in the sport of Nordic skiing today. Ask students if there are factors that might cause wood to be used to make skis in the future (*climate change and sustainability are mentioned as is the desire to maintain heritage/cultural traditions*).

Tell students they will be conducting research to track a recreationally used forest product from forest to



finish. Tell students that they can pick a forest product that either has been or is currently used in sports, music, or other hobbies/interests they have (i.e. wood carving, wild rice harvesting, etc.). Tell students that before they select their recreationally used forest product, they should look to see if they can find enough information about it and its use of wood. Suggest that if they are interested in pursuing a sport-related product, they consider sports that are included in *Wood in Sport Equipment*, the book they downloaded during the initial read aloud activity.

- Tennis, Golf, Archery, Gymnastics, Baseball, Basketball, Paralympics, Rowing, Cycling (outdoor), Equestrian Disciplines, Hockey, Track and Field events, Boxing, Bobsledding, Luge, Skeleton, Ski jumping, Shooting sports, Skateboarding, Skiing and/or Snowboarding, Sport Climbing, Surfing, Table Tennis, Taekwondo, Cycling (track), Billiards, Bowling, Chess, Wooden Bowls with Weights

If students are interested in pursuing music, share links for the following articles as a starting point (links are included in materials list):

- What Makes a Good Tonewood for Musical Instruments?
- Tonewoods – An Introduction

Tell students that after they complete their research they will create an infographic – a visual image that includes information/data in the form of charts, diagrams, images, and text – about their forest product.

Pass out the That's Made from Trees Infographic Rubric. Discuss the criteria for proficiency with students – make sure students understand each checkbox under the Description of Tree and Characteristics/Properties of wood categories. Ask students if they have questions about any of the requirements. Tell students that they should use the requirements on the rubric to guide their research. Remind them that they must use at least 3 different sources and research all criteria listed in each category. Let students know how much time you will be giving them to work in class on their research (at least 1 class period is recommended).

## Activity 2: That's Made from Trees - Infographic SETUP:

Prior to beginning Activity 2, determine the format students should use create their infographic, how much class time they will be provided to work on the project, and if there is an appropriate authentic audience for their work.

**Format:** Consider the following options for creating the infographics:

- Google Slides
  - 1-page Printable option: Instruct students to go to File, scroll down to Page Setup, select Custom and enter 11 x 17 inches.
  - Multi-age Printable option: Instruct students to go File, scroll down to Page Setup, select Custom and enter either 8.5 x 11 inches or 11 x 8.5 inches. Students create multiple pages, print them and glue/tape them together to create the infographic.
- Paper/Pencil
  - Give all students one large sheet of paper (11 x 17) or multiple 8.5 x 11 sheets of paper to



glue/tape together

- Third party applications: easly (easel.ly – free), Canva, adobe, Piktochart

**Time:** While students could complete a basic infographic in 1 class period, consider allowing them to work on the project for at least 2 or more class periods.

**Audience:** Try to provide students with an authentic audience to share their work with. Perhaps the school or local library, area municipal buildings or community businesses would be willing to hang the infographics up. Another option would be to post the infographics in hallways of the school building so parents/community members can see them when they come to school events. A final option is to have students share their work with other students in the school – or even students from younger grades.

### Instructions for students:

Ask students to take out their recreational forest product research and rubric. Explain to students that they are going to share their research with others by creating an infographic. Share the following pre-determined parameters for the project with students:

- Format
- Time
- Audience

Explain the infographic requirements to students. They must:

- Cite a minimum of 3 sources somewhere on the infographic (in-text OR bibliographic – review how to do this with students if needed)
- Include all criteria from all 5 topic areas on the infographic. Tell students to check criteria off on their rubric as they add them to their infographic.
- Include graphics, images, icons, etc. that support the information
- Make sure their infographic is organized, easy to follow and has no errors that distract viewers from the content.

Give students ample time to work and support them as they work. Encourage them to seek feedback from their peers prior to submitting their work. Peer feedback should be meaningful. Encourage students to point out something their peer has done well and something that could be improved.

### Conclusion: Share Student Work

Print student work. Have them share what they learned with others in the class. Display student work for the chosen audience.

### Extending the Lesson (Optional) Elementary School Recommendations

While this lesson can be completed by upper elementary students, with either support from educators – finding grade appropriate research texts, the following LEAF lessons may be more appropriate for elementary students.



## LEAF 2<sup>nd</sup>-3<sup>rd</sup> Grade Forestry Lesson Guide, Lesson 4: Forests Are Important to Me!

- Students explore and graph their personal forest values. Using a checklist, they discover how many of the forest products they use are made right here in Wisconsin and map them. As a conclusion, students create a collage and write about why they value forests. <https://www.uwsp.edu/wp-content/uploads/2023/11/leaf-2-3-lesson-4-forests-are-important-to-me.pdf>

## LEAF K-1<sup>st</sup> Grade Forestry Lesson Guide, Lesson 4: Forest Products Time Machine

- Students learn about historical uses of forest resources. Students begin by sharing ways we use the forest while playing a game of Hot Pine Cone. Next, the class explores forest resources used to create products of the past, while relating them to present-day goods. To conclude, students examine forest products and draw a picture of one they use every day. <https://www.uwsp.edu/wp-content/uploads/2023/11/leaf-k-1-lesson-4-forest-product-time-machine.pdf>

## Middle/High School Recommendations:

If you would like students to focus on forest products made in Wisconsin, consider using the following LEAF lesson and checking out the LEAF Forest Product Kit. The lesson includes a google slideshow, educator guide and student documents. LEAF's Forest Products Kit has materials that support the lesson.

### LEAF: Track That Product from Finish to Forest

- Students explore a product and develop a model to tell the complete story of one of Wisconsin's forest products from the tree it came from to finished product. [https://drive.google.com/drive/folders/1uVUYdXSYBZxK9UMoXISiVNvu8pPonl8r?usp=drive\\_link](https://drive.google.com/drive/folders/1uVUYdXSYBZxK9UMoXISiVNvu8pPonl8r?usp=drive_link)

### LEAF Forest Products Kit

- The Forest Products Kit allows students to learn about forest products and associated careers through hands-on exploration. <https://www.uwsp.edu/wcee/wcee/kits/forest-products-kit/>

## Student Pages

See additional documents that will need to be included:

- 9-12\_That's Made from Trees\_Infographic Rubric

## STANDARDS

### WISCONSIN STANDARDS FOR SCIENCE (Middle School)

- SCI.CC6.m Students model complex and microscopic structures and systems and visualize how their function depends on the shapes, composition, and relationships among their parts. They analyze many complex natural and designed structures and systems to determine how they function. They design structures to serve particular functions by taking into account properties of different materials and how materials can be shaped and used.
- SCI.PS1.A.m The fact that matter is composed of atoms and molecules can be used to explain the properties of substances, diversity of materials, states of matter, phase changes, and conservation of matter.
- SCI.ETS2.B.m All human activity draws on natural resources and has both short- and long-term consequences, positive as well as negative, for the health of people and the natural environment.



## WISCONSIN STANDARDS FOR ENVIRONMENTAL LITERACY AND SUSTAINABILITY

- ELS.EX2.B.h Compare and contrast the competitive, predatory, and mutually beneficial interactions between different species and ecosystems and evaluate the impacts of each on the system.
- ELS.EX4.A.h Examine the role of renewable and nonrenewable resources in creating sustainable economies. Analyze how the movement of natural resources through acquisition, production, consumption, and disposal impact sustainability of local, regional, and global systems.

## WISCONSIN STANDARDS FOR ENGLISH LANGUAGE ARTS (Middle School 6-8)

- ELA.R.9-12.1 Cite textual evidence that strongly supports an analysis of what the text says explicitly/implicitly and make logical inferences, develop questions for further exploration.
- ELA.R.9-12.2 Objectively and accurately summarize texts, from a variety of genres, to determine one or more themes or central ideas and analyze its development, including how it emerges and is shaped and refined by specific details.
- ELA.W.9-12.3 Create writing that utilizes organization: introduce a topic; organize complex ideas, concepts, analysis, information and claims to make important connections and distinctions. Establish and maintain a structure and conventions consistent with the mode of writing. Provide a concluding statement or section that follows from and supports the topic, themes, and experiences presented in the text.
- ELA.W.9-12.4 Produce clear and coherent writing in which the development, organization and style are culturally sustaining and rhetorically authentic to task, purpose and audience.
- ELA.W.9-12.7 Conduct short as well as more sustained research projects to answer a question or solve a problem that is rhetorically authentic and culturally sustaining; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating an understanding of the subject under investigation.
- ELA.W.9-12.8 Gather relevant information from multiple authoritative print and digital, academic and popular sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation.
- ELA.W.9-12.9 Draw evidence from literary or informational texts to support analysis, reflection, and research.

## Resources

- Great Lakes Veneer. (2024) <https://greatlakesveneer.com/>
- Meier, Eric. (2024) Wood Filter. The Wood Database. <https://www.wood-database.com/wood-filter/>
- Millers Music. (2021, February 25). Tonewoods – An Introduction. Millers Music. <https://millersmusic.co.uk/blogs/blog/tonewoods-an-introduction>.
- Negro, Francesco. Wood in Sport Equipment Heritage, Present, Perspective. University of Torino, Italy: DISAFA, May 2022. [https://www.swst.org/wp/wp-content/uploads/2022/05/Wood-in-sport-equipment\\_Heritage-present-perspective.pdf](https://www.swst.org/wp/wp-content/uploads/2022/05/Wood-in-sport-equipment_Heritage-present-perspective.pdf).
- Showalter, Levi. (2023, April 17). What Makes a Good Tonewood for Musical Instruments? PennState Extension. <https://extension.psu.edu/what-makes-a-good-tonewood-for-musical-instruments>.
- Wiemann, Michael. (2021). Characteristics and availability of commercially important woods. Forest Products Laboratory, chapter 2 in FBL-GTR-282. <https://research.fs.usda.gov/treesearch/62246>.
- Wisconsin Department of Natural Resources. (2024) Forestry and the Wisconsin Economy. <https://dnr.wisconsin.gov/topic/forestbusinesses/factsheets>



	<b>Exemplary</b>	<b>Proficient</b>	<b>Developing</b>	<b>Beginning</b>
<b>Research &amp; Citations</b>	More than 3 sources	Information is accurate and 3 credible sources are used and cited correctly	At least 1 source or some inaccuracies	No evidence that sources were used; inaccurate
<b>Description of Tree</b>	Includes information above and beyond those required to be proficient	Tree Description includes: <ul style="list-style-type: none"> <li><input type="checkbox"/> Name</li> <li><input type="checkbox"/> Habitat &amp; Location</li> <li><input type="checkbox"/> Height &amp; Shape</li> <li><input type="checkbox"/> Growth rate &amp; Longevity</li> <li><input type="checkbox"/> Leaves/Twigs/Bark</li> <li><input type="checkbox"/> Flowers/Fruits/Seeds</li> </ul>	Missing 1-3 criteria required to be proficient	Missing 4 or more criteria required to be proficient
<b>Characteristics/ Properties of Wood</b>	Includes information above and beyond those required to be proficient	Characteristics/Properties of Wood includes: <ul style="list-style-type: none"> <li><input type="checkbox"/> Heartwood &amp; Sapwood</li> <li><input type="checkbox"/> Weight/Density</li> <li><input type="checkbox"/> Hardness/Strength</li> <li><input type="checkbox"/> Texture/Grain</li> <li><input type="checkbox"/> Shrinkage/Warping</li> <li><input type="checkbox"/> Rot Resistance</li> <li><input type="checkbox"/> Workability/Woodworking P</li> <li><input type="checkbox"/> Pricing/Availability</li> </ul>	Missing 1-4 or more criteria required to be proficient	Missing 5 or more criteria required to be proficient
<b>Processes of Production</b>	Includes information above and beyond those required to be proficient	Processes include: <ul style="list-style-type: none"> <li><input type="checkbox"/> Harvesting</li> <li><input type="checkbox"/> Lumber Processing</li> <li><input type="checkbox"/> Creating the Product</li> <li><input type="checkbox"/> Marketing and Distribution</li> </ul>	Missing 1-2 criteria required to be proficient	Missing 3 or more criteria required to be proficient
<b>Featured Career</b>	Includes information above and beyond those required to be proficient	Featured Career includes: <ul style="list-style-type: none"> <li><input type="checkbox"/> Title/Job Description</li> <li><input type="checkbox"/> Skills/Education required</li> <li><input type="checkbox"/> Salary/Job Outlook</li> </ul>	Missing 1-2 criteria required to be proficient	Missing 3 or more criteria required to be proficient
<b>Ecological / Environmental Impacts</b>	Includes information above and beyond those required to be proficient	Ecological Environmental Impacts includes: <ul style="list-style-type: none"> <li><input type="checkbox"/> Current impact of this product on ecology and the environment</li> <li><input type="checkbox"/> How ecological and environmental change may impact this product in the future</li> </ul>	Missing 1 of the criteria required to be proficient	Missing both criteria required to be proficient
<b>Presentation</b>	Infographic exceeds expectations for Proficient; Minimal/no errors	Infographic is well organized, easy to follow and supported with relevant graphics; Errors do not distract from content.	Not organized well; Some graphics are irrelevant; Errors are distracting	Poorly organized; No relevant graphics; Many errors





## RECOMMENDED RESOURCES

### For all students:

- The Wood Database – Wood Filter.
  - <https://www.wood-database.com/wood-filter/>
  - Or search by title
- Wood Handbook – Wood as an Engineering Material, Chapter 2 Characteristics and Availability of Commercially Important Woods from the Forest Products Lab.
  - [https://www.fpl.fs.usda.gov/documnts/fplgtr/fplgtr282/chapter\\_02\\_fpl\\_gtr282.pdf](https://www.fpl.fs.usda.gov/documnts/fplgtr/fplgtr282/chapter_02_fpl_gtr282.pdf)
  - Or search by title

### For students researching forest products related to sports:

- Wood in Sport Equipment – Heritage, Present, Perspective, via one of the two links below.
  - [https://www.swst.org/wp/wp-content/uploads/2022/05/Wood-in-sport-equipment\\_Heritage-present-perspective.pdf](https://www.swst.org/wp/wp-content/uploads/2022/05/Wood-in-sport-equipment_Heritage-present-perspective.pdf)
  - <https://www.swst.org/wp/publications/other-publications/books/>
  - Or find on SWST – International Society of Wood Science and Technology website under Publications (other publications, books)

### For students researching forest products related to music:

- What Makes a Good Tonewood for Musical Instruments?
  - <https://extension.psu.edu/what-makes-a-good-tonewood-for-musical-instruments>
  - Or search for the article by title
- Tonewoods – An Introduction.
  - <https://millersmusic.co.uk/blogs/blog/tonewoods-an-introduction>
  - Or search by title and Miller’s Music