# Unit 2: Lumber Characteristics

Content Area: **Applied Technology**
Course(s):
Time Period: **Marking Period 1**
Length: **2 Weeks**
Status: **Published**

## Brief Summary of Unit

Students will learn about wood as a raw material. They will learn about how the lumbering process and how technology has changed over the past 100 years. Students will learn about the parts of a tree, how it grows, and how it is harvested. Students will learn about the effect of how over-harvesting trees can lead to deforestation and affect the environment and climate change.

Revised July 2023

## Essential Questions/ Enduring Understandings

### Essential Questions

Why is it important to understand the properties of wood as a unique raw material?

Why is it important to understand lumbering practices?

### Enduring Understandings

The diversity of the material and its physical properties offers both a challenge and a source of inspiration to the emerging woodworker.

Overharvesting trees for lumber leads to deforestation and affects climate change and the environment.

The choice of lumber affects the look and feel of the project.

## Objectives

**Students will know:**

the difference between hardwood and softwood.

how to identify specific types of lumber.

how lumber is made.

how lumber is dried and why.

how lumber is dimensioned and the meaning of board foot, square foot, and linear foot.

the meaning of S2S and S4S.

how lumber is graded.

key terms (e.g. old growth, lumbering, coniferous, deciduous)

how forests are harvested.

what the job of a forester is.

lumbers will have varying degrees of difficulties when machining, due to their individual characteristics.

the direction of the grain is equally important as the look and feel of a piece of wood.

the direction of the grain is a major factor in the strength of the wood.

there are many products produced from trees.

tree growth is affected by many factors.

lumbering practices affect the environment.

forest management ensures a long-lasting forest.

the forester works with a myriad of professions in order to maintain a forest.

**Students will be skilled at:**

finding grain direction.

determining the best lumber for a project.

finding the dimensions of the lumber

Identifying parts of the tree.

determine the difficulties when machining wood based on its characteristics.

## Learning Plan

Preview the essential questions and connect to learning throughout the unit.

Introduce new vocabulary.

Present and discuss the following topics: how trees grow, parts of trees, costs of lumber, hardwood vs. softwood, grain direction, wood defects, texture, and durability

use the many environmental sites on the Internet to create a list of endangered trees and explain why they are disappearing as well as the impact this has on the environment.

identify specific types of hardwood.

estimate the cost of lumber using board feet in their calculations.

draw on paper the difference in the look of a plain-sawed log and a quarter-sawn log..

comprise a partial list of items that they use throughout their day, and be able to tell which items come from trees.

given a box of wood blocks, students will be able to separate the blocks into hardwoods and softwoods and using the internet determine what type of wood the blocks are.

Have students read and discuss relevant selections in the woodworking textbook.

Presentation and discussion on overharvesting lumber

Students research the effect of deforestation on the environment

Have students create a bill of materials and a plan of procedure for a project.

Distribute various size boards and have students measure them with a tape measure to the nearest 1/16th of an inch. Record the measurements and determine the board feet of each piece.

Present lesson on layout and using layout tools

Have students read and discuss relevant material in woodworking textbook

Demonstrate the correct procedure for squaring a board using a framing square

Demonstrate laying out parts on a board emphasizing grain direction, multiple cut parts and same size parts.

Divide students into groups, distribute sample project parts and have each group layout the parts. Have the students explain to the class why they chose that specific layout. Compare the decisions of all groups.

Allow students to work independently to layout their parts on the stock.

Writing prompts as homework.

Quizzes/Test

## Assessment

**Formative Assessment**

Participation in class discussion

Do Now Questions

Exit Ticket

Writing Prompt: How do overharvesting trees affect the environment?

Measurement Practice

**Summative Assessment**

Quizzes on measurement , deforestation, wood types

Test on Lumber characteristics

**Benchmark Assessment**

Mid Term Exam

Final Exam

**Alternative Assessment**

Presentation on wood types

## Materials

Woodworking Textbook

Wood samples

measurement tools

Internet

## Standards

| | |
|---|---|
| 9.4.12.CI | Creativity and Innovation |
| 9.2.12.CAP | Career Awareness and Planning |
| 9.4.12.CT | Critical Thinking and Problem-solving |
| MA.K-12.4 | Model with mathematics. |
| MA.K-12.5 | Use appropriate tools strategically. |
| LA.RST.11-12.2 | Determine the central ideas, themes, or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms. |
| LA.RI.11-12.1 | Accurately cite strong and thorough textual evidence, (e.g., via discussion, written response, etc.), to support analysis of what the text says explicitly as well as inferentially, including determining where the text leaves matters uncertain. |
| LA.RST.11-12.4 | Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics. |
| LA.RI.11-12.4 | Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze how an author uses and refines the meaning of a key term or terms over the course of a text (e.g., how Madison defines faction in Federalist No. 10). |
| LA.RST.11-12.7 | Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem. |
| 9.4.12.GCA | Global and Cultural Awareness |
| 9.4.12.IML | Information and Media Literacy |
| 8.2.12.ED.5 | Evaluate the effectiveness of a product or system based on factors that are related to its requirements, specifications, and constraints (e.g., safety, reliability, economic considerations, quality control, environmental concerns, manufacturability, maintenance and repair, ergonomics). |
| 8.2.12.ED.6 | Analyze the effects of changing resources when designing a specific product or system |

| | |
|---|---|
| | (e.g., materials, energy, tools, capital, labor). |
| ETW | Effects of Technology on the Natural World |
| CRP.K-12.CRP8 | Utilize critical thinking to make sense of problems and persevere in solving them. |
| CAEP.9.2.12.C.3 | Identify transferable career skills and design alternate career plans. |

## Suggested Strategies for Modification