Unit 2: Wood Characteristics

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

Brief Summary of Unit

Students will learn more advanced information about wood as a fabrication material. They will learn more about the history of the lumbering process and advanced technologies that are changing the industry today. Students will further develop an understanding for the conservation of wood, our only renewable raw material. They will be exploring some of the many occupations in the forest industry and woodworking. They will know and understand the unique characteristics of the various types of wood commonly used in the furniture industry as well as those commonly found in the shop. They will develop an understanding of how lumber is graded as well as how various cutting methods will affect the final look of the wood. They will compare and evaluate different woods, justifying their choice of a specific wood for their project. Students will work in cooperative groups to produce projects of similar design and assist others on any one-of-a-kind projects that they will be constructing throughout the course of the year.

Standards

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.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.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.
LA.11-12.CCSS.ELA-Literacy.CCRA.RL.1	Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.
TECH.8.1.12	Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
TECH.8.2.12	Technology Education, Engineering, Design, and Computational Thinking - Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

Transfer

- • Select the best kind of wood for a particular job using knowledge of hard/soft wood, lumber grading systems, types of wood panels and lumber defects.
- • Understand cutting, surfacing, and sizing methods as well as being able to calculate board footage for a particular job.

Essential Questions

- • How the lumbering industry changed in the last century and what has brought about these changes.
- • What makes wood a unique material from other natural resources?

Essential Understandings

- • How will I decide which wood/s will work best for my individual project?
- • What is meant by the terms hardwood and softwood?
- • Why are softwoods commonly cut to standard sizes and Hardwoods not?
- • How is a forest renewable?
- • What is the advantage of having more than one cutting method for boards?

Students Will Know

- • how forests are harvested.
- • how lumber is dimensioned and the meaning of board foot, square foot, and linear foot.
- • how lumber is graded. • key terms (e.g. old growth, lumbering, coniferous, deciduous)
- • how to identify specific types of lumber.
- • the main parts of a tree.
- • the meaning of S2S and S4S.
- • what the job of a forester is.
- • how lumber is dried and why.
- • how lumber is made.
- • the difference between a hardwood and softwood.
- • which woods are generally used for furniture, cabinets, construction, and why.

Students Will Be Skilled At

- • Kiln-dried woods behave differently than air dried woods when exposed to atmospheric moisture.
- • Knowing and identifying the many types of wood available to the woodworker.
- • Knowing the many products that are produced from trees.
- • Knowing why grain direction is a major factor in the woods strength.
- • Forest management ensures a long lasting forest and forester works with a scientist to maintain a forest.
- • Knowing the individual's choice of lumber will greatly affect the look, feel, and structural stability of the work.
- • Lumbers will present varying degrees of difficulty 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.

- • Understanding that tree growth is affected by many factors.

Evidence/Performance Tasks

- • actively and meaningfully participate in all classroom activities and discussions.
- • be able to estimate the cost of lumber using board feet in their calculations.
- • be able to identify specific types of hardwood.
- • be able to separate a given number of blocks into hardwoods and softwoods and using the internet determine what type of wood the blocks are.
- • complete a writing prompt related to the characteristics of wood.
- • comprise a partial list of items that they use throughout their day, and be able to tell which items come from trees.
- • using the many environmental sites on the internet, students will create a list of endangered trees and explain why they are disappearing as well as the impact this has on the environment.
- • answer the essential questions.
- • be able to draw on paper the difference in the look of a plain-sawed log and a quarter-sawn log.
- • be able to explain why a particular wood is the best choice of material for a given project.
- • demonstrate knowledge and understanding of shop safety procedures at all times.
- complete a quiz on the characteristics of wood

Learning Plan

- • Discuss the differences between a managed and un-managed forest.
- • Distribute samples of both hardwoods and softwoods and have students separate and document their characteristics.
- • Have students self – evaluate their conservation efforts relating to forest products.
- • Have students use the Internet to research endangered forests and report their findings to the class.
- • Introduce essential questions and key vocabulary.
- • Lumber and wood characteristics quiz
- • Present lesson on lumber characteristics.
- • Present the video “The Forest Goes on Forever” by Weyerhaeuser.
- • Read and discuss relevant selections from woodworking textbook.
- • Writing prompt completion, sharing and evaluation.
- • Have student’s research and discuss the effects of over-harvesting a forest.
- • Have students place several blocks of wood in jars containing ½” of colored water. Students create a 5 day chart of the appearance and dimensions of the blocks, keep a record of the results, and report the findings to the class.
- • Have students saw into boards several 18” – 20” logs. Working in groups students will prepare the boards for the drying process.
- • Monitor the drying boards above throughout the year and chart the moisture content on a graph.
- • Preview the essential questions and connect to learning throughout the unit.

- • Show sample logs of various trees including each of the types used in our shop.
- Have students discuss the condition of today's rainforests and what might be done to combat some of the problems.

Materials

- 18" to 20' fresh logs .
- DVD The Forest Goes on Forever ,
- Internet ,
- lumber grading sheets ,
- Textbook Modern Cabinet Making Goodheart-Wilcox

Suggested Strategies for Modifications

- • handouts of notes, procedures, processes, diagrams, etc.
- • images and visual aids
- • one-to-one instruction and assistance
- • preferential seating
- • study partners
- • testing materials appropriate to student level
- • additional time on task
- • alternative outcome options
- • assessment based on individual development in the area of study
- • audio tape of instruction
- • cooperative learning groups
- • reading material modified to student level
- • revised techniques, use of tools and media in hands-on activity