Unit 4: Shaping and Cutting tools

Content Area: **Applied Technology**
Course(s):
Time Period: **Marking Period 1**
Length: **8-10 days**
Status: **Published**

Brief Summary of Unit

Students will learn about the many types of cutting and shaping tools available to today's woodworker. Students will learn about the various types of saws and shaping tools and be able to safely use them for their intended purpose. The students will learn advanced operations on the table saw, radial arm saw, band saw, scroll saw, power miter box and sliding miter saw. They will learn about the thickness planer and the jointer. The students will learn about and understand the specific safety concerns, and precautions related to the machines they will be working with. They will learn about the uniqueness of each machine and have an opportunity to experiment with each. Students will learn about what features and characteristics to look for when purchasing a saw.

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

- All tools as well as operators have their limitations.
- Demonstrate the ability to self-assess and seek out needed resources.
- That all power machines are inherently dangerous and all safety rules are to be followed when used

Essential Questions

- • What is safety consciousness?
- • Why are accurate cutting and shaping skills important to the quality of a wood project?

Essential Understandings

- • How has cutting lumber changed over the years?
- • How is a straight edge achieved on a board?
- • What is done to prepare wood for cutting on a saw?
- • How can you change the thickness of a board?
- • What are the two main types of saw blades and how can we tell them apart?
- • What is a kick-back and how can it be avoided?
- • What part does the operator play in working safely on a machine?
- • What part does the table saw play in the furniture industry?
- • What part does the wood grain play in choosing a cutting or shaping tool?
- • What process is used to make the two faces of a board parallel?

Students Will Know

- • how the table saw is used in industry.
- • how to check the stock before cutting it on a power saw.
- • how to operate the safety guards.
- • how to safely start, adjust and stop a power machine.:
- • safety practices for using any tool that needs to be plugged in.
- • what types of blades are used with the table saw and how they are properly used.
- • how to change the thickness of a board and how to square up all four sides.
- • how to choose the correct type of saw.
- • how to use cutting and shaping tools safely.
- • key terms and tool names.
- • the difference between a ripping blade and a crosscut blade.
- • the safety rules pertaining to the safe operation of power saws.
- • types of power saws and their uses.

Students Will Be Skilled At

- • All tools as well as operators have their limitations.
- • Concentration and caution must be exercised when operating all machinery.
- • The grain of the wood often dictates what type of tool may be used to cut it.
- • All power machines are inherently dangerous.

- • All saw blades are either a rip blade or a crosscut blade and both types have a specific purpose.
- • Most accidents are not caused by the machine but by the operator.
- • The set of a saw blade is essential to limit friction buildup.

Evidence/Performance Tasks

- • be able to demonstrate that they know how to correctly position the rip fence on the table saw
- • be able to explain the dangers of wearing jewelry or loose clothing while working near a machine.
- • be able to identify the major parts of a saw and call them by their correct name.
- • be able to list 10 safety rules concerning cutting and shaping tools.
- • be able to produce a cross-cut cut and a rip cut on the table Saw.
- • be able to show how new cutting technologies have affected the amount of waste and why this is a good thing for the environment.
- • be able to square up a piece of stock using the table saw, jointer and the surface planer.
- • be able to use the Internet to research how the technology has improved for cutting materials over the past century.
- • demonstrate an understanding of the importance of being safety conscience at all times.
- • demonstrate the ability to self-assess and seek out needed resources.
- • demonstrate the proper use of both the table saw and the miter saw.
- • demonstrate the use of power miter box, band saw and scroll saw.
- • identify several blades, including the crosscut blade, ripping blade, plywood blade and dado blade.
- • install a blade on both the table saw and the miter saw.
- • answer the essential questions.
- • demonstrate the correct procedure for starting, adjusting and stopping a saw.
- • know how to correctly set up and use both the Jointer and the thickness planer.

Learning Plan

- • Allow students to work independently on their individual projects.
- • Demonstrate how to adjust the various saws for proper operation. • Explain and demonstrate how to attach the Dado blade to both the Table Saw and the Radial Arm Saw.
- • Demonstrate how to properly hold the Miter Gauge.
- • Demonstrate how to use the safety guards and the dust collection system.
- • Demonstrate the preparation process for cutting stock with a power saw.
- • Demonstrate the procedure for cutting a Raised Panel on the Table Saw.
- • Demonstrate the procedure for squaring a board on a power saw.
- • Demonstrate the process of squaring a board using the Jointer, Table Saw and the Surface Planer.
- • Explain and demonstrate how to attach the dado blade to the table saw.
- • Have students cut out project parts using various power saws.
- • Have students read relevant material in the woodworking textbook • Introduce new vocabulary.

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- • Have students self – evaluate their work using rubric
- • Present and discuss the videos “Operating the Table Saw” and “Operating the Miter Saw”
- • Present lesson on operation of the table saw and miter Saw.
- • Present lesson on the jointer and the surface planer.
- • Writing prompts as homework to be shared and evaluated in class.
- • Demonstrate how to adjust the various saws for proper operation.
- • Demonstrate how to properly hold the miter gauge.
- • Demonstrate how to square a board using the Table Saw.
- • Demonstrate how to use the safety guards and the dust collection system.
- • Demonstrate the correct method of both crosscutting and ripping a board.
- • Demonstrate the correct method of both crosscutting and ripping a board.
- • Demonstrate the preparation process for cutting stock with a power saw.
- • Demonstrate the procedure for cutting a raised panel on the table saw.
- • Demonstrate the procedure for squaring a board on a Power Saw.
- • Demonstrate the process of squaring a board using the jointer, table saw and the surface planer.
- • Demonstrate the proper use of the miter saw.
- • Have students cut out project parts using various power saws.
- • Have students use the Internet to create a timeline of cutting tool technology.
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- • Present and discuss the relevant “Hometime” video segments relating to cutting and shaping tools.
- • Present and discuss the videos “Operating the Table Saw” and “Operating the Radial Arm Saw”
- • Present lesson on cutting and shaping tools.
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- • Present lesson on operation of the Table Saw and Radial Arm Saw.
- • Present lesson on the Jointer and the Surface Planer.
- • Preview the essential questions and connect to learning throughout the unit.
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- • Review safety procedures for using all power equipment.
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- • Writing prompts as homework to be shared and evaluated in class.

Materials

- and dust control system .
- DVD,
- jointer ,
- miter saw ,
- Scroll saw ,

- sliding miter saw ,
- surface planer ,
- table saw ,
- Textbook Modern Cabinet Making Goodheart-Wilcox ,
- various types of saw blades ,

Suggested Strategies for Modifications

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