Unit 6: Sanding, Surface Preparation and Finishing

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

Brief Summary of Unit

Students will learn what type of electric hand sanders and stationary type sanders are available, and the procedures to operate them safely. They will learn about the evolution of the electric sander and the impact the new generation of sanding machines have on woodworking today. Students will learn about the health and safety risk involved with sanding wood. Students will learn about the proper storage and maintenance of sanders as well as how to make educated choices when choosing and purchasing sanders. They will also learn to select the correct abrasive and grit required for a given sanding purpose. Students will learn about the finishing process. They will learn how to apply a stain and polyurethane to a piece of properly sanded bare wood. Students will learn about the advantages and disadvantages of the various types of finishes as well as the advantages and disadvantages of a sprayed on finish. Students will be made aware of the safety concerns with toxic finishes. They will learn about environmentally and physically safer finishing materials. Students will learn about other types of finishes as well and have the opportunity to experiment with them. Students will learn how to safely apply finishes at home as well as how to dispose of finishes properly. Students will learn about the many careers in the furniture finishing industry and learn how to recognize a well-done finish.

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

- • Make personal home improvements using knowledge of how to properly sand wood, use a wood scraper, understand the types of abrasive woodworking materials.

Essential Questions

- • How do you know which grit and type of abrasives to use for the different sanders?
- • How have finishing substances evolved over the years and how has this evolution affected the woodworking industry
- • How have sanders evolved over the years and how has this evolution affected the woodworking industry?
- • How is a surface prepared for finishing?
- • What affect will worn out abrasives have on your wood?
- • What is the difference between a belt sander and a drum sander?
- • What safety concerns are specific to the finishing process?
- • What specific health and environmental concerns are related to finishing substances?
- • How do you know if it's time to change the abrasive on a machine?
- • What does the term finishing mean?
- • What is a belt sander and how do you use it?
- • What safety concerns are specific to sanding machines?
- • What types of finishing substances are there and how do I select one for a specific use?
- Are there any heath concerns to be concerned about when sanding wood?

Essential Understandings

- • all finishing materials have very specific manufacturer directions.
- • electric sanders are designed for fairly specific purposes.
- • extreme care must be taken when using a "seemingly safe" electric sander.
- • finishing materials must be used only in well ventilated areas.
- • health and environmental safety concerns have driven the development of finishing substances and processes
- • improper disposal of finishing materials can have very serious results, including fire, explosion and poisoning.
- • most finishing materials are flammable, combustible and toxic.
- • personal protection must be used when in contact with finishing materials.
- • sanding machines have changed the way in which furniture is produced today.
- • stain will change the appearance of a piece of wood, usually making it darker.
- • suspended particles of finishing materials in the air when spraying a finish create numerous safety concerns.
- • worn abrasive paper will do more harm to a project than good.
- • a beautiful finish can only be achieved if the surface it is placed on is smooth and dust free.
- • accidents with electric hand held sanders do happen, are usually caused by carelessness and can be avoided.
- • all tools are inherently dangerous.

- • improper maintenance will drastically reduce the life of a sander.
- • proper alignment of sanding belts is essential.

Students Will Know

- • be able to demonstrate the correct procedure for setting up and using both the vertical belt sander and the horizontal drum sander.
- • be able to take the safety rules learned for other machines and relate them to the electric sanders.
- • be able to use the internet to research the types of finishes available in today's market and make a list using a spreadsheet of the most environmentally friendly finishes readily available today.
- • demonstrate knowledge and understanding of shop safety procedures at all times.
- • properly setup and apply a spray finish.
- • research careers available in the wood finishing industry.
- • use personal safety precautions when applying finish.
- • be able to demonstrate proficiency in setting up and operating the stationary sanders.
- • Be able to identify the various sanders in the shop.
- • clean up and dispose of staining products.
- • demonstrate the ability to choose between oil based, lacquer based and water based finishes for a specific application.
- • know the proper safety precautions to take before using an electric sander.
- • properly apply polyurethane.
- • recognize a well-done finish.
- • safely apply a stain.

Students Will Be Skilled At

- • be able to demonstrate proficiency in setting up and operating the stationary sanders.
- • be able to demonstrate the correct procedure for setting up and using both the vertical belt sander and the horizontal drum sander.
- • Be able to identify the various sanders in the shop.
- • be able to take the safety rules learned for other machines and relate them to the electric sanders.
- • be able to use the internet to research the types of finishes available in today's market and make a list using a spreadsheet of the most environmentally friendly finishes readily available today.
- • complete a quiz on sanding tools and finishing processes.
- • complete a self—assessment rubric.
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- • complete a writing prompt related to the selecting the proper finishing techniques for a specific task.
- • demonstrate knowledge and understanding of shop safety procedures at all times.
- • properly setup and apply a spray finish.
- • research careers available in the wood finishing industry.

- • use personal safety precautions when applying finish.
- • actively and meaningfully participate in all classroom activities and discussions.
- • clean up and dispose of staining products.
- • demonstrate the ability to choose between oil based, lacquer based and water based finishes for a specific application.
- • know the proper safety precautions to take before using an electric sander.
- • properly apply polyurethane.
- • recognize a well-done finish.
- • safely apply a stain.

Evidence/Performance Tasks

- • actively and meaningfully participate in all classroom activities and discussions.
- • Allow students to work independently to apply finishes to their project.
- • be able to demonstrate the correct procedure for setting up and using both the vertical belt sander and the horizontal drum sander.
- • be able to identify the various sanders in the shop.
- • be able to take the safety rules learned for other machines and relate them to the electric sanders.
- • complete a quiz on sanding tools and finishing processes.
- • complete a self—assessment rubric.
- • complete a writing prompt related to the selecting the proper finishing techniques for a specific task.
- • Demonstrate how to operate the dust collection system with the stationary sanders.
- • Demonstrate the proper procedures for operating the horizontal drum sander.
- • Demonstrate the proper procedures for sanding both edge and end grain on the vertical belt sander.
- • Have student's use the Internet to research health problems resulting from finishing materials.
- • know the proper safety precautions to take before using an electric sander.
- • Present and discuss the video "Awesome sanding machines"
- • properly apply polyurethane.
- • safely apply a stain
- • use personal safety precautions when applying finish.
- . • be able to use the internet to research the types of finishes available in today's market and make a list using a spreadsheet of the most environmentally friendly finishes readily available today.
- . • demonstrate knowledge and understanding of shop safety procedures at all times.
- • answer the essential questions.
- • be able to demonstrate proficiency in setting up and operating the stationary sanders.
- • clean up and dispose of staining products.
- • demonstrate the ability to choose between oil based, lacquer based and water based finishes for a specific application
- • Demonstrate the proper care and use of the portable sanders.
- • Discuss how and when to change the abrasives on both the belt and drum sanders.
- • Have student's use the Internet to research and list all of the many sanders on the market today,

then categorize them by what they can do. Then post the list with average prices in the shop.

- • Have students demonstrate proficiency in using the stationary sanders to sand project parts.
- • Have students self – evaluate their finished work using rubric.
- • Present and discuss the video on finishing.
- • Present lesson on applying a Spray Finish.
- • Present lesson on finishing safety, Staining and Clear coating.
- • Present the lesson on the vertical belt sander.
- • properly setup and apply a spray finish.
- • Read and discuss relevant selections on finishing safety and applying finishes in the woodworking textbook.
- • Read and discuss the relevant selections in the woodworking textbook pertaining to stationary sanders.
- • Read and discuss the relevant selections in the woodworking textbook.
- • recognize a well-done finish
- • research careers available in the wood finishing industry.
- • Show examples of properly finished projects.
- • Writing prompts as homework, sharing and evaluation in class.

Learning Plan

- • Allow students to work independently to apply finishes to their project.
- • Demonstrate how to operate the dust collection system with the stationary sanders.
- • Demonstrate the proper procedures for operating the horizontal drum sander.
- • Demonstrate the proper procedures for sanding both edge and end grain on the vertical belt sander.
- • Have student's use the Internet to research and list all of the many sanders on the market today, then categorize them by what they can do. Then post the list with average prices in the shop.
- • Have student's use the Internet to research health problems resulting from finishing materials.
- • Have students demonstrate proficiency in using the stationary sanders to sand project parts.
- • Have students self – evaluate their finished work using rubric.
- • Present and discuss the video "Awesome sanding machines"
- • Present and discuss the video on finishing.
- • Present lesson on applying a Spray Finish.
- • Present lesson on finishing safety, Staining and Clear coating.
- • Present the lesson on finishing sanders
- • Present the lesson on the vertical belt sander.
- • Quiz on sanding tools and finishing processes.
- • Read and discuss relevant selections on finishing safety and applying finishes in the woodworking textbook.
- • Read and discuss the relevant selections in the woodworking textbook pertaining to stationary sanders.
- • Read and discuss the relevant selections in the woodworking textbook.

- • Show examples of properly finished projects.
- • Writing prompts as homework, sharing and evaluation in class.
- • Demonstrate the proper care and use of the portable sanders.
- • Discuss how and when to change the abrasives on both the belt and drum sanders.
- • Preview the essential questions and connect to learning throughout the unit.

Materials

- water based finishes ,
- , DVD ,
- ½ sheet sanders ,
- ¼ sheet sanders ,
- abrasive materials ,
- belt and disk combination sander ,
- belt sanders ,
- cabinet scrapers ,
- drum sander ,
- oil based finishes and stains ,
- oribatal sander hook and loop sanding disks ,
- oscillating sander ,
- spray finishes .
- Text book Modern Cabinet Making Goodheart-Wilcox
- wood scraper ,

Suggested Strategies for Modifications

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