Unit 5: Sanding, Surface Preparation and Finishing

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

Brief Summary of Unit

Students will learn about the safety procedures to follow for sanders and all power tools. Students will learn about the many types of abrasives and about the health and safety risk involved with sanding wood. 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. 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 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.11-12.1	Accurately cite strong and thorough evidence from the text to support analysis of science and technical texts, attending to precise details for explanations or descriptions.
LA.RST.9-10.1	Accurately cite strong and thorough evidence from the text to support analysis of science and technical texts, attending to precise details for explanations or descriptions.
LA.RST.9-10.2	Determine the central ideas, themes, or conclusions of a text; trace the text's explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text.
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.9-10.3	Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
LA.RST.11-12.3	Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.
LA.RST.9-10.4	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 9-10 texts and topics.
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.11-12.5	Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.
LA.RST.9-10.5	Analyze the relationships among concepts in a text, including relationships among key terms (e.g., force, friction, reaction force, energy).
LA.RST.9-10.6	Determine the author's purpose in providing an explanation, describing a procedure, or

	discussing an experiment in a text, defining the question the author seeks to address.
LA.RST.11-12.6	Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, identifying important issues that remain unresolved.
LA.RST.9-10.7	Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.
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.RST.11-12.8	Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.
LA.RST.9-10.8	Determine if the reasoning and evidence in a text support the author’s claim or a recommendation for solving a scientific or technical problem.
LA.RST.11-12.9	Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.
LA.RST.9-10.9	Compare and contrast findings presented in a text to those from other sources (including their own experiments), noting when the findings support or contradict previous explanations or accounts.
LA.RST.9-10.10	By the end of grade 10, read and comprehend science/technical texts in the grades 9-10 text complexity band independently and proficiently.
LA.RST.11-12.10	By the end of grade 12, read and comprehend science/technical texts in the grades 11-CCR text complexity band independently and proficiently.
CRP.K-12.CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
HPE.2.1.12	All students will acquire health promotion concepts and skills to support a healthy, active lifestyle.
SOC.6.1.12	U.S. History: America in the World: All students will acquire the knowledge and skills to think analytically about how past and present interactions of people, cultures, and the environment shape the American heritage. Such knowledge and skills enable students to make informed decisions that reflect fundamental rights and core democratic values as productive citizens in local, national, and global communities.
VPA.1.1.12	All students will demonstrate an understanding of the elements and principles that govern the creation of works of art in dance, music, theatre, and visual art.
CAEP.9.2.12.C.1	Review career goals and determine steps necessary for attainment.
CAEP.9.2.12.C.3	Identify transferable career skills and design alternate career plans.
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

Essential Questions

- What is safety consciousness?
- Why is finishing important to the quality and function of a wood project?
- Why must you be extra cautious when using finishing materials?

Essential Understandings

- 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 as well as operators have their limitations.
- care must be taken when using a “seemingly safe” electric sander.
- concentration and caution must be exercised when operating all machinery.
- finishing materials must be used only in well-ventilated areas.
- improper disposal of finishing materials can have very serious results, including fire, explosion or poisoning.
- many 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.

Students Will Know

- how to properly align the sanding belt on a belt sander.
- how to recognize the signs of a worn abrasive.
- how to select the appropriate grit for a specific type of sanding operation.
- the basic care and maintenance of the stationary belt sander, the drum sander and the portable finishing sander.
- the proper safety gear and safety precautions to use while operating an electric sander.
- the safe operating procedures for sanding surfaces, edges and ends of lumber on the stationary belt sander, the drum sander and the portable hand held electric sanders.
- vocabulary specific to sanding, surface preparation, and finishing including but not limited to: grit, tack cloth, stain, polyurethane, tooth, grain, etc.

Students Will Be Skilled At

Evidence/Performance Tasks

- answer the essential questions.
- chart the differences between oil based, lacquer based and water based finishes.
- complete a writing prompt: With the development of all sorts of new types of sanders, comes an increase in the amount of wood dust you are exposed to. What concerns must you be aware of when you are in contact with this dust?
- complete self-assessment rubrics for completed work.
- demonstrate knowledge and understanding of the proper safety precautions to take before using an electric sander.
- demonstrate personal safety precautions when applying finish.
- demonstrate proficiency in setting up and operating the stationary sanders.
- demonstrate the ability to apply polyurethane
- demonstrate the ability to clean up and dispose of staining products.
- demonstrate the ability to identify the various sanders in the shop.
- demonstrate the ability to safely apply a stain.
- demonstrate the correct procedure for setting up and using the both the vertical belt sander and the horizontal drum sander.
- explain how to recognize a well-done finish.
- explain what types of careers are available in the wood finishing industry.

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 care and use of the portable sanders including when and how to change the abrasives.
- 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.
- Discuss how and when to change the abrasives on both the belt and drum sanders.
- Have student's research and list all of the many sanders on the market today, then categorize them by what they can do and cost. Prepare and share a multi media presentation with the class using the Smart Board.
- Have student's 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.
- Introduce key vocabulary.
- Present a lesson on portable finishing sanders.
- Present and discuss the video "Awesome sanding machines."
- Present and discuss the video on finishing.
- Present lesson on finishing safety, Staining and Clear coating.
- Present the lesson on the vertical belt sander.
- Preview the essential questions and connect to learning throughout the unit.

- 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.

Materials

Suggested Strategies for Modifications

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