# Unit 6: Sanding, Surface Preparation and Finishing

Content Area: **Applied Technology**
Course(s):
Time Period: **Marking Period 3**
Length: **3 Weeks**
Status: **Published**

## Brief Summary of Unit

Students will learn what types 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 sprayed-on 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 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.

Revised July 2023

## Essential Questions/ Enduring Understandings

### Essential Questions

Why is finishing important to the quality and function of a wood project?

What safety concerns are specific to wood sanding and finishing?

### Essential Understanding

Sanding machines have changed the way in which furniture is produced today.

Improper disposal of finishing materials can have very serious results, including fire, explosion and poisoning.

## Objectives

**Students will know:**

the safe operating procedures for sanding surfaces, edges, and ends of lumber on the stationary belt sander, the drum sander, and the portable handheld electric sanders.

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.

all tools are inherently dangerous.

electric sanders are designed for fairly specific purposes.

improper maintenance will drastically reduce the life of a sander.

worn abrasive paper will do more harm to a project than good.

extreme care must be taken when using a "seemingly safe" electric sander.

many finishing materials are flammable, combustible, and toxic.

personal protection must be used when in contact with finishing materials.

finishing materials must be used only in well-ventilated areas.

all finishing materials have very specific manufacturer directions.

stain will change the appearance of a piece of wood, usually making it darker.

a beautiful finish can only be achieved if the surface it is placed on is smooth and dust free.

suspended particles of finishing materials in the air when spraying a finish create numerous safety concerns.

**Students will be skilled at:**

how to properly align the sanding belt on a belt sander.

how to recognize the signs of a worn abrasive.

proper sanding techniques.

proper finishing techniques

Following proper safety precautions when using electric sanders.

reading and applying the manufacturer's directions when using a finisher

## Learning Plan

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

Introduce new vocabulary.

Present the lesson on finishing sanders.

Demonstrate the proper care and use of the portable sanders.

Read and discuss the relevant selections in the woodworking textbook.

Present the lesson on the vertical belt sander.

Demonstrate the proper procedures for sanding both the edge and end grain on the vertical belt sander.

Demonstrate how to operate the dust collection system with the stationary sanders.

Demonstrate the proper procedures for operating the horizontal drum sander.

Discuss how and when to change the abrasives on both the belt and drum sanders.

Read and discuss the relevant selections in the woodworking textbook pertaining to stationary sanders.

Present and discuss the video “Awesome sanding machines”

Have students use the Internet to research and list all of the many sanders on the market today, and categorize them by what they can do. Students will post the list with average prices in the shop.

Writing prompts as homework, sharing, and evaluation in class.

Quiz

Have students demonstrate proficiency in using the stationary sanders to sand project parts.

Present lesson on finishing safety, staining, and clear coating.

Present a lesson on applying a spray finish.

Read and discuss relevant selections on finishing safety and applying finishes in the woodworking textbook.

Show examples of properly finished projects.

Have students use the Internet to research health problems resulting from finishing materials.

Present and discuss the video on finishing.

Allow students to work independently to apply finishes to their projects.

Have students self–evaluate their finished work using a rubric.

## Assessment

**Formative Assessment**

Do Now Questions

Exit Ticket

Demonstrating proper use of sanding techniques, electric sanders, and applying finishing

Participation in class discussions

Writing Prompts on finishing safety

Proper use of vocabulary

**Summative Assessment**

Quiz on safety when using electric sanders and finishes

Unit Test

Completed project scored with rubric

**Benchmark Assessments**

Mid Term Exam

Final Exam

**Alternative Assessment**

Presentation on the proper safety when finishing and staining

## Materials

Woodworking Textbook

Internet

Safety Equipment

stationary belt sander,  drum sander, portable finishing sander

various grades of sandpaper

various types of stains

## Standards

| | |
|---|---|
| 9.4.12.CI | Creativity and Innovation |
| 9.4.12.CT | Critical Thinking and Problem-solving |
| 9.4.12.CT.1 | Identify problem-solving strategies used in the development of an innovative product or practice (e.g., 1.1.12acc.C1b, 2.2.12.PF.3). |
| 9.4.12.CT.2 | Explain the potential benefits of collaborating to enhance critical thinking and problem solving (e.g., 1.3E.12profCR3.a). |
| 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.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.RI.11-12.5 | Analyze and evaluate the effectiveness of the structure an author uses in his or her exposition or argument, including whether the structure makes points clear, convincing, and engaging. |
| 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. |
| 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

https://docs.google.com/spreadsheets/d/1gk0WLBehVNuQkRKLMYATvY5Zk0vpdBKbdrcODZS_YFw/edit?usp=sharing