

Unit: Power Tools

Title: Fastening and Finishing Tools

Skill(s) and Knowledge: Students will be able to: identify the electric drill, screw gun, pneumatic nail gun, belt sander, and random orbit sander; the accessories and the use and maintenance of each. Students will gain knowledge on why power tools are important and what safety measures must be followed while using the equipment.

Tasks: Lead-up exercises for each tool, pages: 128-142.

Performance objective: To become familiar with each drill, nailer and sander by completing the lead up exercises and practicing using the tools and discussing with others.

Tools, supplies and reference materials:

Variable speed electric drill --4 x 4 x 16", (7) 3/8" x 6" dowels, clamps, 3/8" twist bits, tape measure, combination square, scratch awl, masking tape, pencil, (3/4" spade bit, 1x6 and 2x6).

Screw gun(with adjustable nose)--scrap 2 x 4, clamps, 1 1/4" construction screws, tip to match screws, electric drill, drill index, scrap oak board or flooring.

Pneumatic nail gun--fasteners for your particular model, scrap boards.

Belt sander--replacement belts for your model sander, scrap lumber, clamps, straight edge.

Random orbit sander-- replacement discs for your model, scrap lumber, clamps.

Other items-PPE, air hoses, compressor, extension cords, Career Connection Book 1 Chapter 5 pages: 122-144.

Methods of instruction: Demonstration on how to identify and use and maintenance of each tool, lecture on safe work habits and respect for tools, reference to the Career Connections Book 1 Chapter 5, and hands-on practice with each tool. Try to have enough tools for each student or small group of students. Depending on the tool quantities in your shop, you could dedicate a station to each tool and then students could be divided into small groups and rotate through each station.

Estimated time: 4 hrs. **Number of students:** 10-15

Task analysis or activities: Students will work in small groups at shop tables, with all the previously mentioned power tools, working together to complete all the lead-up exercises and helping each other as they progress at their own pace.

Evaluation: Students will be graded on their use of time, safety methods, quality of work, cleaning and organization of their work area, interaction with other students, and vocational employability skills grading rubric. Manipulative skills assessments and written evaluations on the power tools should be implemented by the instructor to be sure the student can operate the tool safely and with confidence.

Performance Notes:

Vocational Frameworks References

- 2.F.02.01 Demonstrate the use and maintenance of a portable drills.
- 2.F.03.02 Demonstrate the use and maintenance of a portable sanders.
- 2.F.04.01 Demonstrate the use and maintenance of a screw gun.
- 2.F.04.02 Demonstrate the use and maintenance of a pneumatic equipment.

English/Strand 3 Frameworks References:

RST Grades 9-10 #4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases in a technical context.

Frameworks References: Math

G-CO12 Make formal geometric constructions with a variety of tools and methods.

Common Core References:

Read and listen critically for information understanding and enjoyment
Set goals and achieve them by organizing time, workspace, and resources effectively
Work both independently and in groups

SCANS references:**Foundation Skills:**

1. Basic skills— reading, writing, mathematics, speaking, and listening.
2. Thinking Skills-- thinking creatively, making decisions, solving problems, visualizing, knowing how to learn, and reasoning
3. Personal qualities--individual responsibility, self-esteem, sociability, self management, and integrity

Work Place Competencies

1. Resources--allocating time, money, material, space, and staff.
2. Interpersonal skills--working in teams, teaching others, serving customers, leading negotiating, and working well with culturally diverse populations.
3. Information--acquiring and evaluating data, organizing and maintaining files, interpreting & communicating, and using computer to process information
4. Systems--understanding social, organizational, and technological systems, monitoring and correcting performance, and designing or improving systems.
5. Technology--selecting equipment and tools, applying technology to specific tasks, and maintaining and troubleshooting technologies

CAREER CONNECTIONS: PROJECT BOOK 1

Lesson Plan: Chapter 5, Power Tools for Fastening and Finishing

Time Required: Three to five 50-minute class periods (five class periods are outlined below; alternatively, present the information on each tool and check out students using the Tool Safety and Operation Checklist when students need to use the tool for a project)

Goal:

To demonstrate the purpose and proper use of power tools for fastening and finishing.

Objectives:

At the end of this chapter, students should be able to:

1. Classify the basic types of power tools used in carpentry for fastening and finishing.
2. Identify the purpose and parts of an electric drill and show how to use it.
3. Identify the purpose and parts of a screw gun and show how to use it.
4. Identify the purpose and parts of a pneumatic nail gun.
5. Identify the purpose and parts of a belt sander and show how to use it.
6. Identify the purpose and parts of a random orbital sander.

Instruction and Assessment:

The following provides a summary of steps for instruction and assessment.

Teach

Minutes	Activity
Class Period 1	
5	<i>Chapter 5 Introduction</i> Review the lesson goal and objectives with students.
10	<i>Section 1</i> Provide a classroom introduction to fastening and finishing power tools. Review the list of important safety rules.
10	<i>Section 2</i> Introduce the electric drill. Point out the different types. Describe the parts and the uses for different bits. Review electric drill safety rules.
25	<i>Activity</i> In the shop area, have students perform the following procedures (making sure they have the necessary tools and materials): <ul style="list-style-type: none"> ● Using an Electric Drill to Drill a Hole ● Drilling Perpendicular Holes with a Twist Bit ● Drilling Perpendicular Holes with a Spade Bit
Class Period 2	
5	<i>Review</i>

	Review chapter content previously taught.
15	<i>Section 3</i> Introduce the screw gun. Describe the parts and technique for using.
30	<i>Activity</i> Have students perform the following procedures (making sure they have the necessary tools and materials): <ul style="list-style-type: none"> ● Installing Screws with a Screw Gun ● Drilling Pilot Holes
Class Period 3	
5	<i>Review</i> Review chapter content previously taught.
45	<i>Section 4</i> Introduce the pneumatic nail gun. Describe the parts, mechanism, applications, and technique for using. If possible, demonstrate use of the pneumatic nail gun and have students practice using it.
Class Period 4	
5	<i>Review</i> Review chapter content previously taught.
15	<i>Section 5</i> Introduce the belt sander. Describe the parts and uses. Review the rules for belt sander safety.
30	<i>Activity</i> Have students perform the following procedures (making sure they have the necessary tools and materials): <ul style="list-style-type: none"> ● Replacing the Belt on a Belt Sander ● Operating a Belt Sander
Class Period 5	
5	<i>Review</i> Review chapter content previously taught.
35	<i>Section 6</i> Introduce the random orbital sander. Describe the parts and uses. Review the rules for sander safety. If possible, demonstrate use of the random orbital sander and have students practice using it.
10	<i>Chapter Review</i> Answer any questions students have about the chapter. Ask students to review Chapter 6 for the next class.

Assess

Assessment	Assessment Method and Criteria
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Carpentry Frameworks Based Lesson Plan

Framework: 2.F.02, 2.F.03, 2.F.04

Activity	
Procedures	Use the Tool Safety and Operation Checklist to score student competency. Monitor students for safe and accurate results.