Unit 5: Drilling and Boring Tools

Content Area: **Applied Technology**
Course(s):
Time Period: **Marking Period 1**
Length: **2-3 days**
Status: **Published**

Brief Summary of Unit

Students will learn the various purposes and methods of drilling and boring holes in wood. They will learn safe operation procedures for using drilling and boring tools, including the drill press, electric hand drill, and cordless battery drill. The students will learn how to accurately drill and bore holes in a variety of materials using the correct method and tool. Students will learn about many types of drilling and boring tools, bits and accessories available on the market today and be able to make educated decisions when purchasing or using them

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

- • Be able to safely use a drill press.
- • Understanding the difference between drilling and boring, when to use each and the safety rules.

Essential Questions

- • What part does the operator play in working safely with drills?

- • What tools are available to drill holes in wood?
- • How are holes put in lumber?

Essential Understandings

- • how the drill press is used in industry
- • how to recognize drilling and boring tools including the Spade bit, Twist bit, forstner bits and expansion bits
- • how to select the correct drilling or boring tool for the intended use.
- • how to use drilling and boring tools safely.
- • the most common types of drill bits currently available on the market.
- • the safety rules pertaining to the operation of the drill press.
- • what features and quality to look for when purchasing a drill press for personal use.
- • how to care for and maintain boring and drilling tools.
- • key terms and tool names.
- • what types of drill bit can be used in the drill press.

Students Will Know

- • What is the difference between drilling and boring?
- • What safety rules are specific to the use of the drill press?
- • How do you maintain and care for drilling and boring tools?
- • What are the benefits of using the drill press as oppose to an electric hand drill?
- • What is a drill press and how is it used?
- • What is the drill press used for other than drilling holes?
- • What part does the operator play in working safely on the drill press?
- • When purchasing a drill press for home, how do you know what to buy?

Students Will Be Skilled At

- • all machines as well as operators have their limitations.
- • care must be exercised not to exceed the design limits of the drill or the drill bit.
- • concentration is key to operating the drill press.
- • everyone must follow all safety rules and manufacturer’s directions at all times.
- • the density of the wood often dictates the speed and the type of bit that may be used.
- • the drill press can be used for many types of operations
- • tools that are properly maintained and not abused will last a lifetime.
- • when purchasing tools, invest in quality.
- • any tool is inherently dangerous and safety must be number one on the mind..

- • material must be held securely in place before attempting any drilling operation.
- • simple attachments can extend the versatility of the drill press.

Evidence/Performance Tasks

- • actively and meaningfully participate in all classroom activities and discussions.
- • identify the major parts of the drill press and name it's parts.
- • be able to correctly name the drill and bit types used in class.
- • be able to demonstrate the correct procedure for setting up and drilling on the drill press
- • be able to demonstrate the proper procedure for plugging in and unplugging an electric tool as well as how to store it safely.
- • be able to list 10 safety rules concerning drilling and boring tools.
- • be able to relate the safety rules for the drill press to other machines in the shop
- • complete a quiz on drilling and boring tools
- • complete a writing prompt related to the selecting the proper drilling and boring tools for a specific task.
- • demonstrate knowledge and understanding of shop safety procedures at all times.
- • demonstrate the insertion and removal of drill bits from a drill chuck.
- • drill all of the appropriate holes in their project parts using an electric drill.
- • Students will be able to choose the correct drill bit for a given drill.
- . • be able to develop using the Internet, a list of safety regulations governing a school workshop.
- . • complete a self—assessment rubric
- . • demonstrate the procedure for attaching a minimum of 2 attachments to the drill press and demonstrate their use.

Learning Plan

- • Allow students to work independently drilling the holes on their projects.
- • Demonstrate the procedures for attaching jigs and fixtures to the drill press table.
- • Display and have students examine the various types of drill bits available in the shop and have students pair them with the corresponding drill.
- • Have students demonstrate the insertion and removal of drill bits into the manual and electric drill. • Demonstrate the safe and proper use of a drill.
- • Have students design a poster emphasizing safety with electric tools.
- • Have students research the prices and features of various drills and report their recommendations for purchase to the class.
- • Present lesson on drilling and boring tools
- • Quiz on drilling and boring tools.
- • Read and answer questions in the relevant sections of the woodworking textbook.
- • Students will self –assess their work using a rubric
- • Allow students to work independently to drill the required holes in their project.

- • Demonstrate the safe and proper use of the drill press.
- • Discuss and display the attachments available in the shop for the drill press.
- • Discuss the use of the drill press in industry today.
- • Have student's research using the Internet, features of various drill presses on the market and prepare a price comparison.
- • Have students search the Internet and prepare a chart showing how technology has impacted how holes are made in industry today.
- • Have students self – evaluate their accuracy in drilling and compensate accordingly.
- • Present and discuss the video on operating the drill press safely.
- • Present lesson on using the drill press.
- • Preview the essential questions and connect to learning throughout the unit.
- • Read and discuss relevant selections from the woodworking textbook.
- • Writing prompts as homework, in class discussion and evaluation using a rubric.

Materials

- , corded drill ,
- cordless drill ,
- brad point ,
- circle cutter ,
- drill press ,
- drilling guide clamps and v block .
- fostner drill bits ,
- hole saw
- regular drill bits ,
- Text book Modern Cabinet Making Goodheart-Wilcox

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
- • one-to-one instruction and assistance
- • revised techniques, use of tools and media in hands-on activity
- • testing materials appropriate to student level
- • handouts of notes, procedures, processes, diagrams, etc.
- • images and visual aids
- • preferential seating

- • reading material modified to student level
- • study partners