WOOD TECHNOLOGY 20

Description

This course is designed to further provide students with skills and experience necessary for the proper production of wood products. Students learn to build and finish various types of "case" style furniture utilizing several types of wood joints and construction methods. Safe and proper operation of machines will be taught and practiced.

Course Overview

Course Objectives

Students should:

- Develop the ability to analyze and resolve problems through practical experiences.
- Identify and safely use many of the resources, processes, concepts, and tools related to woodworking technology.
- Apply practical technological methods in a problem-solving situation.
- Use appropriate math and science concepts to solve material processing problems.
- Demonstrate the knowledge and ability to construct projects from a given plan or working drawing.
- Operate woodworking equipment as necessary for completion of project based assignments.

Essential Questions

- What does knowledge of tools and machines do to increase one's ability to make proper decisions in manufacturing?
- Why is it important to analyze and resolve problems through practical experiences?
- How is "case" style furniture utilizing several types of wood joints and construction methods used in the world of construction?

Assessments

Common Assessments

- Written tests and quizzes on material presented
- Verbal questioning and explanation

Skill Assessments

- Performance Based Assessment on
- Machine /Tool Use
- Teacher visual evaluation of student work practices/procedures
- Student project construction

Content Outline

I. Unit 1 - General Safety
II. Unit 2 - Machine Use
III. Unit 3 - Project Construction (Case)
IV. Unit 4 - Assembly
V. Unit 5 - Finishing

Standards

Connecticut Technology Education Standards have been met in the following area:

- ***Wood Technology***

Grade Level Skills

Students will:

- construct a drawer following proper procedure.
- construct common wood joints.
- demonstrate cutting, surfacing, and sizing methods used on lumber.
- demonstrate how to "finish" a furniture piece.
- demonstrate how to connect frames and shelves to sides.
- demonstrate how to utilize "dado" and "rabbet" joints in drawer construction.
- demonstrate methods of finish application.
- demonstrate the process to make and mount the top on a cabinet

		base. • demonstrate the proper and safe use of the planer. • demonstrate the proper use of abrasive paper on wood grain surfaces. • demonstrate the safe use of filing and chiseling tools. • describe how to make moldings for furniture. • describe the process to build a “web frame”. • describe the process to cut a raised panel. • describe the process used to make an “overlay” drawer. • discuss the relationship between design layout and actual product manufacturing. • distinguish between uses of the band saw and the scroll saw. • explain the steps in preparing wood for gluing. • identify common finishes used in woodworking. • identify the processes and techniques involved in “case” construction. • lay out geometric shapes on wood stock by making templates. • practice all general shop safety rules and policies. • properly and safely joint edges on a jointer. • properly drill holes and install wood screws. • properly select, drive and set nails. • utilize a router and shape edges and ends of lumber.

Pacing Guide				
1st Marking Period			2nd Marking Period	
Term 1	Month 2	Month 3	Month 4	Month 5
Unit 1 Safety 1 week	Unit 2 Machine use 3 weeks	Unit 3 Construction 8 weeks	Unit 4 Assembly 4 weeks	Unit 5 Finishing 2 weeks

Unit 1 – General Safety, 1 week [top]

Standards

Wood Technology

WM.02 Describe and demonstrate the procedures related to workplace and job-site safety including personal protective equipment, machine safety, and material handling practices.

WM.02.01, WM.O2.02, WM.02.03, WM.02.04

Unit Objectives

Students will be able to:

- describe and demonstrate the procedures related to workplace and job-site safety including personal protective equipment, machine safety, and material handling practices.
- identify and describe various types of personal protective equipment.

Essential Question

- Why is workplace and job-site safety essential to success**?**

Focus Questions

- What needs to be done to ensure student safety in the wood shop?
- What are the basic shop safety rules?
- How do we safely operate machinery in our shop?

Assessments

- Safety quiz – basic shop safety
- Safety quiz – tool and machine safe practices and procedures
- Visual assessment of students work practices
- Students will be evaluated on their knowledge of safety through objective tests, quizzes, and assignments. Safe working habits during shop activities will also be observed and evaluated

Skill Objectives

Students will:

- practice general shop safety and safe practice policies.
- demonstrate safe material handling practices.
- follow workplace and job-site safety procedures.
- use various types of personal protective equipment.
- describe safety practices for specific machines.

Unit 2 – Machine Application and Use, 3 weeks top

Standards

Wood Technology

WM.03 Identify and describe the safe and appropriate use of various types of hand and power tools and machinery used for building.
WM.03.02, WM.03.04, WM.03.06, WM.03.11

WM.04 Explain and be able to demonstrate the methods involved in turning raw materials into useable products.
WM.04.10

WM.07 Set-up, adjusts, and maintains a variety of wood manufacturing power equipment.
WM.07.02, WM.07.06, WM.07.21, WM.07.25, WM.07.26, WM.07.28

Unit Objectives

Students will be able to:

- identify and describe the safe and appropriate use of various types of hand and power tools and machinery used for building.
- explain and be able to demonstrate the methods involved in turning raw materials into useable products.
- set-up, adjust, and maintain a variety of wood manufacturing power equipment.

Essential Question

- How does knowledge of tools and machines increase the ability of making decisions for setting up and completing a task in manufacturing?

Focus Questions

- Why is it important to be able to choose the correct machine for a procedure??
- Why is a safe work environment beneficial for personal and job success?
- How does awareness of the safety procedures involving each machine utilized in a project increase both efficiency and effectiveness?

Assessments

- Observation and evaluation of correct and safe machine operation by the student
- Student performance
- Tests and/or quizzes on individual machines (written and/or practical)

Skill Objectives

Students will:

- joint edges of a board on a jointer.
- cut curves on a band saw.
- surface plane a board to thickness with accuracy of 1/32”.
- drill holes according to a plan.
- shape edges with a hand and/or table router.
- sand materials with a disc, belt or spindle sander.
- cut angles with a miter saw.
- demonstrate the proper procedures for setting up the table saw for a variety of different operations.
- demonstrate radial arm saw crosscutting operations.
- demonstrate miter cutting operations on the saws.
- properly square a board.

Unit 3 – Project Construction, 8 weeks top

Standards

Wood Technology

WM.05 Identify and assemble wood joinery and install mechanical fasteners.
WM.05.14, WM.05.15

WM.06 Identify and demonstrate sanding and gluing techniques.
WM.06.04, WM.06.08

WM.07 Set-up, adjusts, and maintains a variety of wood manufacturing power equipment.
WM.07.02, WM.07.05, WM.07.06, WM.07.08, WM.07.09, WM.07.10, WM.07.11, WM.07.26, WM.07.28

WM.09 Fabricate Traditional and Modern Casework (wall, base, and utility cabinets)
WM.09.01, WM.09.02, WM.09.03, WM.09.05, WM.09.06

Unit Objectives

Students will be able to:

- read and decipher a project plan or drawing and construct from it.
- identify and assemble wood joinery and install mechanical fasteners.
- identify and demonstrate sanding and gluing techniques.
- set-up, adjusts, and maintains a variety of wood manufacturing power equipment.

Essential Question

- How does following a plan increase both accuracy and efficiency in production**?**

Focus Questions

- How does a shelf get connected to the project side?
- What type of joints should be used in various applications?
- What are the 3 types of drawer front construction?
- What type of joints are constructed and used in case construction?
- What types of drawers can be made in a case?
- What are some methods of attaching a top?
- How do we support a drawer in a case?

Assessments

- Student's performance of construction
- Quality of finished parts
- Quantity of student work performed
- Safety performance

Skill Objectives

Students will:

- construct parts of a cabinet.
- construct a project from a plan or drawing
- utilize lumber, supplies and tools to construct and produce various parts of a "case" type cabinet including…sides, web frames, shelves, top, door, raised panel, drawer, molding and back.
- combine basic joining techniques and procedures in manufacturing a furniture piece.
- identify the proper wood joint for a specific part of a project.
- identify several different styles of drawer fronts.
- utilize the table saw to rip, crosscut, cut dados and cut angles using the fence, miter gauge, push stick and other fixtures.
- plane a board down to the needed thickness through adjustment and use of the planer.
- laminate boards by gluing and clamping.
- build an overlay, lip or flush drawer.
- construct a drawer mount
- properly make and utilize several basic wood joints in construction of a project.

Unit 4 – Assembly, 4 weeks top

Standards

Wood Technology

WM.09 Fabricate Traditional and Modern Casework (wall, base, and utility cabinets)

WM.09.03, WM.09.05, WM.09.06

WM.11 Fabricate Furniture

WM.11.03, WM.11.05, WM.11.08, WM.11.09, WM.11.10, WM.11.11

Unit Objectives

Students will be able to:

- explain the uses of different types of fasteners.
- discuss special procedures used when gluing edge joints, frames, finished assemblies, and miter joints.
- explain the steps in preparing wood for gluing attach molding to the base of a cabinet, a top to the cabinet and a back to a cabinet.
- describe the application of hardware on a product related to function.

Essential Question

- What impact does cabinetry have on the way people live?

Focus Questions

- Which joints are stronger in various applications?
- Where some of these joints might be used?
- What types of clamps are used for clamping lumber in various directions?
- When and how are wood screws used?
- How do we "set" a nail?
- What types of glues are available?
- How long does glue have to dry?
- What types of clamps are available?
- How do we set a "parallel" clamp correctly?
- What alternative fasteners can be used to assemble parts?

Assessments

- Student's performance of construction
- Quality of finished parts
- Quantity of student work performed
- Safety performance
- Procedural quizzes

Skill Objectives

Students will:

- glue and clamp up a "side" board, a web frame and a cabinet base.
- properly assemble a raised panel door and an overlay drawer.
- assemble a drawer using dado and rabbet joints.
- demonstrate methods to fasten a top to a project.
- demonstrate procedure for applying glue and clamping a project.
- use clamps and fasteners.
- properly drill holes and install wood screws.
- properly set nails in wood stock.
- install hardware based on function.

Unit 5 – Finishing, 2 weeks top

Standards
Wood Technology
WM.16 Finish woodwork.
WM.16.01, WM.16.02, WM.16.04, WM.16.07

Unit Objectives
Students will be able to:
- describe the application of various types of finishes such as polyurethane, water and oil based stains and polishes.
- explain transparent finishes according to given finish systems.
- prepare wood surfaces for finishing and finish to a desired appearance.

Essential Question
- Why are different finishes used for different applications or product uses?

Focus Questions
- Why do we apply a finish to wood projects?
- How do we apply a finish to projects?
- What is the difference between finishes?
- What do we use to clean brushes?
- What does Latex mean?
- What is the difference between water-based and petroleum based products?
- What does a stain do?
- When should it be applied?
- Are finish types interchangeable?
- Why and when do we wax a project?

Assessments
- Student's performance of finish work
- Quality of finished parts
- Quantity of student work performed
- Safety performance
- Finish preparation

Skill Objectives
Students will:
- define finish terminology.
- prepare surfaces for staining and finishing.
- apply stain to wood.
- apply a protective transparent finish to wood.
- utilize the correct solvent when cleaning brushes.