

## Milford Public Schools Curriculum Map

**Department:** Technology Education

**Course Name:** Wood Technology 1

**Course Description:** This course introduces wood manufacturing technology, its systems, devices and tools, and relationships to other technology systems. Students will be engaged in the safe operation of hand and power tools, plan reading, and construction of usable products. Projects include but are not limited to: tool box, electronics charging station, household accessories, and outdoor furniture.

### Unit 1 – Safety, Hand Tools, Power Tools, and Measurement/Layout

#### Content and Skills:

Students will know and be able to:

1. Apply OSHA safety practices when conducting themselves in the wood shop.
2. Apply knowledge in order to safely and properly use hand tools and power tools.
3. Accurately measure wood stock to 1/16" of an inch.
4. Analyze and interpret woodworking plans.
5. Create an accurate layout grid in order to transfer scroll pattern design.
6. Assess the type of cuts required - rip cut versus cross cut and choose the appropriate power tool.
7. Prove mastery of a rip cut using the table saw.
8. Prove mastery of a cross cut using the compound miter slide saw.
9. Create curves using the jigsaw and bandsaw.
10. Construct projects using vices, tape measures, carpenter's squares, hammers, nails, clamps, screw drivers, drill drivers, nail sets.
11. Construct projects using jig saws, table saws, compound miter slide saws, and drill presses.
12. Construct finished woodworking project by following proper layout, cutting, and assembly process.
13. Connect components of project using butt joints.
14. Apply concepts of the finishing process to create a smooth, uniformly stained, and sealed woodworking project.

#### Standards:

##### 2015 CTE Performance Standards and Competencies

**A. Safety: Describe and demonstrate the procedures related to workplace and job-site safety, including personal protective equipment, machine safety, and material handling practices.**

1. Demonstrate knowledge of proper use, storage, and disposal of hazardous materials following OSHA's proper safety practices for a woodworking facility.
2. Demonstrate and explain knowledge of workplace safety procedures.
3. Demonstrate and explain knowledge of personal safety practices pertaining to eyewear, footwear, clothing, and personal protective equipment (PPE) used in wood technology
4. Describe safety practices for the following machines: table saw, drill press, stationary sander, router table, and mitre saw.
5. Demonstrate and explain knowledge of proper use and storage of basic hand tools.
6. Demonstrate and explain knowledge of proper use and storage of portable power tools.
7. Explain safe proper use, disposal, and storage of chemicals following OSHA standards.

**B. Machines and Tools: Identify and describe the function of various types of layout hand and power tools in the Wood Technology field.**

8. Identify, use, and maintain the following measuring, layout and marking tools: steel rule, tape measure, combination square, sliding "t" bevel, and compass.
9. Identify proper use and function of the following portable power tools: circular saw, drill, jig/saber saw, finishing sanders, and routers.

10. Identify proper use and function of the following fastening tools: hammer, phillip head screwdriver, and slotted / flat head screwdriver.

11. Identify proper use and function of the following hand tools: cross cut saw, rip saw, level, coping saw, nail set, hand plane, chisel, and file.

12. Identify proper use and function of the table and mitre saw.

**C. Design, Measurement, and Layout: Interpret technical drawings, rough drawings and sketches, and the use of fractional measurement.**

13. Describe and identify fractional measurements from a basic plan and assembly drawings.

16. Measure accurately to a sixteenth of an inch.

17. Identify the difference between both nominal and actual dimensions.

19. Consider the natural characteristics of grain, knots, and checks when laying out a board.

**E. Material Processing: Identify and describe the various types of processes associated with the woodworking field and the characteristics of wood as a medium.**

23. Identify and select the proper cutting process based on grain direction.

24. Identify how grain direction affects a material's strength.

25. Understanding kerf and its application to cutting and layout operations.

**F. Abrasives: Describe the various types of abrasive materials used in wood technology.**

26. Describe the abrasive grit numbering system.

**G. Joinery: Identify various types of joints and describe the process for preparation and assembly.**

27. Identify and assemble the following types of joints: butt, miter, dado, rabbet, and lap.

28. Prepare stock for use.

**H. Assembly: Identify and describe the purpose of various types of fasteners, adhesives, and clamping devices.**

29. Identify and describe the purpose and use of the following woodworking fasteners: common nail, round head screws, flat head screws, and oval head screws.

30. Identify and describe the purpose of the following clamping devices: bar clamp, c-clamp, parallel / hand screw clamp, and spring clamps.

**I. Finishing: Describe various types of available finishes and safety precautions used during the application process.**

31. Identify and apply various wood finishes for interior and exterior, with brush, wipe on, for the following: paint, stain, and clear coat.

#### Enduring Understandings

Wood working plans are essential to designing, creating, and building a finished product accurately and cost effectively.

#### Essential Questions

Why are woodworking plans important to understand and follow when working on a project?

## Unit 2 – Joinery, Fasteners, Wood Types, and Adhesives

### Content and Skills:

Students will know and be able to:

1. Compare the characteristics of softwoods versus hardwoods.
2. Analyze the differences between softwoods, hardwoods, MDF, and plywood.
3. Create tight fitting miter joints using the compound miter slide saw, miter clamps, wood glue, hammer, and nails.
4. Create accurate dado joints using the router table.
5. Design serving tray handle using a scale template.
6. Create accurate handles for a serving tray using stop blocks and the router table.
7. Construct finished edges on plywood project using veneer strips.

### Standards:

**A. Safety: Describe and demonstrate the procedures related to workplace and job-site safety, including personal protective equipment, machine safety, and material handling practices.**

1. Demonstrate knowledge of proper use, storage, and disposal of hazardous materials following OSHA's proper safety practices for a woodworking facility.
2. Demonstrate and explain knowledge of workplace safety procedures.
3. Demonstrate and explain knowledge of personal safety practices pertaining to eyewear, footwear, clothing, and personal protective equipment (PPE) used in wood technology
4. Describe safety practices for the following machines: table saw, drill press, stationary sander, router table, and mitre saw.
5. Demonstrate and explain knowledge of proper use and storage of basic hand tools.
6. Demonstrate and explain knowledge of proper use and storage of portable power tools.
7. Explain safe proper use, disposal, and storage of chemicals following OSHA standards.

**B. Machines and Tools: Identify and describe the function of various types of layout hand and power tools in the Wood Technology field.**

8. Identify, use, and maintain the following measuring, layout and marking tools: steel rule, tape measure, combination square, sliding "t" bevel, and compass.
9. Identify proper use and function of the following portable power tools: circular saw, drill, jig/saber saw, finishing sanders, and routers.
10. Identify proper use and function of the following fastening tools: hammer, phillip head screwdriver, and slotted / flat head screwdriver.
11. Identify proper use and function of the following hand tools: cross cut saw, rip saw, level, coping saw, nail set, hand plane, chisel, and file.
12. Identify proper use and function of the table and mitre saw.

**C. Design, Measurement, and Layout: Interpret technical drawings, rough drawings and sketches, and the use of fractional measurement.**

13. Describe and identify fractional measurements from a basic plan and assembly drawings.
16. Measure accurately to a sixteenth of an inch.
17. Identify the difference between both nominal and actual dimensions.
19. Consider the natural characteristics of grain, knots, and checks when laying out a board.

**D. Materials: Describe characteristics and appropriate applications for softwoods, hardwoods, and plywoods.**

20. Identify characteristics and applications of the following coniferous softwoods: Pine, cedar, and fir.
21. Identify characteristics and applications of the following deciduous hardwoods: Oak, maple, and poplar.
22. Identify characteristics and applications of the following engineered lumber: plywood and medium density fiberboard.

**E. Material Processing: Identify and describe the various types of processes associated with the woodworking field and the characteristics of wood as a medium.**

23. Identify and select the proper cutting process based on grain direction.
  24. Identify how grain direction affects a material's strength.
  25. Understanding kerf and its application to cutting and layout operations.
- F. Abrasives: Describe the various types of abrasive materials used in wood technology.
26. Describe the abrasive grit numbering system.

**G. Joinery: Identify various types of joints and describe the process for preparation and assembly.**

27. Identify and assemble the following types of joints: butt, miter, dado, rabbet, and lap.
  28. Prepare stock for use.
- H. Assembly: Identify and describe the purpose of various types of fasteners, adhesives, and clamping devices.
29. Identify and describe the purpose and use of the following woodworking fasteners: common nail, round head screws, flat head screws, and oval head screws.
  30. Identify and describe the purpose of the following clamping devices: bar clamp, c-clamp, parallel / hand screw clamp, and spring clamps.

**I. Finishing: Describe various types of available finishes and safety precautions used during the application process.**

31. Identify and apply various wood finishes for interior and exterior, with brush, wipe on, for the following: paint, stain, and clear coat.

**Enduring Understandings**

Various joints and materials add strength and design to wood products.

**Essential Questions**

What techniques can be utilized to add to the durability of a product?

**Unit 3- Sketching and Design****Content and Skills:**

Students will know and be able to:

1. Create and analyze a rough sketch for an original project.
2. Revise rough sketch and assess the form, function, and proportion of the design.
3. Formulate a complete final plan that includes a front and side view of the project, as well as accurate dimensions.
4. Create a materials list that includes all materials required to construct the project.
5. Assess the finished product's ability to perform its intended function.

**Standards:**

**A. Safety: Describe and demonstrate the procedures related to workplace and job-site safety, including personal protective equipment, machine safety, and material handling practices.**

1. Demonstrate knowledge of proper use, storage, and disposal of hazardous materials following OSHA's proper safety practices for a woodworking facility.
2. Demonstrate and explain knowledge of workplace safety procedures.
3. Demonstrate and explain knowledge of personal safety practices pertaining to eyewear, footwear, clothing, and personal protective equipment (PPE) used in wood technology
4. Describe safety practices for the following machines: table saw, drill press, stationary sander, router table, and mitre saw.
5. Demonstrate and explain knowledge of proper use and storage of basic hand tools.
6. Demonstrate and explain knowledge of proper use and storage of portable power tools.
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**B. Machines and Tools: Identify and describe the function of various types of layout hand and power tools in the Wood Technology field.**

8. Identify, use, and maintain the following measuring, layout and marking tools: steel rule, tape measure, combination square, sliding "t" bevel, and compass.
9. Identify proper use and function of the following portable power tools: circular saw, drill, jig/saber saw, finishing sanders, and routers.
10. Identify proper use and function of the following fastening tools: hammer, phillip head screwdriver, and slotted / flat head screwdriver.
11. Identify proper use and function of the following hand tools: cross cut saw, rip saw, level, coping saw, nail set, hand plane, chisel, and file.
12. Identify proper use and function of the table and mitre saw.

**C. Design, Measurement, and Layout: Interpret technical drawings, rough drawings and sketches, and the use of fractional measurement.**

13. Describe and identify fractional measurements from a basic plan and assembly drawings.
14. Describe and prepare rough drawings and sketches.
15. Explain and prepare a cut list or bill of material from a basic plan and assembly drawing.
16. Measure accurately to a sixteenth of an inch.
17. Identify the difference between both nominal and actual dimensions.
18. Estimate material quantities in both board feet and linear feet.
19. Consider the natural characteristics of grain, knots, and checks when laying out a board.

**E. Material Processing: Identify and describe the various types of processes associated with the woodworking field and the characteristics of wood as a medium.**

23. Identify and select the proper cutting process based on grain direction.
24. Identify how grain direction affects a material's strength.
25. Understanding kerf and its application to cutting and layout operations.

F. Abrasives: Describe the various types of abrasive materials used in wood technology.

26. Describe the abrasive grit numbering system.

**G. Joinery: Identify various types of joints and describe the process for preparation and assembly.**

27. Identify and assemble the following types of joints: butt, miter, dado, rabbet, and lap.

28. Prepare stock for use.

H. Assembly: Identify and describe the purpose of various types of fasteners, adhesives, and clamping devices.

29. Identify and describe the purpose and use of the following woodworking fasteners: common nail, round head screws, flat head screws, and oval head screws.

30. Identify and describe the purpose of the following clamping devices: bar clamp, c-clamp, parallel / hand screw clamp, and spring clamps.

**I. Finishing: Describe various types of available finishes and safety precautions used during the application process.**

31. Identify and apply various wood finishes for interior and exterior, with brush, wipe on, for the following: paint, stain, and clear coat.

#### Enduring Understandings

The important steps of creating a product are: initial design concept, design development, final design, and implementation of design.

#### Essential Questions

What are the important steps for taking a design from concept to completion.