Carpentry/Woods I

Grade 9-12

Credits: 5

ABSTRACT

Carpentry/ Woodworking I is designed as a basic exploratory woodworking course. Students learn craftsmanship through established industry standards including the latest technological techniques. The students experience the use of all available hand tools in addition to basic machinery and operations. The properties of wood, construction methods, and finishing procedures are the fundamental units of study. All technical skills, woodworking techniques, consumer knowledge, environmentally sound practices, and safety regulations act as the foundational basis for post-secondary education and/or employment.
## MONTVILLE TOWNSHIP PUBLIC SCHOOLS
Carpentry/Woods I

<table>
<thead>
<tr>
<th>Unit of Study:</th>
<th>Unit #1</th>
<th>Unit #2</th>
<th>Unit #3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Shop Safety &amp; Awareness</strong></td>
<td><strong>Planning/Measuring/Layout</strong></td>
<td><strong>Materials</strong></td>
<td></td>
</tr>
<tr>
<td><strong>(Timeframe)</strong></td>
<td><strong>(2 Weeks and ongoing)</strong></td>
<td><strong>(1 week and ongoing)</strong></td>
<td></td>
</tr>
</tbody>
</table>

### STAGE 1: Desired Results

#### Established Goals: NJSLS:
- **21st Century Life and Careers**
- **Technology**

#### Enduring Understandings:
- Following safety procedures and using personal protection equipment is integral to a technological or industrial work environment.
- Planning is an essential component for design, construction, material usage, and efficiency.
- The basis for all woodworking materials are found in nature.
- Every type of woods has unique properties and characteristics that affect their application.

#### Essential Questions:
1. What are the safety concerns to be considered when working in a lab setting in school or on the job?
2. What protection can be used in the shop environment?
3. What are the elements of an effective safety program?

### STAGE 2: Evidence

#### Assessment & Evidence:
- **Safety Test**
  - Signed safety contracts.
  - Student self-assessment of safety procedures
  - Performance test to include safety scenarios and emergency situations
  - Safety posters to be hung around classroom
- **Student self-assessment**
  - Performance test of material selection for desired purpose
  - Plan of procedure, Bill of Material, and sheet stock optimization forms
  - Final project
- **Written test**
  - Mid-term exam
  - Final exam
  - Performance test of material selection for desired purpose
  - Final project
  - Wood/Material identification quiz

### STAGE 3: Learning Plan
### Learning Activities/Content:

(What is the core content of this unit? What performance tasks/activities will students do? What skills will students know?)

- Teacher lecture and class discussion.
- Students will view a PowerPoint presentation on classroom and occupational safety procedures, and hazardous signage.
- Classroom Research
- Learn school emergency guidelines packet
- Learn how to read a MSDS safety sheet
- Design a safety poster.
- In small groups, create a safety video project relating to shop safety, tool safety or procedure safety

- Teacher lecture/demonstration and class discussion
- Large group guided instruction on form usage
- Station and group work on Measurement of objects linearly, 2 dimensionally and 3 dimensionally
- Learn to read a working drawing to attain necessary information.
- Learn to complete a Measurement worksheet
- Learn dimensional lumber measurements.
- Create a working drawing and materials list project

- Discuss and understand the following:
  - What are the methods of drying lumber?
  - What is the difference between nominal and actual size specifications?
  - What are engineered lumber products?
  - Why are specific forest products more suited to certain applications than others?

### Resources:

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Lecture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td>Lecture</td>
</tr>
<tr>
<td>PowerPoint presentation on classroom and occupational safety procedures, PPE, and hazardous signage.</td>
<td>Bill of materials sheet</td>
</tr>
<tr>
<td>Research</td>
<td>Plan of Procedure sheet(s)</td>
</tr>
<tr>
<td>Computer, projector with screen</td>
<td>Sheet stock optimizing paper</td>
</tr>
<tr>
<td>School emergency guidelines packet</td>
<td>Calculator, ruler, measurement sheets</td>
</tr>
<tr>
<td>MSDS safety sheet</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Research</th>
<th>Lecture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research</td>
<td>Lecture</td>
</tr>
<tr>
<td>Computer, projector with screen</td>
<td>Pieces of lumber, plywood, particle board, Homasote, Masonite, etc</td>
</tr>
<tr>
<td>School emergency guidelines packet</td>
<td>Streaming video clips, virtual field trip</td>
</tr>
<tr>
<td>MSDS safety sheet</td>
<td>Computer, projector with screen</td>
</tr>
</tbody>
</table>

### Interdisciplinary Connections: (e.g. writing, literacy, math, science, history, 21st century life and careers, technology)

<table>
<thead>
<tr>
<th>Mathematics</th>
<th>Mathematics</th>
<th>Mathematics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measuring, arithmetic, and geometry.</td>
<td>Measuring, arithmetic, and geometry.</td>
<td>Measuring, arithmetic, and geometry.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>English Language Arts</th>
<th>English Language Arts</th>
<th>English Language Arts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Writing/journaling and research.</td>
<td>Writing/journaling and research.</td>
<td>Writing/journaling and research.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>9.3.12.AC- CST.5 Apply practices and procedures required to maintain jobsite safety.</td>
<td>9.3.12.AC- CST.5 Apply practices and procedures required to maintain jobsite safety.</td>
<td>9.3.12.AC- CST.5 Apply practices and procedures required to maintain jobsite safety.</td>
</tr>
<tr>
<td>9.3.12.AC- DES.1 Justify design solutions through the use of research documentation and analysis of data.</td>
<td>9.3.12.AC- DES.1 Justify design solutions through the use of research documentation and analysis of data.</td>
<td>9.3.12.AC- DES.1 Justify design solutions through the use of research documentation and analysis of data.</td>
</tr>
<tr>
<td>9.3.12.AC- DES.2 Use effective communication skills and strategies</td>
<td>9.3.12.AC- DES.2 Use effective communication skills and strategies</td>
<td>9.3.12.AC- DES.2 Use effective communication skills and strategies</td>
</tr>
</tbody>
</table>
### Differentiation:
(What type of differentiated instruction will be used for ELL, SP.ED. and G&T students?)

- Students with individual learning styles can be assisted through adjustments in assessment standards, one-to-one teacher support, additional testing time, and use of visual and auditory teaching methods.
- A wide variety of assessments and strategies complement the individual learning experience.
- A hands-on approach to assignments and projects is recommended as the most effective method of learning and assessment.
- Provide time for revision of work when students show need.
- Teachers may also provide ancillary materials and re-teaching assignments to students who require additional practice on the content, themes, concepts and skills of this unit.

### Unit of Study:
(Timeframe)

<table>
<thead>
<tr>
<th>Unit # 4</th>
<th>Unit #5</th>
<th>Unit #6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wood Fasteners and Joinery</td>
<td>Hand Tools of the trade</td>
<td>Power Tools of the trade</td>
</tr>
<tr>
<td>(2 weeks on going)</td>
<td>(2 weeks on going)</td>
<td>(2 weeks on going)</td>
</tr>
</tbody>
</table>

### STAGE 1: Desired Results

**Established Goals:**

**NJSLS:**
(Standards that are only applicable to the unit; include technology and 21st century standards)

|-----------------------------|-----------------------------|-----------------------------|
# Montville Township Public Schools

## Enduring Understandings:
*(What big ideas will students know?)*
- A variety of joinery techniques and fastening methods are integral to woodworking.
- Tools and machinery have specific functions and techniques for usage.

## Essential Questions:
*(What questions are open-ended, debatable, global and spark critical thinking?)*
1. What is the purpose of joinery techniques?
2. What types of mechanical fasteners are used in wood product construction?
3. What types of glues and adhesives are used in wood product construction?

1. Why are hand tools still essential for woodworking?
2. Why are there unique hand tools used for these purposes: cutting, drilling and boring, planing, measuring, drawing, and sanding?

1. How do power tools enhance woodworking?
2. What are the unique machines used for cutting, drilling and boring, routing and shaping, planing and jointing, and sanding?

## Stage 2: Evidence

### Assessment & Evidence:
*(Through what authentic performance tasks will students demonstrate the desired understandings?)
(By what criteria will performances of understanding be judged?)*
- Student self-assessment
- Unit test
- Written test
- Performance test of material selection for desired purpose
- Mid term exam
- Performance test of proper joinery technique
- Performance test of appropriate glue and adhesive selection and application
- Final exam
- Final project

- Lecture and class discussion
- Reading assignment on hand tool usage and safety
- Practice safe use of tools
- Demonstration of proper usage of hand tools
- Models of various styles of hand tools from pioneer days to modern day hand tools
- Select appropriate tool for task at hand
- Models of various styles of hand tools from pioneer days to modern day hand tools
- Including: variety of squares, variety of planes, variety of saws, drills and bits, and variety of sanders.

- Student self-assessment
- Safety test
- Performance test of machine/tool selection for desired purpose
- Performance test of safe use and operation of tools and machinery
- Final exam
- Final project

## Stage 3: Learning Plan

### Learning Activities/Content:
*(What is the core content of this unit? What performance tasks/activities will students do? What skills will students know?)*
- Lecture and class discussion
- Fastening and Joinery Quiz
- Students create a drawing that identifies the following joinery techniques:
  - Butt joint
  - Rabbet joint
  - Dado joint
  - Box or finger joint

- Student self-assessment
- Safety Test on hand tool usage
- Performance test of material selection for desired purpose
- Performance test on tool selection and proper usage
- Safety rules for hand tool usage in notebook
- Final project

- Lecture and class discussion
- Reading assignment on portable power tool and machinery usage and safety
- Demonstration of various power tools that utilize cutting, drilling, boring, routing, shaping, planing, jointing, and sanding.
- Virtual field trip
### MONTVILLE TOWNSHIP PUBLIC SCHOOLS

- Dovetail joint
- Individual Student demonstration technique for the following joinery fastening techniques
  - Countersinking
  - Dowel pin
  - Bisqit joinery
  - Kreg Jig
- Demonstration of proper usage, application, and capabilities of various fasteners.
- Virtual field trip to cabinet shop to show application and creation of various joinery techniques
- Streaming video of process of creating and using glues, adhesives and mechanical fasteners to connect project pieces
- Utilize appropriate joinery depending upon the application.
- Select and utilize appropriate glues and adhesives depending upon application
- Select and utilize necessary mechanical fasteners depending upon the application
- Streaming video
- Practice safe use of tools and machines
- Select appropriate tool/machine for task at hand
- Utilize machinery for intended purpose

### Resources:

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Lecture/Demonstration</th>
<th>Lecture/Demonstration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample pieces of various joints butt joint, lap joint, dado joint, rabbet joint, miter joint etc</td>
<td>Various tools and scrap lumber for demonstration of techniques</td>
<td>Various power tools and scrap lumber for demonstration of techniques</td>
</tr>
<tr>
<td>Streaming video clips</td>
<td>Current textbook</td>
<td>Current textbook</td>
</tr>
<tr>
<td>Computer, projector with screen</td>
<td>Streaming video clips</td>
<td>Streaming video clips</td>
</tr>
<tr>
<td>T square, Try square, speed square, framing square, bench ruler, tape measure, marking gauge, pencil, awl</td>
<td>Portable power tools and machines</td>
<td>Computer, projector with screen</td>
</tr>
<tr>
<td>Computer, projector with screen</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Interdisciplinary Connections: (e.g. writing, literacy, math, science, history, 21st)

- **Mathematics**
  - Measuring, arithmetic, and geometry.
- **Mathematics**
  - Measuring, arithmetic, and geometry.
## MONTVILLE TOWNSHIP PUBLIC SCHOOLS

<table>
<thead>
<tr>
<th>English Language Arts</th>
<th>Writing/journaling and research.</th>
<th>English Language Arts</th>
<th>Writing/journaling and research.</th>
<th>English Language Arts</th>
<th>Writing/journaling and research.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>21st Century Life and Careers</strong></td>
<td>9.3.12.AC- CST.5 Apply practices and procedures required to maintain jobsite safety.</td>
<td>9.3.12.AC- DES.1 Justify design solutions through the use of research documentation and analysis of data.</td>
<td>9.3.12.AC- DES.2 Use effective communication skills and strategies</td>
<td>9.3.12.AC- CST.5 Apply practices and procedures required to maintain jobsite safety.</td>
<td>9.3.12.AC- DES.1 Justify design solutions through the use of research documentation and analysis of data.</td>
</tr>
</tbody>
</table>

### Differentiation:
(What type of differentiated instruction will be used for ELL, SP.ED. and G&T students?)

- Students with individual learning styles can be assisted through adjustments in assessment standards, one-to-one teacher support, additional testing time, and use of visual and auditory teaching methods.
- A wide variety of assessments and strategies complement the individual learning experience.
- A hands-on approach to assignments and projects is recommended as the most effective method of learning and assessment.
- Provide time for revision of work when students show need.
- Teachers may also provide ancillary materials and re-teaching assignments to students who require additional practice on the content, themes, concepts and skills of this unit.

- Students with individual learning styles can be assisted through adjustments in assessment standards, one-to-one teacher support, additional testing time, and use of visual and auditory teaching methods.
- A wide variety of assessments and strategies complement the individual learning experience.
- A hands-on approach to assignments and projects is recommended as the most effective method of learning and assessment.
- Provide time for revision of work when students show need.
- Teachers may also provide ancillary materials and re-teaching assignments to students who require additional practice on the content, themes, concepts and skills of this unit.

- Students with individual learning styles can be assisted through adjustments in assessment standards, one-to-one teacher support, additional testing time, and use of visual and auditory teaching methods.
- A wide variety of assessments and strategies complement the individual learning experience.
- A hands-on approach to assignments and projects is recommended as the most effective method of learning and assessment.
- Provide time for revision of work when students show need.
- Teachers may also provide ancillary materials and re-teaching assignments to students who require additional practice on the content, themes, concepts and skills of this unit.
## MONTVILLE TOWNSHIP PUBLIC SCHOOLS

<table>
<thead>
<tr>
<th>Unit of Study: (Timeframe)</th>
<th>Unit #7 Project Construction (2 weeks on going)</th>
<th>Unit #8 Finishing Techniques (2 weeks on going)</th>
</tr>
</thead>
</table>

### STAGE 1: Desired Results

#### Established Goals: NJSLS:
(Standards that are only applicable to the unit; include technology and 21st century standards)

- **21st Century Life and Careers**

- **21st Century Life and Careers**

#### Enduring Understandings:
(What big ideas will students know?)

- Methods of construction and assembly determine the difference in strength and quality of the final project.

- The type of finish on a wood product will determine its durability and application.

#### Essential Questions:
(What questions are open-ended, debatable, global and spark critical thinking?)

1. Do the methods of construction vary depending upon the project?
2. Is it necessary to carefully consider construction plans, materials, and costs before commencing a project?

1. Are there reasons why there are different types of finishes put on a completed wood product?
2. Does a wood product being inside or outdoors determine the finish used?
3. Why should you know about the types of solvents used in various finishes?
4. Are the procedures for cleaning up after applying finish to a project always the same?

### STAGE 2: Evidence

#### Assessment & Evidence:
(Through what authentic performance tasks will students demonstrate the desired understandings?)
(By what criteria will performances of understanding be judged?)

- **Student self-assessment**
- Written unit test
- Mid-term exam
- Performance test of material selection for desired purpose
- Final exam
- Final project

- **Student self-assessment**
- Written unit test
- Mid-term exam
- Performance test of material selection for desired purpose
- Final exam
- Final project

### STAGE 3: Learning Plan
<table>
<thead>
<tr>
<th>Learning Activities/Content: (What is the core content of this unit? What performance tasks/activities will students do? What skills will students know?)</th>
</tr>
</thead>
<tbody>
<tr>
<td>● Lecture and class discussion</td>
</tr>
<tr>
<td>● Reading assignment on methodology of assembling a project</td>
</tr>
<tr>
<td>● Demonstration of various assembly jobs using rail and stile construction and glued panel construction</td>
</tr>
<tr>
<td>● Virtual field trip – assembly floor of door/window making company</td>
</tr>
<tr>
<td>● Streaming video clip</td>
</tr>
<tr>
<td>● Class specific small tool construction projects:</td>
</tr>
<tr>
<td>o Vanity box</td>
</tr>
<tr>
<td>o Wooden shelf</td>
</tr>
<tr>
<td>o Bookshelf</td>
</tr>
<tr>
<td>o Clock</td>
</tr>
<tr>
<td>o Step Stool</td>
</tr>
<tr>
<td>o Bench</td>
</tr>
<tr>
<td>o Desk top organizer</td>
</tr>
<tr>
<td>● Student specific medium to large project based on student needs that will allow student to use all techniques learned from classroom lessons/lectures.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Resources:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture notes</td>
</tr>
<tr>
<td>Student handout</td>
</tr>
<tr>
<td>Project pieces prepared for assembly</td>
</tr>
<tr>
<td>Current textbook</td>
</tr>
<tr>
<td>Dowelling jig, dowel pins, battery drill, glue, brush, wet paper towels, bar clamps or pipe clamps</td>
</tr>
<tr>
<td>Computer, projector with screen</td>
</tr>
<tr>
<td>Streaming video clips</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Interdisciplinary Connections: (e.g.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics</td>
</tr>
<tr>
<td>Measuring, arithmetic, and geometry.</td>
</tr>
</tbody>
</table>

| Lecture and class discussion |
| Question and answer session |
| Reading assignment on finishes and finishing methodologies |
| Video clips |
| Demonstration of proper application of finishing products including stain clear wood finish, polyurethane, varnish, French polish, and paint |
| Selection of appropriate protective coating per the application |

| Lecture |
| Current textbook |
| Stain, rags, gloves |
| Clear Finish, brush, lacquer thinner |
| Paint, brush, Wax, applicator and buffing cloth |
| Chemical safety handouts, finishing handouts including cleanup directions and application suggestions |
| Computer, projector with screen |
| Streaming video clips |
| MSDS safety sheets |

<p>| Mathematics |
| Measuring, arithmetic, and geometry. |</p>
<table>
<thead>
<tr>
<th>Writing, literacy, math, science, history, 21st century life and careers, technology</th>
</tr>
</thead>
</table>
| **English Language Arts**  
Writing/journaling and research. |
| **21st Century Life and Careers**  
9.3.12.AC- CST.5 Apply practices and procedures required to maintain jobsite safety.  
9.3.12.AC- DES.1 Justify design solutions through the use of research documentation and analysis of data.  
9.3.12.AC- DES.2 Use effective communication skills and strategies |
| **English Language Arts**  
Writing/journaling and research. |
| **21st Century Life and Careers**  
9.3.12.AC- CST.5 Apply practices and procedures required to maintain jobsite safety.  
9.3.12.AC- DES.1 Justify design solutions through the use of research documentation and analysis of data.  
9.3.12.AC- DES.2 Use effective communication skills and strategies |
| Differentiation:  
(What type of differentiated instruction will be used for ELL, SP.ED. and G&T students?) |
| ● Students with individual learning styles can be assisted through adjustments in assessment standards, one-to-one teacher support, additional testing time, and use of visual and auditory teaching methods.  
● A wide variety of assessments and strategies complement the individual learning experience.  
● A hands-on approach to assignments and projects is recommended as the most effective method of learning and assessment.  
● Provide time for revision of work when students show need.  
● Teachers may also provide ancillary materials and re-teaching assignments to students who require additional practice on the content, themes, concepts and skills of this unit. |
| ● Students with individual learning styles can be assisted through adjustments in assessment standards, one-to-one teacher support, additional testing time, and use of visual and auditory teaching methods.  
● A wide variety of assessments and strategies complement the individual learning experience.  
● A hands-on approach to assignments and projects is recommended as the most effective method of learning and assessment.  
● Provide time for revision of work when students show need.  
● Teachers may also provide ancillary materials and re-teaching assignments to students who require additional practice on the content, themes, concepts and skills of this unit. |