

CONSTRUCTION I

Content Standard 8: Production Systems: Students will understand and be able to demonstrate the methods involved in turning raw materials into usable products.

Performance Standard p: demonstrate an ability to safely and accurately use the layout, form, separate, combine, treat and finish tools and processes in manufacturing a product

Content Standard 3: Career Awareness: Students will become aware of the world of work and its function in society, diversity, expectations, trends and requirements.

Performance Standard b: demonstrate an ability to take responsibility for their own actions

| <i>Unit</i> | <i>Learning Objectives</i> | <i>Sample Activities</i> | <i>Assessment Strategies</i> | <i>Resources</i> |
|-------------|--|---|---|--|
| 1. SAFETY | 1a. Students will know how to work safely in the Forest Products Laboratory. They will be able to use the miter saw, band saw, jointer, surfacer planner, and table saw safely | 1a. Safety lessons in general safety and use of the miter saw, band saw, jointer, surfacer planner, and table saw. Students will take safety quizzes for each machine. They must pass each quiz in order to use that machine. | 1a. Safety quizzes and Teacher observation of students while working. | 1a. Safety quizzes for the miter saw, band saw, jointer, surfacer planner, and table saw |

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Content Standard 6: Materials and Processes: Students will know the origins, properties and processing techniques associated with the material building blocks of technology.

Performance Standard a: list the techniques used to extract raw materials from the environment

Performance Standard b: describe the physical structures and properties of materials used in technological systems

Performance Standard c: classify raw materials according to their physical and mechanical properties

| <i>Unit</i> | <i>Learning Objectives</i> | <i>Sample Activities</i> | <i>Assessment Strategies</i> | <i>Resources</i> |
|-----------------------|--|---|--|--|
| 2. WOOD AS A MATERIAL | <p>2a. Students will be able to describe how a tree grows, and how that in turn affects the strength and stability of lumber.</p> <p>2b. Students will be able to identify oak, walnut, mahogany, poplar, maple, cherry, ash, pine, spruce, and Douglas fir.</p> | <p>2a. Lessons on tree growth and wood structure.</p> <p>2b. Students will prepare their own wood sample set.</p> | <p>2a. Quiz</p> <p>2b. Wood identification quiz.</p> | <p>2a. Quiz</p> <p>2b. Wood samples, wood identification quiz.</p> |

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Content Standard 5: Leadership: Students will identify and develop leadership attributes and apply them in team situations.

Performance Standard a: apply organizational skills to classroom and laboratory activities

Performance Standard b: develop a personal time management plan

Performance Standard c: assume roles within a team environment commensurate with their skills and expertise

Performance Standard d: present information in a clear, concise and appropriate manner

Content Standard 8: Production Systems: Students will understand and be able to demonstrate the methods involved in turning raw materials into usable products.

Performance Standard b: differentiate between manufacturing and construction systems

Performance Standard c: trace the historical development of the construction industry

Performance Standard d: differentiate between residential and commercial construction systems

Performance Standard h: demonstrate the safe and accurate use of layout, forming, separating, combining, treating, and finishing tools and procedures in building a shelter or structure

Performance Standard p: demonstrate an ability to safely and accurately use the layout, form, separate, combine, treat and finish tools and processes in manufacturing a product

| <i>Unit</i> | <i>Learning Objectives</i> | <i>Sample Activities</i> | <i>Assessment Strategies</i> | <i>Resources</i> |
|-------------------|--|--|--|--|
| 3. STICK BUILDING | <p>3a. Students will be able to identify these parts of a stick built structure: joist, plate, stud, cripple or jack stud, sill, header, and rafter.</p> <p>3b. Students will be able to layout a wall and rafter.</p> <p>3c. Students will be able to assemble a stick built structure with toe and heal nailing.</p> | <p>3a. Lesson on stick building.</p> <p>3b. Students will layout the walls and floor – 16 inches on center – for a shed. Students will layout a rafter for a shed.</p> <p>3c. Students will assemble a shed.</p> | <p>3a. Quiz</p> <p>3b. Teacher assessment, by rubric, of student layouts.</p> <p>3c. Teacher assessment, by rubric, of shed build.</p> | <p>3a. Quiz and model of shed</p> <p>3b. Lumber for shed. Measuring tape, framing and speed squares.</p> <p>3c. Hammers and nails.</p> |

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| <i>Unit</i> | <i>Learning Objectives</i> | <i>Sample Activities</i> | <i>Assessment Strategies</i> | <i>Resources</i> |
|----------------------------------|--|--|------------------------------|--|
| 3. STICK BUILDING (Continued) | 3d. Students will be able to describe different roofing systems, and their advantages. | 3d. Lesson of roofs. Students will roof shed. | 3d. Quiz | 3d. Samples of various roof types. Quiz. |

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Content Standard 8: Production Systems: Students will understand and be able to demonstrate the methods involved in turning raw materials into usable products.

Performance Standards j: identify and describe the nonstructural characteristics of plumbing, electrical and environmental systems used in construction

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| 4. HOUSE WIRING | <p>4a. Students will be able to describe how AC power distribution systems work.</p> <p>4b. Students will be able to wire 2-way and 3-way switches, as well as convenience outlets and lights.</p> | <p>4a. Lesson.</p> <p>4b. Students will complete a series of wiring exercises.</p> | <p>4a. Quiz</p> <p>4b. Teacher assessment, by rubric, of each students wiring.</p> | <p>4a. Quiz</p> <p>4b. Romex, BX, boxes, outlets, light fixtures, switches, long nose pliers, linesmen pliers, wire nuts, and screw drivers.</p> |

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Content Standard 3: Career Awareness: Students will become aware of the world of work and its function in society, diversity, expectations, trends and requirements.

Performance Standard a: identify career opportunities in the areas of transportation, communications, production and biotechnology

Performance Standard b: demonstrate an ability to take responsibility for their own actions

Performance Standard f: identify future labor market trends

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|-------------|--|--|---------------------------------------|---|
| 5. CAREERS | 5a. Students will be able to describe a number of careers in the building trades, including qualifications and working conditions. | 5a. Students will participate in Construction Careers Day in Wallingford. Students will give a five minute oral report to the class on one career. | 5a. Assessment, by rubric, of report. | 5a. Field trip to Construction Careers Day. |

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| 6. TOOL MAINTENANCE | 6a. Students will be able to sharpen and hone chisels, hand saws, lathe tools, and plane blades. | 6a. Demonstration of grinder, stones, jigs, and saw sets. Students will sharpen a chisel, saw, lathe tool, and plane iron. | 6a. Assessment, by rubric, of student sharpening. | 6a. Grinder, stones, jigs, files, saw set, saw vise, and tools in need of sharpening. |

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Content Standard 4: Problem Solving/Research and Development: Students will recognize technology as the result of a creative act, and will be able to apply disciplined problem-solving strategies to enhance invention and innovation.

Performance Standard a: use research techniques to support design development

Performance Standard c: develop several alternative design solutions to the same problem.

Performance Standard d: use a communication technology to visualize a design idea

Performance Standard h: select appropriate technical processes and fabricate a prototype

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|-------------|---|--|--|--|
| 7. DESIGN | <p>7a. Students will be able to identify the steps of the design process.</p> <p>7b. Students will be able to describe balance, proportion, shape, and scale.</p> | <p>7a. Lesson on the design process.</p> <p>7b. Lesson and student exercises in balance, proportion, shape, and scale.</p> | <p>7a. Quiz</p> <p>7b. Student exercises and quiz.</p> | <p>7a. Design quiz</p> <p>7b. Materials for exercise, including wood for template and drafting tools, and design quiz.</p> |

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Content Standard 10: Enterprise: Students will demonstrate the techniques of enterprise and how they relate to product and service production, economics, human and material resources, and technology.

Performance Standard h: calculate the cost of producing a manufactured product and determine a retail price

| <i>Unit</i> | <i>Learning Objectives</i> | <i>Sample Activities</i> | <i>Assessment Strategies</i> | <i>Resources</i> |
|--------------------------|---|---|---|--|
| 8. TABLE WITH FOUR LEGS. | 8a. Students will be able to prepare a three view sketch of a table of their design, with basic dimensions. | 8a. Students sketch their table design. | 8a. Assessment of sketches by rubric. | 8a. Plain and graph paper for sketching. |
| | 8b. Students will be able to prepare a cut list and estimate materials needed and costs. | 8b. Students complete bill of materials worksheets, including board feet, and cost of materials for table. | 8b. Check for accuracy and completeness, each student's cut list. Quiz on materials estimating. | 8b. Bill of materials worksheets with costs of available woods. Quiz. |
| | 8c. Students will be able to mill lumber. | 8c. Students rough cut wood from the wood pile, and surface four sides with jointer, surface planer, and table saw. | 8c. Asses student work by rubric. | 8c. Selection of hardwood lumber in 4/, 8/4, and 12/4 thickness. Miter saw, jointer, surface planner, and table saw. |
| | 8d. Students will be able to turn or cut matching legs. | 8d. Students prepare a template of their leg. Students use this template to shape their legs. | 8d. Assess student work by rubric. | 8d. MDF or plywood for templates. Lathes with tools, table saw with jigs, and band saw. |

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|---|--|--|---|---|
| <p>8. TABLE WITH FOUR LEGS. (Continued)</p> | <p>8e. Students will be able to layout and cut a mortise and tenon.</p> | <p>8e. Students use a marking gage and square to layout mortise and tenon joints to connect the rails to their legs. Students use a mortiser and saws to cut the joint, and then fit it with shoulder plane and chisel</p> | <p>8e. Assess student work by rubric.</p> | <p>8e. Marking gages and combination squares, mortiser, table saw, band saw, hand saws, shoulder planes, and chisels.</p> |
| | <p>8f. Students will be able to assemble and finish their table.</p> | <p>8f. Students glue up, sand, and apply a finish to their tables.</p> | <p>8f. Assess student work by rubric.</p> | <p>8f. Glue, clamps, brass screws, sanders, abrasive paper, stain, linseed oil, shellac, rags, and brushes.</p> |
| | <p>8g. Students will be able to describe the design designs they made in designing and building their table.</p> | <p>8g. Students complete a reflective writing on their completed tables.</p> | <p>8g. Assess student work by rubric.</p> | <p>8g. Reflective writing worksheet.</p> |

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Content Standard 3: Career Awareness: Students will become aware of the world of work and its function in society, diversity, expectations, trends and requirements.

Performance Standard b: demonstrate an ability to take responsibility for their own actions

Performance Standard c: explain the need to be a lifelong learner

Performance Standard d: exhibit appropriate behaviors in both school and work situations

Performance Standard e: define and demonstrate a personal work ethic

Content Standard 10: Enterprise: Students will demonstrate the techniques of enterprise and how they relate to product and service production, economics, human and material resources, and technology.

Performance Standard d: design a product based on customer need, available materials, tools, equipment and fiscal resources

Performance Standard h: calculate the cost of producing a manufactured product and determine a retail price

| <i>Unit</i> | <i>Learning Objectives</i> | <i>Sample Activities</i> | <i>Assessment Strategies</i> | <i>Resources</i> |
|------------------------|---|--|--|---|
| 9. INDIVIDUAL PROJECTS | 9a. Students will be able to design and build their own projects. | 9a. Students propose, and upon approval, design a project. Students then build their projects. | 9a. Assess student work by rubric developed between the teacher and student. | 9a. The tools and supplies of the forest products laboratory. |

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|---------------------|---|---|---|-------------------------|
| 10. LAB RESTORATION | 10a. Students will demonstrate responsibility for restoring the lab at the end of the year. | 10a. Lab is thoroughly cleaned, and all tools and supplies put away, leaving the lab ready for the next year. | 10a. Student's contribution to lab clean up is evaluated by lab rubric. | 10a. Clean up supplies. |