Unit 3: Layout Design & Planning

Content Area: **Applied Technology**
Course(s):
Time Period: **Marking Period 1**
Length: **5 Days**
Status: **Published**

Brief Summary of Unit

Students will learn about the importance of well-drawn plans and the need for accurate measurement through hands on application of these skills and understandings.

Standards

LA.RST.11-12.1	Accurately cite strong and thorough evidence from the text to support analysis of science and technical texts, attending to precise details for explanations or descriptions.
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.11-12.3	Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.
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.11-12.5	Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.
LA.RST.11-12.6	Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, identifying important issues that remain unresolved.
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.RST.11-12.8	Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.
LA.RST.11-12.9	Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.
HPE.2.1.12	All students will acquire health promotion concepts and skills to support a healthy, active lifestyle.
SOC.6.1.12	U.S. History: America in the World: All students will acquire the knowledge and skills to think analytically about how past and present interactions of people, cultures, and the environment shape the American heritage. Such knowledge and skills enable students to make informed decisions that reflect fundamental rights and core democratic values as productive citizens in local, national, and global communities.
VPA.1.1.12	All students will demonstrate an understanding of the elements and principles that govern the creation of works of art in dance, music, theatre, and visual art.

CAEP.9.2.12.C.1	Review career goals and determine steps necessary for attainment.
CAEP.9.2.12.C.3	Identify transferable career skills and design alternate career plans.
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.

Essential Questions

- What constitutes a design plan?
- Why are accurate planning and layout skills important to the quality of any project?
- What is a working drawing and how is it used?
- What part does the grain of the wood play in the layout process?
- What is the procedure for squaring-up a board and what tools are needed to accomplish the task?

Essential Understandings

- all modern marvels began with a plan.
- getting the most yield out of a piece of lumber is both an economical and ecologically sound practice.
- no amount of skill replaces a well-done plan.
- symbols used in working drawings are standardized in order to improve understanding.
- the woodworker must consider the affects of atmospheric moisture on wood when developing a plan.

Students Will Know

- how to construct a template.
- how to develop a plan and a working drawing.
- how to layout project parts to produce the greatest yield from the material.
- how to properly use a framing square to square-up a board.
- how to take measurements with common measuring tools.
- how to use layout tools to transfer the plans to the wood.
- key terms and vocabulary including but not limited to: grid, estimate, ratio, scale, squaring, pattern, gill of materials, board feet, transfer, rough plan, spec plan, etc.

Students Will Be Skilled At

Evidence/Performance Tasks

- actively and meaningfully participate in all classroom activities, and discussions.
- answer the essential questions.
- complete one or more writing prompts:
- complete self-assessment rubrics for completed work.
- create a bill of materials along with an estimated completed cost for a project.
- create a pattern for a given project from a ¼ scale drawing.
- create a working drawing for a given project.
- demonstrate the ability to use a framing square to properly square-up a board.
- layout project parts to allow for the greatest strength in relation to the wood grain.
- respond to writing prompts: Samuel Slater, a prominent figure in American history depended on accurate plans. Why?
- What period in American history was very dependent on the use of plans?

Learning Plan

- Allow students to work in groups to discuss why plans were so important during the industrial revolution. Have groups present the findings to the class.
- Allow students to work independently to layout their parts on the stock.
- Demonstrate laying out parts on a board emphasizing grain direction, multiple cut parts and same size parts.
- Demonstrate the correct procedure for squaring a board using a framing square.
- Distribute various size boards and have students measure them with a tape measure to the nearest 1/16th of an inch.
- Divide students into groups, distribute sample project parts and have each group layout the parts. Have the students explain to the class why they chose that specific layout. Compare the decisions of all groups.
- Have students create a bill of materials and a plan of procedure for a project.
- Have students create a full size pattern from a ¼ scale drawing.
- Have students read and discuss relevant material in woodworking textbook.
- Have students read and discuss relevant selections in the woodworking textbook.
- Have students record the measurements and determine the board feet of each piece.
- Introduce new vocabulary.
- Present lesson on developing plans.
- Present lesson on layout and using layout tools.
- Preview the essential questions and connect to learning throughout the unit.
- Self-assessment.

Materials

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