Woodworking

Content Area: **Industrial Arts**
Course(s):
Time Period: **Full Year**
Length: **6 Weeks**
Status: **Published**

Unit Overview

As students engage in the design process, and learn how to operate safely in a woodshop, this is their opportunity to put into practice what they have learned. Each grade level will complete a different project.

Enduring Understandings

The creation of each project is unique. From the design process to the finished product, changes will be made from the original design. Each project proposes a problem for students to solve. Through the design process, each student attempts to solve the problem and then begins to execute the design.

Essential Questions

What was the most challenging part of this project?
How could you adapt this design to make it more functional?

Learning Objectives

Students will develop their skills on using had tools, including pull saws, hammers, block planes, brace drills, and eggbeater drills.
Students will use hand saws safely and properly to cut lumber for their projects.
Students will Identify Trademarks and why they are/were used.
Students will identify Stamps (Metal letters) and their use.
Use of a ruler, combination square, tape measure, or other measuring device to measure wood accurately
Choosing the proper clap/vise to hold wood when working with it
Aligning boards and prepping nails to assemble pieces together.
Practice the following techniques – safety, Hand Saws - Rip, crosscut, back, coping, and hack.

Projects

Grades 3 & 4 – Cutting Board
Executing the design process.
Discuss material trade off.
Examine the following: Sustainability, repeatably, and life of the product.
Build a simple machine.
Reinforce measuring and cutting
Utilize hand saw techniques.

Grade 5 – Robot
Executing the design process.
Discuss material trade off.
Examine the following: Sustainability, repeatably, and life of the product.
Build a simple machine.
Reinforce measuring and cutting
Utilize hand saw techniques.

Standards: Content

8.2.5.ED.1	Explain the functions of a system and its subsystems.
8.2.5.ED.2	Collaborate with peers to collect information, brainstorm to solve a problem, and evaluate all possible solutions to provide the best results with supporting sketches or models.
8.2.5.ED.3	Follow step by step directions to assemble a product or solve a problem, using appropriate tools to accomplish the task.
8.2.5.ED.4	Explain factors that influence the development and function of products and systems (e.g., resources, criteria, desired features, constraints).
8.2.5.ED.5	Describe how specifications and limitations impact the engineering design process.
8.2.5.ED.6	Evaluate and test alternative solutions to a problem using the constraints and trade-offs identified in the design process.
8.2.5.ITH.1	Explain how societal needs and wants influence the development and function of a product and a system.
8.2.5.ITH.2	Evaluate how well a new tool has met its intended purpose and identify any shortcomings it might have.
8.2.5.ITH.3	Analyze the effectiveness of a new product or system and identify the positive and/or negative consequences resulting from its use.
8.2.5.ITH.4	Describe a technology/tool that has made the way people live easier or has led to a new business or career.
8.2.5.NT.1	Troubleshoot a product that has stopped working and brainstorm ideas to correct the problem.
8.2.5.NT.2	Identify new technologies resulting from the demands, values, and interests of individuals, businesses, industries, and societies.
8.2.5.NT.3	Redesign an existing product for a different purpose in a collaborative team.
8.2.5.NT.4	Identify how improvement in the understanding of materials science impacts technologies.

Standards: Interdisciplinary

9.4.5.CI.1	Use appropriate communication technologies to collaborate with individuals with diverse perspectives about a local and/or global climate change issue and deliberate about possible solutions (e.g., W.4.6, 3.MD.B.3,7.1.NM.IPERS.6).
1.5.5.Cr1a	Brainstorm and curate ideas to innovatively problem solve during artmaking and design projects.

1.5.5.Cr1b	Individually and collaboratively set goals, investigate, choose, and demonstrate diverse approaches to art-making that is meaningful to the makers.
1.5.5.Cr2a	Experiment and develop skills in multiple art-making techniques and approaches, through invention and practice.
1.5.5.Cr2b	Demonstrate craftsmanship through the safe and respectful use of materials, tools and equipment.
L.KL.5.1	Use knowledge of language and its conventions when writing, speaking, reading, or listening.
L.VL.5.2	Determine or clarify the meaning of unknown and multiple-meaning academic and domain-specific words and phrases based on grade 5 reading and content, choosing flexibly from a range of strategies.
L.WF.3.3	Demonstrate command of the conventions of writing including those listed under grade two foundational skills.
L.VL.4.2	Determine or clarify the meaning of unknown and multiple-meaning academic and domain-specific words and phrases based on grade 4 reading and content, choosing flexibly from a range of strategies.
RI.CR.5.1	Quote accurately from an informational text when explaining what the text says explicitly and make relevant connections when drawing inferences from the text.
L.KL.3.1	Use knowledge of language and its conventions when writing, speaking, reading, or listening.
L.VL.3.2	Determine or clarify the meaning of unknown and multiple-meaning academic and domain-specific words and phrases based on grade 3 reading and content, choosing flexibly from a range of strategies.
RI.CR.4.1	Refer to details and examples as textual evidence when explaining what an informational text says explicitly and make relevant connections when drawing inferences from the text.
8.2.5.ITH.2	Evaluate how well a new tool has met its intended purpose and identify any shortcomings it might have.
RI.CR.3.1	Ask and answer questions and make relevant connections to demonstrate understanding of an informational text, referring explicitly to textual evidence as the basis for the answers.
W.WR.4.5	Conduct short research projects that use multiple reference sources (print and non-print) and build knowledge through investigation of different aspects of a topic.
W.RW.4.7	Write routinely over extended time frames (with time for research and revision) and shorter time frames (a single sitting) for a range of tasks, purposes, and audiences.
SL.PE.4.1	Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 topics and texts, building on others' ideas and expressing their own clearly.
SL.PE.4.1.D	Review the key ideas expressed and explain their own ideas and understanding in light of the discussion.
W.RW.3.7	Engage in independent and task-based writing for both short and extended periods of time, producing written work routinely.
SL.AS.4.6	Differentiate between contexts that call for formal English (e.g., presenting ideas) and situations where informal discourse is appropriate (e.g., small-group discussion); use formal English when appropriate to task and situation.
SL.UM.3.5	Use multimedia to demonstrate fluid reading at an understandable pace; add visual displays when appropriate to emphasize or enhance certain facts or details.
SL.AS.3.6	Speak in complete sentences when appropriate to task and situation in order to provide requested detail or clarification.

Assessment Evidence

Formative	Collaborative Activities, Homework, Classwork, Discussion, Independent Class Assignment, Informal Observations of Students, Interactive Notebooks, Sketchbooks, Safety test
Summative	Tests, Pre-Assessments, Quizzes, Written Responses, Projects
Alternative & Benchmark	Alternative - Read to the student and chart oral responses, graphic organizers, observations, portfolios of student work, orally administered assessments, Project based-learning, Sketchbook Benchmark – LinkIt Benchmark Assessment, Teacher generated summative assessments
Assessment Evidence Resource	

Instructional Resources

Smartboard, Computers, iPads, websites and digital interactives/models, Multi-media presentations, video streaming, Brain Pop, Microsoft 365, hand tools, wood, machines, safety glasses, pencils, folders, rulers, other appropriate tools for the shop.

Instructional Resource List

Curricular Mandates

Below are the curricular requirements as defined in NJ Administrative Code and Statute

	Amistad		Diversity, Equity, and Inclusion
	Holocaust		LGBT and Disabilities (Grades 6-12)
	Climate Change		Asian American & Pacific Islander

Social Emotional Learning (SEL) Competencies

NJ Social and Emotional Learning Competencies & Sub-Competencies

	Self-Awareness	X	Relationship Skills
	Responsible Decision-Making		Social Awareness
	Self-Management		

21st Century Skills & Themes

X	Global and Cultural Awareness		Technology Literacy		Planning and Budgeting
X	Creativity and Innovation		Financial Institutions		Risk Management and Insurance
	Information and Media Literacy		Digital Citizenship		Economic and Government Influences
	Critical Thinking and Problem Solving		Credit Profile		Career Awareness and Planning
	Civic Financial Responsibility		Financial Psychology		