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
Grade 6 – Gumball Dispenser
Executing the design process.
Discuss material trade off.
Examine the following: Sustainability, repeatably, and life of the product.
Use of the handsaw techniques

Grade 7 – Catapult
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 8 – CO2 Powered Racecar
Executing the design process.
Discuss material trade off.
Examine the following: Sustainability, repeatably, and life of the product.
Build a simple machine involving wheels and axles
Utilize the coping saw and pull saw to create a cutout car
Utilize the brace drill to make wheel and body holes
Demonstrate proper set up of the drill press
Drill Press, Safety glasses, drill bits, work sheet
Think about weights and balance for maximum speed

Standards: Content

8.2.8.ED.1	Evaluate the function, value, and aesthetics of a technological product or system, from the perspective of the user and the producer.
8.2.8.ED.2	Identify the steps in the design process that could be used to solve a problem.
8.2.8.ED.3	Develop a proposal for a solution to a real-world problem that includes a model (e.g., physical prototype, graphical/technical sketch).
8.2.8.ED.4	Investigate a malfunctioning system, identify its impact, and explain the step-by-step process used to troubleshoot, evaluate, and test options to repair the product in a collaborative team.
8.2.8.ED.5	Explain the need for optimization in a design process.
8.2.8.ED.6	Analyze how trade-offs can impact the design of a product.
8.2.8.ED.7	Design a product to address a real-world problem and document the iterative design process, including decisions made as a result of specific constraints and trade-offs (e.g., annotated sketches).
8.2.8.ITH.1	Explain how the development and use of technology influences economic, political, social, and cultural issues.
8.2.8.ITH.2	Compare how technologies have influenced society over time.
8.2.8.ITH.3	Evaluate the impact of sustainability on the development of a designed product or system.
8.2.8.ITH.4	Identify technologies that have been designed to reduce the negative consequences of other technologies and explain the change in impact.
8.2.8.ITH.5	Compare the impacts of a given technology on different societies, noting factors that may make a technology appropriate and sustainable in one society but not in another.
8.2.8.NT.1	Examine a malfunctioning tool, product, or system and propose solutions to the problem.
8.2.8.NT.2	Analyze an existing technological product that has been repurposed for a different function.
8.2.8.NT.3	Examine a system, consider how each part relates to other parts, and redesign it for another purpose.

8.2.8.NT.4	Explain how a product designed for a specific demand was modified to meet a new demand and led to a new product.

Standards: Interdisciplinary

L.SS.6.1	Demonstrate command of the system and structure of the English language when writing or speaking.
L.SS.8.1	Demonstrate command of the system and structure of the English language when writing or speaking.
L.SS.7.1	Demonstrate command of the system and structure of the English language when writing or speaking.
9.2.8.CAP.1	Identify offerings such as high school and county career and technical school courses, apprenticeships, military programs, and dual enrollment courses that support career or occupational areas of interest.
1.5.8.Cr1a	Conceptualize early stages of the creative process, including applying methods to overcome creative blocks or take creative risks, and document the processes in traditional or new media.
1.5.8.Cr1b	Develop criteria, identify goals and collaboratively investigate an aspect of present-day life, using contemporary practice of art or design.
1.5.8.Cr2a	Demonstrate persistence and willingness to experiment and take risks during the artistic process. Artists and designers develop excellence through practice and constructive critique, reflecting on, revising and refining work over time.
1.5.8.Cr3a	Use criteria to examine, reflect on and plan revisions for a work of art, and create an artistic statement.
RI.CR.7.1	Cite several pieces of textual evidence and make relevant connections to support analysis of what an informational text says explicitly as well as inferences drawn from the text.
RI.CR.6.1	Cite textual evidence and make relevant connections to support analysis of what an informational text says explicitly as well as inferences drawn from the text.
RI.CR.8.1	Cite a range of textual evidence and make clear and relevant connections (including informational text features such as charts, graphs, and diagrams) that strongly support an analysis of multiple aspects of what an informational text says explicitly, as well as inferences drawn from the text.
9.4.5.IML.1	Evaluate digital sources for accuracy, perspective, credibility and relevance (e.g., Social Studies Practice - Gathering and Evaluating Sources).
W.AW.7.1	Write arguments on discipline-specific content (e.g., social studies, science, technical subjects, English/Language Arts) to support claims with clear reasons and relevant evidence.
W.AW.8.1	Write arguments on discipline-specific content (e.g., social studies, science, technical subjects, English/Language Arts) to support claims with clear reasons and relevant evidence.
W.AW.6.1	Write arguments on discipline-specific content (e.g., social studies, science, math, technical subjects, English/Language Arts) to support claims with clear reasons and relevant evidence.
9.4.5.IML.7	Evaluate the degree to which information meets a need including social emotional learning, academic, and social (e.g., 2.2.5. PF.5).
8.2.8.ITH.1	Explain how the development and use of technology influences economic, political, social, and cultural issues.

SL.PE.7.1	Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 7 topics, texts, and issues, building on others' ideas and expressing their own clearly.
SL.PE.8.1	Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 8 topics, texts, and issues, building on others' ideas and expressing their own clearly.
SL.PE.6.1	Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 6 topics, texts, and issues, building on others' ideas and expressing their own clearly.

Assessment Evidence

Formative	Collaborative Activities, Homework, Classwork, Discussion, Independent Class Assignment, Informal Observations of Students, Interactive Notebooks, Sketchbooks, Safety Assessments
Summative	Tests, Pre-Assessments, Quizzes, Written Responses, Projects, Safety Test
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		Relationship Skills
	Responsible Decision-Making		Social Awareness
X	Self-Management		

21st Century Skills & Themes

	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
X	Critical Thinking and Problem Solving		Credit Profile		Career Awareness and Planning
	Civic Financial Responsibility		Financial Psychology		