

<b>Advanced Woods</b>		<b>Grades 9-12</b>	
<b>Standards</b>		<b>Benchmarks</b>	<b>Activities/Examples</b>
1. Students will develop an understanding of the characteristics and scope of technology.	J	The nature and development of technological knowledge and processes are functions of the setting.	Students use processes learned in Woods I and II to create and design their own projects at a high level.
			Students create a project proposal which must include a drawing, materials list, cost and time estimations and present it to their instructor before construction can begin.
2. Students will develop an understanding of the core concepts of technology.	W	Systems thinking applies logic and creativity with appropriate compromises in complex real-life problems.	Nearly all projects are completed using industry-standard processes and equipment.
	Y	The stability of a technological system is influenced by all of the components in the system, especially those in the feedback loop.	Students use the design process and evaluate system components as they are completed.
	Z	Selecting resources involves trade-offs between competing values, such as availability, cost, desirability, and waste.	When students are selecting wood for their project, they need to be thinking about how much it costs and how much waste is involved depending on the design of their project. This is discussed continuously.
	AA	Requirements involve the identification of the criteria and constraints of a product or system and the determination of how they affect the final design and development.	Student projects must meet provided constraints.
	CC	New technologies create new processes.	Students evaluate individual projects with a written summary which includes problems encountered, new techniques learned, exact cost and the exact time required for completion.
	DD	Quality control is a planned process to ensure that a product, service, or system meets established criteria.	Student project proposals are discussed with instructor to ensure process involved will provide highest quality possible.
	EE	Management is the process of planning, organizing, and controlling work.	Students create a project proposal which must include a drawing, materials list, cost and time estimations and present it to their instructor before construction can begin.
	FF	Complex systems have many layers of controls and feedback loops to provide information.	Students evaluate individual projects with a written summary which includes problems encountered, new techniques learned, exact cost and the exact time required for completion.

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5. Students will develop an understanding of the effects of technology on the environment.	J	The alignment of technological processes with natural processes maximizes performance and reduces negative impacts on the environment.	The class discusses why we use the woods that we do (don't use mahogany because it is from the rain forest). Also, we recycle our wood scraps and properly dispose of varnishes, lacquers and varnishes.
8. Students will develop an understanding of the attributes of design.	H	The design process includes defining a problem, brainstorming, researching and generating ideas, identifying criteria and specifying constraints, exploring possibilities, selecting an approach, developing a design proposal, making a model or prototype, testing and evaluating the design using specifications, refining the design, creating or making it, and communicating processes and results.	Students follow the design process to create and write their project proposals. Most designs are a derivative of research. Many projects are posted on social media.
	I	Design problems are seldom presented in a clearly defined form.	Students create a project proposal which must include a drawing, materials list, cost and time estimations and present it to their instructor before construction can begin.
			Students read and summarize a magazine article on any current woodworking topic.
			Students evaluate individual projects with a written summary which includes problems encountered, new techniques learned, exact cost and the exact time required for completion.
J	Established design principles are used to evaluate existing designs, to collect data, and to guide the design process.	Most student project designs are derived from something they have already seen and then recreate it in a manner that fits their design wishes.	
	K	Requirements of a design, such as criteria, constraints, and efficiency, sometimes compete with each other.	Students must design these projects while balancing cost, time, constraint, requirements and abilities.

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9. Students will develop an understanding of engineering design.	I	Established design principles are used to evaluate existing designs, to collect data, and to guide the design process. Engineering design is influenced by personal characteristics, such as creativity, resourcefulness, and the ability to visualize and think abstractly.	Students select appropriate wood finishes and used proper techniques in application. Woodworking projects are typically created with certain standardized processes as a series of sub-processes that create the large design.	
	J	Engineering design is influenced by personal characteristics, such as creativity, resourcefulness, and the ability to visualize and think abstractly. A prototype is a working model used to test a design concept by making actual observations and necessary adjustments.	Students evaluate individual projects with a written summary which includes problems encountered, new Projects are designed and created by individual students according to their needs, preferences, abilities and creativity.	
	10. Students will develop an understanding of the role of troubleshooting, research and development, invention and innovation, and experimentation in problem solving.	I	Research and development is a specific problem-solving approach that is used intensively in business and industry to prepare devices and systems for the marketplace.	Class projects are frequently part of the course. Most of the class projects are requested from the community or school district and always have an intended purpose but rarely include a design or dimensions. Students are required to perform research and development to solve and build the solution along with necessary building processes.
		L	Many technological problems require a multidisciplinary approach.	Many student projects are built from combined operations in welding, woodworking, automotive, machining and construction.

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11. Students will develop the abilities to apply the design process.	M	Identify the design problem to solve and decide whether or not to address it.	Students use the design process to plan their projects.
	N	Identify criteria and constraints and determine how these will affect the design process.	Students use the design process to plan their projects.
	R	Evaluate final solutions and communicate observation, processes, and results of the entire design process, using verbal, graphic, quantitative, virtual, and written means, in addition to three-dimensional models.	Students evaluate individual projects with a written summary which includes problems encountered, new techniques learned, exact cost and the exact time required for completion.
12. Students will develop the abilities to use and maintain technological products and systems.	J	Use computers and calculators in various applications.	Project designs are researched via the internet while students are in the design phase. Calculators are also used extensively to find sizes, square footage and project cost.
	K	Operate and maintain systems in order to achieve a given purpose.	Student projects are the result of combining several systems and practices.
20. Students will develop an understanding of and be able to select and use construction technologies.	J	Infrastructure is the underlying base or basic framework of a system.	Student cabinets/projects all begin by creating the infrastructure of the component.
	K	Structures are constructed using a variety of processes and procedures.	All projects built by students are created through a variety of systematic processes.
	L	The design of structures includes a number of requirements.	All student projects are designed around criteria and constraints.