



MANUFACTURING I & II

CURRICULUM

Middle Township Public Schools

216 S. Main Street

Cape May Court House, NJ 08210

Born: October 17, 2019

Content Area:	Manufacturing I	Grade(s): 9-11			
Unit Plan Title:	Unit 1: General Shop Safety				
Overview					
Essential Content: Safety, Work practice, Hand tool safety, Power tool safety. Grade Level: 9-12					
Enduring Understandings:					
<p><i>Students will understand that...</i></p> <ul style="list-style-type: none">•Shop safety is a developed attitude through gaining understanding of general safety principles.•Shop safety needs to be practiced by all individuals in the classroom.•Safety essentials learned in the workplace carry to other areas outside of the shop.•Woodworking and construction is a dangerous activity and should be treated as such with the utmost respect and seriousness.•Paying close attention to the instructor will result in a safe working knowledge in and around the shop area.					
Essential Questions :					
<ul style="list-style-type: none">•Where are other areas that safe work practices should be applied?•Are hand tool safety practices something that should be used with all types of hand tools, regardless of the type of work being done?• What might some of the distractions be that could cause injuries in the workplace?					
21 st Century Connections					
Check all that apply.		Indicate whether these skills are E -Encouraged, T -Taught, and/or A -Assessed in this unit by marking E, T, A on the line before the appropriate skill.			
21 st Century Interdisciplinary Themes		21 st Century Skills			
	X	Global Awareness		E,T,A	Critical Thinking and Problem Solving
	X	Environmental Literacy		E	Creativity and Innovation
		Health Literacy		E,T,A	Communication and Collaboration
	X	Civic Literacy		E, T	Flexibility and Adaptability

		Financial, Economic , Business and Entrepreneurial Literacy	E	Initiative and Self-Direction
			E,T,A	Social and Cross-Cultural Skills
			E,T,A	Productivity and Accountability
			E	Leadership and Responsibility
			E,T	Informational Literacy Skills
			E,T,A	Media Literacy Skills
			E,T,A	Information, Communication, and Technology (ICT) Literacy
Career Ready Practices:				
<i>Indicate whether these skills are E-Encouraged, T-Taught, or A-Assessed in this unit by marking E, T, A on the line before the appropriate skill.</i>				
	E, T	CRP1. Act as a responsible and contributing citizen and employee		
	E, T, A	CRP2. Apply appropriate academic and technical skills		
		CRP3. Attend to personal health and financial well-being		
	E, A	CRP4. Communicate clearly and effectively with reason		
	T, A	CRP5. Consider the environmental, social and economic impacts of decisions		
	E, T, A	CRP6. Demonstrate creativity and innovation		
	E, T, A	CRP7. Employ valid and reliable research strategies		
	E, T, A	CRP8. Utilize critical thinking to make sense of problems and persevere in solving them		
	E	CRP9. Model integrity, ethical leadership, and effective management		
		CRP10. Plan education and career paths aligned to personal goals		
	E, T, A	CRP11. Use technology to enhance productivity		

	E, T, A	CRP12. Work productively in teams while using cultural global competence
Student Learning Goals/Objectives:		
Students will know.... The student will know: <ol style="list-style-type: none"> 1. How to safely work in the shop area. 2. What is necessary when choosing the proper clothing to wear in the shop? 3. Why safety glasses are to be worn in the shop. 4. The difference is between regular glasses and safety glasses. 5. What is necessary to maintain a clean shop and work area. 6. That injuries should be reported and that there should be proper follow-up. 		<i>Students will be able to (do)...</i> The student will be able to: <ol style="list-style-type: none"> A. Identify a minimum of ten general shop safety practices. B. Recognize safety issues prior to an accident. C. Develop the habit of wearing safety glasses whenever in the shop area or on a job site. D. Create a safe working environment through careful and thorough clean up procedures. E. Learn and understand the importance of maintaining a clean work area in the shop or on the job site. F. Communicate the importance of preventing injuries and reporting them should they occur.
Assessment Evidence:		
Performance Tasks: Completion of a safety assignment. Teacher administered general shop safety test. Class participation for the working days during class.		Other Assessment Measures: Quizzes, tests, essay prompts, homework, review games, tickets out the door, benchmarks, , group research assessment and typed critical thinking assignments.

Content Area:	Manufacturing I		Grade(s): 9-11	
Unit Plan Title:	Unit 2: Project Selection, Planning and Material Review			
Overview				
Essential Content: Project plans, Wood Species/Material, Bill of Material, Style				
Enduring Understandings:				
<p><i>Students will understand that...</i></p> <ul style="list-style-type: none">• A complete set of working plans are necessary for success.•Working plans should include a (drawing) plan, a plan of procedure, and a bill of material.•A general knowledge of styles is necessary to choose an appropriate project.•A good grasp of one’s ability will play a major role in the choice of project.•Material choice will greatly affect the cost of a project.•It is necessary to prepare an estimate of material prior to the beginning of constructing a project.•An understanding of the characteristics of various wood species will enhance the quality of a project.				
Essential Questions :				
<ul style="list-style-type: none">• Why is planning critical in the development of a project?•Will a proper set of plans provide additional knowledge to an individual as they begin working on a project?•Is cost estimating limited to only simple small projects, or is the skill useful beyond the classroom.• If cost estimating is essential in project construction, where might it also be helpful?				
21 st Century Connections				
Check all that apply.			Indicate whether these skills are E -Encouraged, T -Taught, and/or A -Assessed in this unit by marking E, T, A on the line before the appropriate skill.	
21 st Century Interdisciplinary Themes			21 st Century Skills	
	X	Global Awareness	E,T,A	Critical Thinking and Problem Solving
	X	Environmental Literacy	E	Creativity and Innovation

	Health Literacy	E,T,A	Communication and Collaboration
X	Civic Literacy	E, T	Flexibility and Adaptability
	Financial, Economic , Business and Entrepreneurial Literacy	E	Initiative and Self-Direction
		E,T,A	Social and Cross-Cultural Skills
		E,T,A	Productivity and Accountability
		E	Leadership and Responsibility
		E,T	Informational Literacy Skills
		E,T,A	Media Literacy Skills
		E,T,A	Information, Communication, and Technology (ICT) Literacy

Career Ready Practices:

Indicate whether these skills are *E*-Encouraged, *T*-Taught, or *A*-Assessed in this unit by marking *E, T, A* on the line before the appropriate skill.

E, T	CRP1. Act as a responsible and contributing citizen and employee
E, T, A	CRP2. Apply appropriate academic and technical skills
	CRP3. Attend to personal health and financial well-being
E, A	CRP4. Communicate clearly and effectively with reason
T, A	CRP5. Consider the environmental, social and economic impacts of decisions
E, T, A	CRP6. Demonstrate creativity and innovation
E, T, A	CRP7. Employ valid and reliable research strategies
E, T, A	CRP8. Utilize critical thinking to make sense of problems and persevere in solving them
E	CRP9. Model integrity, ethical leadership, and effective management

		CRP10. Plan education and career paths aligned to personal goals
	E, T, A	CRP11. Use technology to enhance productivity
	E, T, A	CRP12. Work productively in teams while using cultural global competence
Student Learning Goals/Objectives:		
Students will know.... The student will know: <ol style="list-style-type: none"> 1. What projects fit the course requirements. 2. What constitutes a complete set of working plans and drawings. 3. How to calculate a bill of material in order to determine project cost. 4. What material is best suited to the project and design that they are constructing. 		<i>Students will be able to (do)...</i> The student will be able to: <ol style="list-style-type: none"> A. Choose a project that is suited to the student's ability. B. Develop or obtain a set of plans that will enable the student to build the project of their choice within the parameters set by the instructor. CRP 2 C. Design a plan of procedure that will enable the student to build the project of their choice. CRP 6 D. Create a working bill of material using an excel spreadsheet to the cost of material needed to build a project. CRP 11 E. Choose the material that is most appropriate for their project based on availability and cost.
Assessment Evidence:		
<i>Performance Tasks:</i>		Other Assessment Measures: Quizzes, tests, essay prompts, homework, review games, tickets out the door, benchmarks, group research assessment and typed critical thinking assignments.

Content Area:	Manufacturing I	Grade(s): 9-11			
Unit Plan Title:	Unit 3: Measurement and Layout Tools				
Overview					
Essential Content: Rulers, Measuring systems, Inch, Fractions, Layout, Square, Straight, Reference.					
Enduring Understandings:					
<p><i>Students will understand that...</i></p> <ul style="list-style-type: none">•The ability to read a ruler is foundational in woodworking.•Measurement and basic manipulations of measurements is as skill the needs to be mastered.•Careful layout and measurement is essential in woodworking.• A variety of tools are available to the woodworker performing layout work.					
Essential Questions:					
<ul style="list-style-type: none">•Where would the ability to read a ruler come into play outside the classroom?•How is an understanding of measurement beneficial?•What would the outcomes be if a lack of mastery in measurement existed?•Can measurement change in its practice and application?					
21 st Century Connections					
Check all that apply.		Indicate whether these skills are E -Encouraged, T -Taught, and/or A -Assessed in this unit by marking E, T, A on the line before the appropriate skill.			
21 st Century Interdisciplinary Themes		21 st Century Skills			
	X	Global Awareness		E,T,A	Critical Thinking and Problem Solving
	X	Environmental Literacy		E	Creativity and Innovation
		Health Literacy		E,T,A	Communication and Collaboration
	X	Civic Literacy		E, T	Flexibility and Adaptability

	Financial, Economic , Business and Entrepreneurial Literacy	E	Initiative and Self-Direction
		E,T,A	Social and Cross-Cultural Skills
		E,T,A	Productivity and Accountability
		E	Leadership and Responsibility
		E,T	Informational Literacy Skills
		E,T,A	Media Literacy Skills
		E,T,A	Information, Communication, and Technology (ICT) Literacy
Career Ready Practices:			
<i>Indicate whether these skills are E-Encouraged, T-Taught, or A-Assessed in this unit by marking E, T, A on the line before the appropriate skill.</i>			
	E, T	CRP1. Act as a responsible and contributing citizen and employee	
	E, T, A	CRP2. Apply appropriate academic and technical skills	
		CRP3. Attend to personal health and financial well-being	
	E, A	CRP4. Communicate clearly and effectively with reason	
	T, A	CRP5. Consider the environmental, social and economic impacts of decisions	
	E, T, A	CRP6. Demonstrate creativity and innovation	
	E, T, A	CRP7. Employ valid and reliable research strategies	
	E, T, A	CRP8. Utilize critical thinking to make sense of problems and persevere in solving them	
	E	CRP9. Model integrity, ethical leadership, and effective management	
		CRP10. Plan education and career paths aligned to personal goals	
	E, T, A	CRP11. Use technology to enhance productivity	

	E, T, A	CRP12. Work productively in teams while using cultural global competence
Student Learning Goals/Objectives:		
Students will know.... The student will know: <ol style="list-style-type: none"> 1. Ruler divisions in the English system of measurement. N-Q.A 3 2. How to read a ruler. N-Q.A 3 3. The various measuring tools available in the shop. 4. How to use measurement in the construction of their individual projects. N-Q.A 3 5. How to add, subtract, and divide measurements. N-Q.A1,2,3 6. How to convert decimals to fractions and fractions to decimals. N-Q.A1,2,3 		Students will be able to (do)... The student will be able to: <ol style="list-style-type: none"> A. Read a ruler down to 32nds of an inch. N-Q.A 3 B. Use the correct hand tool for the layout operation being performed. C. Identify by sight the basic tools used for layout work in woodworking D. Integrate basic math skills students should be able to add, subtract, multiply and divide fractions. N-Q.A1,2,3 E. Convert fractions to decimals. N-Q.A1,2,3 F. Convert decimals to fractions. N-Q.A1,2,3
Assessment Evidence:		
Performance Tasks:		Other Assessment Measures: Quizzes, tests, essay prompts, homework, review games, tickets out the door, benchmarks, group research assessment and typed critical thinking assignments.

Content Area:	Manufacturing I	Grade(s): 9-11			
Unit Plan Title:	Unit 4: Hand Planing				
Overview					
Essential Content: Reference edge, Square, Straight, Hand planes					
Enduring Understandings:					
<p><i>Students will understand that...</i></p> <ul style="list-style-type: none">• All woodwork must establish a reference edge on a piece of lumber.•The most basic of tools use to create a straight and square edge on a board is a hand plane•Proper set up on a hand plane is essential to getting a good cut.•A variety of plane sizes are available to work with a variety of material lengths.•A sharp tool is a safe tool!					
Essential Questions					
<ul style="list-style-type: none">• Is knowledge about hand planning essential in the field of woodworking?•Are there alternatives when creating square edges on boards?•Can hand plane sharpening techniques be applied to other tools in the shop?					
21 st Century Connections					
Check all that apply.		Indicate whether these skills are E -Encouraged, T -Taught, and/or A -Assessed in this unit by marking E , T , A on the line before the appropriate skill.			
21 st Century Interdisciplinary Themes		21 st Century Skills			
	X	Global Awareness		E,T,A	Critical Thinking and Problem Solving
	X	Environmental Literacy		E	Creativity and Innovation
		Health Literacy		E,T,A	Communication and Collaboration

X	Civic Literacy	E, T	Flexibility and Adaptability
	Financial, Economic , Business and Entrepreneurial Literacy	E	Initiative and Self-Direction
		E,T,A	Social and Cross-Cultural Skills
		E,T,A	Productivity and Accountability
		E	Leadership and Responsibility
		E,T	Informational Literacy Skills
		E,T,A	Media Literacy Skills
		E,T,A	Information, Communication, and Technology (ICT) Literacy

Career Ready Practices:

Indicate whether these skills are *E*-Encouraged, *T*-Taught, or *A*-Assessed in this unit by marking *E, T, A* on the line before the appropriate skill.

E, T	CRP1. Act as a responsible and contributing citizen and employee
E, T, A	CRP2. Apply appropriate academic and technical skills
	CRP3. Attend to personal health and financial well-being
E, A	CRP4. Communicate clearly and effectively with reason
T, A	CRP5. Consider the environmental, social and economic impacts of decisions
E, T, A	CRP6. Demonstrate creativity and innovation
E, T, A	CRP7. Employ valid and reliable research strategies
E, T, A	CRP8. Utilize critical thinking to make sense of problems and persevere in solving them
E	CRP9. Model integrity, ethical leadership, and effective management
	CRP10. Plan education and career paths aligned to personal goals

	E, T, A	CRP11. Use technology to enhance productivity
	E, T, A	CRP12. Work productively in teams while using cultural global competence
Student Learning Goals/Objectives:		
Students will know.... The student will know: <ol style="list-style-type: none"> 1. What hand plane to use for the work being done. 2. How to use a hand plane to create a reference edge on a piece of lumber. 3. When a hand plane requires sharpening. 4. How to disassemble, sharpen, clean, and adjust a hand plane for optimum performance. 		<i>Students will be able to (do)...</i> The student will be able to: <ol style="list-style-type: none"> A. Identify the various types of hand planes. B. Demonstrate the ability to properly square the edge of a board. C. Identify the parts of a hand plane. D. Disassemble sharpen and reassemble a hand plane.
Assessment Evidence:		
<i>Performance Tasks:</i>		Other Assessment Measures: Quizzes, tests, essay prompts, homework, review games, tickets out the door, benchmarks, group research assessment and typed critical thinking assignments.

Content Area:	Manufacturing I			Grade(s): 9-11	
Unit Plan Title:	Unit 5: Miter Saw Usage and Safety				
Overview					
Essential Content: Safety, Parts identification, Usage, Procedures, Crosscutting, Miters					
Enduring Understandings:					
<p><i>Students will understand that...</i></p> <ul style="list-style-type: none">• Woodworking is dangerous and great care must be taken when working with power tools• Miter saws can perform a variety of operations quickly and accurately.• Basic miter saw safety procedures must be followed in order to prevent injury.• The miter saw can be used for rough cutting as well as finish work.• The miter saw has become one of the essential machines used in a variety of woodworking trades.					
Essential Questions					
<ul style="list-style-type: none">• What are some of the applications where a miter saw would be the best machine choice, and when would you choose a different machine?• In practicing safe machine usage on the miter saw, what practices could be followed on other machines both inside and outside the shop?• Could there be other applications where a miter saw could be used outside of the field of woodworking?					
21 st Century Connections					
Check all that apply.			Indicate whether these skills are E -Encouraged, T -Taught, and/or A -Assessed in this unit by marking E , T , A on the line before the appropriate skill.		
21 st Century Interdisciplinary Themes			21 st Century Skills		
	X	Global Awareness		E,T,A	Critical Thinking and Problem Solving
	X	Environmental Literacy		E	Creativity and Innovation
		Health Literacy		E,T,A	Communication and Collaboration
	X	Civic Literacy		E, T	Flexibility and Adaptability

	Financial, Economic , Business and Entrepreneurial Literacy	E	Initiative and Self-Direction
		E,T,A	Social and Cross-Cultural Skills
		E,T,A	Productivity and Accountability
		E	Leadership and Responsibility
		E,T	Informational Literacy Skills
		E,T,A	Media Literacy Skills
		E,T,A	Information, Communication, and Technology (ICT) Literacy

Career Ready Practices:

Indicate whether these skills are **E**-Encouraged, **T**-Taught, or **A**-Assessed in this unit by marking **E, T, A** on the line before the appropriate skill.

E, T	CRP1. Act as a responsible and contributing citizen and employee
E, T, A	CRP2. Apply appropriate academic and technical skills
	CRP3. Attend to personal health and financial well-being
E, A	CRP4. Communicate clearly and effectively with reason
T, A	CRP5. Consider the environmental, social and economic impacts of decisions
E, T, A	CRP6. Demonstrate creativity and innovation
E, T, A	CRP7. Employ valid and reliable research strategies
E, T, A	CRP8. Utilize critical thinking to make sense of problems and persevere in solving them
E	CRP9. Model integrity, ethical leadership, and effective management
	CRP10. Plan education and career paths aligned to personal goals
E, T, A	CRP11. Use technology to enhance productivity

	E, T, A	CRP12. Work productively in teams while using cultural global competence
Student Learning Goals/Objectives:		
Students will know.... 1. The parts of the miter saw. 2. How to properly set up a miter saw for the desired cut. 3. How to safely operate the miter saw. CRP 2 4. When to use the miter saw in the completion of their project.		<i>Students will be able to (do)...</i> A. Identify the various parts of the miter saw. B. Set up the miter saw in order to do the following operations: a) Rough cross cut b) Squaring an end c) Cutting a board to length d) Cutting a miter e) Cutting a bevel f) Cutting a compound miter. C. Safely operate the miter saw. CRP 2 D. Practice proper safety techniques in handling and using a miter saw on a job site. E. Complete a miter saw test with a minimum of 80 points prior to using the machine.
Assessment Evidence:		
<i>Performance Tasks:</i>		Other Assessment Measures: Quizzes, tests, essay prompts, homework, review games, tickets out the door, benchmarks, group research assessment and typed critical thinking assignments.

Content Area:		Manufacturing I		Grade(s): 9-11	
Unit Plan Title:		Unit 6: Jointer Usage and Safety			
Overview					
Essential Content: Safety, Parts identification, Usage, Procedures					
Enduring Understandings:					
<p><i>Students will understand that...</i></p> <ul style="list-style-type: none">• The jointer can be used for a variety of woodworking operations.• Establishing a straight edge on a board is essential in woodworking.• A machine must be properly set in order to perform correctly.• Machines are designed and intended to be used for specific purposes.• An understanding of the parts and their functions is essential for working on the Jointer.• Woodworking is dangerous and great care must be taken when working with power tools.					
Essential Questions					
<ul style="list-style-type: none">• Can a basic understanding of the jointer improve your woodworking skills?• Why is the jointer the machine of choice for generating a reference edge?• Are there limits to using different jointers?• In practicing safe machine usage on the jointer, what practices could be followed on other machines both inside and outside of the shop?					
21 st Century Connections					
Check all that apply.			Indicate whether these skills are E -Encouraged, T -Taught, and/or A -Assessed in this unit by marking E, T, A on the line before the appropriate skill.		
21 st Century Interdisciplinary Themes			21 st Century Skills		
	X	Global Awareness		E,T,A	Critical Thinking and Problem Solving
	X	Environmental Literacy		E	Creativity and Innovation
		Health Literacy		E,T,A	Communication and Collaboration

X	Civic Literacy	E, T	Flexibility and Adaptability
	Financial, Economic , Business and Entrepreneurial Literacy	E	Initiative and Self-Direction
		E,T,A	Social and Cross-Cultural Skills
		E,T,A	Productivity and Accountability
		E	Leadership and Responsibility
		E,T	Informational Literacy Skills
		E,T,A	Media Literacy Skills
		E,T,A	Information, Communication, and Technology (ICT) Literacy

Career Ready Practices:

Indicate whether these skills are *E*-Encouraged, *T*-Taught, or *A*-Assessed in this unit by marking *E, T, A* on the line before the appropriate skill.

E, T	CRP1. Act as a responsible and contributing citizen and employee
E, T, A	CRP2. Apply appropriate academic and technical skills
	CRP3. Attend to personal health and financial well-being
E, A	CRP4. Communicate clearly and effectively with reason
T, A	CRP5. Consider the environmental, social and economic impacts of decisions
E, T, A	CRP6. Demonstrate creativity and innovation
E, T, A	CRP7. Employ valid and reliable research strategies
E, T, A	CRP8. Utilize critical thinking to make sense of problems and persevere in solving them
E	CRP9. Model integrity, ethical leadership, and effective management
	CRP10. Plan education and career paths aligned to personal goals

	E, T, A	CRP11. Use technology to enhance productivity
	E, T, A	CRP12. Work productively in teams while using cultural global competence
Student Learning Goals/Objectives:		
Students will know.... 1. The parts of the jointer and how each of them affects the cut. 2. How to safely operate the jointer. 3. When to use the jointer in the completion of their project.		<i>Students will be able to (do)...</i> A. Identify the parts of the jointer and their uses. B. Safely use the jointer in the construction of a woodworking project. C. Identify and perform the following operations on the jointer <ul style="list-style-type: none"> a. Jointing an Edge b. Jointing a Face c. Jointing a Rabbet d. Cutting a Taper e. Cutting a Chamfer. f. Proper use of push sticks D. Complete a safety test on the machine with a minimum of 80 points.
Assessment Evidence:		
<i>Performance Tasks:</i>		Other Assessment Measures: Quizzes, tests, essay prompts, homework, review games, tickets out the door, benchmarks, group research assessment and typed critical thinking assignments.

Content Area:	Manufacturing I	Grade(s): 9-11			
Unit Plan Title:	Unit 7: Band Saw Usage And Safety				
Overview					
Essential Content: Safety, Parts identification, Usage, Procedures, Curves, Compound cutting					
Enduring Understandings:					
<p><i>Students will understand that...</i></p> <ul style="list-style-type: none">•The band saw is a creative as well as fundamental woodworking machine.•Safe operating procedures need to be followed when working on the band saw.•The band saw is essential for creating curved work pieces in woodworking.• While it is a safe woodworking machine the band saw is also a machine that can cause injury when care is not taken in its use.					
Essential Questions					
<ul style="list-style-type: none">• How can a good understanding of the band saw improve your woodworking skills?•Why is the band saw the best choice for creating curves in woodwork and what are some of the features that could affect the way the band saw operates?•What might some of the limits be when using different styles and sizes of band saws?• In practicing safe machine usage on the band saw, what practices could be followed on other machines both inside and outside of the shop?					
21 st Century Connections					
Check all that apply.		Indicate whether these skills are E -Encouraged, T -Taught, and/or A -Assessed in this unit by marking E, T, A on the line before the appropriate skill.			
21 st Century Interdisciplinary Themes		21 st Century Skills			
	X	Global Awareness		E,T,A	Critical Thinking and Problem Solving
	X	Environmental Literacy		E	Creativity and Innovation
		Health Literacy		E,T,A	Communication and Collaboration

X	Civic Literacy	E, T	Flexibility and Adaptability
	Financial, Economic , Business and Entrepreneurial Literacy	E	Initiative and Self-Direction
		E,T,A	Social and Cross-Cultural Skills
		E,T,A	Productivity and Accountability
		E	Leadership and Responsibility
		E,T	Informational Literacy Skills
		E,T,A	Media Literacy Skills
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Career Ready Practices:

Indicate whether these skills are *E*-Encouraged, *T*-Taught, or *A*-Assessed in this unit by marking *E, T, A* on the line before the appropriate skill.

E, T	CRP1. Act as a responsible and contributing citizen and employee
E, T, A	CRP2. Apply appropriate academic and technical skills
	CRP3. Attend to personal health and financial well-being
E, A	CRP4. Communicate clearly and effectively with reason
T, A	CRP5. Consider the environmental, social and economic impacts of decisions
E, T, A	CRP6. Demonstrate creativity and innovation
E, T, A	CRP7. Employ valid and reliable research strategies
E, T, A	CRP8. Utilize critical thinking to make sense of problems and persevere in solving them
E	CRP9. Model integrity, ethical leadership, and effective management
	CRP10. Plan education and career paths aligned to personal goals

	E, T, A	CRP11. Use technology to enhance productivity
	E, T, A	CRP12. Work productively in teams while using cultural global competence
Student Learning Goals/Objectives:		
Students will know.... 1. All the parts of the Band Saw. 2. How to safely use the band saw for a variety of cutting operations. 3. When the band saw is the proper machine for the job. 4. How to change the band saw blade. 5. All safety rules and procedures for the band saw.		<i>Students will be able to (do)...</i> A. Perform the following operations on the band saw. <ul style="list-style-type: none"> • Cutting a curve / following a pattern • Cutting an accurate circle • Compound cutting. • Re-sawing. • Cutting multiple parts. • Cutting pound stock safely. • Cutting with a fence • Freehand cutting. B. Accomplish the necessary compound cutting for roughing out. C. Create a small shape of the student's design using compound cuts on the band saw. D. Change and adjust the band saw blade under teacher supervision. E. Complete a safety test on the machine with a minimum of 80 points. F. Identify and follow all safety operating instructions for the band saw.
Assessment Evidence:		
Performance Tasks:		Other Assessment Measures: Quizzes, tests, essay prompts, homework, review games, tickets out the door, benchmarks, group research assessment and typed critical thinking assignments.

Content Area:	Manufacturing I	Grade(s): 9-11			
Unit Plan Title:	Unit 8: Drill Press Usage and Safety				
Overview					
Essential Content: Safety, Parts identification, Usage, Procedures, Drill bit types, Set up					
Enduring Understandings:					
<p><i>Students will understand that...</i></p> <ul style="list-style-type: none">•Woodworking is dangerous and great care must be taken when working with power tools.•Greater accuracy is attainable with a drill press over the use of a hand electric drill.•The drill press is usable with a great variety of materials and not limited to woodworking.• The drill press is capable of a variety of operations.					
Essential Questions					
<ul style="list-style-type: none">•Can a good understanding of the drill press improve your woodworking skills?•What are some of the factors that make the drill press the best choice?•What are some of the features that could affect the way the drill press operates?•What might some of the limits be when using different styles and sizes of drill press or boring machines?•In practicing safe machine usage on the drill, what practices could be followed on other machines both inside and outside of the shop?					
21 st Century Connections					
Check all that apply.		Indicate whether these skills are E -Encouraged, T -Taught, and/or A -Assessed in this unit by marking E, T, A on the line before the appropriate skill.			
21 st Century Interdisciplinary Themes		21 st Century Skills			
	X	Global Awareness		E,T,A	Critical Thinking and Problem Solving
	X	Environmental Literacy		E	Creativity and Innovation
		Health Literacy		E,T,A	Communication and Collaboration

X	Civic Literacy
	Financial, Economic , Business and Entrepreneurial Literacy

E, T	Flexibility and Adaptability
E	Initiative and Self-Direction
E,T,A	Social and Cross-Cultural Skills
E,T,A	Productivity and Accountability
E	Leadership and Responsibility
E,T	Informational Literacy Skills
E,T,A	Media Literacy Skills
E,T,A	Information, Communication, and Technology (ICT) Literacy

Career Ready Practices:

Indicate whether these skills are *E*-Encouraged, *T*-Taught, or *A*-Assessed in this unit by marking *E, T, A* on the line before the appropriate skill.

E, T	CRP1. Act as a responsible and contributing citizen and employee
E, T, A	CRP2. Apply appropriate academic and technical skills
	CRP3. Attend to personal health and financial well-being
E, A	CRP4. Communicate clearly and effectively with reason
T, A	CRP5. Consider the environmental, social and economic impacts of decisions
E, T, A	CRP6. Demonstrate creativity and innovation
E, T, A	CRP7. Employ valid and reliable research strategies
E, T, A	CRP8. Utilize critical thinking to make sense of problems and persevere in solving them
E	CRP9. Model integrity, ethical leadership, and effective management
	CRP10. Plan education and career paths aligned to personal goals

	E, T, A	CRP11. Use technology to enhance productivity
	E, T, A	CRP12. Work productively in teams while using cultural global competence
Student Learning Goals/Objectives:		
Students will know.... 1. All the parts of the Drill Press. 2. How to safely use the drill press for a variety of boring operations. 3. When the drill press is the proper machine for the job. 4. How to change the bits on the drill press. 5. How to change the speed of the drill press and when it needs to be adjusted. 6. All safety rules and procedures for the drill press.		<i>Students will be able to (do)...</i> A. Identify the parts of the drill press and their use. B. Demonstrate proper clamping techniques for securing work to the table of the drill press. C. Set up the drill press for the following situations. a. Drilling a deep hole b. Drilling into small work pieces and stock. c. Drilling into round sock with the use of a v-block or clamp d. Drilling multiple holes along a straight line. e. Sanding with a drum sander on the drill press. f. Drilling holes with large bits. D. Determine the proper drill bit / cutter for a specific operation. E. Use the drill press for operations required on the construction of a woodworking project. F. Determine and set the proper operating speed of the drill press as determined by the bit / cutter being used. G. Complete a safety test on the machine with a minimum of 80 points.
Assessment Evidence:		
Performance Tasks:		Other Assessment Measures: Quizzes, tests, essay prompts, homework, review games, tickets out the door, benchmarks, group research assessment and typed critical thinking assignments.

Content Area:	Manufacturing I	Grade(s): 9-11		
Unit Plan Title:	Unit 10: Basic Wood Joinery			
Overview				
Essential Content: Butt joint, Dowels, Biscuits, Edge joints, Leg and Rail, Miters, Dado				
Enduring Understandings:				
<p><i>Students will understand that...</i></p> <ul style="list-style-type: none">• Joinery in woodworking is not limited to the use of mechanical fasteners.• Modern adhesives are not a substitute for quality cut wood joinery.• Wood joinery can be cut using a variety of methods that include both hand cutting as well as machine cutting of the wood.• Quality woodworking incorporates the use of quality joinery.• There are both standard and common joinery methods as well as many very specialized types of joinery.				
Essential Questions				
<ul style="list-style-type: none">• Why are certain joints chosen over other joints?• Can choosing the wrong type of woodworking joint affect the integrity of a piece of furniture?• What would seem most reliable, mechanical fasteners or well fitted joinery, and is there a place for both?• How can the execution of woodworking joinery affect the strength?				
21 st Century Connections				
Check all that apply.		Indicate whether these skills are E -Encouraged, T -Taught, and/or A -Assessed in this unit by marking E, T, A on the line before the appropriate skill.		
21 st Century Interdisciplinary Themes		21 st Century Skills		
	X	Global Awareness	E,T,A	Critical Thinking and Problem Solving
	X	Environmental Literacy	E	Creativity and Innovation
		Health Literacy	E,T,A	Communication and Collaboration

X	Civic Literacy	E, T	Flexibility and Adaptability
	Financial, Economic , Business and Entrepreneurial Literacy	E	Initiative and Self-Direction
		E,T,A	Social and Cross-Cultural Skills
		E,T,A	Productivity and Accountability
		E	Leadership and Responsibility
		E,T	Informational Literacy Skills
		E,T,A	Media Literacy Skills
		E,T,A	Information, Communication, and Technology (ICT) Literacy

Career Ready Practices:

Indicate whether these skills are *E*-Encouraged, *T*-Taught, or *A*-Assessed in this unit by marking *E, T, A* on the line before the appropriate skill.

E, T	CRP1. Act as a responsible and contributing citizen and employee
E, T, A	CRP2. Apply appropriate academic and technical skills
	CRP3. Attend to personal health and financial well-being
E, A	CRP4. Communicate clearly and effectively with reason
T, A	CRP5. Consider the environmental, social and economic impacts of decisions
E, T, A	CRP6. Demonstrate creativity and innovation
E, T, A	CRP7. Employ valid and reliable research strategies
E, T, A	CRP8. Utilize critical thinking to make sense of problems and persevere in solving them
E	CRP9. Model integrity, ethical leadership, and effective management
	CRP10. Plan education and career paths aligned to personal goals

	E, T, A	CRP11. Use technology to enhance productivity
	E, T, A	CRP12. Work productively in teams while using cultural global competence
Student Learning Goals/Objectives:		
Students will know.... 1. A variety of different woodworking joints. 2. How to choose the proper joint for a variety of applications. 3. How to identify the following wood joints: <ul style="list-style-type: none"> • Miter • Dado • Rabbet • dowel • Groove 4. How to clamp boards together. 5. How to square up a clamped assembly so that it ends up square.		<i>Students will be able to (do)...</i> A. Identify a minimum of 5 different types of wood joinery. B. Determine the most appropriate woodworking joint for the situation. C. Create the following wood joints using machine or hand tool methods. <ul style="list-style-type: none"> • Dado • Dado / Rabbet • Groove • Stop Dado • Miter • Spline miter • Dowel Butt Joint • Dovetail • Finger joint • Mortise and tenon D. Identify the proper clamping technique for the various joinery types. E. Assess assemblies for square and understand the importance of a square assembly.
Assessment Evidence:		
<i>Performance Tasks:</i>		<i>Other Assessment Measures:</i> Quizzes, tests, essay prompts, homework, review games, tickets out the door, benchmarks, group research assessment and typed critical thinking assignments.

Content Area:		Manufacturing I		Grade(s): 9-11	
Unit Plan Title:		Unit 11: Abrasives and Prepping for A Finish			
Overview					
Essential Content: Abrasive types, Grits, Backing types, Backing Weights, Procedure, Sanders					
Enduring Understandings:					
<p><i>Students will understand that...</i></p> <ul style="list-style-type: none">•Abrasives are graded and need to be used in a specific order.•There are various abrasive materials; each possessing a particular quality, and they need to be used for a specific purpose.•Proper use of abrasives in preparing for a finish will result in a quality finish.•Attention to detail is key in preparing for a finish.• Sanding is by far the most tedious part of the woodworking process and must be approached in a very methodical fashion to be completed most efficiently as possible.					
Essential Questions					
<ul style="list-style-type: none">• Does the selection of various types and grits of abrasive material affect the results when preparing for a finish?•What sanding techniques would be most effective when working with a variety of wood species?•Why are abrasives necessary to woodworking and what could their applications be outside of the woodworking field?•What might some alternative techniques be to using abrasives on wood?					
21 st Century Connections					
Check all that apply.			Indicate whether these skills are E -Encouraged, T -Taught, and/or A -Assessed in this unit by marking E, T, A on the line before the appropriate skill.		
21 st Century Interdisciplinary Themes			21 st Century Skills		
	X	Global Awareness		E,T,A	Critical Thinking and Problem Solving
	X	Environmental Literacy		E	Creativity and Innovation
		Health Literacy		E,T,A	Communication and Collaboration
	X	Civic Literacy		E, T	Flexibility and Adaptability

	Financial, Economic , Business and Entrepreneurial Literacy

E	Initiative and Self-Direction
E,T,A	Social and Cross-Cultural Skills
E,T,A	Productivity and Accountability
E	Leadership and Responsibility
E,T	Informational Literacy Skills
E,T,A	Media Literacy Skills

Career Ready Practices:

Indicate whether these skills are *E-Encouraged*, *T-Taught*, or *A-Assessed* in this unit by marking *E, T, A* on the line before the appropriate skill.

E, T	CRP1. Act as a responsible and contributing citizen and employee
E, T, A	CRP2. Apply appropriate academic and technical skills
	CRP3. Attend to personal health and financial well-being
E, A	CRP4. Communicate clearly and effectively with reason
T, A	CRP5. Consider the environmental, social and economic impacts of decisions
E, T, A	CRP6. Demonstrate creativity and innovation
E, T, A	CRP7. Employ valid and reliable research strategies
E, T, A	CRP8. Utilize critical thinking to make sense of problems and persevere in solving them
E	CRP9. Model integrity, ethical leadership, and effective management
	CRP10. Plan education and career paths aligned to personal goals
E, T, A	CRP11. Use technology to enhance productivity
E, T, A	CRP12. Work productively in teams while using cultural global competence

Student Learning Goals/Objectives:	
<p>Students will know....</p> <ol style="list-style-type: none"> 1. What the different grits of abrasive are. 2. How to properly sand a piece of wood. 3. How to properly prepare a project for finishing. 4. How to set up and use power sanders. 	<p><i>Students will be able to (do)...</i></p> <ol style="list-style-type: none"> A. Understand the grading of abrasives and be able to choose the proper grit size for the job. B. Demonstrate the techniques for using abrasives when hand sanding. C. Demonstrate the techniques for using abrasives when power sanding. D. Understand the system used for grading abrasives and how the various grading terminologies relate to each other. E. Sand and prepare a surface for finishing.
Assessment Evidence:	
<p><i>Performance Tasks:</i></p>	<p>Other Assessment Measures: Quizzes, tests, essay prompts, homework, review games, tickets out the door, benchmarks, group research assessment and typed critical thinking assignments.</p>

Content Area:	Manufacturing I	Grade(s): 9-11			
Unit Plan Title:	Unit 12: Basic Wood Finishing				
Overview					
Essential Content: Safety, Staining, Top coating, Clear finish types, Methods of application					
Enduring Understandings:					
<p><i>Students will understand that...</i></p> <ul style="list-style-type: none">•There are a great variety of finishes available in woodworking.•Different finishes are suited to different purposes and a woodworker needs to choose the proper finish for the application that it is being used for.•Wood finishing involves working with hazardous materials at times and needs to be treated with caution when appropriate.•Wood finishing enhances the appearance of woodwork while at the same time protecting the wood from moisture, dirt, light, etc.•There are a variety of methods used to apply finish and a basic understanding of several methods is essential.					
Essential Questions					
<ul style="list-style-type: none">• How does someone determine the best finish to use on a particular project?•Why might one method of finish application be chosen over another?•How does someone determine when greater safety measures need to be followed when applying the various finishes woodworkers can choose from?•If finishing ultimately has the purpose of protecting the wood and many finishes can accomplish that, what are some of the variables that determine finish choice?					
21 st Century Connections					
Check all that apply.		Indicate whether these skills are E -Encouraged, T -Taught, and/or A -Assessed in this unit by marking E, T, A on the line before the appropriate skill.			
21 st Century Interdisciplinary Themes		21 st Century Skills			
	X	Global Awareness		E,T,A	Critical Thinking and Problem Solving
	X	Environmental Literacy		E	Creativity and Innovation

	Health Literacy	E,T,A	Communication and Collaboration
X	Civic Literacy	E, T	Flexibility and Adaptability
	Financial, Economic , Business and Entrepreneurial Literacy	E	Initiative and Self-Direction
		E,T,A	Social and Cross-Cultural Skills
		E,T,A	Productivity and Accountability
		E	Leadership and Responsibility
		E,T	Informational Literacy Skills
		E,T,A	Media Literacy Skills
		E,T,A	Information, Communication, and Technology (ICT) Literacy

Career Ready Practices:

Indicate whether these skills are *E*-Encouraged, *T*-Taught, or *A*-Assessed in this unit by marking *E, T, A* on the line before the appropriate skill.

E, T	CRP1. Act as a responsible and contributing citizen and employee
E, T, A	CRP2. Apply appropriate academic and technical skills
	CRP3. Attend to personal health and financial well-being
E, A	CRP4. Communicate clearly and effectively with reason
T, A	CRP5. Consider the environmental, social and economic impacts of decisions
E, T, A	CRP6. Demonstrate creativity and innovation
E, T, A	CRP7. Employ valid and reliable research strategies
E, T, A	CRP8. Utilize critical thinking to make sense of problems and persevere in solving them
E	CRP9. Model integrity, ethical leadership, and effective management
	CRP10. Plan education and career paths aligned to personal goals

	E, T, A	CRP11. Use technology to enhance productivity
	E, T, A	CRP12. Work productively in teams while using cultural global competence
Student Learning Goals/Objectives:		
Students will know.... 1. How to stain their project. 2. The various topcoat finishes that are available. 3. How to apply a variety of finishes. 4. How to brush on a finish. 5. How to wipe on a finish. 6. What a properly applied finish should look like.		<i>Students will be able to (do)...</i> A. Apply a stain to a project. B. Identify the various finishes that are available in the shop. C. Identify the proper finish application method for the finish type. D. Demonstrate the proper technique when finishing by brush application. E. Demonstrate the proper technique when finishing by using a wipe on application. F. Complete a proper finishing job on a project that the student constructed. G. Determine the safety rules that need to be followed in the application of wood finishes.
Assessment Evidence:		
<i>Performance Tasks:</i>		Other Assessment Measures: Quizzes, tests, essay prompts, homework, review games, tickets out the door, benchmarks, group research assessment and typed critical thinking assignments.

Content Area:	Manufacturing II	Grade(s): 10-12
Unit Plan Title:	Unit 1: General Shop Safety	
Overview		
Essential Content: Safety, Work practice, Hand tool safety, Power tool safety.		

Enduring Understandings:

Students will understand that...

- Shop safety is a developed attitude through gaining understanding of general safety principles.
- Shop safety needs to be practiced by all individuals in the classroom.
 - Safety essentials learned in the workplace carry to other areas outside of the shop.
- Woodworking and construction is a dangerous activity and should be treated as such with the utmost respect and seriousness.
- Paying close attention to the instructor will result in a safe working knowledge in and around the shop area.
- Careful study of both general and specific safety practices will result in a safe working environment.

Essential Questions :

- Where are other areas that safe work practices should be applied?
- Are hand tool safety practices something that should be used with all types of hand tools, regardless of the type of work being done?
- What might some of the distractions be that could cause injuries in the workplace?

21st Century Connections

Check all that apply.			Indicate whether these skills are E -Encouraged, T -Taught, and/or A -Assessed in this unit by marking E , T , A on the line before the appropriate skill.		
21 st Century Interdisciplinary Themes			21 st Century Skills		
	X	Global Awareness		E,T,A	Critical Thinking and Problem Solving
	X	Environmental Literacy		E	Creativity and Innovation
		Health Literacy		E,T,A	Communication and Collaboration
	X	Civic Literacy		E, T	Flexibility and Adaptability
		Financial, Economic , Business and Entrepreneurial Literacy		E	Initiative and Self-Direction
				E,T,A	Social and Cross-Cultural Skills
				E,T,A	Productivity and Accountability
				E	Leadership and Responsibility

		E,T	Informational Literacy Skills
		E,T,A	Media Literacy Skills
		E,T,A	Information, Communication, and Technology (ICT) Literacy
Career Ready Practices:			
Indicate whether these skills are E -Encouraged, T -Taught, or A -Assessed in this unit by marking E, T, A on the line before the appropriate skill.			
	E, T	CRP1. Act as a responsible and contributing citizen and employee	
	E, T, A	CRP2. Apply appropriate academic and technical skills	
		CRP3. Attend to personal health and financial well-being	
	E, A	CRP4. Communicate clearly and effectively with reason	
	T, A	CRP5. Consider the environmental, social and economic impacts of decisions	
	E, T, A	CRP6. Demonstrate creativity and innovation	
	E, T, A	CRP7. Employ valid and reliable research strategies	
	E, T, A	CRP8. Utilize critical thinking to make sense of problems and persevere in solving them	
	E	CRP9. Model integrity, ethical leadership, and effective management	
		CRP10. Plan education and career paths aligned to personal goals	
	E, T, A	CRP11. Use technology to enhance productivity	
	E, T, A	CRP12. Work productively in teams while using cultural global competence	
Student Learning Goals/Objectives:			
Students will know....		Students will be able to (do)...	
The student will know:		The student will be able to:	
1. 1. How to safely work in the shop area.		A. Identify a minimum of ten general shop safety practices.	
2. What is necessary when choosing the proper clothing to wear in the		B. Be able to identify safety issues prior to an accident.	

<p>shop.</p> <p>3. Why safety glasses are to be worn in the shop.</p> <p>4. What the difference is between regular glasses and safety glasses.</p> <p>5. What is necessary to maintain a clean shop and work area.</p> <p>6. That injuries should be reported and that there should be proper follow</p>	<p>C. Develop the habit of wearing safety glasses whenever in the shop area or on a job site.</p> <p>D. Create a safe working environment through careful and thorough clean up procedures.</p> <p>E. Learn and understand the importance of maintaining a clean work area in the shop or on the job site.</p>
Assessment Evidence:	
<p>Performance Tasks:</p> <p>Progress on student's projects will be evaluated twice per marking period, once at the midpoint and once at the end. Project grades will be determined by the teacher with student input provided by the projects grading worksheet. Project grades will account for 60% of the student's course average.</p> <p>Assessments are made on a regular basis with a minimum of a biweekly grade. Some specific assignments will be considered as performance assessment grades. Daily performance assessment grades should be averaged into weekly grades. Performance assessment grades will account for 20% of the student's course average.</p> <p>Performance Assessment Criteria :</p> <ul style="list-style-type: none"> *Time on task / Project work through the period. *Ability to follow general shop safety rules. *Safety glasses *Talking while on a machine. *Clean up activities at the end of the period. *Attentiveness during lectures and demonstrations. *Willingness to assist others as needed. *Completion of additional in class assignments. 	<p>Other Assessment Measures: Quizzes, tests, essay prompts, homework, review games, tickets out the door, benchmarks, group research assessment and typed critical thinking assignments.</p> <p>Each unit will include at least one written assessment in order to insure that students are able to organize, process, and apply what they have learned in an individual, standardized context. Written assessments will account for 20% of the student's course average.</p>

Content Area:	Manufacturing II	Grade(s): 10-12
Unit Plan Title:	Unit 2: Project Selection, Planning and Material Review	
Overview		
Essential Content: Project plans, Wood Species/Material, Bill of Material, Style		
Enduring Understandings:		

Students will understand that...

- A complete set of working plans are necessary for success.
- Working plans should include a plan (drawing), a plan of procedure, and a bill of material.
- A general knowledge of styles is necessary to choose an appropriate project.
- A good grasp of one's ability will play a major role in the choice of project.
- Material choice will greatly affect the cost of a project.
- It is necessary to prepare an estimate of material prior to the beginning of constructing a project.
- An understanding of the characteristics of various wood species will enhance the quality of a project.

Essential Questions :

- Is planning critical in the development of a project?
- Will a proper set of plans provide additional knowledge to an individual as they begin working on a project?
- Is cost estimating limited to only simple small projects, or is the skill useful beyond the classroom?
- If cost estimating is essential in project construction, where might it also be helpful?
- Is there more than one way to complete a job?

21st Century Connections

<i>Check all that apply.</i>			<i>Indicate whether these skills are E-Encouraged, T-Taught, and/or A-Assessed in this unit by marking E, T, A on the line before the appropriate skill.</i>		
21st Century Interdisciplinary Themes			21st Century Skills		
	X	Global Awareness		E,T,A	Critical Thinking and Problem Solving
	X	Environmental Literacy		E	Creativity and Innovation
		Health Literacy		E,T,A	Communication and Collaboration
	X	Civic Literacy		E, T	Flexibility and Adaptability
		Financial, Economic , Business and Entrepreneurial		E	Initiative and Self-Direction
				E,T,A	Social and Cross-Cultural Skills

	Literacy

E,T,A
E
E,T
E,T,A
E,T,A

Productivity and Accountability

Leadership and Responsibility

Informational Literacy Skills

Media Literacy Skills

Information, Communication, and Technology (ICT) Literacy

Career Ready Practices:

Indicate whether these skills are E-Encouraged, T-Taught, or A-Assessed in this unit by marking E, T, A on the line before the appropriate skill.

E, T	CRP1. Act as a responsible and contributing citizen and employee
E, T, A	CRP2. Apply appropriate academic and technical skills
	CRP3. Attend to personal health and financial well-being
E, A	CRP4. Communicate clearly and effectively with reason
T, A	CRP5. Consider the environmental, social and economic impacts of decisions
E, T, A	CRP6. Demonstrate creativity and innovation
E, T, A	CRP7. Employ valid and reliable research strategies
E, T, A	CRP8. Utilize critical thinking to make sense of problems and persevere in solving them
E	CRP9. Model integrity, ethical leadership, and effective management
	CRP10. Plan education and career paths aligned to personal goals
E, T, A	CRP11. Use technology to enhance productivity
E, T, A	CRP12. Work productively in teams while using cultural global competence

Student Learning Goals/Objectives:

Students will know....

Students will be able to (do)...

<p>The student will know:</p> <ol style="list-style-type: none"> 1. What projects fit the course requirements. 2. What constitutes a complete set of working plans and drawings. 3. How to calculate a bill of material in order to determine project cost. 4. What material is best suited to the project and design that they are constructing. 	<p>The student will be able to:</p> <ol style="list-style-type: none"> A. Choose a project that is suited to the student's ability. B. Develop or obtain a set of plans that will enable the student to build the project of their choice within the parameters set by the instructor. CRP 2 C. Design a plan of procedure that will enable the student to build the project of their choice. CRP 6 D. Create a working bill of material using an excel spreadsheet to the cost of material needed to build a project. CRP 11 E. Choose the material that is most appropriate for their project based on availability and cost.
<p>Assessment Evidence:</p>	
<p>Performance Tasks:</p> <p>Progress on student's projects will be evaluated twice per marking period, once at the midpoint and once at the end. Project grades will be determined by the teacher with student input provided by the projects grading worksheet. Project grades will account for 60% of the student's course average.</p> <p>Assessments are made on a regular basis with a minimum of a biweekly grade. Some specific assignments will be considered as performance assessment grades. Daily performance assessment grades should be averaged into weekly grades. Performance assessment grades will account for 20% of the student's course average.</p> <p>Performance Assessment Criteria :</p> <ul style="list-style-type: none"> *Time on task / Project work through the period. *Ability to follow general shop safety rules. *Safety glasses *Talking while on a machine. 	<p>Other Assessment Measures: Quizzes, tests, essay prompts, homework, review games, tickets out the door, benchmarks, group research assessment and typed critical thinking assignments.</p> <p>Each unit will include at least one written assessment in order to insure that students are able to organize, process, and apply what they have learned in an individual, standardized context. Written assessments will account for 20% of the student's course average.</p>

<ul style="list-style-type: none"> *Clean up activities at the end of the period. *Attentiveness during lectures and demonstrations. *Willingness to assist others as needed. *Completion of additional in class assignments 	

Content Area:	Manufacturing II	Grade(s): 10-12
Unit Plan Title:	Unit 3: Machine Review and Safety	
Overview		
Essential Content: Miter saw, Jointer, Table saw, Band saw, Drill press		
Enduring Understandings:		

Students will understand that...

Woodworking machines are inherently dangerous and need to be used with great caution and safety.

- Machine use is limited to those machines that students have received instruction on prior to use.
- All machines require both a general and specific safety knowledge base prior to use.
- Students need to demonstrate proficiency on machine prior to using the machine without teacher permission.
- Machines in the shop can only be operated in the presence of a certified Industrial Arts / Technology teacher.
- Only machines in good repair and functioning properly should be used.
- Machines are designed for specific tasks and therefore should not be operated for other purposes.
- Safety should be the number one priority when working with shop equipment.

Essential Questions

- What attitudes need to be maintained while working with machines?
- What effects might a lack of knowledge about some of the specific machines have on a project or safety in the shop?
- How are the woodworking machines used in conjunction with one another in order to produce the desired outcomes?
- What affects the choices that must be made when working a variety of available machinery?

21st Century Connections

<i>Check all that apply.</i>			<i>Indicate whether these skills are E-Encouraged, T-Taught, and/or A-Assessed in this unit by marking E, T, A on the line before the appropriate skill.</i>		
21st Century Interdisciplinary Themes			21st Century Skills		
	X	Global Awareness		E,T,A	Critical Thinking and Problem Solving
	X	Environmental Literacy		E	Creativity and Innovation
		Health Literacy		E,T,A	Communication and Collaboration
	X	Civic Literacy		E, T	Flexibility and Adaptability
		Financial, Economic , Business and Entrepreneurial Literacy		E	Initiative and Self-Direction
				E,T,A	Social and Cross-Cultural Skills
				E,T,A	Productivity and Accountability
				E	Leadership and Responsibility

		E,T	Informational Literacy Skills
		E,T,A	Media Literacy Skills
		E,T,A	Information, Communication, and Technology (ICT) Literacy

Career Ready Practices:		
Indicate whether these skills are <i>E-Encouraged</i> , <i>T-Taught</i> , or <i>A-Assessed</i> in this unit by marking <i>E, T, A</i> on the line before the appropriate skill.		
	E, T	CRP1. Act as a responsible and contributing citizen and employee
	E, T, A	CRP2. Apply appropriate academic and technical skills
		CRP3. Attend to personal health and financial well-being
	E, A	CRP4. Communicate clearly and effectively with reason
	T, A	CRP5. Consider the environmental, social and economic impacts of decisions
	E, T, A	CRP6. Demonstrate creativity and innovation
	E, T, A	CRP7. Employ valid and reliable research strategies
	E, T, A	CRP8. Utilize critical thinking to make sense of problems and persevere in solving them
	E	CRP9. Model integrity, ethical leadership, and effective management
		CRP10. Plan education and career paths aligned to personal goals
	E, T, A	CRP11. Use technology to enhance productivity
	E, T, A	CRP12. Work productively in teams while using cultural global competence

Student Learning Goals/Objectives:	
Students will know.... The student will know: 1. How to use the main machines available in the shop. 2. The safety rules associated with each machine in the shop.	Students will be able to (do)... The student will be able to: A. Pass a safety test on each of the main machines prior to use. B. Use the correct machine for the operation being performed.

<p>3. How to incorporate the necessary machines into their individual projects when necessary.</p> <p>4. What each machine can be used for.</p>	<p>C. Identify the various operations that a machine can perform.</p> <p>D. Properly set up the machine for the various operations that it is designed for.</p> <p>E. Identify the most common uses for each machine in the shop.</p> <p>F. Incorporate the various machines as needed on their individual projects.</p>
Assessment Evidence:	
<p>Performance Tasks:</p> <p>Progress on student's projects will be evaluated twice per marking period, once at the midpoint and once at the end. Project grades will be determined by the teacher with student input provided by the projects grading worksheet. Project grades will account for 60% of the student's course average.</p> <p>Assessments are made on a regular basis with a minimum of a biweekly grade. Some specific assignments will be considered as performance assessment grades. Daily performance assessment grades should be averaged into weekly grades. Performance assessment grades will account for 20% of the student's course average.</p> <p>Performance Assessment Criteria :</p> <ul style="list-style-type: none"> *Time on task / Project work through the period. *Ability to follow general shop safety rules. *Safety glasses *Talking while on a machine. *Clean up activities at the end of the period. *Attentiveness during lectures and demonstrations. *Willingness to assist others as needed. *Completion of additional in class assignments. 	<p>Other Assessment Measures: Quizzes, tests, essay prompts, homework, review games, tickets out the door, benchmarks, group research assessment and typed critical thinking assignments.</p> <p>Each unit will include at least one written assessment in order to insure that students are able to organize, process, and apply what they have learned in an individual, standardized context. Written assessments will account for 20% of the student's course average.</p>

Content Area:	Manufacturing II	Grade(s): 10-12
Unit Plan Title:	Unit 4: Wood Carving: Tools and Techniques	
Overview		
Essential Content: Safety, Tool Profiles, Wood Species		
Enduring Understandings:		
Students will understand that...		

- Woodcarving can be practiced at a variety of different scales and skill levels, each holding its own intrinsic value.
- Woodcarving is an area of woodworking that stands well alone or can be combined with other woodworking skills as needed.
- Woodcarving has been practiced since the beginning of time and has evolved only slightly in terms of tools and results.
- While specific learned skills are necessary to master woodcarving, techniques will improve through trial and error as well as consistent practice.
- Woodcarvings entail a great degree of hand eye coordination and enhance the development of those skills in the individual.

Essential Questions

- Can the choices of wood species have an effect on the variety of carving techniques?
- Are there fundamental differences between, Knife Carving, Relief Carving, Carving in the Round, and Power Carving?
- Does the practice of woodcarving enhance the overall ability of the woodworker?

21st Century Connections

Check all that apply.			Indicate whether these skills are E -Encouraged, T -Taught, and/or A -Assessed in this unit by marking E , T , A on the line before the appropriate skill.		
21 st Century Interdisciplinary Themes			21 st Century Skills		
	X	Global Awareness		E,T,A	Critical Thinking and Problem Solving
	X	Environmental Literacy		E	Creativity and Innovation
		Health Literacy		E,T,A	Communication and Collaboration
	X	Civic Literacy		E, T	Flexibility and Adaptability
		Financial, Economic , Business and Entrepreneurial Literacy		E	Initiative and Self-Direction
				E,T,A	Social and Cross-Cultural Skills
				E,T,A	Productivity and Accountability
				E	Leadership and Responsibility
				E,T	Informational Literacy Skills
				E,T,A	Media Literacy Skills
				E,T,A	Information, Communication, and Technology (ICT) Literacy

Career Ready Practices:

Indicate whether these skills are **E**-Encouraged, **T**-Taught, or **A**-Assessed in this unit by marking **E, T, A** on the line before the appropriate skill.

	E, T	CRP1. Act as a responsible and contributing citizen and employee
	E, T, A	CRP2. Apply appropriate academic and technical skills
		CRP3. Attend to personal health and financial well-being
	E, A	CRP4. Communicate clearly and effectively with reason
	T, A	CRP5. Consider the environmental, social and economic impacts of decisions
	E, T, A	CRP6. Demonstrate creativity and innovation
	E, T, A	CRP7. Employ valid and reliable research strategies
	E, T, A	CRP8. Utilize critical thinking to make sense of problems and persevere in solving them
	E	CRP9. Model integrity, ethical leadership, and effective management
		CRP10. Plan education and career paths aligned to personal goals
	E, T, A	CRP11. Use technology to enhance productivity
	E, T, A	CRP12. Work productively in teams while using cultural global competence

Student Learning Goals/Objectives:

Students will know....

The student will know:

1. The variety of carving tool profiles and shapes, and the techniques they are best suited to.
2. The various forms of power carving tools and techniques.
3. How to properly and safely handle a variety of carving tools
4. The importance of safely holding the work piece and what system works best for the style of work they are doing.

Students will be able to (do)...

The student will be able to:

- A. Identify the various types of hand carving tools.
- B. Identify the various types of power carving tools and their proper set up.
- C. Demonstrate proper hand position when using carving tools.
- D. Demonstrate the proper methods for holding work while it is being carved.
- E. Properly sharpen basic carving tools and also know how to keep

<p>5. How to sharpen and hone the cutting edges on hand carving tools.</p>	<p>them sharp during use. F. Understand and practice the proper care and safe handling of carving tools.</p>
<p>Assessment Evidence:</p>	
<p>Performance Tasks: Progress on student's projects will be evaluated twice per marking period, once at the midpoint and once at the end. Project grades will be determined by the teacher with student input provided by the projects grading worksheet. Project grades will account for 60% of the student's course average. Assessments are made on a regular basis with a minimum of a biweekly grade. Some specific assignments will be considered as performance assessment grades. Daily performance assessment grades should be averaged into weekly grades. Performance assessment grades will account for 20% of the student's course average.</p> <p>Performance Assessment Criteria :</p> <ul style="list-style-type: none"> *Time on task / Project work through the period. *Ability to follow general shop safety rules. *Safety glasses *Talking while on a machine. *Clean up activities at the end of the period. *Attentiveness during lectures and demonstrations. *Willingness to assist others as needed. *Completion of additional in class assignments 	<p>Other Assessment Measures: Quizzes, tests, essay prompts, homework, review games, tickets out the door, benchmarks, group research assessment and typed critical thinking assignments.</p> <p>Each unit will include at least one written assessment in order to insure that students are able to organize, process, and apply what they have learned in an individual, standardized context. Written assessments will account for 20% of the student's course average.</p>

Content Area:	Manufacturing II	Grade(s): 10-12
Unit Plan Title:	Unit 5: Wood Carving: Relief Carving	
Overview		
Essential Content: Relief, Safety, Tools, Practice		
Enduring Understandings:		
<p><i>Students will understand that...</i></p> <ul style="list-style-type: none">• Woodcarving can be practiced at a variety of different scales and skill levels, each holding its own intrinsic value.• Woodcarving is an area of woodworking that stands well alone or can be combined with other woodworking skills as needed.		

- Woodcarving has been practiced since the beginning of time and has evolved only slightly in terms of tools and results.
- While specific learned skills are necessary to master woodcarving, techniques will improve through trial and error as well as consistent practice.
- Woodcarving entails a great degree of hand eye coordination and enhances the development of those skills in the individual.

Essential Questions

- Does practice have an impact on the final results of a project?
- What affect can material choice have on the practice of relief carving?
- What guides the decision making process when choosing the subject matter for relief carving?

21st Century Connections

Check all that apply.		Indicate whether these skills are E -Encouraged, T -Taught, and/or A -Assessed in this unit by marking E , T , A on the line before the appropriate skill.	
21 st Century Interdisciplinary Themes		21 st Century Skills	
	X Global Awareness		E,T,A Critical Thinking and Problem Solving
	X Environmental Literacy		E Creativity and Innovation
	Health Literacy		E,T,A Communication and Collaboration
	X Civic Literacy		E, T Flexibility and Adaptability
	Financial, Economic , Business and Entrepreneurial Literacy		E Initiative and Self-Direction
			E,T,A Social and Cross-Cultural Skills
			E,T,A Productivity and Accountability
			E Leadership and Responsibility
			E,T Informational Literacy Skills
			E,T,A Media Literacy Skills
			E,T,A Information, Communication, and Technology (ICT) Literacy

Career Ready Practices:

Indicate whether these skills are *E-Encouraged*, *T-Taught*, or *A-Assessed* in this unit by marking *E, T, A* on the line before the appropriate skill.

	E, T	CRP1. Act as a responsible and contributing citizen and employee
	E, T, A	CRP2. Apply appropriate academic and technical skills
		CRP3. Attend to personal health and financial well-being
	E, A	CRP4. Communicate clearly and effectively with reason
	T, A	CRP5. Consider the environmental, social and economic impacts of decisions
	E, T, A	CRP6. Demonstrate creativity and innovation
	E, T, A	CRP7. Employ valid and reliable research strategies
	E, T, A	CRP8. Utilize critical thinking to make sense of problems and persevere in solving them
	E	CRP9. Model integrity, ethical leadership, and effective management
		CRP10. Plan education and career paths aligned to personal goals
	E, T, A	CRP11. Use technology to enhance productivity
	E, T, A	CRP12. Work productively in teams while using cultural global competence

Student Learning Goals/Objectives:

Students will know....

1. How to compensate and work with grain structure in a variety of materials.
2. What types of images most readily transfer to relief carving.
3. The techniques and tool strokes needed to create a variety of lettering styles.
4. The fundamental difference between incised and relieved lettering.

Students will be able to (do)...

- A. Understand the basic grain structure in order to carve in the right direction.
- B. Find or create patterns or pictures that could be used for relief carving.
- C. Create a relief carved letter.
- D. Identify and use the proper tools that should be used for various cuts.

Assessment Evidence:

Performance Tasks:

Progress on student's projects will be evaluated twice per marking

Other Assessment Measures: Quizzes, tests, essay prompts, homework, review games, tickets out the door, benchmarks, group research

period, once at the midpoint and once at the end. Project grades will be determined by the teacher with student input provided by the projects grading worksheet. Project grades will account for 60% of the student's course average.

Assessments are made on a regular basis with a minimum of a biweekly grade. Some specific assignments will be considered as performance assessment grades. Daily performance assessment grades should be averaged into weekly grades. Performance assessment grades account for 20% of the student's course average.

Performance Assessment Criteria :

- *Time on task / Project work through the period.
- *Ability to follow general shop safety rules.
- *Talking while on a machine.
- *Clean up activities at the end of the period.
- *Attentiveness during lectures and demonstrations.
- *Willingness to assist others as needed.
- *Completion of additional in class assignments.

assessment and typed critical thinking assignments.

Each unit will include at least one written assessment in order to insure that students are able to organize, process, and apply what they have learned in an individual, standardized context. Written assessments will account for 20% of the student's course average.

Content Area:	Manufacturing II	Grade(s): 10-12
Unit Plan Title:	Unit 6: Wood Carving: Carving in the Round	
Overview		
Essential Content: Pattern, Tools, Shape, Detail		
Enduring Understandings:		
Students will understand that...		

- Woodcarving can be practiced at a variety of different scales and skill levels, each holding its own intrinsic value.
- Woodcarving is an area of woodworking that stands well alone or can be combined with other woodworking skills as needed.
- While specific learned skills are necessary to master wood carving, techniques will improve through trial and error as well as consistent practice.
- Woodcarving entails a great degree of hand eye coordination and enhances the development of those skills in the individual.

Essential Questions

- What impacts subject matter choices when carving in the round?
- What affect can material choice have on the practice of carving in the round?
- How can the practice of carving in the round enhance the overall ability of the woodworker?
- What affect will tool choice and care have on results when carving in the round?

21st Century Connections

Check all that apply.			Indicate whether these skills are E -Encouraged, T -Taught, and/or A -Assessed in this unit by marking E , T , A on the line before the appropriate skill.		
21 st Century Interdisciplinary Themes			21 st Century Skills		
	X	Global Awareness		E,T,A	Critical Thinking and Problem Solving
	X	Environmental Literacy		E	Creativity and Innovation
		Health Literacy		E,T,A	Communication and Collaboration
	X	Civic Literacy		E, T	Flexibility and Adaptability
		Financial, Economic , Business and Entrepreneurial Literacy		E	Initiative and Self-Direction
				E,T,A	Social and Cross-Cultural Skills
				E,T,A	Productivity and Accountability
				E	Leadership and Responsibility
				E,T	Informational Literacy Skills
				E,T,A	Media Literacy Skills
				E,T,A	Information, Communication, and Technology (ICT) Literacy

Career Ready Practices:

Indicate whether these skills are **E**-Encouraged, **T**-Taught, or **A**-Assessed in this unit by marking **E, T, A** on the line before the appropriate skill.

E, T	CRP1. Act as a responsible and contributing citizen and employee
E, T, A	CRP2. Apply appropriate academic and technical skills
	CRP3. Attend to personal health and financial well-being
E, A	CRP4. Communicate clearly and effectively with reason
T, A	CRP5. Consider the environmental, social and economic impacts of decisions
E, T, A	CRP6. Demonstrate creativity and innovation
E, T, A	CRP7. Employ valid and reliable research strategies
E, T, A	CRP8. Utilize critical thinking to make sense of problems and persevere in solving them
E	CRP9. Model integrity, ethical leadership, and effective management
	CRP10. Plan education and career paths aligned to personal goals
E, T, A	CRP11. Use technology to enhance productivity
E, T, A	CRP12. Work productively in teams while using cultural global competence

Student Learning Goals/Objectives:

Students will know....

1. How to create patterns to be used when carving in the round.
2. What techniques are unique to carving in the round.
3. How to safely use the band saw when prepping material for carving in the round.
4. How to safely mount material for carving in the round. D. Identify proper techniques for holding a carving in the round.

Students will be able to (do)...

- A. Create a pattern to be used for a project.
- B. Be able to perform the necessary compound cutting for roughing out a carving blank on the band saw.
- C. Create a small shape of the student's design using compound cuts on the band saw and carving the shape. (The object created need not be anything in particular; it should however demonstrate the techniques necessary for "good" carving.)

Assessment Evidence:**Performance Tasks:**

Progress on student's projects will be evaluated twice per marking period, once at the midpoint and once at the end. Project grades will be determined by the teacher with student input provided by the projects grading worksheet. Project grades will account for 60% of the student's course average.

Assessments are made on a regular basis with a minimum of a biweekly grade. Some specific assignments will be considered as performance assessment grades. Daily performance assessment grades should be averaged into weekly grades. Performance assessment grades will account for 20% of the student's course average.

Performance Assessment Criteria :

- *Time on task / Project work through the period.
- *Ability to follow general shop safety rules.
- *Safety glasses
- *Talking while on a machine.
- *Clean up activities at the end of the period.
- *Attentiveness during lectures and demonstrations.
- *Willingness to assist others as needed.
- *Completion of additional in class assignments.

Other Assessment Measures: Quizzes, tests, essay prompts, homework, review games, tickets out the door, benchmarks, group research assessment and typed critical thinking assignments.

Each unit will include at least one written assessment in order to insure that students are able to organize, process, and apply what they have learned in an individual, standardized context. Written assessments will account for 20% of the student's course average.

Content Area:	Manufacturing II	Grade(s): 10-12
Unit Plan Title:	Unit 7: Wood Carving: CNC Power Carving	
Overview		
Essential Content: XYZ Axis’s, Tool paths, Safety, Design		
Enduring Understandings:		
<p><i>Students will understand that...</i></p> <ul style="list-style-type: none">• CNC Routing can be practiced at a variety of different scales and skill levels, each holding its own intrinsic value.• CNC Routing is an area of woodworking that stands well alone or can be combined with other woodworking skills as needed.• While specific learned skills are necessary to master CNC woodcarving, techniques will improve through trial and error as well as consistent practice.		

- CNC Routing / Carving is an ever evolving technology and consistent update and practice is essential.

Essential Questions

- How can CNC routing affect the woodworking classroom and industry?
- What are the essential safety issues in the various areas of CNC carving?
- How does the practice of CNC woodcarving enhance the overall ability of the woodworker?
- Where can the potential of CNC Routing / Carving take us in the future?

21st Century Connections

Check all that apply.			Indicate whether these skills are E -Encouraged, T -Taught, and/or A -Assessed in this unit by marking E , T , A on the line before the appropriate skill.		
21 st Century Interdisciplinary Themes			21 st Century Skills		
	X	Global Awareness		E,T,A	Critical Thinking and Problem Solving
	X	Environmental Literacy		E	Creativity and Innovation
		Health Literacy		E,T,A	Communication and Collaboration
	X	Civic Literacy		E, T	Flexibility and Adaptability
		Financial, Economic , Business and Entrepreneurial Literacy		E	Initiative and Self-Direction
				E,T,A	Social and Cross-Cultural Skills
				E,T,A	Productivity and Accountability
				E	Leadership and Responsibility
				E,T	Informational Literacy Skills
				E,T,A	Media Literacy Skills
				E,T,A	Information, Communication, and Technology (ICT) Literacy
Career Ready Practices:					
Indicate whether these skills are E -Encouraged, T -Taught, or A -Assessed in this unit by marking E , T , A on the line before the appropriate skill.					

	E, T	CRP1. Act as a responsible and contributing citizen and employee
	E, T, A	CRP2. Apply appropriate academic and technical skills
		CRP3. Attend to personal health and financial well-being
	E, A	CRP4. Communicate clearly and effectively with reason
	T, A	CRP5. Consider the environmental, social and economic impacts of decisions
	E, T, A	CRP6. Demonstrate creativity and innovation
	E, T, A	CRP7. Employ valid and reliable research strategies
	E, T, A	CRP8. Utilize critical thinking to make sense of problems and persevere in solving them
	E	CRP9. Model integrity, ethical leadership, and effective management
		CRP10. Plan education and career paths aligned to personal goals
	E, T, A	CRP11. Use technology to enhance productivity
	E, T, A	CRP12. Work productively in teams while using cultural global competence
Student Learning Goals/Objectives:		
Students will know.... 1. The principles of the XYZ axis's as they relate to CNC work. 2. How to create the appropriate designs for CNC work. 3. How to set up tool paths using the available software in the industry as well as the classroom. 4. The safety rules and operating procedures for a CNC machine.		Students will be able to (do)... A. Create a project using CNC Router technology. B. Set up, maintain, and run a CNC Router. C. Interpret tool path and program languages and edit as necessary for the desired result. D. Practice the necessary safety procedures associated with the CNC a. Eye Safety b. Dust protection c. Hand safety
Assessment Evidence:		
Performance Tasks: Progress on student's projects will be evaluated twice per marking period, once at the midpoint and once at the end. Project grades will be determined by the teacher with student input provided by the		Other Assessment Measures: Quizzes, tests, essay prompts, homework, review games, tickets out the door, benchmarks, group research assessment and typed critical thinking assignments.

projects grading worksheet. Project grades will account for 60% of the student's course average.

Assessments are made on a regular basis with a minimum of a biweekly grade. Some specific assignments will be considered as performance assessment grades. Daily performance assessment grades should be averaged into weekly grades. Performance assessment grades will account for 20% of the student's course average.

Performance Assessment Criteria :

- *Time on task / Project work through the period.
- *Ability to follow general shop safety rules.
- *Talking while on a machine.
- *Clean up activities at the end of the period.
- *Attentiveness during lectures and demonstrations.
- *Willingness to assist others as needed.
- *Completion of additional in class assignments.

Each unit will include at least one written assessment in order to insure that students are able to organize, process, and apply what they have learned in an individual, standardized context. Written assessments will account for 20% of the student's course average.

Content Area:	Manufacturing II	Grade(s): 10-12
Unit Plan Title:	Unit 8: Wood Bending	
Overview		
Essential Content: Laminating, Steam Bending, Kerf bending, Safety		
Enduring Understandings:		
<i>Students will understand that...</i> <ul style="list-style-type: none">• Wood can be shaped and formed not only by the machine process but also using the bending process.		

- There are always several ways to reach the same end result and you have to consider the end use of a product to determine the most appropriate method in wood bending.
- Not all materials are alike, therefore you need to be able to determine the suitability of certain wood species when choosing it to use in a bending application.
- Safety issues must be taken into consideration in the process of wood bending.
- Wood is pliable in its different states as a material; that property is what gives the material its ability to take on different shapes yet retain its overall strength.

Essential Questions

- How can safety issues impact choices made when considering the various methods of wood bending.
- How can choice of wood bending method affect the outcome of your work?
- How is form and function related when considering the topic of wood bending?
- What impact does wood bending have on the woodworking industry?

21st Century Connections

Check all that apply.			Indicate whether these skills are E -Encouraged, T -Taught, and/or A -Assessed in this unit by marking E , T , A on the line before the appropriate skill.		
21 st Century Interdisciplinary Themes			21 st Century Skills		
	X	Global Awareness		E,T,A	Critical Thinking and Problem Solving
	X	Environmental Literacy		E	Creativity and Innovation
		Health Literacy		E,T,A	Communication and Collaboration
	X	Civic Literacy		E, T	Flexibility and Adaptability
		Financial, Economic , Business and Entrepreneurial Literacy		E	Initiative and Self-Direction
				E,T,A	Social and Cross-Cultural Skills
				E,T,A	Productivity and Accountability
				E	Leadership and Responsibility
				E,T	Informational Literacy Skills
				E,T,A	Media Literacy Skills

E,T,A

Information, Communication, and Technology (ICT) Literacy

Career Ready Practices:

Indicate whether these skills are *E*-Encouraged, *T*-Taught, or *A*-Assessed in this unit by marking *E, T, A* on the line before the appropriate skill.

	E, T	CRP1. Act as a responsible and contributing citizen and employee
	E, T, A	CRP2. Apply appropriate academic and technical skills
		CRP3. Attend to personal health and financial well-being
	E, A	CRP4. Communicate clearly and effectively with reason
	T, A	CRP5. Consider the environmental, social and economic impacts of decisions
	E, T, A	CRP6. Demonstrate creativity and innovation
	E, T, A	CRP7. Employ valid and reliable research strategies
	E, T, A	CRP8. Utilize critical thinking to make sense of problems and persevere in solving them
	E	CRP9. Model integrity, ethical leadership, and effective management
		CRP10. Plan education and career paths aligned to personal goals
	E, T, A	CRP11. Use technology to enhance productivity
	E, T, A	CRP12. Work productively in teams while using cultural global competence

Student Learning Goals/Objectives:**Students will know....**

1. How to bend material using Laminating, Steam Bending, and Kerf Bending.
2. How to construct forms for wood bending.
3. How to determine the best material for each particular wood-bending task they are attempting.
4. The safety rules that need to be followed with each method of

Students will be able to (do)...

- A. Determine proper bending method required for various materials.
- B. Understand proper techniques for building bending jigs and forms.
- C. Understand the proper techniques for clamping.
- D. Identify the proper adhesives and their properties for bent laminations and the differences of the materials that are available.

<p>wood bending.</p> <p>5. How to incorporate wood bending into a project of their choice.</p>	<p>E. Practice the necessary safety precautions when cutting and shaping laminated stock to final dimensions.</p>
<p>Assessment Evidence:</p>	
<p>Performance Tasks:</p> <p>Progress on student's projects will be evaluated twice per marking period, once at the midpoint and once at the end. Project grades will be determined by the teacher with student input provided by the projects grading worksheet. Project grades will account for 60% of the student's course average.</p> <p>Assessments are made on a regular basis with a minimum of a biweekly grade. Some specific assignments will be considered as performance assessment grades. Daily performance assessment grades should be averaged into weekly grades. Performance assessment grades will account for 20% of the student's course average.</p> <p>Performance Assessment Criteria :</p> <ul style="list-style-type: none"> *Time on task / Project work through the period. *Ability to follow general shop safety rules. *Safety glasses *Talking while on a machine. *Clean up activities at the end of the period. *Attentiveness during lectures and demonstrations. *Willingness to assist others as needed. *Completion of additional in class assignments. 	<p>Other Assessment Measures: Quizzes, tests, essay prompts, homework, review games, tickets out the door, benchmarks, group research assessment and typed critical thinking assignments.</p> <p>Each unit will include at least one written assessment in order to insure that students are able to organize, process, and apply what they have learned in an individual, standardized context. Written assessments will account for 20% of the student's course average.</p>

Content Area:	Manufacturing II	Grade(s): 10-12
Unit Plan Title:	Unit 10: Wood Turning: Tools and Techniques, Spindles, Bowls, and Segmented Turning	
Overview		
Essential Content: Tools, Spindle turning, Bowls, Segmented turning, & Safety		
Enduring Understandings:		
<p><i>Students will understand that...</i></p> <ul style="list-style-type: none">• Woodturnings can be both functional as well as decorative.• A good understanding of form and design are fundamental in the successful design of any wood-turned product.<ul style="list-style-type: none">• Wood species play greatly into the design of a wood turned product.• Techniques used in woodturning are specific to the type of material being turned as well as the species of wood being turned.• The quality of the tool and equipment has an impact on the quality of the product.• Great consideration must be given to the safety rules when setting up and performing any woodturning.		

- Woodturning is an area of woodworking that stands well alone or can be combined with other woodworking skills as needed.
- Woodturnings are made using both hand tool and automated methods for production.
- Woodturning skills are essential to the wood worker.

Essential Questions

- How is woodturning both a standalone skill as well as a skill that all woodworkers must possess?
- How does a safe approach to woodturning affect the work as well as the woodworker?
- What impact does skill in woodturning have on the scope of a woodworkers work?
- What impact can the ever changing technologies in woodturning have on the woodworker and the products they produce?

21st Century Connections

Check all that apply.		Indicate whether these skills are E -Encouraged, T -Taught, and/or A -Assessed in this unit by marking E , T , A on the line before the appropriate skill.	
21 st Century Interdisciplinary Themes		21 st Century Skills	
	X	E,T,A	Critical Thinking and Problem Solving
	X	E	Creativity and Innovation
		E,T,A	Communication and Collaboration
	X	E, T	Flexibility and Adaptability
		E	Initiative and Self-Direction
		E,T,A	Social and Cross-Cultural Skills
		E,T,A	Productivity and Accountability
		E	Leadership and Responsibility
		E,T	Informational Literacy Skills
		E,T,A	Media Literacy Skills
		E,T,A	Information, Communication, and Technology (ICT) Literacy

Career Ready Practices:

Indicate whether these skills are **E**-Encouraged, **T**-Taught, or **A**-Assessed in this unit by marking **E, T, A** on the line before the appropriate skill.

	E, T	CRP1. Act as a responsible and contributing citizen and employee
	E, T, A	CRP2. Apply appropriate academic and technical skills
		CRP3. Attend to personal health and financial well-being
	E, A	CRP4. Communicate clearly and effectively with reason
	T, A	CRP5. Consider the environmental, social and economic impacts of decisions
	E, T, A	CRP6. Demonstrate creativity and innovation
	E, T, A	CRP7. Employ valid and reliable research strategies
	E, T, A	CRP8. Utilize critical thinking to make sense of problems and persevere in solving them
	E	CRP9. Model integrity, ethical leadership, and effective management
		CRP10. Plan education and career paths aligned to personal goals
	E, T, A	CRP11. Use technology to enhance productivity
	E, T, A	CRP12. Work productively in teams while using cultural global competence

Student Learning Goals/Objectives:**Students will know....**

1. What tools are available to them in the area of woodturning.
2. What tools would be most appropriate to use for each of the woodturning methods.
3. How to set up the lathe for basic and complex spindle turning.
4. Will be able to turn a spindle with straights, beads, and coves.
5. Will be able to properly choose material for a variety of woodturning projects.
6. Basic and advanced bowl mounting techniques.

Students will be able to (do)...

- A. Identify all the tools that can be used in woodturning for either spindle or bowl turning.
- B. Identify all the parts of the standard woodturning lathe.
- C. Demonstrate proper hand position for wood turning tools for either spindle or bowl turning.
- D. Set up the lathe and stock for spindle turning.
- E. Set up the lath and stock for bowl turning.
- F. Satisfactorily complete a safety assessment on the wood lathe prior to using the lathe.
- G. Turn a completed spindle turning.

<p>7. What tools are best suited to bowl turning.</p> <p>8. How to create segmented wood turnings.</p> <p>9. The safety rules for the woodturning lathe.</p>	<p>H. Turn a completed bowl turning.</p> <p>I. Know the proper sequence and technique for sanding on the lathe.</p>
<p>Assessment Evidence:</p>	
<p>Performance Tasks:</p> <p>Progress on student's projects will be evaluated twice per marking period, once at the midpoint and once at the end. Project grades will be determined by the teacher with student input provided by the projects grading worksheet. Project grades will account for 60% of the student's course average.</p> <p>Assessments are made on a regular basis with a minimum of a biweekly grade. Some specific assignments will be considered as performance assessment grades. Daily performance assessment grades should be averaged into weekly grades. Performance assessment grades will account for 20% of the student's course average.</p> <p>Performance Assessment Criteria :</p> <ul style="list-style-type: none"> *Time on task / Project work through the period. *Ability to follow general shop safety rules. *Safety glasses *Talking while on a machine. *Clean up activities at the end of the period. *Attentiveness during lectures and demonstrations. *Willingness to assist others as needed. *Completion of additional in class assignments 	<p>Other Assessment Measures: Quizzes, tests, essay prompts, homework, review games, tickets out the door, benchmarks, group research assessment and typed critical thinking assignments.</p> <p>Each unit will include at least one written assessment in order to insure that students are able to organize, process, and apply what they have learned in an individual, standardized context. Written assessments will account for 20% of the student's course average.</p>

Content Area:	Manufacturing II	Grade(s): 10-12
Unit Plan Title:	Unit 11: Decorative Woodworking: Pyrography, Wood Burning, and Laser Engraving	
Overview		
Essential Content: Pyrography, Patterns, Wood Burning, Laser Cutting / Engraving		
Enduring Understandings:		
<p><i>Students will understand that...</i></p> <ul style="list-style-type: none">• Good equipment is essential in getting good results.• Wood burning and laser engraving can be used to enhance the appearance of a woodworking project, but if not done properly could actually ruin a good project.• Wood burning and laser engraving is an area of woodworking that stands well alone or can be combined with other woodworking skills as needed.• Decorative types of woodworking are relatively inexpensive areas of woodworking to get started in.• Although artistic skill would be helpful decorative woodworking is accessible for any woodworker.		
Essential Questions		

- How can wood burning impact the work that a woodworker does?
- What are some of the various types of techniques that can be used in wood burning?
- How does equipment choice affect the outcome and direction of wood burning or laser engraving?
- What impact will a safe working procedure have on the overall practice of wood burning or laser engraving?

21st Century Connections

Check all that apply.			Indicate whether these skills are E -Encouraged, T -Taught, and/or A -Assessed in this unit by marking E , T , A on the line before the appropriate skill.		
21 st Century Interdisciplinary Themes			21 st Century Skills		
	X	Global Awareness		E,T,A	Critical Thinking and Problem Solving
	X	Environmental Literacy		E	Creativity and Innovation
		Health Literacy		E,T,A	Communication and Collaboration
	X	Civic Literacy		E, T	Flexibility and Adaptability
		Financial, Economic , Business and Entrepreneurial Literacy		E	Initiative and Self-Direction
				E,T,A	Social and Cross-Cultural Skills
				E,T,A	Productivity and Accountability
				E	Leadership and Responsibility
				E,T	Informational Literacy Skills
				E,T,A	Media Literacy Skills
				E,T,A	Information, Communication, and Technology (ICT) Literacy

Career Ready Practices:

Indicate whether these skills are E -Encouraged, T -Taught, or A -Assessed in this unit by marking E , T , A on the line before the appropriate skill.		
	E, T	CRP1. Act as a responsible and contributing citizen and employee
	E, T, A	CRP2. Apply appropriate academic and technical skills

		CRP3. Attend to personal health and financial well-being
	E, A	CRP4. Communicate clearly and effectively with reason
	T, A	CRP5. Consider the environmental, social and economic impacts of decisions
	E, T, A	CRP6. Demonstrate creativity and innovation
	E, T, A	CRP7. Employ valid and reliable research strategies
	E, T, A	CRP8. Utilize critical thinking to make sense of problems and persevere in solving them
	E	CRP9. Model integrity, ethical leadership, and effective management
		CRP10. Plan education and career paths aligned to personal goals
	E, T, A	CRP11. Use technology to enhance productivity
	E, T, A	CRP12. Work productively in teams while using cultural global competence
Student Learning Goals/Objectives:		
Students will know.... 1. How to safely operate a wood burner and a laser engraver. 2. How to incorporate wood burning into their projects. 3. How to create and transfer patterns to material. 4. What materials are best suited to wood burning. 5. How to enter engraving and cutting patterns into a laser cutter/engraver. 6. What materials are best suited to Laser cutting and engraving.		<i>Students will be able to (do)...</i> A. Follow all safety procedures associated with the wood burner. B. Set up the wood burner for a variety of effects. C. Choose and transfer patters to material. D. Choose the proper and best materials suited to pyrography. E. Set up a laser cutter / engraver for a task. F. Follow safe work practices when using a laser cutter / engraver. G. Complete a basic wood burning or laser engraving using at least three different techniques.
Assessment Evidence:		
<i>Performance Tasks:</i> Progress on student's projects will be evaluated twice per marking period, once at the midpoint and once at the end. Project grades will be determined by the teacher with student input provided by the projects grading worksheet. Project grades will account for 60% of the		<i>Other Assessment Measures:</i> Quizzes, tests, essay prompts, homework, review games, tickets out the door, benchmarks, group research assessment and typed critical thinking assignments. Each unit will include at least one written assessment in order to insure

student's course average.

Assessments are made on a regular basis with a minimum of a biweekly grade. Some specific assignments will be considered as performance assessment grades. Daily performance assessment grades should be averaged into weekly grades. Performance assessment grades will account for 20% of the student's course average.

Performance Assessment Criteria :

- *Time on task / Project work through the period.
- *Ability to follow general shop safety rules.
- *Safety glasses
- *Talking while on a machine.
- *Clean up activities at the end of the period.
- *Attentiveness during lectures and demonstrations.
- *Willingness to assist others as needed.
- *Completion of additional in class assignments.

that students are able to organize, process, and apply what they have learned in an individual, standardized context. Written assessments will account for 20% of the student's course average.

Content Area:	Manufacturing II			Grade(s): 10-12	
Unit Plan Title:	Unit 12: Decorative Woodworking: Intarsia / Scroll Saw Work				
Overview					
Essential Content: Scroll Saw, Intarsia, & Safety					
Enduring Understandings:					
<p><i>Students will understand that...</i></p> <ul style="list-style-type: none">• Good equipment is essential in getting good results.• Wood burning can be used to enhance the appearance of a woodworking project, but if not done properly could actually ruin a good project.• Wood burning is an area of woodworking that stands well alone or can be combined with other woodworking skills as needed.• Decorative types of woodworking are relatively inexpensive areas of woodworking to get started in.• Although artistic skill would be helpful decorative woodworking is accessible for any woodworker.					
Essential Questions					
<ul style="list-style-type: none">• What design options does scroll saw work add to the field of woodworking?• How can scroll saw work impact the work that a woodworker does?• How do woodworkers choose techniques and materials as they relate to the scroll saw?• How does safety play a role in intarsia and scroll saw work?					
21 st Century Connections					
Check all that apply.			Indicate whether these skills are E -Encouraged, T -Taught, and/or A -Assessed in this unit by marking E, T, A on the line before the appropriate skill.		
21 st Century Interdisciplinary Themes			21 st Century Skills		
	X	Global Awareness		E,T,A	Critical Thinking and Problem Solving
	X	Environmental Literacy		E	Creativity and Innovation

	Health Literacy	E,T,A	Communication and Collaboration
X	Civic Literacy	E, T	Flexibility and Adaptability
	Financial, Economic , Business and Entrepreneurial Literacy	E	Initiative and Self-Direction
		E,T,A	Social and Cross-Cultural Skills
		E,T,A	Productivity and Accountability
		E	Leadership and Responsibility
		E,T	Informational Literacy Skills
		E,T,A	Media Literacy Skills
		E,T,A	Information, Communication, and Technology (ICT) Literacy

Career Ready Practices:

Indicate whether these skills are *E*-Encouraged, *T*-Taught, or *A*-Assessed in this unit by marking *E, T, A* on the line before the appropriate skill.

E, T	CRP1. Act as a responsible and contributing citizen and employee
E, T, A	CRP2. Apply appropriate academic and technical skills
	CRP3. Attend to personal health and financial well-being
E, A	CRP4. Communicate clearly and effectively with reason
T, A	CRP5. Consider the environmental, social and economic impacts of decisions
E, T, A	CRP6. Demonstrate creativity and innovation
E, T, A	CRP7. Employ valid and reliable research strategies
E, T, A	CRP8. Utilize critical thinking to make sense of problems and persevere in solving them
E	CRP9. Model integrity, ethical leadership, and effective management

		CRP10. Plan education and career paths aligned to personal goals
	E, T, A	CRP11. Use technology to enhance productivity
	E, T, A	CRP12. Work productively in teams while using cultural global competence
Student Learning Goals/Objectives:		
Students will know.... 1. What is Instaria? 2. How to incorporate intarsia into a larger woodworking project where it is appropriate. 3. How to properly set up a scroll saw. 4. The safety rules for the scroll saw. 5. What constitutes basic scroll saw work. 6. How to choose the best material for both scroll saw and intarsia work.		Students will be able to (do)... A. Define the term Intarsia B. Be able to identify various projects that incorporate intarsia techniques. C. Set up and use the scroll saw. D. Identify the safety rules and apply them for the scroll saw. E. Identify the various techniques for matching parts in an Intarsia project. F. Understand wood selection and where to get the materials for an intarsia project.
Assessment Evidence:		
Performance Tasks: Progress on student's projects will be evaluated twice per marking period, once at the midpoint and once at the end. Project grades will be determined by the teacher with student input provided by the projects grading worksheet. Project grades will account for 60% of the student's course average. Assessments are made on a regular basis with a minimum of a biweekly grade. Some specific assignments will be considered as performance assessment grades. Daily performance assessment grades should be averaged into weekly grades. Performance assessment grades will account for 20% of the student's course average. Performance Assessment Criteria :		Other Assessment Measures: Quizzes, tests, essay prompts, homework, review games, tickets out the door, benchmarks, group research assessment and typed critical thinking assignments. Each unit will include at least one written assessment in order to insure that students are able to organize, process, and apply what they have learned in an individual, standardized context. Written assessments will account for 20% of the student's course average.

*Time on task / Project work through the period.	
*Ability to follow general shop safety rules.	
*Safety glasses	
*Talking while on a machine.	
*Clean up activities at the end of the period.	
*Attentiveness during lectures and demonstrations.	
*Willingness to assist others as needed.	
*Completion of additional in class assignments.	