Grade, Subject/Course: Construction Technology (10-12)	
Unit: Safety	**__X__ Essential _____ Important _____ Compact**
Big Idea: Safety is an inherent part of technology and engineering design.	
STEELS/Tech and Engineering Strand: 3.5.9-12.AA Safely apply an appropriate range of making skills to a design thinking process. 3.5.9-12.L Interpret laws, regulations, policies, and other factors that impact the development and use of technology.	**Pacing:** 2 weeks
Essential Questions: UEQ: Why is safety an attitude not a set of rules? LEQ: What PPE is needed to safely operate tools and machines in making products? LEQ: Why is safety so important in the technology lab? LEQ: What are the machine safety rules and operations used in making design prototypes? LEQ: Why is it important to understand force when operating hand or power tools? LEQ: Why are cleanliness and organization important in the technology lab?	**Understandings:** Students will know that… ● General safety rules for the lab need to be followed based on the PDE safety guide. ● Each machine has specific safety rules and operational processes. ● Rules about the production environment are regulated by the Occupational Safety & Health Association (OSHA). ● Safety Data Sheets (SDS) contain information about hazardous chemicals in the workplace. ● There are codes for fire prevention and safety. ● Lock Out Tag Out procedures are in place to prevent accidents when using machines. ● General lab maintenance and clean-up procedures are necessary to maintain a safe work environment.
Knowledge: General Lab Safety Personal Protective Equipment (PPE) Machine Specific Safety Lab Maintenance	**Do/Skills:** Students will be able to… ● Appropriately use personal protective equipment in the production lab. ● Safely operate all power tools and equipment with 100% accuracy. ● Correctly use SDS sheets to gather information on chemicals and products used in the production lab. ● Recognize possible fire situations, correctly select the appropriate fire extinguisher, and use it efficiently to extinguish a fire. ● Properly maintain established clear standards for student work areas.
Vocabulary: Safety Data Sheets (SDS), Danger Zone, Lock Out Tag Out (LOTO), Personal Protective Equipment (PPE)	**Core Resources:** Schoology LMS Woodworking Lab Machinery

Common Assessment(s): Safety Tests 1. Planer 2. Jointer 3. Table Saw 4. Compound Miter Saw 5. Sanders (Belt/Disc) 6. Drill Press 7. Band Saw 8. Lathe	**Supplemental Resources:** PDE Safety Guide ITEEA Safety Resources Teacher created activities, tutorials and assignments

Grade, Subject/Course: Construction Technology (10-12)	
Unit: Wood Processing	**__X__ Essential _____ Important _____ Compact**
Big Idea: Wood processing combines the art and science of transforming raw wood into functional, durable, and aesthetically pleasing products through techniques like cutting, shaping, and finishing.	

STEELS/Tech and Engineering Strand:	**Pacing:**
3.5.9-12.A Use various approaches to communicate processes and procedures for using, maintaining, and assessing technological products and systems. 3.5.9-12.B Critically assess and evaluate a technology that minimizes resource use and resulting waste to achieve a goal. 3.5.9-12.E Evaluate how technology and engineering advancements alter human health and capabilities. 3.5.9-12.H Evaluate ways that technology and engineering can impact individuals, society, and the environment. 3.5.9-12.I (ETS) Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts. 3.5.9-12.O Apply appropriate design thinking processes to diagnose, adjust, and repair systems to ensure precise, safe, and proper functionality. 3.5.9-12.AA Safely apply an appropriate range of making skills to a design thinking process. 3.5.9-12.JJ Identify and explain how the evolution of civilization has been directly affected by, and has in turn affected, the development and use of tools, materials, and processes. 3.5.9-12.MM Troubleshoot and improve a flawed system embedded within a larger technological, social, or environmental system.	8 weeks

Essential Questions:	**Understandings:** Students will know that…
UEQ: How can wood processing techniques transform raw wood into functional, durable, and aesthetically pleasing products? LEQ: What are the key steps involved in the wood processing workflow, from raw material selection to finished product? LEQ: How do different wood types and their properties impact the processing methods and the final outcome of a project? LEQ: What role do cutting, shaping, and finishing techniques play in transforming raw wood into usable components? LEQ: How do safety considerations affect wood processing techniques and the operation of related equipment? LEQ: In what ways do wood processing methods influence the environmental sustainability of a project, and how can waste be minimized? LEQ: How do technological advances, such as CNC machines and laser cutting, enhance the precision and efficiency of wood processing? LEQ: How does the grain, moisture content, and natural defects of wood influence its processing and the stability of the finished product? LEQ: What are the best practices for choosing appropriate tools and techniques for various wood processing tasks (e.g., sanding, planing, cutting)? LEQ: How can graphic designs be applied to enhance the functionality and aesthetic appeal of wood-based products through wood processing techniques? LEQ: How do finishing techniques such as staining, varnishing, and painting affect the appearance, durability, and functionality of wood products? LEQ: What are the most common challenges in wood processing, and how can they be overcome through proper technique and material selection?	• Wood processing techniques can transform raw wood into functional, durable, and visually appealing products by applying various methods such as cutting, shaping, and finishing. • The wood processing workflow involves multiple steps, including material selection, cutting, shaping, finishing, and assembling, which together result in a completed product. • The properties of different wood types, such as grain, moisture content, and natural defects, significantly affect the processing methods and the final outcome of a project. • Cutting, shaping, and finishing techniques are essential in converting raw wood into usable components and refining the material into the desired form. • Safety considerations are critical in wood processing to ensure the proper operation of equipment and minimize risks to operators during tasks like cutting and sanding. • Wood processing methods can influence environmental sustainability by using materials efficiently and minimizing waste, for example, by recycling scrap wood or using eco-friendly finishes. • Technological advances like CNC machines and laser cutting have improved the precision, efficiency, and complexity of wood processing, allowing for more intricate designs and faster production. • The grain, moisture content, and natural defects in wood must be considered when processing it, as they affect the material's stability and overall durability. • Best practices for selecting tools and techniques depend on the specific wood processing task, ensuring the correct approach for tasks such as sanding, planing, or cutting. • Graphic designs can be integrated into wood products to enhance their aesthetics and functionality, especially when applied with techniques such as engraving or custom finishes. • Finishing techniques like staining, varnishing, and painting not only improve the appearance of wood products but also increase their durability and resistance to wear and environmental factors. • Common challenges in wood processing, such as material defects, tool wear, and the impact of environmental conditions, can be addressed through careful technique selection and material management.

Knowledge:	**Do/Skills:** Students will be able to…
Wood species characteristics Project plans Reading drawings Creating cutting diagrams Order of operations Machine tool usage	● Understand the key wood processing techniques that transform raw wood into functional, durable, and aesthetically pleasing products. ● Identify and describe the key steps involved in the wood processing workflow, from material selection to the completion of the finished product. ● Analyze how different wood types and their properties impact the processing methods and the outcome of a project. ● Demonstrate proficiency in cutting, shaping, and finishing techniques used to transform raw wood into usable components. ● Apply safety considerations in wood processing and the safe operation of related equipment during wood processing tasks. ● Evaluate the environmental impact of wood processing methods and explore strategies to minimize waste and promote sustainability. ● Explore the use of technological advancements, such as CNC machines and laser cutting, to enhance the precision and efficiency of wood processing. ● Examine how the grain, moisture content, and natural defects of wood affect its processing and the stability of the final product. ● Select and apply appropriate tools and techniques for various wood processing tasks, such as sanding, planing, and cutting. ● Integrate graphic design elements into wood products to enhance functionality and aesthetics through appropriate processing techniques. ● Explore the effects of different finishing techniques, such as staining, varnishing, and painting, on the appearance, durability, and functionality of wood products. ● Identify and solve common challenges in wood processing through the proper selection of techniques and materials. ● Utilize the appropriate tools and resources necessary to design and fabricate their own wood products.
Vocabulary: Forester, Clear Cut, Selective Cut, Plain Sawn Lumber, Quarter Sawn Lumber, Deciduous, Coniferous, Hardwood, Softwood, Rough Lumber, Surfaced Lumber, Kiln-Dried, Air-Dried, Rip Cut, Crosscut, Chop Cut, Slide Cut, Dado, Rabbet, Groove, Kerf, Miter, Square, Warp, Cup, Crook, Bow, Knot, Check, Shake, Kickback, Exotic vs Domestic Lumber, Defect, Character	**Core Resources:** Schoology LMS Planer Jointer Table Saw Compound Miter Saw Sanders (Belt/Disc) Drill Press Band Saw Lathe Router

Common Assessment(s):	**Supplemental Resources:**
1. Wood Identification and Terms Activity 2. Exotic Woods Activity 3. Wood Turning Project 4. Steam Bending Project 5. Wood Processing Project 6. Graphic Design	Teacher created activities, tutorials and assignments

Grade, Subject/Course: Construction Technology (10-12)	
Unit: Framing	**__X__ Essential _____ Important _____ Compact**
Big Idea: Construction framing is the foundational process that ensures the structural integrity and safety of buildings, where understanding material selection, design principles, and building codes is crucial to creating durable and functional structures.	
STEELS/Tech and Engineering Strand: 3.5.9-12.AA Safely apply an appropriate range of making skills to a design thinking process. 3.5.9-12.F Evaluate a technological innovation that arose from a specific society's unique need or want. 3.5.9-12.L Interpret laws, regulations, policies, and other factors that impact the development and use of technology. 3.5.9-12.LL Analyze the stability of a technological system and how it is influenced by all of the components in the system, especially those in the feedback loop. 3.5.9-12.PP Demonstrate the use of conceptual, graphical, virtual, mathematical, and physical modeling to identify conflicting considerations before the entire system is developed and to aid in design decision making. 3.5.9-12.QQ Implement quality control as a planned process to ensure that a product, service, or system meets established criteria	**Pacing:** 3 weeks

Essential Questions:	**Understandings:** Students will know that…
UEQ: How do material selection, design principles, and building codes work together to ensure the structural integrity and safety of construction framing? LEQ: How do the principles of construction framing ensure the structural integrity and safety of buildings? LEQ: What are the key differences between various types of framing systems (e.g., wood, steel, concrete), and how do these affect the design and construction process? LEQ: How do building codes and regulations influence the materials and techniques used in framing a structure? LEQ: What role do tools and machinery play in the framing process, and how can they be used to enhance precision and efficiency? LEQ: How do environmental factors such as load distribution, weather conditions, and material selection impact the design and durability of framed structures?	● Material selection, design principles, and adherence to building codes are essential for ensuring the structural integrity and safety of construction framing. ● The principles of construction framing, including load distribution, joint design, and material strength, are critical for creating safe and stable structures. ● Different framing systems (wood, steel, concrete) each offer unique benefits and limitations, affecting the choice of materials, tools, techniques, and the overall design process. ● Building codes and regulations provide guidelines that influence the types of materials used and the specific framing techniques required to meet safety standards. ● Tools and machinery, such as saws, drills, and framing hammers, play a significant role in the framing process by ensuring precision, efficiency, and quality control in construction. ● Environmental factors, such as load distribution, weather conditions, and the properties of materials, must be considered when designing and constructing durable and functional framed structures.
Knowledge: Framing Systems Building Codes and Regulations Material Selection Framing Techniques Load Distribution Environmental Considerations	**Do/Skills:** Students will be able to… ● Explain how material selection, design principles, and building codes work together to ensure the structural integrity and safety of construction framing. ● Describe the principles of construction framing and their role in ensuring the structural integrity and safety of buildings. ● Identify the key differences between various framing systems (wood, steel, concrete) and analyze how these differences influence the design and construction process. ● Evaluate how building codes and regulations impact the materials and techniques used in framing a structure. ● Demonstrate the role of tools and machinery in the framing process and explain how they enhance precision and efficiency. ● Analyze the environmental factors, such as load distribution, weather conditions, and material properties, that influence the design and durability of framed structures.
Vocabulary: Framing, Load-Bearing Wall, Non-Load-Bearing Wall, Studs, Joists, Rafters, Header, Trusses, Sheathing, Sill Plate, Top Plate, Subfloor, Corner Bracing, Fasteners, Shear Wall, Beam, Column, Cantilever, Span, Building Codes, Load Distribution, Tie Plate, Plumb, Level, Overhang, Rough Opening, Stud Spacing.	**Core Resources:** Schoology LMS

Common Assessment(s):	**Supplemental Resources:**
1. Framing Plans 2. Framing Project	Teacher created activities, tutorials and assignments

Grade, Subject/Course:	
Construction Technology (10-12)	
Unit: Electrical	**__X__ Essential _____ Important _____ Compact**
Big Idea: Understanding household electrical wiring empowers us to safely and responsibly design, troubleshoot, and maintain essential circuits in our homes.	
STEELS/Tech and Engineering Strand: 3.5.9-12.AA Safely apply an appropriate range of making skills to a design thinking process. 3.5.9-12.F Evaluate a technological innovation that arose from a specific society's unique need or want. 3.5.9-12.L Interpret laws, regulations, policies, and other factors that impact the development and use of technology. 3.5.9-12.LL Analyze the stability of a technological system and how it is influenced by all of the components in the system, especially those in the feedback loop. 3.5.9-12.PP Demonstrate the use of conceptual, graphical, virtual, mathematical, and physical modeling to identify conflicting considerations before the entire system is developed and to aid in design decision making. 3.5.9-12.QQ Implement quality control as a planned process to ensure that a product, service, or system meets established criteria	**Pacing:** 3 weeks
Essential Questions: UEQ: How does understanding household electrical wiring enable us to safely design, troubleshoot, and maintain the circuits that power our homes? LEQ: Why is electrical safety crucial when working with household wiring?	**Understandings:** Students will know that… ● Electrical safety is essential in residential wiring to prevent hazards like shocks, fires, and electrical failures. ● Grounding, circuit breakers, and GFCIs are critical safety features that protect people and property from electrical faults and overloading.

LEQ: What are the common hazards associated with residential electrical systems? LEQ: How do grounding and circuit breakers protect against electrical hazards? LEQ: What safety equipment and practices should be used when working on electrical circuits? LEQ: What is a circuit, and how does it work in a residential setting? LEQ: How do different types of circuits (e.g., series vs. parallel) impact electrical flow in a home? LEQ: What role do fuses and circuit breakers play in residential circuits? LEQ: What are the main components in a household electrical system (e.g., outlets, switches, light fixtures)? LEQ: How do outlets and switches connect to the circuit to control electrical flow? LEQ: What is the function of a ground fault circuit interrupter (GFCI), and where is it typically used? LEQ: What types of wiring are commonly used in residential settings, and how are they identified? LEQ: How can a basic residential circuit be safely assembled for learning purposes? LEQ: What steps are involved in creating a circuit with a switch, an outlet, and a light fixture? LEQ: How do you ensure a sample circuit is wired correctly to prevent electrical hazards? LEQ: How can troubleshooting techniques be applied to fix issues in a sample circuit?	• Using appropriate safety equipment and following best practices are necessary for safe electrical work. • Residential circuits allow electrical energy to flow to power devices, with different circuit types (series vs. parallel) affecting the distribution and control of power in a home. • Circuit breakers and fuses play key roles in regulating electrical flow and preventing overloading in household circuits. • The main components of a household electrical system include outlets, switches, light fixtures, and wiring, each serving a specific function to control and distribute power. • Outlets and switches connect to circuits to manage the flow of electricity safely and effectively. • GFCIs provide an essential safety feature by detecting ground faults and shutting off power, especially in areas with water exposure. • Various types of wiring are used in residential settings, each with unique markings and insulation for easy identification and specific uses. • Basic residential circuits can be safely assembled by following steps that ensure correct connections and prevent hazards. • Building a circuit with components such as switches, outlets, and lights requires a sequential process to ensure functionality and safety. • Proper circuit assembly and troubleshooting techniques are essential to correct wiring issues and maintain a safe electrical system in residential settings.
Knowledge: Electrical Safety Electrical Components and Wiring Types of Circuits Assembly of Basic Circuits	**Do/Skills:** Students will be able to… • Identify and explain common hazards in residential electrical systems and the importance of electrical safety in preventing accidents. • Describe the function and importance of grounding, circuit breakers, and GFCIs in protecting people and property from electrical faults and overloads. • Demonstrate the correct use of safety equipment and best practices for safe electrical work. • Explain the purpose of residential circuits and compare series and parallel circuits in terms of electrical flow and power distribution. • Describe the roles of circuit breakers and fuses in managing electrical flow and preventing overloads in household circuits. • Identify the main components of a household electrical system (outlets, switches, light fixtures, wiring) and explain their functions in controlling and distributing power.

	• Illustrate how outlets and switches connect to circuits and regulate the flow of electricity safely. • Explain the role of GFCIs in residential settings, including their function in areas with water exposure. • Identify various types of residential wiring, recognizing their markings and insulation, and explain their specific uses. • Safely assemble a basic residential circuit by following correct steps to ensure secure connections and minimize hazards.
Vocabulary: Voltage, Current, Resistance, Watt, Circuit, Series Circuit, Parallel Circuit, Grounding, Breaker Panel, Circuit Breaker, Fuse, GFCI (Ground Fault Circuit Interrupter), Short Circuit, Load, Switch, Outlet (Receptacle), Wire Gauge, Insulation, Hot Wire, Neutral Wire, Ground Wire, Conduit, Amperage (Amps), Multimeter, Transformer	**Core Resources:** Schoology LMS Lab Trainers
Common Assessment(s): 1. Wiring Lab 1 2. Wiring Lab 2 3. Wiring Lab 3 4. Wiring Lab 4 5. Wiring Lab 5 6. Wiring Lab 6	**Supplemental Resources:** Teacher created activities, tutorials and assignments