

# Wallenpaupack Area School District Planned Course Curriculum Guide

## Career and Technical Education

### Building Construction Level 3

#### Course Description:

Masonry/Interior Finish/Advanced Roofing

This course introduces students to the materials, tools, and techniques used to construct and repair masonry structures in residential and light commercial construction. Learners work with brick, concrete block, cinder block, and stone to build and repair walls, partitions, arches, veneers, and related structural and decorative elements. Instruction emphasizes accurate measurement from reference points, laying out work from blueprints and specifications, and marking guidelines to ensure proper alignment and layout.

Students learn to prepare and spread mortar beds, apply mortar to units, and place, level, and align masonry units to achieve required joint thickness and structural integrity. They practice cutting masonry units to fit confined spaces, finishing and tooling joints, and cleaning and detailing completed work for a professional appearance. Proper use and maintenance of hand and power tools, safe material handling, and consistent use of appropriate personal protective equipment (PPE) are stressed throughout all lab activities.

In addition to core masonry skills, the course extends into related interior and exterior finish work. Students are introduced to installing insulation and gypsum board (sheetrock), setting interior trim, and installing tile in accordance with manufacturer instructions and applicable building codes. Instruction also highlights eco-friendly construction practices, including energy-efficient detailing and responsible material use and waste reduction, as well as advanced roof-related masonry details where applicable. Learners gain experience with surface preparation and application of paint and stain, helping them understand how masonry and carpentry finishes work together in a complete building system.

**Initial Creation Date (if applicable) and Revision Dates:**9/2025



Wallenpaupack Area School District Curriculum	
<b>COURSE: Building Trades</b>	<b>GRADE/S: 12</b>
<b>UNIT: Masonry Orientation &amp; Safety</b>	<b>TIMEFRAME: 1-2 weeks</b>

**PA COMMON CORE/NATIONAL STANDARDS:**

**ELA:**

CC.1.2.11–12.F Evaluate how words and phrases shape meaning and tone in texts.

CC.1.2.11–12.J Acquire and use accurately general academic and domain specific words and phrases, sufficient for reading, writing, speaking, and listening at the college- and career-readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

**Math:**

CC.2.4.HS.B.1 Summarize, represent, and interpret data on a single count or measurement variable.

CC.2.4.HS.B.5 Make inferences and justify conclusions based on sample surveys, experiments, and observational studies.

**Career Education:**

13.2.11.D Analyze, revise, and apply an individualized career portfolio to chosen career path.

13.3.11.A Evaluate personal attitudes and work habits that support career retention and advancement.

**Science:**

3.1.12. A. Apply concepts of systems, subsystems, feedback, and control to solve complex technological problems.

Apply knowledge of control systems concept by designing and modeling control systems that solve specific problems.

Apply systems analysis to predict results.

Analyze and describe the function, interaction and relationship among subsystems and the system itself.

Compare and contrast several systems that could be applied to solve a single problem.

Evaluate the causes of a system’s inefficiency.

3.2.12. A. Evaluate the nature of scientific and technological knowledge.

**UNIT OBJECTIVES (SWBATS):**

- Construction site safety & PPE
- Hand & power tool safety
- Understanding job roles, team dynamics
- Basic industry terminology and materials

**INSTRUCTIONAL STRATEGIES/ACTIVITIES:**

- **Direct Instruction & Orientation Session**
  - Review course syllabus, grading, attendance policies, and program goals.
  - Discuss career opportunities and the importance of masonry skills.
- **Safety Training & Demonstration**
  - Introduce OSHA safety standards relevant to masonry.
  - Demonstrate proper use of PPE including hard hats, gloves, goggles, boots, and hearing protection.
- **Interactive Discussions**
  - Facilitate group discussions on why safety is critical and experiences with workplace hazards.
- **Visual Aids and Multimedia**
  - Use videos showing jobsite safety practices and common hazards in masonry work.
- **Hands-On Safety Practice**
  - Practice correct donning and doffing of PPE.
  - Conduct mock safety inspections or hazard identifications.
- **Collaborative Learning**
  - Role-play emergency scenarios and safety drills.

**ASSESSMENTS (Diagnostic/Benchmark/Formative/Summative):**

- A short multiple-choice or matching quiz assessing understanding of PPE, basic OSHA rules, emergency exits, tool names, and safety signs.
- Students fill out what they Know, what they Want to know, and later what they Learned about masonry safety and shop practices.
- “Have you ever used hand tools before? What safety rules do you know from previous experiences?”
- Show a photo of a construction site and ask students to identify potential safety hazards or violations.
- Covers PPE, hand/power tool safety, and emergency procedures. Can be digital (e.g., Quizizz, Kahoot) or paper-based.
- Students demonstrate correct use of gloves, goggles, hard hats, boots, etc., graded on rubric criteria (fit, use, sequencing, accuracy).
- Students complete a guided tool inspection checklist and identify whether tools are safe for use.
- Groups receive safety scenarios (e.g., broken ladder, chemical spill, power cord across walkway) and describe the correct response.
- Prompts like: “Name two PPE items used in masonry” or “List one shop rule and its purpose.”
- Based on mock job site photos, students circle hazards or label violations.
- Flashcards or station-based rotation identifying tools and stating their safe usage.
- Students keep notes, reflections, or diagrams on safety practices learned each day.
- Students teach back to peers (e.g., “how to safely lift a cinder block”) in small groups.

- ncludes multiple-choice, true/false, short answer, diagram labeling (e.g., PPE parts), and hazard identification.
- Students complete a safety walkthrough, demonstrate proper PPE use, tool handling, and housekeeping using a rubric.
- Completion and understanding of shop rules and expectations (students sign after group creation and discussion).
- Students present or create a poster showing 5 common construction hazards and how to prevent them.
- “What did I learn about safety that surprised me?” or “How would I teach a new student to stay safe in this shop?”

**DIFFERENTIATED INSTRUCTION (Acceleration/Enrichment):**

- **Extended Research Projects**
  - Assign advanced students to research OSHA safety standards in-depth, including updates and case studies on masonry-related accidents, and present findings to the class.
- **Safety Leadership Roles**
  - Designate accelerated learners as “Safety Ambassadors” to lead peer safety inspections, assist with PPE demonstrations, and promote safety throughout the course.
- **Scenario-Based Problem Solving**
  - Provide complex, realistic jobsite hazard scenarios requiring students to create detailed safety plans and emergency responses, encouraging critical thinking and application.
- **Technology Integration**
  - Use interactive safety software or virtual reality (VR) jobsite safety simulations where students can practice identifying hazards and correct safety procedures in a virtual environment.
- **Guest Speaker/Expert Interaction**
  - Facilitate enrichment through sessions with industry safety professionals, allowing students to ask questions and engage in discussions beyond basic safety protocols.
- **Peer Teaching Opportunities**
  - Encourage advanced students to develop mini-lessons or safety workshops to teach peers, reinforcing their knowledge and communication skills.
- **Advanced Safety Documentation Review**
  - Have students analyze and critique real safety reports or OSHA inspection records to identify areas of compliance and improvement.

**RESOURCES (Technology Based Resources, Text Resources, etc.):**

**KEY VOCABULARY:**

<b>Wallenpaupack Area School District Curriculum</b>	
<b>COURSE: Building Trades</b>	<b>GRADE/S: 12</b>

**PA COMMON CORE/NATIONAL STANDARDS:****ELA:**

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**Career Education:**

13.2.11.D Analyze, revise, and apply an individualized career portfolio to chosen career path.

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**Science:**

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**UNIT OBJECTIVES (SWBATS):**

- Types of masonry units (brick, CMU, stone, veneer)
- Mortar & concrete types, mixing procedures

- Tool selection & care (trowels, levels, hammers, saws, etc.)
- Blueprint/plan reading basics for masonry layout

**INSTRUCTIONAL STRATEGIES/ACTIVITIES:**

- **Direct Instruction & Demonstration**
  - Present lectures explaining characteristics of common masonry materials and tools.
  - Demonstrate correct use, handling, and maintenance of tools and materials, emphasizing safety.
- **Hands-On Exploration**
  - Provide samples of materials for tactile inspection (e.g., different bricks, mortar types).
  - Allow students to practice using hand tools and power tools in a controlled setting.
- **Visual Learning**
  - Use photos, videos, and diagrams to show tool identification, material properties, and application.
- **Collaborative Learning**
  - Organize group activities for tool identification quizzes and material comparison exercises.
- **Inquiry-Based Learning**
  - Pose real-world questions like “Which mortar is best for a cold climate?” to encourage research and discussion.
- **Safety Emphasis**
  - Reinforce personal protective equipment (PPE) use and safe handling of tools and materials throughout.
- **Formative Assessment & Feedback**
  - Conduct regular questioning, quizzes, and supervised practice with immediate feedback.
- Students handle and classify samples of bricks, blocks, stone, and mortar mixes.
- Use real tools or images; students identify names and proper uses.
- Practice safe and proper use of hand tools (trowels, hammers) and power tools (mixers, saws).
- Demonstrate water absorption, compressive strength, and other material tests; students observe and record results.
- Students practice cleaning, sharpening, and storing tools properly.
- Groups discuss and present on suitable materials for various environmental conditions.
- Simulate tool use scenarios with PPE checks and hazard identification.
- Students write about their experiences handling tools/materials and lessons learned.

**ASSESSMENTS (Diagnostic/Benchmark/Formative/Summative):**

- Basic multiple choice or matching: names of common tools (trowel, jointer, level), types of masonry units (brick, CMU), and PPE.
- In pairs or groups, students list as many masonry tools and materials as they can think of. Share results with the class.
- Show pictures of 5 tools or materials and ask: “What is this called?” “Have you seen/used it before?”

- Updated with “What I want to know about masonry tools and materials.”
- Students match tools to their names, uses, and safety rules; may use actual tools or photos.
- In a small-group lab, students demonstrate correct hand position, grip, and technique with trowels, levels, hammers, etc
- Students compare brick vs CMU vs stone by filling out a chart (weight, use, properties, cost, etc.).
- Practice using a tape measure or ruler to check CMU dimensions and determine required quantities for a project.
- Students practice in stations or digital flashcard platforms (e.g., Quizlet) to reinforce recognition.
- Prompts like: “Name one material used in stone veneer.” / “Why is tool maintenance important?”
- Students observe and record the properties of different materials — porosity, weight, texture, etc.
- Students sort a pile of tools/materials into categories (cutting tools, measuring tools, brick types, etc.) and justify their choices
- Checklist
- Students inspect tools for wear, damage, and cleanliness — then log needed repairs/cleaning.
- Questions like: “Which tool do you think is the most dangerous and why?”
- Multiple choice, matching, labeling, and short answer covering: tool ID, uses, material types, safety procedures, tool care.
- In a “station rotation,” students walk through tables or lab stations identifying tools by name and describing their use.
- Students demonstrate safe and correct use of at least 3 tools (e.g., trowel, level, jointer) using a rubric for posture, control, and accuracy.
- Students are given a small mock project (“Build a garden wall”) and must choose correct materials/tools and justify their choices.
- “Tool of the Week” or “Material Spotlight” — small groups create a poster or slide deck explaining a tool or masonry material in depth.
- Students clean, inspect, and store tools following proper shop procedures. Evaluated using a checklist or rubric.

#### **DIFFERENTIATED INSTRUCTION (Acceleration/Enrichment):**

- **In-Depth Material Analysis**
  - Assign students to research and present on advanced material science topics such as chemical composition of mortars, innovative masonry materials (e.g., lightweight concrete blocks, sustainable products), or the effects of environmental factors on material durability.
- **Tool Maintenance and Repair Workshop**
  - Enrich learning by having students perform detailed maintenance, sharpening, and minor repairs on power tools and hand tools, including creating maintenance schedules and troubleshooting common tool issues.
- **Comparative Tool Studies**
  - Task students with comparing traditional hand tools versus modern power tools, evaluating pros, cons, cost-effectiveness, and safety considerations in different masonry tasks.

- **Materials Testing and Reporting**
  - Conduct advanced materials testing (e.g., compressive strength tests, absorption tests) and require students to compile formal lab reports with data analysis and conclusions.
- **Design and Innovation Challenge**
  - Challenge students to design a new masonry tool or material modification aimed at improving efficiency or safety; create prototypes or detailed concept drawings.
- **Peer Demonstration & Teaching**
  - Have advanced students develop and lead mini-workshops on specialized tools or materials, teaching peers proper use and care techniques.
- **Industry Trends Exploration**
  - Research emerging trends in masonry tools and materials (automation, robotics, green materials), then create multimedia presentations or reports.

**RESOURCES (Technology Based Resources, Text Resources, etc.):**

**KEY VOCABULARY:**

<b>Wallenpaupack Area School District Curriculum</b>	
<b>COURSE: Building Trades Concrete &amp; Block Work</b>	<b>GRADE/S: 12</b>
<b>UNIT 3: Masonry Basic Masonry Construction Techniques</b>	<b>TIMEFRAME: 3-4 weeks</b>

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**UNIT OBJECTIVES (SWBATS):** • Laying first course: leveling, plumb, squaring corners

- Bonding patterns and masonry units alignment
- Joints: types (concave, flush, weathered, raked), finishing joints
- Mortar application & tooling

**INSTRUCTIONAL STRATEGIES/ACTIVITIES:**

- **Direct Instruction & Demonstration**
  - Instructor demonstrates step-by-step techniques for laying masonry units, bonding patterns (running bond, stack bond, etc.), and joint finishing (tooled, raked, struck).
  - Use close-up visuals and videos to highlight key techniques.
- **Guided Practice**
  - Students practice each technique in stages with instructor feedback (e.g., first practice mortar application, then laying bricks, then joint finishing).
- **Visual Learning**
  - Use diagrams, photos, and sample wall sections showing different bond patterns and joint finishes.
- **Collaborative Learning**
  - Pair students for building mock walls, sharing tips, and checking each other's work for alignment and quality.
- **Kinesthetic Learning**
  - Emphasize hands-on, tactile practice — the best way to learn the “feel” of mortar and unit placement.
- **Formative Assessment & Peer Feedback**
  - Conduct regular check-ins and peer reviews on workmanship quality, proper alignment, spacing, and finish
- Use samples and images; students identify and name common masonry bond patterns.

- Practice mixing and applying mortar to units before laying.
- Lay a single course of bricks or blocks using proper alignment and mortar joints.
- Build a short wall section demonstrating a selected bond pattern (running bond, stack bond, Flemish bond).
- Practice tooling mortar joints with different finishes (concave, struck, raked).
- Peer inspection of walls checking for plumb, level, joint uniformity, and mortar consistency.
- Watch a professional mason demonstrate advanced techniques and discuss tips.
- Students write about challenges and skills gained during wall construction.

**ASSESSMENTS (Diagnostic/Benchmark/Formative/Summative):**

- Students answer: “Have you ever laid brick or block?” / “What’s a bond pattern?” / “What tools are used to make joints?”
- Present images of completed masonry walls. Students label visible elements (e.g., bond pattern, joint type, mortar lines).
- Simple exercise: Have students try to plumb/level a short edge using a level — observe their technique.
- Provide a short list of key terms (e.g., bed joint, head joint, stretcher, weep hole) and ask students to match to definitions.
- Students build a small wall (2–3 courses) and are evaluated on layout, spacing, alignment, and joint finish using a rubric.
- Matching activity with diagrams of running bond, stack bond, Flemish, English, etc.
- Midpoint observation: Are students using tools properly (trowel angles, jointing techniques, level checks)?
- Measure the wall’s alignment and level; students record deviations from ideal and make adjustments.
- Students track progress: tools used, skills practiced, what went well, and what to improve.
- In pairs, students check each other’s walls for plumb, level, and alignment — then discuss corrections.
- Students take before/during/after pictures of their work and annotate issues they encountered.
- 
- Daily entries summarizing what bond pattern was practiced, any issues with spacing, or joint quality.
- Rotate through small skill stations: joint finishing, spreading mortar, buttering brick, tool cleaning, etc.
- In pairs, students check each other’s walls for plumb, level, and alignment — then discuss corrections.
- Students take before/during/after pictures of their work and annotate issues they encountered.
- Daily entries summarizing what bond pattern was practiced, any issues with spacing, or joint quality.
- Rotate through small skill stations: joint finishing, spreading mortar, buttering brick, tool cleaning, etc.
- Terms: stretcher, header, lead, gauge, bond. Diagrams for students to label.

- Students build a straight, level, multi-course brick or block wall section with corners. Graded on accuracy, bond, joint quality, plumb, and cleanup.
- Multiple-choice, short-answer, and diagram-based: mortar types, bond patterns, joint types, tool names, safety protocols.
- Students demonstrate at least two types of joint finishes (e.g., concave, raked) using a rubric.
- Students reflect on their wall: alignment, neatness, teamwork, and how they would improve next time.
- Label a wall drawing: stretcher, header, joint types, lead corner, gauge line.
- Instructor or peers use a checklist to assess plumb, level, straightness, and joint spacing (in fractions of an inch).

**DIFFERENTIATED INSTRUCTION (Acceleration/Enrichment):**

- **Advanced Technique Research**
  - Assign students to research specialized masonry construction techniques such as seismic reinforcement, historic restoration methods, or large-scale commercial masonry practices and present their findings.
- **Complex Project Planning**
  - Challenge students to create detailed step-by-step construction plans for complex masonry structures, including considerations for sequencing, material handling, and quality control.
- **Mock Construction Management**
  - Enrich learning through role-play as site supervisors managing masonry crews, solving real-world problems like delays, material shortages, or safety incidents during construction.
- **Integration of Technology**
  - Use CAD (computer-aided design) software or BIM (Building Information Modeling) tools to design masonry components or entire walls, linking theory to digital construction workflows.
- **Peer-Led Skill Clinics**
  - Advanced students teach peers specialized masonry techniques such as advanced brick bonding patterns or complex layout measurements.
- **Field Study and Reflection**
  - Organize site visits or virtual tours of masonry projects to observe advanced construction techniques, followed by critical reflection and discussion.
- **Problem-Solving Case Studies**
  - Present real or hypothetical construction challenges for students to analyze and propose innovative solutions, emphasizing efficiency, safety, and structural integrity.

**RESOURCES (Technology Based Resources, Text Resources, etc.):**

**KEY VOCABULARY:**

**Wallenpaupack Area School District Curriculum**

**COURSE: Building Trades**

**GRADE/S: 12**

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**UNIT OBJECTIVES (SWBATS):** • Mixing, forming, pouring concrete footings/foundations  
• Working with concrete masonry units (CMU), reinforcement, bond beam, cell filling

- Block yields, dimensions, and layout

#### **INSTRUCTIONAL STRATEGIES/ACTIVITIES:**

- **Direct Instruction & Demonstration**
  - Present lectures and step-by-step demonstrations on mixing concrete (proportions, consistency), forming footings, pouring techniques, and finishing.
  - Demonstrate CMU block laying, including reinforcement placement, bond beam installation, and proper cell filling.
- **Hands-On Practice**
  - Students mix small batches of concrete, form and pour mock footings in controlled lab environments.
  - Practice laying CMUs with proper mortar, placing rebar, and filling cells.
- **Visual Aids & Technical Drawings**
  - Use diagrams and photos of footings, bond beams, and reinforced block walls.
  - Show construction drawings detailing block layout, reinforcement schedules, and concrete specifications.
- **Collaborative Learning**
  - Work in teams for forming and pouring exercises, promoting communication and jobsite teamwork.
- **Problem-Based Learning**
  - Present real-world scenarios that require calculating block yields, designing reinforcement, and planning pours.
- **Formative Assessments & Feedback**
  - Regular observation, checklists, and peer reviews during lab work to ensure correct techniques.
- Mix concrete batches by hand or with a mixer, testing consistency and slump.
- Build forms for footings using lumber and stakes, following layout specifications.
- Pour concrete into formed footings or small slabs; practice finishing techniques (screeding, floating).
- Lay concrete masonry units in a running bond pattern with mortar, focusing on alignment and joint thickness.
- Install rebar according to bond beam and footing details, then fill cells with grout or concrete.
- Calculate the number of blocks needed for a wall given dimensions and account for openings.
- Watch a professional demonstrate reinforced block wall construction; discuss techniques and safety.
- Students reflect on challenges and best practices in concrete work and block laying.

#### **ASSESSMENTS (Diagnostic/Benchmark/Formative/Summative):**

- Covers basics: What is concrete made of? How is it different from mortar? What is a bond beam? Why reinforce block walls?
- Students label parts of a block wall (core, web, face shell) and tools used for concrete work (float, edger, screed).
- Pose a jobsite situation: "You're asked to mix concrete and fill block cells—what steps do you take?"
- Specifically about concrete and CMU work: what students already know vs. what they want to learn.

- Students dry-lay or chalk a 2-course CMU wall on a mock foundation. Evaluate alignment, spacing, and orientation.
- Instructor observes students mixing small batches of concrete by hand or machine; evaluated on mix ratios, consistency, and safety.
- In small groups, students rotate through stations demonstrating use of a trowel, screed, float, and jointer.
- Students diagram rebar placement, grout cells, and bond beam layout from a simple plan drawing.
- Students record batch mix ratios, slump (if tested), application method, and finish observations.
- Students take progress photos of block walls or concrete pours, then write a quick reflection: What went well? What needs improvement?
- Topics: CMU sizes and uses, parts of a block, bond beam purpose, curing times, concrete mix components.
- Flashcards or in-shop activity identifying tools and explaining their functions during concrete/block work.
- Students pair up and use a rubric to check each other's block walls for level, spacing, joint quality, and overall neatness.
- Instructor intentionally builds a flawed wall or form (e.g., misaligned blocks, poor mortar coverage), and students must identify and explain corrections.
- Students build a small block wall to spec (e.g., 3 courses high, corners, correct spacing). Graded with rubric: alignment, level, joints, and cleanliness.
- Students prepare, pour, and finish a small slab, curb, or form (real or mockup). Evaluated on mix control, safety, pour smoothness, and finishing quality.
- Topics: Concrete vs mortar, CMU parts, reinforcement, curing, formwork, tools, bond beams, and wall layout. Includes diagrams.
- Students are given a basic plan (e.g., footing with CMU wall and bond beam) and must label dimensions, rebar placement, and construction sequence.
- Students score their own wall or concrete work and reflect on what they would do differently next time.
- Students submit documentation of their wall and/or concrete work with a captioned description of the process and lessons learned.

#### **DIFFERENTIATED INSTRUCTION (Acceleration/Enrichment):**

- **Advanced Mix Design Research**
  - Assign students to research different concrete mix designs (e.g., high-strength, lightweight, fiber-reinforced concrete) and analyze their suitability for various construction scenarios.
- **Experimental Pouring & Testing**
  - Conduct lab experiments where students mix and pour different concrete formulations, test curing times, and measure compressive strengths, documenting results scientifically.
- **Complex Block Layout Planning**
  - Challenge students to design block layouts that include reinforcement placements, bond beams, and cell filling, incorporating architectural and structural considerations.
- **Construction Detailing Exercises**

- Have students create detailed drawings or models of footings, foundations, and block wall assemblies, highlighting reinforcement and pouring sequences.
- **Site Management Simulation**
  - Role-play scenarios where students manage concrete pours on-site, dealing with timing, weather, equipment, and quality control issues.
- **Sustainability and Innovation Discussions**
  - Explore innovations in concrete materials (e.g., green concrete, recycled aggregates) and discuss their impact on sustainability and construction practices.
- **Peer Teaching & Demonstration**
  - Advanced learners prepare and lead demonstrations on specialized topics like bond beam reinforcement or proper grout placement techniques.

**RESOURCES (Technology Based Resources, Text Resources, etc.):**

**KEY VOCABULARY:**

**Wallenpaupack Area School District Curriculum**

**COURSE: Building Trades**

**GRADE/S: 12**

**UNIT 5: Masonry Advanced Masonry Features**

**TIMEFRAME: 3-4 weeks**

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**UNIT OBJECTIVES (SWBATS):**

- Stone veneer and decorative stonework
- Arch construction (formwork, keystones, shaping)
- Fireplaces / chimneys (firebrick vs. regular brick, clearances, safety)
- Retaining walls and basic drainage with masonry

**INSTRUCTIONAL STRATEGIES/ACTIVITIES:**

- **Direct Instruction & Modeling**
  - Present detailed explanations and demonstrations on constructing arches, lintels, fireplaces, chimneys, and columns.
  - Use scale models or videos to show assembly and structural principles.
- **Hands-On Construction Practice**
  - Provide students with opportunities to build small-scale models or mock-ups of arches, lintels, and columns.
  - Practice shaping and placing masonry units for curved or decorative work.
- **Visual Aids & Diagrams**
  - Use diagrams and photos highlighting different types of arches (segmental, Gothic, semicircular), lintel installation methods, and chimney construction details.
- **Collaborative Projects**
  - Assign team projects to design and build advanced masonry feature mock-ups, encouraging planning, problem-solving, and communication.
- **Problem-Based Learning**
  - Present design challenges requiring students to plan masonry features that meet structural and aesthetic goals.
- **Formative Assessment & Feedback**
  - Conduct progress reviews during projects with constructive peer and instructor feedback.
- Build a small-scale masonry arch using bricks or blocks and wooden formwork.

- Demonstrate placement of steel and masonry lintels over openings; students practice mock installations.
- Review design and construction details; create models or drawings of fireplaces and chimneys.
- Construct square or round column sections with emphasis on alignment and bonding.
- Investigate and create sample patterns or textured masonry finishes for decorative purposes.
- In teams, design and build a small-scale advanced masonry feature incorporating learned techniques.
- Watch industry professionals build advanced masonry features; discuss techniques and challenges.
- Reflect on the complexity and skills required for advanced masonry features and personal growth areas.

**ASSESSMENTS (Diagnostic/Benchmark/Formative/Summative):**

- Multiple choice and matching questions on arches, lintels, veneer walls, control joints, and masonry terminology
- Show photos of arches, veneer walls, and control joints; students identify and describe each feature
- “What advanced masonry features have you seen or heard about?” Students share ideas and experiences
- Students create a mind map of what they know about masonry features beyond basic walls
- Label parts of an arch, types of arches, lintel materials, and function
- Students demonstrate the layout for an arch or installation of a lintel using scale models or drawings
- Students mark and justify control joint locations on a mock wall drawing
- Compare structural block walls vs. veneer walls — materials, applications, and construction methods
- Students journal what new advanced feature they practiced and challenges faced
- 
- Capture progress photos of arches, lintels, veneer mockups; annotate key construction points
- Build small scale arches or place mock lintels; practice installing control joints on sample walls
- Students evaluate each other’s work using a rubric focusing on accuracy, alignment, and workmanship
- Short checks on vocabulary, tools, and procedures related to advanced features
- Build a small arch or install a lintel on a wall mock-up; graded on accuracy, safety, and quality
- Includes labeling diagrams, multiple choice, and short answer questions about arches, lintels, veneer, and control joints
- Students submit a scaled drawing showing location and specifications for advanced masonry features in a hypothetical project
- Evaluate their own advanced masonry work, describing challenges, solutions, and improvements
- Optional: Students design and present a decorative masonry feature incorporating learned techniques

**DIFFERENTIATED INSTRUCTION (Acceleration/Enrichment):**

- **Architectural History & Design Research**
  - Assign students to research historical masonry features from various cultures (e.g., Roman arches, Gothic vaults) and present on their construction techniques and cultural significance.
- **Advanced Geometry & Layout**
  - Challenge learners to calculate and draft precise templates for arches, vaults, and curved columns using geometric principles.
- **Custom Mock-Up Projects**
  - Encourage students to design and build scale models or sections of advanced masonry features incorporating reinforcement, decorative patterns, and complex bonding.
- **Material Experimentation**
  - Investigate the use of alternative materials or additives in decorative masonry, assessing their effect on aesthetics and durability.
- **Structural Analysis Case Studies**
  - Analyze real-world examples of advanced masonry structures, focusing on load distribution, reinforcement, and failure modes.
- **Peer Instruction Workshops**
  - Students prepare and teach mini-lessons on specific advanced features such as chimney construction or arch forming techniques.
- **Creative Design Challenge**
  - Task students with designing an original masonry feature incorporating both functional and aesthetic elements, then present their design rationale.

**RESOURCES (Technology Based Resources, Text Resources, etc.):**

**KEY VOCABULARY:**

<b>Wallenpaupack Area School District Curriculum</b>	
<b>COURSE: Building Trades</b>	<b>GRADE/S: 12</b>
<b>UNIT 6: Masonry Structural Considerations &amp; Reinforcement</b>	<b>TIMEFRAME: 2-3 weeks</b>

**PA COMMON CORE/NATIONAL STANDARDS:**

**ELA:**

CC.1.2.11–12.F Evaluate how words and phrases shape meaning and tone in texts.

CC.1.2.11–12.J Acquire and use accurately general academic and domain specific words and phrases, sufficient for reading, writing, speaking, and listening at the college- and career-readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

**Math:**

CC.2.4.HS.B.1 Summarize, represent, and interpret data on a single count or measurement variable.

CC.2.4.HS.B.5 Make inferences and justify conclusions based on sample surveys, experiments, and observational studies.

**Career Education:**

13.2.11.D Analyze, revise, and apply an individualized career portfolio to chosen career path.

13.3.11.A Evaluate personal attitudes and work habits that support career retention and advancement.

**Science:**

3.1.12. A. Apply concepts of systems, subsystems, feedback, and control to solve complex technological problems.

Apply knowledge of control systems concept by designing and modeling control systems that solve specific problems.

Apply systems analysis to predict results.

Analyze and describe the function, interaction and relationship among subsystems and the system itself.

Compare and contrast several systems that could be applied to solve a single problem.

Evaluate the causes of a system's inefficiency.

3.2.12. A. Evaluate the nature of scientific and technological knowledge.

**UNIT OBJECTIVES (SWBATS):**

- Reinforced masonry basics: rebar, steel reinforcement, grout filling
- Load-bearing vs non-load-bearing masonry walls
- Foundations, lintels, bond beams
- Expansion joints & control joints

**INSTRUCTIONAL STRATEGIES/ACTIVITIES:**

- **Direct Instruction & Demonstration**
  - Teach fundamentals of structural reinforcement including types of reinforcement (steel rebar, wire mesh), grout, and their roles.
  - Demonstrate proper placement of reinforcement within masonry cells and footings using sample blocks or mockups.
- **Visual Aids & Technical Drawings**

- Use diagrams, construction drawings, and videos showing reinforcement placement in walls, bond beams, and footings.
- **Hands-On Practice**
  - Provide opportunities for students to place reinforcement bars in blocks, set up bond beams, and pour grout into cells.
- **Collaborative Learning**
  - Team exercises to plan reinforcement layouts based on structural requirements.
- **Problem-Based Learning**
  - Analyze case studies requiring selection and placement of reinforcement to meet load demands.
- **Formative Assessment & Feedback**
  - Continuous instructor observation and peer feedback during practical reinforcement exercises
- Practice bending and placing rebar within CMU cells according to reinforcement schedules.
- Mix and pour grout into reinforced CMU cells, ensuring proper consolidation.
- Assemble bond beam sections with reinforcement and grout in mock wall sections.
- Interpret structural drawings specifying reinforcement size, spacing, and placement.
- Analyze different structural scenarios and recommend reinforcement solutions.
- Reflect on the importance of reinforcement for masonry strength and personal learning progress.

**ASSESSMENTS (Diagnostic/Benchmark/Formative/Summative):**

- Multiple choice and short answer questions about common defects (cracks, efflorescence, spalling), repair materials, and maintenance practices
- Students identify defects in photos of masonry walls (e.g., cracked mortar, loose bricks, staining)
- “What problems can happen to masonry over time? Have you seen or fixed any before?”
- What students know, want to learn, and eventually learned about repair and maintenance
- Given images and descriptions, students identify issues and recommend repair methods
- Match repair materials (epoxy, mortar mix, sealants) with appropriate uses
- Students demonstrate use of tools for repair (grinder, tuckpointing tools) and proper PPE
- Students draft a simple repair plan for a cracked masonry wall including steps and materials
- Practice removing old mortar (raking joints), cleaning masonry, and repointing mortar joints
- Students document steps, materials used, and observations during repair practice
- Before-and-after photos of repair work with annotations
- Students observe and give constructive feedback on each other’s repair technique
- Terms and procedures for sealing cracks, waterproofing, and patching masonry
- Students perform a full repointing on a mock wall section or repair cracks and spalling with correct materials and techniques
- Covers diagnosis, repair techniques, safety, material properties, and preventive maintenance
- Students present a detailed repair and maintenance plan for a given masonry defect scenario
- Evaluation
- Students assess their repair work and describe challenges and improvements

- Include photos and documentation of repairs performed throughout the unit

**DIFFERENTIATED INSTRUCTION (Acceleration/Enrichment):**

- **Advanced Structural Analysis**
  - Assign students to analyze load-bearing masonry walls using structural engineering principles, calculating stresses, load paths, and reinforcement requirements.
- **Reinforcement Detailing Projects**
  - Challenge students to create detailed reinforcement layouts for complex masonry structures including bond beams, lintels, and shear walls, using CAD or hand drafting.
- **Material Science Exploration**
  - Research innovative reinforcement materials such as fiber-reinforced polymers (FRP) and discuss their applications compared to traditional steel rebar.
- **Case Study Evaluation**
  - Study structural failures in masonry buildings, analyze causes, and propose improved reinforcement strategies.
- **Field Simulation Exercises**
  - Conduct mock reinforcement installations on sample walls or blocks with focus on accuracy, safety, and adherence to design specifications.
- **Peer Teaching & Presentation**
  - Prepare and deliver in-depth presentations on reinforcement techniques, emphasizing code compliance and best practices.
- **Problem-Based Learning Challenges**
  - Present real-world structural problems requiring students to design appropriate reinforcement solutions within budget and safety constraints.

**RESOURCES (Technology Based Resources, Text Resources, etc.):**

**KEY VOCABULARY:**

<b>Wallenpaupack Area School District Curriculum</b>	
<b>COURSE: Building Trades</b>	<b>GRADE/S: 12</b>
<b>UNIT 7: Masonry Estimating, Planning, &amp; Project Management</b>	<b>TIMEFRAME: 2 weeks</b>

**PA COMMON CORE/NATIONAL STANDARDS:**

**ELA:**

CC.1.2.11–12.F Evaluate how words and phrases shape meaning and tone in texts.

CC.1.2.11–12.J Acquire and use accurately general academic and domain specific words and phrases, sufficient for reading, writing, speaking, and listening at the college- and career-readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

**Math:**

CC.2.4.HS.B.1 Summarize, represent, and interpret data on a single count or measurement variable.

CC.2.4.HS.B.5 Make inferences and justify conclusions based on sample surveys, experiments, and observational studies.

**Career Education:**

13.2.11.D Analyze, revise, and apply an individualized career portfolio to chosen career path.

13.3.11.A Evaluate personal attitudes and work habits that support career retention and advancement.

**Science:**

3.1.12. A. Apply concepts of systems, subsystems, feedback, and control to solve complex technological problems.

Apply knowledge of control systems concept by designing and modeling control systems that solve specific problems.

Apply systems analysis to predict results.

Analyze and describe the function, interaction and relationship among subsystems and the system itself.

Compare and contrast several systems that could be applied to solve a single problem.

Evaluate the causes of a system's inefficiency.

3.2.12. A. Evaluate the nature of scientific and technological knowledge.

**UNIT OBJECTIVES (SWBATS):**

- **Quantity take-offs for masonry units, mortar, concrete, stone**
- **Cost estimation: materials, labor, overhead**
- **Job planning: sequence, scheduling, site layout, safety planning**
- **Blueprint reading advanced (elevations, sections, details)**

**INSTRUCTIONAL STRATEGIES/ACTIVITIES:**

**ASSESSMENTS (Diagnostic/Benchmark/Formative/Summative):**

- Questions on basic OSHA rules, PPE types, common hazards in masonry, and emergency procedures
- Show images/videos of masonry jobsite scenes; students identify potential safety hazards
- "What safety gear have you used or seen on job sites? Why is safety important in masonry?"
- What students know, want to learn, and eventually learn about safety and regulations

- Students demonstrate proper use of PPE (hard hats, gloves, eye protection, respirators) and inspect PPE for defects
- “What safety gear have you used or seen on job sites? Why is safety important in masonry?”
- What students know, want to learn, and eventually learn about safety and regulations
- Students demonstrate proper use of PPE (hard hats, gloves, eye protection, respirators) and inspect PPE for defects
- Multiple choice and true/false questions on OSHA standards relevant to masonry (fall protection, scaffolding, material handling)
- Students identify hazards in a simulated or real workspace and propose corrective actions
- Practice responding to jobsite emergencies (fire, injury, chemical spill) following safety protocols
- Students record daily safety observations, near misses, and personal reflections on jobsite safety
- Document proper and improper safety practices observed in class/shop with notes
- Students assess peers during lab activities for compliance with safety rules using a checklist
- Short quizzes on hazard recognition, PPE types, OSHA standards
- Regular inspections of tools and equipment for safe operation
- Written test covering OSHA regulations, hazard recognition, PPE, emergency procedures, and jobsite safety rules
- Students demonstrate correct PPE use, scaffold setup, ladder safety, and safe material handling
- Given a scenario with safety hazards, students write a plan to identify and mitigate risks
- Students reflect on their safety practices and areas for improvement
- Include logs, checklists, quiz results, and reflections from the unit

#### **DIFFERENTIATED INSTRUCTION (Acceleration/Enrichment):**

- **Advanced Estimating Projects**
  - Give students more complex blueprints or larger projects to estimate.
- **Use Industry Software in Depth**
  - Let students explore advanced features of estimating software or learn to customize reports.
- **Research and Present Innovations**
  - Have students research new masonry materials or modern estimating techniques and present findings to the class.
- **Cost Analysis and Profit Margin**
  - Teach students to calculate not just costs but also profit margins and bid pricing strategies.
- **Create Training Materials**
  - Ask students to design a short tutorial or guide for beginners on estimating or planning.
- **Peer Mentoring**
  - Pair advanced students with peers who need help, so they explain concepts and guide activities.

**KEY VOCABULARY:**

**Wallenpaupack Area School District Curriculum**

**COURSE: Building Trades**

**GRADE/S: 12**

**UNIT 8: Masonry Project Management and Estimating**

**TIMEFRAME: 3-4 weeks (or integrated throughout)**

**PA COMMON CORE/NATIONAL STANDARDS:**

**ELA:**

CC.1.2.11–12.F Evaluate how words and phrases shape meaning and tone in texts.

CC.1.2.11–12.J Acquire and use accurately general academic and domain specific words and phrases, sufficient for reading, writing, speaking, and listening at the college- and career-readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

**Math:**

CC.2.4.HS.B.1 Summarize, represent, and interpret data on a single count or measurement variable.

CC.2.4.HS.B.5 Make inferences and justify conclusions based on sample surveys, experiments, and observational studies.

**Career Education:**

13.2.11.D Analyze, revise, and apply an individualized career portfolio to chosen career path.

13.3.11.A Evaluate personal attitudes and work habits that support career retention and advancement.

**Science:**

3.1.12. A. Apply concepts of systems, subsystems, feedback, and control to solve complex technological problems.

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Analyze and describe the function, interaction and relationship among subsystems and the system itself.

Compare and contrast several systems that could be applied to solve a single problem.

Evaluate the causes of a system's inefficiency.

3.2.12. A. Evaluate the nature of scientific and technological knowledge.

**UNIT OBJECTIVES (SWBATS):**

- •Understand the basics of masonry project management, including the roles and responsibilities of a project manager.
- Develop skills to create and manage project schedules, using tools like Gantt charts or project management software.
- Identify key factors in estimating masonry projects, including materials, labor, equipment, and overhead costs.
- Perform accurate quantity takeoffs from blueprints and drawings for masonry materials.
- Calculate total project costs by applying unit prices to material quantities and labor hours.
- Develop a comprehensive project plan that integrates scheduling, estimating, and resource allocation.
- Recognize common challenges in masonry project management and strategies to mitigate risks (e.g., delays, budget overruns).
- Use technology and software tools to support estimating and project management tasks.
- Communicate project plans and estimates effectively to clients, supervisors, or team members.

**INSTRUCTIONAL STRATEGIES/ACTIVITIES:**

- **Direct Instruction with Visual Aids**
  - Use slides, charts, and real masonry project examples to explain project management basics and estimating concepts.
  - Show sample blueprints and walk through the estimating process visually.
  - Highlight key terms like “quantity takeoff,” “labor cost,” “schedule,” and “budget.”
- **Guided Practice**
  - Work together on a sample project estimate.
  - Instructor models how to measure from blueprints, calculate quantities, and apply unit prices.
  - Students complete similar exercises with instructor support.
- **Hands-On Learning**
  - Provide students with actual masonry units (bricks, blocks) to measure dimensions physically.
  - Let students practice calculating the number of units needed for a mock wall.
  - Practice measuring and calculating mortar volume.
- **Group Collaboration Projects**
  - Divide students into small groups.
  - Assign a project where students must plan the sequence of masonry tasks, estimate materials and labor, and develop a project schedule.
  - Encourage assigning roles like estimator, scheduler, and project manager within the group.
- **Technology Integration**

- Introduce software like Microsoft Project, PlanSwift, or industry-specific estimating tools.
- Demonstrate how to input data and generate cost estimates and schedules.
- Have students practice using the software with sample projects.
- **Problem-Based Learning**
  - Present scenarios such as material delays, budget cuts, or weather impacts.
  - Have students discuss and propose solutions to keep the project on track.
  - Facilitate reflection on risk management.
- **Formative Assessment and Feedback**
  - Use quizzes on estimating formulas and project management terms.
  - Give quick exit tickets asking for one thing learned or a question they have.
  - Review student estimates and schedules for accuracy and provide feedback.
- Measure Materials- Look at a blueprint and figure out how many bricks and mortar are needed.
- Add Up Costs- Use prices for materials and labor to find the total cost of the project.
- Make a Timeline- List all the tasks and plan when each one will happen.
- Teamwork Project -with others to create an estimate and schedule, then share your plan.
- Try Estimating Software -Use a computer program to help make estimates and reports.
- Talk About Problems -Look at a real project with problems and discuss how to fix them.
- Share Your Plan- Explain your estimate and schedule to the group and answer questions.

#### **ASSESSMENTS (Diagnostic/Benchmark/Formative/Summative):**

- Questions on basic project phases, estimating terminology, and key construction documents
- “What steps are involved in managing a masonry project? What factors affect cost and scheduling?”
- Students create a mind map of project management tasks and estimating concepts they know
- Track what students Know, Want to learn, and have Learned about project management and estimating
- Students calculate masonry unit quantities and mortar volumes from sample plans or drawings
- Complete a simplified material and labor cost estimate for a masonry wall project
- Questions on critical path, milestones, and sequencing masonry tasks
- Identify key details on project drawings affecting scheduling and estimating (dimensions, specifications, notes)
- Students record quantities, unit costs, and totals for various materials and labor tasks
- Create Gantt charts or basic schedules for masonry project phases
- Review and critique classmates’ quantity takeoffs and estimates
- Focused on formulas for area, volume, unit costs, and reading specifications
- Manage project constraints like weather delays, material shortages, or labor issues
- Project
- Complete a full quantity takeoff and cost estimate for a masonry project based on detailed plans
- Covers project management principles, estimating formulas, plan reading, and scheduling concepts
- Students create a detailed schedule, resource plan, and risk management plan for a masonry project

- Reflect on estimating accuracy, planning decisions, and project management challenges
- Include all estimating worksheets, schedules, plans, and reflections from the unit

**DIFFERENTIATED INSTRUCTION (Acceleration/Enrichment):**

- **Complex Project Management Scenarios**
  - Challenge students with managing larger or multi-phase masonry projects, including handling unexpected problems like delays or budget changes.
- **Advanced Software Tools**
  - Have students explore project management software (like Microsoft Project or Buildertrend) to create detailed schedules, budgets, and resource plans.
- **Cost-Benefit Analysis**
  - Encourage students to analyze different materials or methods for cost-effectiveness and long-term value.
- **Leadership Roles**
  - Assign advanced learners as “project managers” in group activities to plan, delegate, and supervise a masonry project from start to finish.
- **Case Study Research**
  - Students research real masonry projects and present lessons learned regarding management and estimating challenges.
- **Develop Training Modules**
  - Have students create teaching materials or videos on project management techniques for masonry beginners.

**RESOURCES (Technology Based Resources, Text Resources, etc.):**

**KEY VOCABULARY:**

**Wallenpaupack Area School District Curriculum**

**COURSE: Building Trades**

**GRADE/S: 12**

**UNIT 9: Masonry Career Readiness**

**TIMEFRAME:**

**PA COMMON CORE/NATIONAL STANDARDS:**

**ELA:**

CC.1.2.11–12.F Evaluate how words and phrases shape meaning and tone in texts.

CC.1.2.11–12.J Acquire and use accurately general academic and domain specific words and phrases, sufficient for reading, writing, speaking, and listening at the college- and career-readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

**Math:**

CC.2.4.HS.B.1 Summarize, represent, and interpret data on a single count or measurement variable.

CC.2.4.HS.B.5 Make inferences and justify conclusions based on sample surveys, experiments, and observational studies.

**Career Education:**

13.2.11.D Analyze, revise, and apply an individualized career portfolio to chosen career path.

13.3.11.A Evaluate personal attitudes and work habits that support career retention and advancement.

**Science:**

3.1.12. A. Apply concepts of systems, subsystems, feedback, and control to solve complex technological problems.

Apply knowledge of control systems concept by designing and modeling control systems that solve specific problems.

Apply systems analysis to predict results.

Analyze and describe the function, interaction and relationship among subsystems and the system itself.

Compare and contrast several systems that could be applied to solve a single problem.

Evaluate the causes of a system's inefficiency.

3.2.12. A. Evaluate the nature of scientific and technological knowledge.

**UNIT OBJECTIVES (SWBATS):**

- Identify essential masonry skills and traits
  - Technical, physical, and interpersonal skills
  - Reliability, attention to detail, safety awareness
- Explore masonry career paths and opportunities
  - Bricklayer, block mason, restoration specialist, supervisor, contractor
  - Roles within the masonry industry
- Develop professional job application materials
  - Create resumes and cover letters tailored to masonry jobs
  - Highlight skills, experience, and certifications
- Practice interviewing and communication skills
  - Prepare for common masonry interview questions
  - Develop professional verbal and nonverbal communication
- Understand industry certifications and licensing
  - OSHA safety training, NCCER credentials, state licensing
  - Continuing education for career growth

- Recognize workplace safety and ethical practices
  - Job site safety rules and regulations
  - Ethical behavior and professionalism
- Create a personal career development plan
  - Set short-term and long-term goals
  - Identify steps for education and skill development
- Value teamwork and professionalism
  - Importance of collaboration on job sites
  - Impact of professionalism on reputation and advancement
- Build networking and job search skills
- Connect with professionals via job fairs, apprenticeships, organizations
- Strategies for job searching and applications

#### **INSTRUCTIONAL STRATEGIES/ACTIVITIES:**

- Interactive Lectures
  - Present key career readiness topics with visuals and real-world examples.
- Guest Speakers / Industry Professionals
  - Invite local masons or contractors to share career insights and answer questions.
- Resume and Cover Letter Workshops
  - Guide students step-by-step in creating professional resumes and cover letters.
- Mock Interviews
  - Practice common interview questions and professional communication skills in pairs or groups.
- Career Exploration Research
  - Assign research projects on different masonry careers and certifications.
- Role-Playing Scenarios
  - Simulate workplace situations to practice teamwork, safety, and professionalism.
- Technology Use
  - Use online job search tools and industry websites for job hunting and networking.
- Goalsetting sessions
  - Help students develop personal career plans with achievable short- and long-term goals.
- Create a Masonry Resume and Cover Letter- Students draft and peer-review resumes, and cover letters tailored to masonry jobs.
- Mock Job Interview- Conduct practice interviews with feedback on answers, body language, and professionalism.
- Career Path Presentation- Students research a masonry career specialty and present what they learned to the class.
- Safety and Ethics Role-Play- Act out common workplace scenarios emphasizing safety rules and ethical choices.
- Job Search Practice- Explore online job boards, apprenticeship programs, and industry associations.
- Personal Career Plan Worksheet- Students write down their career goals and steps to achieve them.

- Networking Activity- Simulate attending a job fair or industry event and practice networking conversations.

**ASSESSMENTS (Diagnostic/Benchmark/Formative/Summative):**

- Questions on workplace skills, resume components, interview basics, and professionalism
- “What qualities make a good employee in construction? What are your career goals?”
- Students rate their current soft skills (communication, teamwork, punctuality, etc.)
- Track what students Know, Want to learn, and have Learned about career readiness
- Students create or update a resume tailored to masonry or construction jobs
- Situational questions on ethics, communication, conflict resolution, and safety culture
- Conduct a practice interview with peer or instructor feedback on responses and presentation
- Prepare and deliver a brief professional self-introduction
- Draft cover letters for job applications emphasizing skills and experiences
- Practice communication and behavior in common workplace situations
- Review and critique classmates’ resumes, cover letters, and interview skills
- Short quizzes on teamwork, punctuality, communication, and workplace behavior
- Track job leads, applications, and networking efforts
- Submit a polished resume, cover letter, and job application form for a masonry position
- Participate in a recorded or live interview assessed on professionalism, communication, and preparedness
- Reflect on career goals, workplace expectations, and personal growth throughout the unit
- Include resumes, cover letters, job applications, interview notes, and reflections
- 

**DIFFERENTIATED INSTRUCTION (Acceleration/Enrichment):**

- **Advanced Career Research**
  - Have students research specialized masonry careers (e.g., historic restoration, advanced masonry technology) and present their findings.
- **Certification & Licensing Prep**
  - Provide resources and practice for industry certifications or licensing exams beyond the basic requirements.
- **Portfolio Development**
  - Encourage students to create a professional portfolio with resumes, photos of projects, certifications, and references.
- **Mock Interviews & Networking**
  - Organize advanced mock interviews and teach networking skills with professionals in the masonry industry.
- **Entrepreneurship Skills**
  - Challenge students to develop a simple business plan for a masonry contracting business.
- **Mentorship Opportunities**
  - Connect advanced students with masonry professionals for mentoring or job shadowing.

**RESOURCES (Technology Based Resources, Text Resources, etc.):**

**KEY VOCABULARY:**

**Wallenpaupack Area School District Curriculum**

**COURSE:**

**GRADE/S:**

**UNIT: Insulation**

**TIMEFRAME:**

**PA COMMON CORE/NATIONAL STANDARDS:**

**UNIT OBJECTIVES (SWBATS):**

[Residential Insulation and Green Construction — Unit Framework](#)

- Purpose and Function of Insulation
  - Explain how insulation improves comfort, controls heat transfer, reduces energy consumption, and contributes to sustainable housing .
- Types of Insulation Materials
  - Compare fiberglass, cellulose, spray foam, rigid foam boards, mineral wool, and structural insulated panels (SIPs) based on R-value, moisture control, fire resistance, and environmental impact .
- R-Value and Thermal Performance
  - Discuss how R-value measures thermal resistance; examine regional code requirements and determine appropriate insulation levels based on local climate zones .
- Building Codes and Standards
  - Review applicable codes and best practices, including the International Energy Conservation Code (IECC) and ASHRAE 90.1 energy performance standards .
- Installation Methods and Best Practices
  - Demonstrate correct insulation placement in walls, attics, and floors with vapor barrier alignment, sealing of penetrations, and continuous coverage to eliminate thermal bridges .
- Air Sealing and Moisture Management
  - Identify methods for controlling air leakage using caulking, spray foam, and weatherstripping, and discuss the role of vapor retarders in condensation prevention .
- Acoustic and Fire-Resistant Insulation Applications
  - Describe materials designed for soundproofing and discuss ASTM fire-safety standards guiding their usage in residential construction .
- Energy-Efficient Framing and Design Concepts
  - Explore advanced framing techniques, continuous exterior insulation, and high-performance window systems that minimize energy loss .
- Green Building Principles

- Define sustainable design goals emphasizing energy efficiency, renewable materials, waste reduction, and low-VOC (volatile organic compound) finishes .
- LEED and Energy Star Construction Standards
  - Examine certification frameworks promoting eco-friendly building through insulation performance, reduced emissions, and renewable resource integration .
- Reflective and Radiant Barrier Insulation Systems
  - Study radiant barriers and reflective insulation designed to reduce solar heat gain in warm climates, following ASTM standards .
- Evaluation and Performance Testing
  - Apply methods like blower door tests and infrared thermography to identify air leaks, insulation voids, and energy inefficiencies .
- Safety and Environmental Considerations
  - Follow safe handling procedures for fiberglass and spray foam products; discuss disposal, recycling, and low-emission material selection .
- Cost Efficiency and Life Cycle Benefits
  - Assess material costs, long-term savings, and return on investment when integrating high-performance insulation and green materials .

**INSTRUCTIONAL STRATEGIES/ACTIVITIES:**

**ASSESSMENTS (Diagnostic/Benchmark/Formative/Summative):**

**DIFFERENTIATED INSTRUCTION (Acceleration/Enrichment):**

**RESOURCES (Technology Based Resources, Text Resources, etc.):**

**KEY VOCABULARY:**

<b>Wallenpaupack Area School District Curriculum</b>	
<b>COURSE:</b>	<b>GRADE/S:</b>
<b>UNIT :exterior finish</b>	<b>TIMEFRAME:</b>

**PA COMMON CORE/NATIONAL STANDARDS:**

## **UNIT OBJECTIVES (SWBATS):**

### Exterior Finish Work — Unit Framework

- Purpose and Function of Exterior Finishes
  - Examine the role of exterior finishes in protecting structures from weather, providing thermal efficiency, and enhancing curb appeal .
- Types of Exterior Finishes
  - Identify and differentiate finish materials such as brick, stucco, vinyl siding, fiber cement, stone veneer, and metal cladding; discuss durability, cost, and maintenance .
- Surface Preparation and Substrate Evaluation
  - Demonstrate processes for cleaning, leveling, and priming exterior wall surfaces to achieve proper adhesion and long-term durability .
- Weatherproofing and Moisture Control
  - Explore techniques for water-resistive barriers, flashing, joint sealants, and drainage systems to prevent moisture intrusion and mold .
- Insulation and Energy Efficiency
  - Review integration of rigid foam boards, house wrap, or exterior insulation systems to improve thermal resistance and energy performance .
- Cladding and Siding Installation
  - Apply the installation sequence for wood, composite, and metal siding, focusing on alignment, fastening, and expansion gaps .
- Stucco and Cement-Based Finishes
  - Examine plaster systems, including scratch, brown, and finish coats; analyze texture creation methods such as trowel, dash, or Tyrolean .
- Architectural Details and Trim
  - Practice installing exterior trims, soffits, fascia, and corner boards to achieve clean, weather-tight joints and provide visual definition .
- Paints, Sealants, and Protective Coatings
  - Study surface finishing options, including exterior paints, stains, and coatings designed for UV and moisture resistance .
- Fasteners and Connectors for Exterior Applications
  - Identify corrosion-resistant fasteners and anchoring systems suitable for various cladding materials in exterior conditions .
- Fire Resistance and Code Compliance
  - Explore code requirements related to exterior wall assemblies, including fire rating, structural performance, and wind load resistance .
- Safety Procedures for Exterior Work
  - Implement safe practices for ladder use, scaffolding, handling of siding materials, and equipment operation .
- Quality Assessment and Maintenance
  - Conduct inspection routines for joint integrity, finish uniformity, and water-tightness; address defects and plan preventive maintenance .
- Sustainability and Aesthetic Design

- Evaluate eco-friendly materials, recycled cladding products, and design approaches that balance environmental responsibility with visual impact

**INSTRUCTIONAL STRATEGIES/ACTIVITIES:**

**ASSESSMENTS (Diagnostic/Benchmark/Formative/Summative):**

**DIFFERENTIATED INSTRUCTION (Acceleration/Enrichment):**

**RESOURCES (Technology Based Resources, Text Resources, etc.):**

**KEY VOCABULARY:**

**Wallenpaupack Area School District Curriculum**

**COURSE:**

**GRADE/S:**

**UNIT : Interior finish**

**TIMEFRAME:**

**PA COMMON CORE/NATIONAL STANDARDS:**

**UNIT OBJECTIVES (SWBATS):**

- Material Identification and Applications
  - Explore the range of materials used in interior finish work, such as drywall, trim, flooring, cabinets, and coatings, discussing properties, quality grades, and appropriate use .
- Sequence of Interior Finishing Operations
  - Examine the chronological order of interior finish tasks, including drywall, painting, trim installation, and flooring, emphasizing coordination among trades .
- Drywall and Trim Installation Techniques
  - Practice precise measuring, cutting, and fitting of drywall panels and molding components, following layout plans and finish standards .
- Tool and Equipment Proficiency
  - Introduce essential finish carpentry tools—miter saws, nail guns, levels, and sanders—focusing on accurate use, maintenance, and safety handling .
- Interpreting Finish Drawings and Schedules
  - Review finish drawings, schedules, and specifications to plan layouts, verify materials, and execute installations to architectural standards .
- Door, Cabinet, and Hardware Installation

- Demonstrate proper alignment and fastening methods for pre-hung doors, window trim, cabinetry, and interior hardware .
- Surface Preparation and Coating
  - Apply procedures for surface preparation including sanding, sealing, and priming before finishing with paint, stain, or wall treatments .
- Flooring Systems and Underlayments
  - Discuss the installation of hardwood, laminate, tile, and resilient flooring systems, including subfloor preparation and adhesive application .
- Quality Assurance and Detailing
  - Implement inspection techniques for finish accuracy, seam alignment, and aesthetic quality while correcting imperfections .
- Safety and Environmental Practices
  - Enforce interior finish safety procedures, PPE usage, dust control, and environmentally responsible material selection .
- Project Planning and Estimating
  - Calculate material quantities, labor requirements, and sequence tasks for time-efficient, cost-effective interior finishing .
- Craftsmanship and Design Integration
  - Emphasize precise workmanship, proportion, and detail in shaping architectural features such as casing, crown moldings, and wainscoting to enhance visual appeal .

**INSTRUCTIONAL STRATEGIES/ACTIVITIES:**

**ASSESSMENTS (Diagnostic/Benchmark/Formative/Summative):**

**DIFFERENTIATED INSTRUCTION (Acceleration/Enrichment):**

**RESOURCES (Technology Based Resources, Text Resources, etc.):**

**KEY VOCABULARY:**