Massachusetts Career Technical Education

Mason Tile Setting Framework

2014

# [Strand 2: Technical Knowledge and Skills](#_bookmark0)

##### Masonry and Tile Setting Safety and Health Knowledge and Skills

* + 1. Complete safety training for all masonry equipment and materials.
       1. Demonstrate use of all masonry related hand and power tools according current industry and OSHA standards.
       2. Identify, describe and demonstrate the procedures for erection and dismantling of steel tubular scaffolding.
       3. Demonstrate the use and maintenance of fall protection systems.
       4. Explain use and storage of various masonry related materials, including cements, sands, mixes, and various chemicals according to manufacturers’ specifications and industry and OSHA standards.
       5. Identify and apply OSHA and other health and safety regulations that apply to specific tasks and jobs in masonry.
    2. Performance Example:
       - Students will successfully complete OSHA 10-hour certification training.

##### Read and Interpret Prints

* + 1. Identify, describe and use working drawings.
       1. Explain the basic layout of a set of prints as well as the importance of the accompanying job specifications document.
       2. Identify and define basic print terms, abbreviations, line types, symbols and notes.
       3. Interpret and follow drawing dimensions using an architect scale.
       4. Read and interpret all aspects of a plan.
       5. Describe, develop and complete material quantity takeoff sheets.
       6. Explain how state and/or local requirements apply to prints.
    2. Performance Examples:
       - Perform shop/job site projects/work from appropriate sets of prints/drawings.
       - Draw appropriate cross sections and/or details.
       - Develop a material quantity takeoff for the project/job.
       - Prepare an application for a specified permit.

##### Basics of Mason and Tile Setting Trade

* + 1. Explain the fundamentals of the masonry and tile setting trade.
       1. Describe trade history and trade opportunities.
       2. Set-up materials and work area according to industry standards.
    2. Performance Example:
       - The student will give an oral presentation using appropriate masonry/construction terminology noting locations of hazards and first-aid supplies.

##### Hand Tools

* + 1. Identify and use masonry hand tools.
       1. Identify the mason’s basic hand tools.
       2. Use and clean hand tools.
       3. Apply mortar with a trowel.
       4. Cut brick and block with a hammer and set.
       5. Demonstrate how to level, plumb, and range units.
       6. Secure line to pins, blocks and stretcher and trigs.
    2. Performance Example:
       - Students will identify hand tools and describe and demonstrate their use.

##### Power Tools

* + 1. Select and use appropriate power tools**.**
       1. Set-up and operate power hand tools and fastening equipment.
       2. Set-up and operate a diamond-blade wet saw.
       3. Set-up and operate various electric and gas powered equipment.
    2. Performance Example:
       - Students will demonstrate the use and application of masonry power tools.

##### Mixing of Various Cementitious Materials

* + 1. Demonstrate the preparation of various mixes.
       1. Identify appropriate mortar for a specified application.
       2. Mix mortar by hand.
       3. Mix concrete by hand.
       4. Mix grout for reinforcement by hand.
       5. Mix with power mixers.
    2. Performance Example:
       - Students will select the ingredients and demonstrate the procedure and of mixing various cementitious products.

##### Measurements

* + 1. Demonstrate how to accurately take measurements.
       1. Identify fractions on a rule.
       2. Measure with various spacing rules.
       3. Measure and estimate materials for a specific project.
       4. Establish grades and or heights with a builder’s level.
       5. Calculate the area and volume of a specified project.
    2. Performance Example:
       - Students will demonstrate the use of various measuring tools by taking various measurements (lengths, widths, and heights) to calculate the areas and materials needed for a specified project.

##### Brick Bonds

* + 1. Demonstrate the layout of brick bonds and positions according to industry standards..
       1. Identify the six brick positions.
       2. Demonstrate the layout of Stretcher or Running Bond.
       3. Demonstrate the layout of Common or American Bond.
       4. Demonstrate the layout of English Bond.
       5. Demonstrate the layout of Flemish Bond.
       6. Demonstrate the layout of Stack Bond.
    2. Performance Example:
       - Students will construct several given projects using the various brick positions and bonds.

##### Brick Paving

* + 1. Demonstrate installation of pavers according to industry standards.
       1. Identify basic brick paving tools.
       2. Prepare base for area to be paved.
       3. Install pavers using the Stretcher or Running Pattern.
       4. Install pavers using the Basket Weave Pattern.
       5. Install pavers using the Herringbone Pattern.

##### Brick Leads and Corners

* + 1. Demonstrate the construction of various brick leads.
       1. Construct standard inside and outside brick corner lead.
       2. Construct brick quoin corner.
       3. Construct brick jam lead.
       4. Construct brick rack-back lead.
    2. Performance Example:
       - Students will construct several specified projects using brick for various corners and leads.
    3. Construct concrete masonry unit, corners and walls.
       1. Construct 4” block corner lead.
       2. Construct 4” block wall between established leads or deadmen.
       3. Construct 6” block corner lead.
       4. Construct 6” block wall between established leads or deadmen.
       5. Construct 8” block corner lead.
       6. Construct 8” block wall between established leads or deadmen.
       7. Construct 12” block corner lead.
       8. Construct12” block wall between established leads or deadmen.

2.J.02 Performance Example:

* Students will construct several specified projects using the various block wall and corner construction.

##### Masonry Finishing and Restoration

* + 1. Demonstrate how to joint, cut, repoint and clean masonry.
       1. Demonstrate the use of various jointing techniques and finishes.
       2. Cut out joints and tuck point wall on existing work.
       3. Rub, brush and touch-up a wall.
       4. Demonstrate the ‘Wash-Down’ procedure with chemical cleaners following current industry and OSHA standards.
    2. Performance Example:
       - Students will demonstrate the jointing, cutting and washing techniques on masonry walls.

##### Building Layout

* + 1. Apply the fundamentals of building layout.
       1. Read and interpret a basic masonry drawing.
       2. Snap chalk lines and square layout using 3-4-5 method (Pythagorean Theorem).
       3. Arrange masonry materials for efficient use.
    2. Performance Example:
       - Students will demonstrate layout of a building using specified layout tools and methods from a given drawing, according to industry standards.

###### Tile Setting

* + 1. Demonstrate proper tile setting techniques.
       1. Identify tile setter’s basic hand tools.
       2. Prepare an area to be tiled.
       3. Layout the pattern of a work area.
       4. Spread thin set mortar and other tile adhesive.
       5. Set tile into notched adhesive bedding.
       6. Make cuts in tile using various tile cutting tools.
       7. Grout tile joints.
       8. Clean a completed surface area.
    2. Performance Example:
       - Students will show tile setting procedures on given pattern and project area.

##### Scaffolding

* + 1. Demonstrate assembly, use, and dismantling of scaffolding according to industry and OSHA standards.
       1. Identify all components of steel tubular sectional scaffolding.
       2. Layout scaffold location and place mud-sill planking.
       3. Erect frames with cross-braces on screw jacks.
       4. Level, plumb and range scaffold frames.
       5. Set-up side brackets, walking plank and deck plank.
       6. Prepare scaffolding for inclement weather.
       7. Stock materials on scaffold for safe and efficient use.
    2. Performance Example:
       - Students will assemble scaffolding from given plans according to industry and OSHA standards.

##### Various Masonry Walls

* + 1. Demonstrate the construction of various masonry walls**.**
       1. Construct a brick veneer on a wood-frame structure.
       2. Construct composite walls with brick and block.
       3. Construct partition and cavity walls.
       4. Lay out openings and space for doors and windows.
       5. Set sills and lintels at designated heights.
    2. Performance Example:
       - Students will construct several projects using various block and brick construction.

##### Reinforcement of Masonry

* + 1. Demonstrate various ways to reinforce masonry.
       1. Identify load-bearing and non-load-bearing walls.
       2. Install wire reinforcement tracking in bed joints.
       3. Install anchors and wall ties.
       4. Cut, bend and install rebar and wire mesh.
    2. Performance Example:
       - Students will describe and demonstrate bearing wall construction and installation of reinforcement and anchors.

##### Waterproof Masonry Construction

* + 1. Demonstrate the installation of flashing and waterproofing.
       1. Demonstrate how to damp-proof walls.
       2. Install flashing using various techniques.
       3. Caulk expansion joints, window and door jambs.
       4. Apply sealer to masonry surfaces.
    2. Performance Example:
       - Students will demonstrate various flashing and waterproofing techniques.

##### Chimneys and Fireplaces

* + 1. Construct residential chimneys and fireplaces according to industry and OSHA standards.
       1. Construct single or double flue chimney.
       2. Construct firebox with ash dump, damper and smoke chamber.
       3. Install lead flashing and cap chimney.

1. R01 Performance Example:
   * Student will construct chimney and fireplace projects from given plans.

##### Concrete Finishing

* + 1. Demonstrate how to place and finish concrete.
       1. Identify basic concrete finishing hand tools.
       2. Prepare area to grade and set forms.
       3. Place, screed, and bull-float the concrete surface.
       4. Edge and groove according to job requirements.
       5. Demonstrate various finishing techniques (e.g., broomed, troweled, pattern stamped).
    2. Performance Example:
       - Students will identify and demonstrate the use and techniques of placement and finishing concrete.

##### Arches

* + 1. Demonstrate the construction of various arches.
       1. Identify the various arches.
       2. Explain the construction of wooden forms and arches.
       3. Layout and construct various arches (e.g., segmental, semi-circular, gothic).
    2. Performance Example:
       - Students will identify and construct arch projects.

##### Residential and Ornamental Masonry

* + 1. Construct residential and ornamental masonry.
       1. Construct brick and block planter with cap.
       2. Construct brick steps with a platform.
       3. Construct a curved masonry project (serpentine wall or well).
       4. Describe procedures used to install landscape retaining walls.
       5. Compare and contrast the construction of stone and brick/block walls.
       6. Define details from a basic set of construction plans
    2. Performance Example:
       - Students will construct given masonry projects using working drawings.

# [Strand 3: Embedded Academics](#_bookmark0)

Strand 3: Embedded Academics, a critical piece of a Vocational Technical Education Framework, are presented as Crosswalks between the Massachusetts Vocational Technical Education Frameworks and the Massachusetts Curriculum Frameworks. These Crosswalks are located in the Appendix of this Framework.

##### Academic Crosswalks

[Appendix A: English Language Arts](#_bookmark20) [Appendix B: Mathematics](#_bookmark20)

[Appendix C: Science and Technology/Engineering](#_bookmark22) Earth and Space Science

Life Science (Biology)

Physical Science (Chemistry and Physics) Technology/Engineering

# [Embedded Academic Crosswalks](#_bookmark0)

### [Embedded English Language Arts and Literacy](#_bookmark0)

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| CVTE  Learning Standard Number | Strand Coding Designation Grades ELAs  Learning Standard Number | Text of English Language Arts Learning Standard |
| 2.B.01 | RST Grades 9-10 #1  RST Grades 11-12 #1 | Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.  Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the  account.  Performance Example:  Research and present on a power point the various jobs in Health care that are specifically involved in providing immediate first aid to an injured person. Explain the role of the providers.  Performance Example:  The student will discuss the specific textual evidence and discuss the distinctions and inconsistencies in a set of working drawings. |
| 2.B.01 | RST Grades 9-10, 11-12 #4 | Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 9-10*  *texts and topics/grades 11-12 tests and topics.*  Performance Example:  The student will discuss a set of working drawings, interpret all aspects of the plan, and accurately determine the meaning of various abbreviations, symbols and notes. |
| 2.B.01 | RST Grades 9-10 #7 | Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically  (e.g., in an equation) into words.  Performance Example:   * Using a set of technical drawings or prints, the student will develop comprehensive material quantity takeoff sheets. The student will deliver a multimedia presentation (handouts, PowerPoint presentation,   poster, etc.) that includes tables and/or charts, reflecting the materials, quantities and cost of the proposed project. |
| 2.B.01 | RST Grades 9-10 #10  RST Grades 11-12 #10 | By the end of grade 10, read and comprehend science/technical texts in the grades 9 – 10 text complexity band independently and proficiently.  By the end of grade 12, read and comprehend science/technical texts in the grades 11-CCR text complexity band independently and proficiently.  Performance Example:  The student will identify all aspects of a plan, and discuss the complexity of the proposed project and how it will affect the building progress. |
| 2.B.01 | WHST Grades 9-10, 11-12  #4 | Produce clear and coherent writing in which the development, organization and style are appropriate to task, purpose and  audience.  Performance Example:   * The student will interpret a set of working drawings, and prepare a report that identifies materials, quantities and cost of the proposed project. The report will demonstrate an understanding of the project as   well as the customer’s specific needs, and will be written in a style that is appropriate to the trade. |
| 2.C.01 | RST Grades 9 – 10 #2  RST Grades 11 - 12 #2 | Determine the central ideas or conclusions of a text; trace the text’s explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text.  Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information  presented in a text by paraphrasing them in simpler but still accurate terms. |
| 2.C.01 | WHST Grades 9-10, 11-12  #4 | Produce clear and coherent writing in which the development,  organization and style are appropriate to task, purpose and audience.  Performance Example:   * The student will discuss a proposed project and work area, citing specific industry standards and necessary   materials. The student will provide an accurate summary of the complex process, but will “break-down” the presentation by paraphrasing in accurate terms more appropriate for the given audience.  Performance Example:   * The student will evaluate information presented in a multimedia format (e.g. video), comparing and contrasting (either written or orally) the appropriate use of tools and materials. The student will discuss and demonstrate the appropriate use of tools and materials in a multi-step procedure. |
| 2.D.01,  2.E.01,  2.F.01,  2.G.01,  2.H.01,  2.I.01,  2.J.01,  2.K.01,  2.L.01,  2.M.01,  2.N.01,  2.O.01,  2.P.01,  2.Q.01,  2.R.01,  2.S.01,  2.T.01,  2.U.01 | RST Grades 9-10 #3  RST Grades 11-12 #3  RST Grades 9-10 #4  RST Grades 11-12 #4  RST Grades 9-10 #7  RST Grades 11-12 #7 | Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.  Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.  Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 9-10 texts and topics.*  Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 11-12 texts and topics.*  Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.  Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem. |
|  | RST Grades 9-10 #10  RST Grades 11-12 #10  WHST Grades 9-10 #2 a-e  WHST Grades 9-10, 11-12  #4  WHST Grades 9-10, 11-12  #5  WHST Grades 9-10 #6  WHST Grades 11-12 #6  WHST Grades 9-10, 11-12  #9 | By the end of grade 10, read and comprehend science/technical texts in the grades 9-10 text complexity band independently and proficiently.  By the end of grade 12, read and comprehend science/technical texts in the grades 11-CCR text complexity band independently and proficiently.  Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.   1. Introduce a topic and organize ideas, concepts and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension. 2. Develop the topic with well-chosen, relevant, and sufficient facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience’s knowledge of the topic. 3. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among ideas and concepts. 4. Use precise language and domain-specific vocabulary to manage the complexity of the topic and convey a style appropriate to the discipline and context as well as to the expertise of likely readers. 5. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.   Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.  Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.  Use technology, including the Internet, to produce, publish and update individual or shared writing products, taking advantage of technology’s capacity to link to other information and to display information flexibly and dynamically.  Use technology, including the Internet, to produce, publish and update individual or shared writing products in response to ongoing feedback, including new arguments or information.  Draw evidence from informational texts to support analysis, reflection, and research. |

### [Embedded Mathematics](#_bookmark0)

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| CVTE  Learning Standard Number | Math Content Conceptual Category and Domain Code Learning Standard Number | Text of Mathematics Learning Standard |
| 2.B.01 | G-SRT1 | The dilation of a line segment is longer or shorter in the ratio given by the scale factor.  Performance Example:  Given a set of plans, students will determine the actual size of project to be built. |
| 2.B.01 | N-Q3 MA.3.A | Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.  Identify significant figures in recorded measures and computed values based on the context given and the precision  of the tools used to measure.  Performance Example:  Given a set of plans, students will estimate a materials list and approximate cost. |
| 2.D.01 | S-ID2 | Use statistics appropriate to the shape of the data distribution to compare center ( median, mean) and spread (interquartile  range, standard deviation) of two or more different data sets  Performance Example:  Students will determine slope of work area and how it would change given different range of dimensions. |
| 2.D.01 | G-SRT8 | Use trigonometric ratios and Pythagorean Theorem to solve right triangles in applied problems.  Performance Example:  Students will determine the diagonal distances across a rectangular area to be used for patio. |
| 2.F.01 | G-MG2 MA.4 | Apply concepts of density based on area and volume in modeling situations.  Use dimensional analysis for unit conversions to confirm that expressions and equations make sense.  Performance Example:  Students will compute area for project and volume of material needed to complete. |
| 2.G.01 | N-Q2 MA.3.a | Define appropriate quantities (fractions) for the purpose of descriptive modeling with various measuring tools.  Describe the effects of approximate error in measurement and  rounding on measurements and on computed values from measurements.  Performance Example:  Students will estimate work area and volume of materials, measuring within 1/8 of an inch. Determine variance. |
| 2.G.01 | N-Q3 MA.3.A | Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.  Identify significant figures in recorded measures and computed values based on the context given and the precision  of the tools used to measure.  Performance Example: Given a set of plans, students will estimate material list and then measure for exact amount necessary. Students will compare cost variation between the two results. |
| 2.G.01 | G-MG2 MA.4 | Apply concepts of density based on area and volume in modeling situations and specific real life projects.  Use dimensional analysis for unit conversions to confirm that expressions and equations make sense.  Performance Example:  Students will convert units between yards, feet, and inches. Students will be asked to confirm “that expressions and equations make sense.” |
| 2.J.01 | G-CO12 | Make formal geometric constructions with a variety of tools  and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.  Performance Example:  Students will make a model structure with paper/cardboard given proper scale. |
| 2.L.01 | G-SRT8 | Use trigonometric ratios and Pythagorean Theorem to solve right triangles in applied problems.  Performance Example:  Given two sides of a structure, students will determine the length of the diagonal connecting the two. |
| 2.M.01 | G-CO12 | Make formal geometric constructions with a variety of tools  and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.  Performance Example:  With string, students will layout the perimeter for 5 to 8 sided project. |
| 2.M.01 | G-GPE7 | Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.  Performance Example:  Students will compute the distance between two points in a coordinate grid. |
| 2.U.01 | G-GMD1 | Give an informal argument for the formulas for the  circumference of a circle, area of a circle, volume of a cylinder, pyramid, and a cone.  Performance Example:  Students will compute the amount of material needed for a semi-circled patio. |

### [Embedded Science and Technology/Engineering](#_bookmark0)

#### [Earth and Space Science](#_bookmark0)

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| CVTE  Learning Standard Number | Subject Area, Topic Heading and  Learning Standard Number | Text of Earth and Space Science Learning Standard |
| 2.U.01  2.Q.01 | 3. Earth Process and Cycles 3.1 | Explain how physical and chemical weathering leads to erosion and the formation of soils and sediments, and creates various types of landscapes. Give examples that show the effects of physical and  chemical weathering on the environment.  Performance Example:  Students will describe procedures used to install landscape retaining walls, and their benefits. Students will discuss the benefit of damp-proof walls, and how to install flashing. |

#### [Physical Science (Chemistry)](#_bookmark0)

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| CVTE  Learning Standard Number | Subject Area, Topic Heading and  Learning Standard Number | Text of Chemistry Learning Standard |
| 2.F.01  2.K.01 | 7. Solutions, Rates of Reaction, and Equilibrium 7.1, 7.3 | 7.1 Describe the process by which solutes dissolve in solvents.  7.3 Identify and explain the factors that affect the rate of dissolving (e.g. temperature, concentration, surface area, pressure, mixing).  7.5 Identify the factors that affect the rate of a chemical reaction (temperature, mixing, concentration, particle size, surface area,  catalyst).  Performance Example:   * Students will demonstrate an understanding of the process by which solutes dissolve in solvents by mixing various cementitious materials to specifications. Students will demonstrate the “Wash-Down” procedure   with chemical cleaners. |
| 2.F.01 | 6. States of Matter, Kinetic Molecular Theory, and Thermochemistry 6.4 | Describe the law of conservation of energy. Explain the difference between an endothermic process and an exothermic process.  Performance Example:  Students will identify basic concrete principles and understand process is exothermic. |

#### [Physical Science (Physics)](#_bookmark0)

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| CVTE  Learning Standard Number | Subject Area, Topic Heading and  Learning Standard Number | Text of Physics Learning Standard |
| 2.G.01 | 1. Motion and Forces 1.1 | Compare and contrast vector quantities (e.g. displacement, velocity, acceleration force, linear momentum) and scalar quantities (e.g.  distance, speed, energy, mass, work.  Performance Example:  Students will demonstrate the proper use of various measuring tools by taking various measurements (lengths, widths, and heights) to calculate the areas and materials needed for a specific project. |
| 2.J.01 | 1. Motion and Force 1.5 | Use a free-body diagram to show forces acting on a system consisting of a pair of interacting objects. For a diagram with only co-linear forces, determine the net force acting on a system and between the  objects.  Performance Example:  Students will construct several projects using brick for various corners and leads. |
| 2.P.01 | 1. Motion and Force 1.4 | Interpret and apply Newton’s three laws of motion.  Performance Example:  Students will demonstrate and identify bearing wall construction and the installation of reinforcement and anchors. |

#### [Technology/Engineering](#_bookmark0)

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| CVTE  Learning Standard Number | Subject Area, Topic Heading and  Learning Standard Number | Text of Technology/Engineering Learning Standard | |
| 2.B.01 | 1. Engineering Design 1.1, 1.4,  1.5 | 1.1 Identify and explain the steps of the engineering design process: identify the problem, research the problem, develop possible solutions, select the best possible solution(s), and redesign.  1.4 Interpret and apply scale and proportion to orthographic projections and pictorial drawings (e.g., ¼” = 1’0, 1 cm = 1m).  1.5 Interpret plans, diagrams, and working drawings in the construction of prototypes or models.  Performance Example:  Students will discuss the steps of the engineering design process, reading and interpreting prints. | |
| 2B.01 | 2. Construction Technologies  2.6 | Recognize the purposes of zoning laws and building codes in the design and use of structures.  Performance Example:  Students will discuss state and local building requirements, and prepare an application for an appropriate permit. | |
| 2.C.01 | 2. Construction Technologies  2.1 | Identify and explain the engineering properties of materials used in structures (e.g., elasticity, plasticity, R value, density, strength).  Performance Example:  Students will identify and discuss the differences between various masonry walls (e.g. brick veneer, composite, etc.). |
| 2.L.01 | 1. Engineering Design 1.5 | Interpret plans, diagrams, and working drawings in the construction of prototypes or models.  Performance Example:  Students will demonstrate proper layout of a building using various layout tools and methods according to industry standards from a given drawing. |
| 2.M.01 | 7. Manufacturing  Technologies 7.1 | Describe the manufacturing processes of casting and molding, forming, separating, conditioning, assembling, and finishing.  Performance Example:  Students will show proper tile setting procedures on given pattern and project area. |
| 2.N.01 | 7. Manufacturing  Technologies 7.2 | Identify the criteria necessary to select safe tools and procedures for a manufacturing process (e.g., properties of materials, required tolerances, end-uses).  Performance Example:  Students will assemble scaffolding from given plans according to industry standards. |
| 2.C.01  2.R.01 | 1. Engineering Design 1.2 | Understand that engineering design process is used in the solution of problems and the advancement of society. Identify examples of technologies, objects, and processes that have been modified to advance society, and explain why and how they were modified.  Performance Example:  Students will demonstrate an understanding of trade history and opportunities. Students will discuss examples of masonry processes that have modified to accommodate the advancement of society (e.g. chimney, fireplace, retaining walls, etc.) |
| 2.T.01 | 2. Construction Technologies  2.4 | Calculate the resultant force(s) for a combination of live loads and dead loads.  Performance Example:  Students will identify, lay-out, and construct various arch projects. |
| 2.B.01  2.L.01 | 1. Engineering Design 1.5 | Interpret plans, diagrams, and working drawings in the construction of prototypes or models.  Performance Example:  Students will demonstrate proper layout of a building using various layout tools and methods according to industry standards from a given drawing. |

[Industry Recognized Credentials](#_bookmark0) (Licenses and Certifications/Specialty Programs)

Occupational Safety and Health Administration (OSHA) 10 Hour Card – Construction