

Unit 9 Masonry Careers: Concrete Installations, Foundations and Footers.

Content Area: **Industrial Technology**
Course(s): **Construction Technology II**
Time Period: **2 marking periods**
Length: **Weeks**
Status: **Published**

Unit Overview

Students will be able to identify and describe the correct way to dig footings, steel reinforcement and pouring of footings.

Students will be able to identify and describe the correct way to measure and run cinder block walls for a foundation or cellar.

Students will be able to identify and describe different methods to create foundation walls for a foundation or cellar.

Transfer

Students will be able to independently use their learning to...

To pour their own footings and construct cinderblock foundations for their home or go into the Masonry Field as a Career.

For more information, read the following article by Grant Wiggins.

http://www.authenticeducation.org/ae_bigideas/article.lasso?artid=60

Meaning

SWBAT build their own concrete and cinder block walls and possible select Masonry as a Career in the Building trades to earn a living,

Understandings

Students will understand that...

- What specifically do you want students to understand?
- What inferences should they make/grasp/realize?

Essential Questions

Students will keep considering...

- Why is a good Foundation needed when constructing a residence or a building?
- What is the correct method to reinforce a footing?
- Why is it important that the foundation is plumb, level and at the correct height?
- Why a foundation should not be back filled right away?
- Can I earn money in the Masonry Field?

Application of Knowledge and Skill

Students will apply the knowledge and skill to identify footings and walls that have been incorrectly installed.

Students will know...

Students will know...

How to identify and describe the correct way to dig footings, steel reinforcement and pouring of footings.

How to identify and describe the correct way to measure and run cinder block walls for a foundation or cellar.

How to identify and describe different methods to create foundation walls for a foundation or cellar.

Students will be skilled at...

Students will be skilled at...

Laying out and digging Footings to the proper depth and width to support a residence or building.

The correct method to reinforce a footing.

Making sure that a foundation is plumb, level and at the correct height.

Identifying the different methods of creating a Foundation or Cellar.

Academic Vocabulary

Monolithic, Strength, Tensile, Mixture, Aggregate.

Learning Goal 1

Masonry Careers

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| 9.3.12.AC.5 | Describe the roles, responsibilities, and relationships found in the architecture and construction trades and professions, including labor/management relationships. |
| 9.3.12.AC.7 | Describe career opportunities and means to achieve those opportunities in each of the Architecture & Construction Career Pathways. |
| 9.3.12.AC-CST.4 | Apply scheduling practices to ensure the successful completion of a construction project. |
| 9.3.12.AC-CST.7 | Compare and contrast the building systems and components required for a construction project. |
| 9.3.12.AC-CST.8 | Demonstrate the construction crafts required for each phase of a construction project. |
| 9.3.12.AC-CST.9 | Safely use and maintain appropriate tools, machinery, equipment and resources to accomplish construction project goals. |
| 9.3.12.AC-DES.6 | Apply the techniques and skills of modern drafting, design, engineering and construction to projects. |
| 9.3.12.AC-DES.8 | Apply standards, applications and restrictions pertaining to the selection and use of construction materials, components and assemblies in the project design. |
| 9.3.12.AC-MO.3 | Apply construction skills when repairing, restoring or renovating existing buildings. |

Target 1

SWBAT identify and describe the various Careers related to the Masonry Industry.

Target 2

SWBAT research online and work with online resources the typical wages for the various Masonry Careers and present to the class with a Google Slide Show.

Learning Goal 2

Layout and Installation of footings in a residential or commercial building,

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| 9.3.12.AC.1 | Use vocabulary, symbols and formulas common to architecture and construction. |
| 9.3.12.AC.2 | Use architecture and construction skills to create and manage a project. |
| 9.3.12.AC.4 | Evaluate the nature and scope of the Architecture & Construction Career Cluster and the role of architecture and construction in society and the economy. |
| 9.3.12.AC.5 | Describe the roles, responsibilities, and relationships found in the architecture and construction trades and professions, including labor/management relationships. |
| 9.3.12.AC.6 | Read, interpret and use technical drawings, documents and specifications to plan a project. |
| 9.3.12.AC.7 | Describe career opportunities and means to achieve those opportunities in each of the Architecture & Construction Career Pathways. |

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| 9.3.12.AC-CST.8 | Demonstrate the construction crafts required for each phase of a construction project. |
| 9.3.12.AC-CST.9 | Safely use and maintain appropriate tools, machinery, equipment and resources to accomplish construction project goals. |

Target 1

SWBAT layout and calculate width and depth for a residential footing in the Southern New Jersey area,

Target 2

SWBAT to demonstrate the proper method of installing rebar to reinforce footings and calculate the amount of concrete they would need for a footing pour.

Learning Goal 3

Creating a Foundation

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| 9.3.12.AC.1 | Use vocabulary, symbols and formulas common to architecture and construction. |
| 9.3.12.AC.2 | Use architecture and construction skills to create and manage a project. |
| 9.3.12.AC.3 | Comply with regulations and applicable codes to establish and manage a legal and safe workplace. |
| 9.3.12.AC.4 | Evaluate the nature and scope of the Architecture & Construction Career Cluster and the role of architecture and construction in society and the economy. |
| 9.3.12.AC.5 | Describe the roles, responsibilities, and relationships found in the architecture and construction trades and professions, including labor/management relationships. |
| 9.3.12.AC.6 | Read, interpret and use technical drawings, documents and specifications to plan a project. |
| 9.3.12.AC.7 | Describe career opportunities and means to achieve those opportunities in each of the Architecture & Construction Career Pathways. |
| 9.3.12.AC-CST.1 | Describe contractual relationships between all parties involved in the building process. |
| 9.3.12.AC-CST.2 | Describe the approval procedures required for successful completion of a construction project. |
| 9.3.12.AC-CST.3 | Implement testing and inspection procedures to ensure successful completion of a construction project. |
| 9.3.12.AC-CST.4 | Apply scheduling practices to ensure the successful completion of a construction project. |
| 9.3.12.AC-CST.5 | Apply practices and procedures required to maintain jobsite safety. |
| 9.3.12.AC-CST.6 | Manage relationships with internal and external parties to successfully complete construction projects. |
| 9.3.12.AC-CST.7 | Compare and contrast the building systems and components required for a construction project. |

9.3.12.AC-CST.8

Demonstrate the construction crafts required for each phase of a construction project.

9.3.12.AC-CST.9

Safely use and maintain appropriate tools, machinery, equipment and resources to accomplish construction project goals.

Target 1

SWBAT calculate the amount of cinder blocks needed to purchase on a specific size foundation along with the cost.

Target 2

SWBAT to install and run a simulated small foundation wall.

Target 3

SWBAT to identify, describe and operate bricklaying and masonry tools for installing Cinderblock, Bricks and Stone.

Formative Assessment and Performance Opportunities

Students will be graded on calculations for depth and width of a footing.

Students will be graded on calculations for material needed for a foundation.

Students will be graded on simulated foundation wall they will construct based on Instructor Observation and Weekly Work Grade.

Summative Assessment

Students will be graded on written test that are given in Google Classroom on Footing Identification.

Students will be graded on written test that are given in Google Classroom on Foundation Identification.

Accommodations/Modifications

Students with Accommodations/Modifications can be assisted by students that have already completed the task.

Students with Accommodations/Modifications can retake the topic tests or take the test with a Special Needs Teacher.

Unit Resources

Online Footing and Foundation Plans.

Online Youtube videos related to Footings.

Online Youtube videos related to Foundation Installation.

Online tests posted in Google Classroom related to Masonry.

21st Century Life and Careers

Select all applicable standards from the applicable standards

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| CAEP.9.2.12.C.1 | Review career goals and determine steps necessary for attainment. |
| CAEP.9.2.12.C.2 | Modify Personalized Student Learning Plans to support declared career goals. |
| CAEP.9.2.12.C.3 | Identify transferable career skills and design alternate career plans. |
| CAEP.9.2.12.C.4 | Analyze how economic conditions and societal changes influence employment trends and future education. |
| CAEP.9.2.12.C.5 | Research career opportunities in the United States and abroad that require knowledge of world languages and diverse cultures. |
| CAEP.9.2.12.C.6 | Investigate entrepreneurship opportunities as options for career planning and identify the knowledge, skills, abilities, and resources required for owning and managing a business. |
| CAEP.9.2.12.C.7 | Examine the professional, legal, and ethical responsibilities for both employers and employees in the global workplace. |
| CAEP.9.2.12.C.8 | Assess the impact of litigation and court decisions on employment laws and practices. |
| CAEP.9.2.12.C.9 | Analyze the correlation between personal and financial behavior and employability. |

Interdisciplinary Connections

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| MA.K-12.1 | Make sense of problems and persevere in solving them. |
| MA.K-12.4 | Model with mathematics. |
| SCI.HS-ETS1-3 | Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts. |
| SCI.HS-ETS1-4 | Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem. |
| SCI.HS-ETS1 | Engineering Design |
| SCI.HS-ETS1-2 | Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering. |
| SCI.HS-ETS1-1 | Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants. |
| TECH.8.1.12 | Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge. |
| TECH.8.1.12.A | Technology Operations and Concepts: Students demonstrate a sound understanding of technology concepts, systems and operations. |
| TECH.8.1.12.A.CS1 | Understand and use technology systems. |
| TECH.8.1.12.C.CS1 | Interact, collaborate, and publish with peers, experts, or others by employing a variety of digital environments and media. |
| TECH.8.1.12.D.CS1 | Advocate and practice safe, legal, and responsible use of information and technology. |
| TECH.8.1.12.E | Research and Information Fluency: Students apply digital tools to gather, evaluate, and use information. |
| TECH.8.2.12 | Technology Education, Engineering, Design, and Computational Thinking - Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment. |
| TECH.8.2.12.C | <p>Design: The design process is a systematic approach to solving problems.</p> <p>Mathematically proficient students can apply the mathematics they know to solve problems arising in everyday life, society, and the workplace. In early grades, this might be as simple as writing an addition equation to describe a situation. In middle grades, a student might apply proportional reasoning to plan a school event or analyze a problem in the community. By high school, a student might use geometry to solve a design problem or use a function to describe how one quantity of interest depends on another.</p> <p>Mathematically proficient students who can apply what they know are comfortable making assumptions and approximations to simplify a complicated situation, realizing that these may need revision later. They are able to identify important quantities in a practical situation and map their relationships using such tools as diagrams, two-way tables, graphs, flowcharts and formulas. They can analyze those relationships mathematically to draw conclusions. They routinely interpret their mathematical results in the context of the situation and reflect on whether the results make sense, possibly improving the model if it has not served its purpose.</p> <p>Mathematically proficient students start by explaining to themselves the meaning of a problem and looking for entry points to its solution. They analyze givens, constraints, relationships, and goals. They make conjectures about the form and meaning of the solution and plan a solution pathway rather than simply jumping into a solution attempt. They consider analogous problems, and try special cases and simpler forms of the original</p> |

problem in order to gain insight into its solution. They monitor and evaluate their progress and change course if necessary. Older students might, depending on the context of the problem, transform algebraic expressions or change the viewing window on their graphing calculator to get the information they need. Mathematically proficient students can explain correspondences between equations, verbal descriptions, tables, and graphs or draw diagrams of important features and relationships, graph data, and search for regularity or trends. Younger students might rely on using concrete objects or pictures to help conceptualize and solve a problem. Mathematically proficient students check their answers to problems using a different method, and they continually ask themselves, "Does this make sense?" They can understand the approaches of others to solving complex problems and identify correspondences between different approaches.