Fundamentals of Construction

Safety

Identify safety hazards on a jobsite and demonstrate practices for safe working conditions. Accurately read, interpret, and demonstrate adherence to safety rules, including but not limited to rules pertaining to electrical safety, Occupational Safety and Health Administration (OSHA) guidelines, and state and national code requirements. Be able to distinguish between the rules and explain why certain rules apply.

1. Students will be able to identify job site hazards and demonstrate practices for working safely on the job.
2. Students will be able to interpret safety rules.
3. Students will understand the need for Occupational, Safety & Health Administration (OSHA) regulations.
4. Students will follow procedures to work safely around materials. Adhere to responsibilities for employees in material safety as outlined by the Hazard Communication Standard (HazCom), such as locating and interpreting material safety data sheets (MSDS). Demonstrate safe procedures to move materials by planning the movement, properly lifting, stacking, and storing materials, and selecting proper materials-handling equipment.

History of Architecture & Construction

1. Students will investigate the evolution of architecture and construction across a variety of civilizations.

Introduction to the Construction Industry

1. Students will read resources such as textbooks, websites, and research centers such as the National Center for Construction Education and Research (NCCER),they will analyze the organization of the modern construction industry. Distinguish among the various personnel involved in the industry and explain the roles of each in the construction process, including but not limited to the owner, developer, architects, engineers, building officials, contractors, suppliers, unions, and professional craftsmen. For example, create a written report describing the basic steps of traditional building delivery for a construction project (from pre-design to post-construction), and what is involved in each step.

2. Research basic regulations affecting today's construction industry.
   a. Investigate and report on the process for securing a building permit for a selected location in the community.
   b. Explain what a building code is and where to find published local building codes.

Career Exploration

1. Research the major professions and trades within construction, such as electrician, carpenter, mason, plumber, HVAC technician, cost estimator, and construction manager. Produce a chart or other graphic detailing the aptitudes and training needed for at least three careers of interest. For example, outline the typical steps needed to become a journeyman electrician, such as completing postsecondary training and obtaining on-the-job training through an apprenticeship, and devise a tentative career plan to reach employment goals.

2. Evaluate jobs data and employment projections in the construction industry from sources such as O*Net OnLine, summarize findings from each source.

Introduction to Measurement

1. Students will use and learn to read accurately carpenter tape measures, 100-200' tape measures,architect's scale,micrometer's,protractors to determine accurate measurement
2. Students will be able to given accurately set up layouts to complete a project. For example, use an architect's scale to measure distance on a construction drawing, and then use a measuring tape to lay out cuts in dimensional lumber to an accuracy of 1/16 inch.

Construction Math

1. Apply mathematics concepts to solve construction problems,
2. a. Students will be able to use whole numbers, fractions, and decimals.

b. Perform conversions between fractions, decimals, and percent. For example, convert a decimal to a fraction

c. Work with units such as feet, inches, meters, centimeters, and millimeters, For example, determine how many pieces of 2 ft. 4 in. PVC pipe may be cut from a 10 ft. piece and how much pipe will be left over.

d. Calculate the area of two-dimensional spaces. Calculate surface area and volume for three-dimensional objects employing related geometric terminology.

e. Estimate quantities of materials to be used.

f. Using basic rules of right triangles, such as the Pythagorean Theorem, to find missing lengths.

Tools & Equipment

1. Accurately identify a wide range of hand and power tools used in the construction trades, such as striking tools, cutting tools, torque producing tools, leveling and squaring tools, grinding and shaping tools, clamping tools, and pulling and lifting tools.
2. Select the proper tool and accessories, Identify condition of the tool, use the tool to accomplish the desired task, and then return the tool and accessories to their proper storage.

Introduction to Building Systems and Materials

1. Distinguish between the properties and uses of basic construction materials used in building construction processes, such as aggregates, asphalt, concrete, steel, wood, and masonry materials.
2. Distinguish between the various types of fasteners commonly used in construction, such as nails, screws, and bolts, by creating a visual display outlining the properties and uses of each type. Demonstrate the ability to accurately select and install the appropriate fastener in a variety of situations.
3. Identify major building systems (foundation, structural, mechanical, electrical, and plumbing systems) to establish a basic knowledge of their purpose, structure, and function. Interpret the common symbols used in Construction drawings.

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Construction Drawings & Specifications

1. Study and interpret construction drawings, diagrams, and written specifications for construction projects. Explain how pictorial representations relate to a physical layout. Use an architect's scale and the given dimensions on a construction document to determine an unknown dimension. For example, interpret electrical schedules and single-pole or three-way light switch symbols in electrical plans to determine the types, quantities, and exact physical locations of the light switches to be installed in a construction project.

2. Describe the purpose of specifications in a construction document set.

3. Create two-dimensional scale drawings using accepted dimensioning rules and measurement systems.

Course Project

1. Interpret construction drawings to determine the correct materials, tools, and equipment needed to complete a basic construction project. Plan and implement the steps needed to complete the project, considering precise details and using safe practices.
For example, read and interpret a technical document to build a simple tool box.

Portfolio

1. Keep important papers an drawings to create a portfolio of their work.