YEAR ONE

Foundation of Residential and Commercial Construction

The Residential and Commercial Construction course is designed to teach basic skills for the construction trades through a course rich in connections to construction projects that will generate interest in the math and increase students' likelihood of success. The course covers basic construction math; measurement and scale, blueprint reading, safety, procedural use of hand and power tools. Students acquire these skills through the use of technology and real-world problem solving. Integrated throughout the course are foundation standards, which include communication, ethics, interpersonal/team skills, critical thinking and other employment skills, needed for the 21st Century.
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YEAR 1: Scope and Sequence

Lessons are designed for a 50-minute class period. Depending on student progress towards mastery of learning objectives, lessons may need to be extended or shortened. This is up to teacher discretion.

UNIT 1: Safety

8 class periods

Learning Objectives:
- Identify general shop safety practices/expectations.
- Demonstrate knowledge of a safe attitude.
- Answer questions concerning occupational safety based on graphic information.
- Recognize the different types and components of graphs.
- Use various strategies in the interpretation of information presented visually.
- Use data analysis/statistics to generalize about occupational safety in differing fields.
- Recognize terms that are commonly used in the analysis of data and statistics.
- Identify the key factors that facilitate effective group/team operation.

UNIT 2: Measurement

9 class periods

Learning Objectives:
- Identify the five major math disciplines used in the construction industry.
- Identify and correctly spell measurement terminology.
- Use both standard and metric units in determining given lengths using a tape measure.
- Identify proper, improper fractions and mixed numbers.
- Convert improper fractions and mixed numbers back and forth.
- Identify the LCD and borrow from whole numbers in the addition and subtraction of fractions.
- Convert fractions into decimals.
- Add any two mixed numbers using only a tape measure.
Unit 3: Scale

7 class periods

Learning Objectives:
- Define the meanings of the words scale, ratio, proportion, and scale factor
- Measure given lengths in given scales using an architect’s rule/scale
- Read a scale drawing.
- Find a scaling factor when scaling an object.
- Apply measurement procedures in context and then translating those measurements to a scale drawing.
- Understand that a scale drawing is two-dimensional drawing that accurately represents an object and is mathematically like the object.
- Use google sketch up (cad), build a three-dimensional object based on two-dimensional drawings.
- Build to scale a model tiny house that includes the floor, walls, windows and door

UNIT 4: Wood, Fasteners, and Tools

23 class periods

Learning Objectives:
- Identify tree species and recognize a hard or soft wood based on the physical properties of the tree.
- Identify the three basic steps involved in turning a tree into lumber.
- Take notes using the Cornell Notes format.
- Explain the history/development of glues, nails, and screws; their attributes and applications.
- Identify 5 types of nails/brads 1) common nail, 2) sinker, 3) finish nail, 4) brad (nail), and the 5) pin.
- Identify the major woodworking hand tools and their proper function/use.
- Demonstrate the proper use of the major woodworking hand tools.
- Obtain and apply information found in working drawings to a given project.
UNIT 5: Power Tool – Table Saw
4 class periods

Learning Objectives:
▪ Identify each of the major components of the Table Saw, and their purpose.
▪ Describe the uses of the Table Saw.
▪ Demonstrate the safe operation of the Table Saw.
▪ Identify each of the major components of the Radial-Arm Saw and their purpose.
▪ Describe the use and operation of the Radial-Arm Saw.
▪ Demonstrate the safe operation of the Radial-Arm Saw.

UNIT 6: Power Tool – Band Saw
3 class periods

Learning Objectives:
▪ Identify each of the major components of the Band Saw and their purpose.
▪ Describe the use and operation of the Band Saw.
▪ Demonstrate the safe operation of the Band Saw.

UNIT 7: Power Tool – Miter Saw
3 class periods

Learning Objectives:
▪ Identify each of the major components of the Miter saw, and their purpose.
▪ Describe the uses of the Miter saw.
▪ Demonstrate the safe operation of the Miter Saws.

UNIT 8: Project # 1
13 Class periods

Learning Objectives:
▪ Identify blueprints, blue lines, and CAD prints
▪ Obtain the information they need from a schematic or working drawing.
▪ Develop a bill-of-materials.
▪ Build a three-dimensional object based on two-dimensional drawings.
UNIT 9:  Power Tools-Drill, Router, & Sander
8 class periods

Learning Objectives:
▪ Identify the Router, Disc and Palm Sanders, the cordless Driver/Drill, and their major components.
▪ Demonstrate the safe operation of each tool.
▪ Identify/describe the six primary drill bits (Twist, Auger, Forstner, Spade/Butterfly, Hole Saw, and Self-Feed) used in the construction industry, and their uses.
▪ Identify the three basic router bits (Mortising [straight], Round-Over, (Rabbeting) used in the shop.

UNIT 10:  Project #2
12 class periods

Learning Objectives:
▪ Identify blueprints, bluelines, and CAD prints
▪ Obtain the information they need from a schematic or working drawing.
▪ Develop a bill-of-materials.
▪ Build a three-dimensional object based on two-dimensional drawings.

UNIT 11:  Jig Saw and Scroll Saw
3 class periods

Learning Objectives:
▪ Identify the components on the Jigsaw and the Scroll Saw.
▪ Demonstrate the safe operation of each tool.
UNIT 12: **Pneumatics: Nailers, Staplers, and Compressors**

8 class periods

**Learning Objectives:**
- Identify the major components of both the pneumatic nailer and stapler.
- Demonstrate the safe operation of each tool.
- Identify/describe the different types of nailers and staplers and their use.
- Identify several (min. 3) uses for each type of tool.
- Demonstrate basic compressor operations and safety.

UNIT 13: **Schematics/Blueprints and Visualization**

6 class periods

**Learning Objectives:**
- Identify the five components of a set of residential blueprints. (Plans, Elevations, Sections, Details and Specifications)
- Describe the differences between the five components of residential blueprints.
- Draw a 3D object in 3 different elevations

UNIT 14: **Construction Company Organization and Operations**

7 class periods

**Learning Objectives:**
- Identify the basic organization of a corporation, its officers, and their responsibilities.
- Work effectively as part of a team/company.
- Identify the three basic types of companies
UNIT 15: Building Energy Efficiency Basics
15 class periods

Learning Objectives:
- Identify different types and sources of energy.
- Describe the relationship between potential and kinetic energy.
- Determine the approximate energy used by various tools or systems.
- Understand heat transfer in a building assembly.
- Identify ways to improve an assembly to limit heat transfer.
- Describe ways to maintain indoor comfort.
- Identify three main types and general locations of climate-hot, cold, and moderate.
- Recall number of climate zones by memory or ability to locate in reference documents.
- Describe how the physical location of a building can impact energy use.

UNIT 16: Tiny House Project
45 class periods

Learning Objectives:
- Layout and construct a scale model floor frame using blueprints.
- Assemble a floor frame using the correct materials in the correct order.
- Assemble wall framing using the correct materials in the correct order.
- Layout and construct model home walls from blueprints.
- Name and identify the primary members of both conventionally stacked and trussed roofs.
- Layout and construct a conventional roof for a 1” scale model home from blueprints.
- Layout, and construct a conventionally stacked roof in 1” scale from blueprints.