

# Scope and Sequence



# Overview of Lessons

These construction lessons offer a comprehensive exploration of the construction industry. Each lesson includes introductory instructional videos and interactive 3D models to facilitate a more effective and engaging learning experience. Starting with an overview of career opportunities and safety protocols, students will progress through a step-by-step journey of residential construction.

The lessons cover all phases of construction, from site preparation and foundational work to the framing of floors, walls, and roofs. Each section uses 3D models, allowing students to engage with the construction process interactively. The VIVED Carpentry course offers students an engaging interactive learning experience that they can access any place, any time.



## VIVED Carpentry Course Overview

**Module 1:** Career Exploration (2 lessons)

**Module 2:** Safety (2 lessons)

**Module 3:** Sitework (2 lessons)

**Module 4:** Foundation Systems (3 lessons)

**Module 5:** Floor Framing (3 lessons)

**Module 6:** Wall Framing (4 lessons)

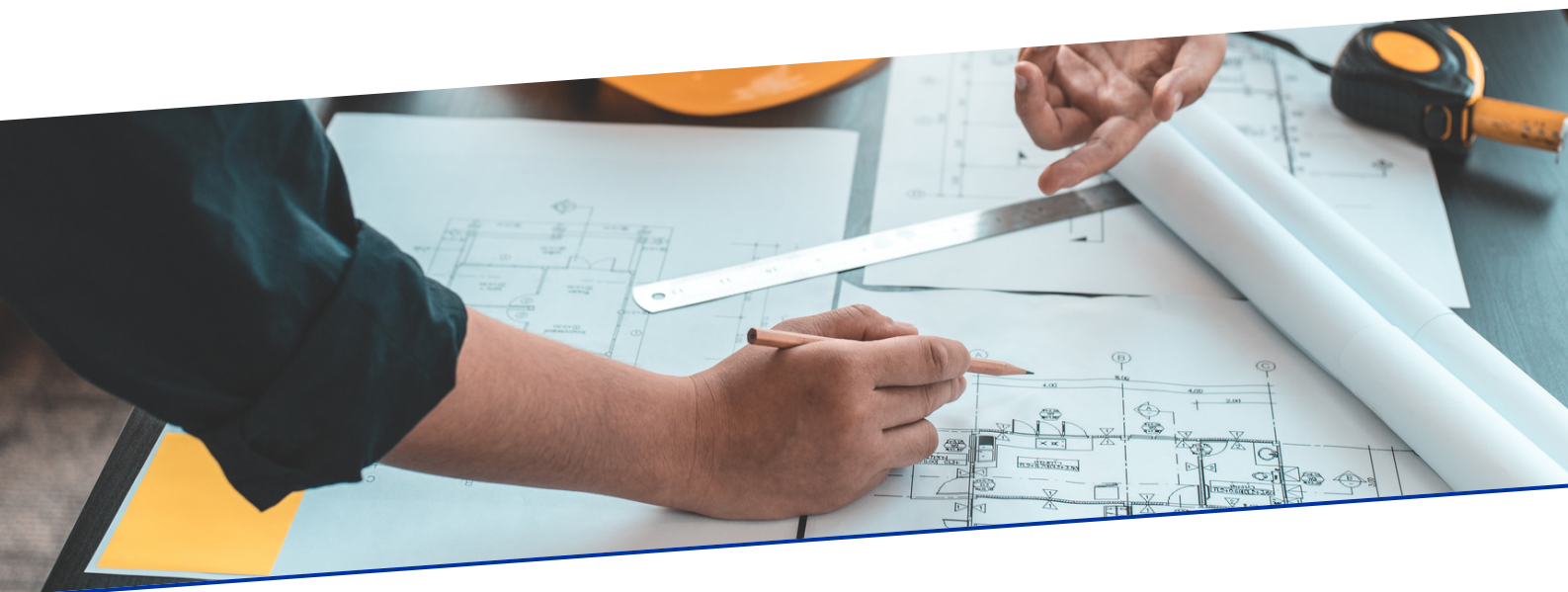
**Module 7:** Roof Framing (3 lessons)



## Module 1: Career Exploration

This unit introduces students to various career opportunities in the residential construction industry. They will learn about different roles, such as carpenters, electricians, plumbers, architects, civil engineers, project managers, and more. Students will gain an understanding of the skills and education needed for each career and how these roles contribute to the larger project of building a home. This unit will use resources within the [www.explore-ace.org](http://www.explore-ace.org) website.

<b>Lesson</b>	1: Exploration of ACE (Architecture, Construction, Civil Engineering) careers
<b>Objective</b>	Understand and explain the process of researching careers in the ACE (Architecture, Construction, Engineering) industry.
<b>Key Terms</b>	Architect, Construction Manager, Civil Engineer, Blueprint, Infrastructure, Sustainability, Zoning
<b>Common Career Technical Core standards</b>	<ul style="list-style-type: none"> <li>• Use vocabulary, symbols, and formulas common to architecture and construction.</li> <li>• Describe the roles, responsibilities, and relationships found in the architecture and construction trades and professions, including labor/management relationships.</li> <li>• Read, interpret, and use technical drawings, documents, and specifications to plan a project.</li> </ul>



# Module 1: Career Exploration

<b>Lesson</b>	2: Exploration of ACE (Architecture, Construction, Civil Engineering) careers
<b>Objective</b>	Understand and explain the process of researching careers in the ACE (Architecture, Construction, Engineering) industry.
<b>Key Terms</b>	Architect, Construction Manager, Civil Engineer, Blueprint, Infrastructure, Sustainability, Zoning
<b>Common Career Technical Core standards</b>	<ul style="list-style-type: none"> <li>• Use vocabulary, symbols, and formulas common to architecture and construction.</li> <li>• Describe the roles, responsibilities, and relationships found in the architecture and construction trades and professions, including labor/management relationships.</li> <li>• Read, interpret, and use technical drawings, documents, and specifications to plan a project.</li> </ul>

<b>Lesson</b>	3: Exploration of ACE (Architecture, Construction, Civil Engineering) careers
<b>Objective</b>	Understand and explain the process of researching careers in the ACE (Architecture, Construction, Engineering) industry.
<b>Key Terms</b>	Architect, Construction Manager, Civil Engineer, Blueprint, Infrastructure, Sustainability, Zoning
<b>Common Career Technical Core standards</b>	<ul style="list-style-type: none"> <li>• Use vocabulary, symbols, and formulas common to architecture and construction.</li> <li>• Describe the roles, responsibilities, and relationships found in the architecture and construction trades and professions, including labor/management relationships.</li> <li>• Read, interpret, and use technical drawings, documents, and specifications to plan a project.</li> </ul>



## Module 2: Safety

In these lessons, students will learn about the safety measures required on a construction site. Topics include proper use of personal protective equipment (PPE), hazard identification, first-aid procedures, handling of tools and equipment, and safety regulations set by OSHA (Occupational Safety and Health Administration). This unit lays the groundwork for all other lessons, ensuring students know how to operate in a safe manner.

<b>Lesson</b>	1: Understanding Safety: OSHA Regulations and Ensuring a Secure Construction Environment
<b>Objective</b>	Students will be able to identify and understand fundamental construction safety measures using multimedia resources, interactive simulations, and assessment tools to ensure a foundational knowledge of workplace hazards and precautions.
<b>Key Terms</b>	Personal Protective Equipment (PPE), Occupational Safety and Health Administration (OSHA), Hazard Identification, First-aid Procedures, Safety Regulations, Construction Site Safety, Risk Assessment
<b>Common Career Technical Core standards</b>	<ul style="list-style-type: none"> <li>• Use vocabulary, symbols, and formulas common to architecture and construction.</li> <li>• Describe the roles, responsibilities, and relationships found in the architecture and construction trades and professions, including labor/management relationships.</li> <li>• Read, interpret, and use technical drawings, documents, and specifications to plan a project.</li> </ul>



## Module 3: Sitework

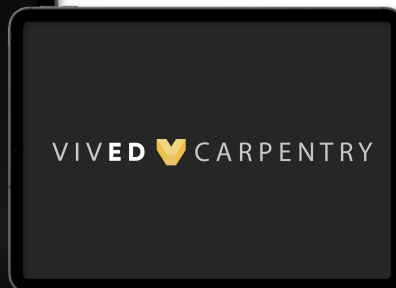
Students will learn about the preparation needed before a house can be built. This includes understanding site assessment, surveying, soil testing, and layout. Students will also learn about the machines used in sitework, like bulldozers and excavators. This lesson is important for understanding how to transform raw land into a ready-to-build construction site.

<b>Lesson</b>	1: Understanding the Site Preparation Process in Construction
<b>Objective</b>	Understand and explain the process of preparing a site for construction, including clearing, grading, and excavation.
<b>Key Terms</b>	Clearing, Grading, Excavation, Topsoil, Subgrade, Site plan, Earthwork
<b>Common Career Technical Core standards</b>	<ul style="list-style-type: none"> <li>• Use vocabulary, symbols, and formulas common to architecture and construction.</li> <li>• Describe the roles, responsibilities, and relationships found in the architecture and construction trades and professions, including labor/management relationships.</li> <li>• Read, interpret, and use technical drawings, documents, and specifications to plan a project.</li> </ul>





<b>Lesson</b>	2: Understanding and Addressing Site Drainage and Erosion Control for Building Integrity
<b>Objective</b>	Recognize and discuss the importance of proper site drainage and erosion control in maintaining the integrity of a building.
<b>Key Terms</b>	Site Drainage, Erosion Control, Building Integrity, Sediment, Grading, Stormwater Runoff, Erosion Prevention
<b>Common Career Technical Core standards</b>	<ul style="list-style-type: none"><li>• Use vocabulary, symbols, and formulas common to architecture and construction.</li><li>• Describe the roles, responsibilities, and relationships found in the architecture and construction trades and professions, including labor/management relationships.</li><li>• Read, interpret, and use technical drawings, documents, and specifications to plan a project.</li></ul>





## Module 4: Foundation Systems

This unit focuses on the different types of foundation systems, such as slab, deep foundations, and full basements. Students will learn about the materials, tools, and techniques used in laying a foundation. This lesson is key to understanding how buildings are anchored and supported.

<b>Lesson</b>	1: Understanding the Elements of a Foundation System
<b>Objective</b>	Identify and describe the components of a foundation system, including footings, foundation walls, and slabs.
<b>Key Terms</b>	Foundation System, Footings, Foundation Walls, Slabs, Bearing Capacity, Load Distribution, Groundwater drainage

<b>Lesson</b>	2: Understanding the Fundamental Factors Influencing Foundation System Design in Construction
<b>Objective</b>	Understand and explain the factors that influence the design of a foundation system, such as soil conditions and load requirements
<b>Key Terms</b>	Foundation System Design, Soil Conditions, Load Requirements, Bearing Capacity, Settlement, Structural Integrity, Foundation Failure

<b>Lesson</b>	3: Interpreting Foundation Plans and Blueprints
<b>Objective</b>	Analyze and interpret foundation plans and blueprints, identifying key components and their placement.
<b>Key Terms</b>	Blueprint, Foundation Plan, Footing, Load-Bearing Wall, Grade Beam, Pile, Reinforcing Bar (Rebar)

## Module 5: Floor Framing

Students will learn about the structure that supports a house's floors and the materials commonly used, like joists and subfloors. They will gain hands-on experience by creating floor plans and assembling a mock-up of a floor frame. This lesson gives students the practical skills needed to frame a floor.

<b>Lesson</b>	1: Conventional floor framing systems
<b>Objective</b>	Identify and describe the components of a floor framing system, including joists and sill plates.
<b>Key Terms</b>	Floor Framing System, Sill Plates, Floor Joists, Load, Foundation

<b>Lesson</b>	2: Conventional floor framing systems
<b>Objective</b>	Understand and explain the factors and materials that influence the design of a floor framing
<b>Key Terms</b>	Joist, Header, Load-bearing, Span, Loads, Beam

<b>Lesson</b>	3: Commercial floor framing systems
<b>Objective</b>	Identify and describe the engineered components of a commercial floor framing system, including slabs, steel decking, and composite.
<b>Key Terms</b>	Concrete Slab, Steel Decking, Composite Material, Load-Bearing, Reinforcement Bar (Rebar), Precast Concrete Slab, Cast-in-Place Concrete Slab

## Module 6: Wall Framing

Students will learn how to construct the skeleton of a house using vertical studs, top plates, and bottom plates. They will also learn about different wall types, like load-bearing walls and partition walls.

<b>Lesson</b>	1: Decoding the Wall Framing System: Studs, Plates, and Headers
<b>Objective</b>	Identify and describe the components of a wall framing system, including studs, plates, and headers.
<b>Key Terms</b>	Stud, Plate, Header, Wall Framing System, Top Plate, Bottom Plate, King Stud
<b>Common Career Technical Core standards</b>	<ul style="list-style-type: none"> <li>• Use vocabulary, symbols, and formulas common to architecture and construction.</li> <li>• Describe the roles, responsibilities, and relationships found in the architecture and construction trades and professions, including labor/management relationships.</li> <li>• Read, interpret, and use technical drawings, documents, and specifications to plan a project.</li> </ul>
<b>Lesson</b>	2: Mastering the Basics of Wall Framing: Layout, Cutting, and Assembly
<b>Objective</b>	Understand and explain the process of assembling a wall frame, including layout, cutting, and assembly.
<b>Key Terms</b>	Wall Frame, Stud, Header, Sill, Sheathing, Joist, Sole Plate, Formative Quiz
<b>Common Career Technical Core standards</b>	<ul style="list-style-type: none"> <li>• Use vocabulary, symbols, and formulas common to architecture and construction.</li> <li>• Describe the roles, responsibilities, and relationships found in the architecture and construction trades and professions, including labor/management relationships.</li> <li>• Read, interpret, and use technical drawings, documents, and specifications to plan a project.</li> </ul>



<b>Lesson</b>	3: Understanding Wall Bracing and Sheathing
<b>Objective</b>	Recognize and discuss the importance of proper wall bracing and sheathing in maintaining structural integrity.
<b>Key Terms</b>	Structural Integrity, Wall Bracing, Sheathing, Load Bearing, Racking Forces, Diagonal Bracing, Wall Studs
<b>Common Career Technical Core standards</b>	<ul style="list-style-type: none"> <li>• Use vocabulary, symbols, and formulas common to architecture and construction.</li> <li>• Describe the roles, responsibilities, and relationships found in the architecture and construction trades and professions, including labor/management relationships.</li> <li>• Read, interpret, and use technical drawings, documents, and specifications to plan a project.</li> </ul>

<b>Lesson</b>	4: Interpreting Wall Framing Blueprints
<b>Objective</b>	Analyze and interpret wall framing plans and blueprints, identifying key components and their placement.
<b>Key Terms</b>	Blueprint, Wall Framing, Joist, Stud, Sill Plate, Top Plate, Sheathing
<b>Common Career Technical Core standards</b>	<ul style="list-style-type: none"> <li>• Use vocabulary, symbols, and formulas common to architecture and construction.</li> <li>• Describe the roles, responsibilities, and relationships found in the architecture and construction trades and professions, including labor/management relationships.</li> <li>• Read, interpret, and use technical drawings, documents, and specifications to plan a project.</li> </ul>

## Module 7: Roof Framing

This unit teaches students about the structure that supports a house's roof. Students will learn about different types of roof systems, like gable, hip, and shed roofs, as well as the components that make up these systems, like rafters and trusses. This lesson provides insight into how a building is protected from the weather.

<b>Lesson</b>	1: Introduction to Roof Framing Basics
<b>Objective</b>	Define roof design and explain the function and location of key roof components.
<b>Key Terms</b>	Roof Design, Gable Roof, Hip Roof, Flat Roof, Eaves, Ridge, Valley
<b>Common Career Technical Core standards</b>	<ul style="list-style-type: none"> <li>• Use vocabulary, symbols, and formulas common to architecture and construction.</li> <li>• Describe the roles, responsibilities, and relationships found in the architecture and construction trades and professions, including labor/management relationships.</li> <li>• Read, interpret, and use technical drawings, documents, and specifications to plan a project.</li> </ul>

<b>Lesson</b>	2: Identifying and Describing Roof Framing Systems
<b>Objective</b>	Students will be able to identify and describe the structural details of a roof framing system, including rafters and trusses.
<b>Key Terms</b>	Rafter, Truss, Joist, Sheathing, Fascia, Ridge board, Eave
<b>Common Career Technical Core standards</b>	<ul style="list-style-type: none"> <li>• Use vocabulary, symbols, and formulas common to architecture and construction.</li> <li>• Describe the roles, responsibilities, and relationships found in the architecture and construction trades and professions, including labor/management relationships.</li> <li>• Read, interpret, and use technical drawings, documents, and specifications to plan a project.</li> </ul>

<b>Lesson</b>	3: Assembling, Layout and Placement
<b>Objective</b>	Understand and explain the process of assembling a roof frame, including layout and placement.
<b>Key Terms</b>	Rafter, Truss, Load, Span, Pitch, Overhang, Bearing Point
<b>Common Career Technical Core standards</b>	<ul style="list-style-type: none"><li>• Use vocabulary, symbols, and formulas common to architecture and construction.</li><li>• Describe the roles, responsibilities, and relationships found in the architecture and construction trades and professions, including labor/management relationships.</li><li>• Read, interpret, and use technical drawings, documents, and specifications to plan a project.</li></ul>

