Course Title:	Content Area:	Grade Level:	Credit (if applicable)
Construction Technology	CTE	9-12	0.5 (Half-Year Course)

Course Description:

This course introduces students to the fundamental principles and practices of the construction industry. Through hands-on projects and classroom instruction, students will explore residential, commercial, and civil construction techniques, materials, tools, and safety protocols. Emphasis is placed on blueprint reading, site preparation, framing, electrical, plumbing, and finish work. Students will also learn about construction math, project planning, sustainability, and career pathways in the skilled trades. This course prepares students for further study in construction-related fields and develops essential skills for entry-level employment or technical certification.

Aligned Core Resources:	Connection to the ***BPS Vision of the Graduate***
CCTC Standards (CTE)	CONTENT MASTERY • Develop and draw from a baseline understanding of knowledge in academic disciplines from our Bristol curriculum. CRITICAL (THINKING AND PROBLEM SOLVING • Collect, assess and analyze relevant information • Reason effectively. Use systems thinking. • Make sound judgments and decisions. Identify, define and solve authentic problems and essential questions. • Reflect critically on learning experience, processes and solutions. • Transfer knowledge to other situations.
Additional Course Information: ***Knowledge/Skill Dependent courses/prerequisites***	**Link to *Completed Equity Audit***
None	Construction Technology - Equity Curriculum Review (2025)

Standard Matrix

Standard	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
CCTC - AC - Use vocabulary, symbols and formulas common to architecture and construction.	X				X	X
CCTC - AC - Comply with regulations and applicable codes to establish and manage a legal and safe workplace.	X	X		X		
CCTC - AC-Apply practices and procedures required to maintain jobsite safety.	X					
CCTC - AC - Apply the techniques and skills of modern drafting, design, engineering and construction to projects.	X		X			
CCTC- AC- Describe contractual relationships between all parties involved in the building process.		X				
CCTC -AC- Describe the approval procedures required for successful completion of a construction project.		X				
CCTC - AC - Justify design solutions through the use of research documentation and analysis of data.			X			
CCTC - AC- Demonstrate the construction crafts required for each phase of a construction project.				X	X	X

CCTC - AC- Read, interpret and use technical drawings, documents and specifications to plan a project.					X	X
CCTC - AC- Compare and contrast the building systems and components required for a construction project.					X	X
CCTC - AC- Safely use and maintain appropriate tools, machinery, equipment and resources to accomplish construction project goals					X	
CCTC - AC- Safely use and maintain appropriate tools, machinery, equipment and resources to accomplish construction project goals.						X
CCTC - AC - Evaluate the nature and scope of the Architecture & Construction Career Cluster and the role of architecture and construction in society and the economy.						X

Unit Links

Unit 1: Measurement/ Safety
Unit 2: Construction Lifecycle/ Zoning/ Building Codes
Unit 3: Loads on Structures
Unit 4: Foundations
Unit 5: Residential Framing
Unit 6: Systems

Unit Title:	
Unit 1: Measurement/Safety	
Relevant Standards: Bold indicates priority	
CCTC - AC - Use vocabulary, symbols and formulas common to architecture and construction. CCTC - AC - Comply with regulations and applicable codes to establish and manage a legal and safe workplace. CCTC - AC - Apply practices and procedures required to maintain jobsite safety. CCTC - AC - Apply the techniques and skills of modern drafting, design, engineering and construction to projects.	
Essential Question(s):	**Enduring Understanding(s):**
• Can you measure to the nearest 1/16 of an inch? • How is incorporating safety important inside and outside the laboratory?	• Learning how to measure properly is a skill that is beneficial in everyday life. • Safety is a top priority in whatever you do. • Tool and machine safety keeps everyone safe.
Demonstration of Learning:	**Pacing for Unit**
Formative and summative assessments	5 Block Periods
Family Overview (link below)	**Integration of Technology:**
Family Overview - Construction Technology Family Overview - Construction Technology - Spanish	N/A
Unit-specific Vocabulary:	**Aligned Unit Materials, Resources, and Technology (beyond core resources):**
Ruler, Tape Measure, 1/16th's, Inches, feet, millimeter, centimeter, meter, OSHA, SDS/MSDS, PPE, Z87	N/A
Opportunities for Interdisciplinary Connections:	**Anticipated misconceptions:**
• Students will use and reinforce what they learned in math classes regarding the relationship between fractions and decimals, addition and subtraction of fractions. • Safety knowledge can be important for other lab based courses such as Science.	• Students may struggle with reading a ruler and understanding what each mark means on a ruler. • Eyewear is not important • Injuries will not happen to me
Connections to Prior Units:	**Connections to Future Units:**
N/A	Students will be using measurements throughout the course on various projects while utilizing the safety procedures discussed in class.
Differentiation through *Universal Design for Learning*	
UDL Indicator & Teacher Actions	
Representation • Use visual demonstrations (e.g., videos, live measuring demos, color-coded rulers) to show how to read various measurement tools (tape measures, calipers, micrometers). • Post illustrated safety posters and diagrams around the shop for common tools and procedures. • Provide bilingual safety signage or translated safety contracts for ELL students. • Offer written and audio safety instructions and allow students to replay them as needed. Action and Expression • Let students demonstrate measurement skills through hands-on practice, digital simulations, or video walkthroughs of their work. • Provide flexible tools: large-print measuring tapes, digital calipers, or rulers with tactile markers for students with visual or motor challenges. • Use scaffolded checklists or task cards for practicing step-by-step tool use and safety procedures. • Allow students to present safety procedures via poster, skit, or infographic. Engagement • Gamify safety and measurement with challenges (e.g., "Measurement Relay" or "Spot the Safety Violation"). • Use real-world construction or manufacturing examples to highlight relevance. • Give students a voice by letting them create classroom safety rules or a peer safety contract. • Celebrate milestone achievements (e.g., "Measuring Mastery" or "Tool Safety Champion")	

Supporting Multilingual/English Learners						
Related *CELP standards* aligned to Learning Targets:						
CELP Level	**LT 1**	**LT 2**	**LT 3**	**LT 4**	**LT 5**	**LT 6**
Emerging	I can identify whole inches and some marks on a ruler.	I can match or name simple fractions like ½ or ¼.	I can name PPE items (gloves, goggles) and say what they protect.	I can say OSHA helps keep workers safe.	I can follow rules like not touching wires and wearing gloves.	I can name things that make a workspace safe (clean, organized, signs).
Expanding	I can independently and accurately measure to the nearest 1/16" using standard tools.	I can independently reduce any fraction related to measurement or construction.	I can explain how PPE reduces risk, and connect it to specific tasks and hazards.	I can explain how OSHA enforces safety and give examples of its impact on job sites.	I can apply and explain electrical safety procedures in different worksite situations.	I can evaluate a workspace for hazards and explain how to maintain a safe environment.
Bridging	I can measure to the nearest 1/4, 1/8, and 1/16 inch with guidance.	I can reduce common fractions to lowest terms with some support.	I can describe why workers wear PPE and give examples of when to use it.	I can describe what OSHA does (rules, inspections, training).	I can explain why it's important to turn off power and use the right tools.	I can describe what makes a work area safe and how to fix unsafe conditions.

Lesson Sequence	Learning Target	Success Criteria/Assessment
1-5	I can accurately measure to the nearest 1/16th of an inch.	• I can identify and explain the markings on a standard ruler or tape measure, including whole inches, half-inch, quarter-inch, eighth-inch, and sixteenth-inch increments. • I can transfer accurate measurements onto wood for cutting, drilling, or assembling
1-5	I can accurately reduce fractions as necessary.	• I can identify when a fraction can be simplified. • I can simplify fractions in woodworking measurements (e.g., reducing 8/16 to 1/2 inch).
1-5	I can explain the purpose of PPE	• I can name different types of PPE to protect the five senses • I can name appropriate PPE types to protect each of the human senses
1-5	I explain the purpose of OSHA in the workplace	• I can explain the purpose of the organization. • I can explain how OSHA uses training and fines to encourage workplace safety
1-5	I can apply rules and guidelines of safe electrical usage	• I can explain what the guidelines are for electrical usage. • I can apply safe electric usage rules to a factory setting.
1-5	I can explain what a safe work environment may look like	• I can explain the importance of lighting and a clean workplace • I can explain the importance of appropriate ventilation in the workplace • I can use safe work practices when working with tools, materials and machines

Unit Title:
Unit 2: Construction Life Cycle/Zoning/Building Codes
Relevant Standards: Bold indicates priority
CCTC- AC- Describe contractual relationships between all parties involved in the building process. CCTC -AC- Describe the approval procedures required for successful completion of a construction project. CCTC - AC-Comply with regulations and applicable codes to establish and manage a legal and safe workplace.

Essential Question(s):	**Enduring Understanding(s):**
• What is the process to build a structure on a piece of land? • What are zoning codes and building codes?	• The student will be able to understand the process to build a structure from start to finish. • Students will understand the importance of zoning and building codes.
Demonstration of Learning:	**Pacing for Unit**
Formative and Summative Assessments	7 Block Periods
Family Overview (link below)	**Integration of Technology:**
Family Overview - Construction Technology Family Overview - Construction Technology - Spanish	N/A
Unit-specific Vocabulary:	**Aligned Unit Materials, Resources, and Technology (beyond core resources):**
Zoning Codes Building Codes Fire Codes International Building Codes (IBC) Permit Inspection Occupancy Egress	N/A
Opportunities for Interdisciplinary Connections:	**Anticipated misconceptions:**
N/A	• Structures can be placed wherever someone wants. • There are no guidelines as to what can be built and where it can be built.
Connections to Prior Units:	**Connections to Future Units:**
Measurement may be incorporated into projects such as the zoning activity.	Students will use their understanding of building codes and zoning codes when working on future projects that involve electrical, plumbing and HVAC.

Differentiation through *Universal Design for Learning*
UDL Indicator & Teacher Actions
Representation • Present code and zoning content using diagrams, videos, real-world case studies, and physical blueprints. • Use color-coded overlays or graphic organizers to help students interpret zoning maps. • Offer text-to-speech or translated versions of code documents for ELL and struggling readers. • Invite a local code inspector or zoning official for a guest Q&A or virtual tour. Action and Expression • Allow students to demonstrate understanding through a variety of assessments (e.g., drawing a compliant building plan, oral presentation, digital project). • Offer scaffolded templates for writing a zoning variance request or permit application. • Facilitate group projects where roles are assigned based on student strengths (e.g., researcher, designer, presenter). • Include a build challenge where students apply codes to a scale model or virtual simulation. Engagement

- Connect the unit to students' communities by researching local zoning disputes or upcoming developments.
- Offer choices in project topics (e.g., residential vs. commercial code focus).
- Acknowledge career relevance by linking content to construction, engineering, urban planning, and legal professions.

Supporting Multilingual/English Learners

Related *CELP standards* aligned to Learning Targets:

CELP Level	LT 1	LT 2	LT 3	LT 4
Emerging	I can say why codes are used (keep people safe, control where buildings go).	I can name some code words (permit, zone, setback).	I can find where a code is used on a plan.	I can list the steps of building (plan, build, inspect).
Expanding	I can explain how zoning and building codes protect people and guide community planning.	I can correctly use building code vocabulary when explaining or writing about regulations.	I can apply multiple codes to assess or design a realistic building plan.	I can explain how zoning and building codes apply throughout the full construction life cycle.
Bridging	I can describe how codes help make buildings safe and organized.	I can use code words in sentences and match them to definitions.	I can check if a simple plan follows codes.	I can describe what happens in each stage and when codes are used.

Lesson Sequence	Learning Target	Success Criteria/Assessment
1-2	I can explain the purpose and importance of building and zoning codes.	• I can describe at least two reasons why building codes exist (e.g., safety, public health). • I can give examples of how zoning affects what can be built in a specific area. • I can identify the differences between building codes and zoning regulations.
3-4	I can identify and use key vocabulary related to codes and zoning.	• I can correctly define terms such as "setback," "permit," "egress," and "variance." • I can use the terms in discussion or in writing to explain a zoning scenario. • I can match vocabulary to real-world examples or images.
5-6	I can apply zoning and building codes to evaluate or create a building plan.	• I can read a basic zoning map and identify land use zones. • I can determine if a building design complies with zoning and code requirements. • I can suggest modifications to a plan to bring it into compliance.
7	I can describe the stages of the construction life cycle and their relationship to codes and zoning.	• I can list and explain the main phases of the construction life cycle (planning, design, permitting, construction, inspection, and occupancy). • I can describe how zoning and building codes influence decisions at each stage. • I can explain who is responsible for code compliance during each phase (e.g., architect, contractor, inspector).

Unit Title:	
Unit 3: Loads on Structures	
Relevant Standards: Bold indicates priority	
CCTC - AC - Justify design solutions through the use of research documentation and analysis of data. CCTC - AC - Apply the techniques and skills of modern drafting, design, engineering and construction to projects.	
Essential Question(s):	**Enduring Understanding(s):**
• How do forces which act upon a structure dictate how a structure is built?	• Understanding how different types of loads react on a structure will be a primary reason for selecting a specific construction style
Demonstration of Learning:	**Pacing for Unit**
• Written documents • Student created projects which implement theory • Summative assessment	8 Block Periods
Family Overview (link below)	**Integration of Technology:**
Family Overview - Construction Technology Family Overview - Construction Technology - Spanish	N/A
Unit-specific Vocabulary:	**Aligned Unit Materials, Resources, and Technology (beyond core resources):**
Compression, tension, deflection , sheer, stability, forces, loads (live, dead, uniform, concentrated)	N/A
Opportunities for Interdisciplinary Connections:	**Anticipated misconceptions:**
Forces and how they react on an object can be important for other lab based courses such as Science or Physics.	Building a structure out of a stronger material rather than utilizing engineering theory will keep structures safe for it occupants
Connections to Prior Units:	**Connections to Future Units:**
Students will be able to implement the theory of how forces act upon a structure to build examples of residential framing	This will be the basis for residential framing techniques
Differentiation through *Universal Design for Learning*	
UDL Indicator & Teacher Actions	
Engagement • Start with case studies or videos showing bridge collapses, skyscraper designs, or earthquake-proof buildings to hook interest. • Include culturally relevant examples (e.g., bamboo structures in Asia, adobe buildings in the Southwest). • Allow students to choose the type of structure they want to analyze (e.g., bridges, towers, homes). • Gamify parts of the lesson with structural design challenges (e.g., penny bridge and West Point Bridge Design challenges) . • Use group activities where students take on engineering roles and design structures that must withstand specific loads. Representation • Diagrams, infographics, and animations showing different load types (dead, live, wind, seismic). • Interactive simulations of load forces using online tools like PhET or SketchUp. • Use simple materials (e.g., balsa wood, string, clay) to demonstrate load distribution. • Create comparison charts for different construction styles (e.g., truss vs. arch vs. cantilever). • Provide vocabulary glossaries and visuals for ELL and IEP students. • Use closed captioning and transcripts for video materials. Action and Expression • Use guided templates or step-by-step design journals. • Offer sentence starters and checklists for writing or presenting. • Let students use design software (like West Point Bridge Design) to simulate load effects. • Include accessibility tools like screen readers or speech-to-text for diverse learners.	

Supporting Multilingual/English Learners			
Related *CELP standards* aligned to Learning Targets:			
CELP Level	**LT 1**	**LT 2**	**LT 3**
Emerging	I can name types of loads (dead load, live load, wind).	I can say loads can make a structure bend, break, or fall.	I can look at a model and say if it looks strong or weak.
Expanding	I can explain multiple types of loads and how they act on parts of a structure.	I can explain how engineers design for load distribution and balance to ensure stability.	I can analyze a design using load concepts and explain how to improve it for safety and efficiency.
Bridging	I can describe what each load is and give a simple example.	I can describe how designers change a structure to handle different loads.	I can tell if a design works well or needs changes to support loads.

Lesson Sequence	Learning Target	Success Criteria/ Assessment	Resources
1-2	I can identify different types of loads that act on structures.	• I can define and give examples of dead loads, live loads, environmental loads (e.g., wind, snow, seismic). • I can visually identify loads in real structures or diagrams. • I can classify loads correctly based on their source and behavior.	
3-4	I can explain how loads affect the design and stability of a structure.	• I can describe how different loads transfer through structural elements (e.g., beams, columns, foundations). • I can explain why accounting for all loads is critical to structural safety. • I can discuss what might happen if a structure is not designed to withstand certain loads.	
5-8	I can evaluate structural designs for load efficiency and safety.	• I can identify structural components that carry specific types of loads. • I can critique a simple design and suggest improvements for load management. • I can explain how load paths influence the strength and stability of a structure.	

Unit Title:	
Unit 4: Foundations	
Relevant Standards: Bold indicates priority	
CCTC -AC- Demonstrate the construction crafts required for each phase of a construction project. CCTC-AC- Comply with regulations and applicable codes to establish and manage a legal and safe workplace.	
Essential Question(s):	**Enduring Understanding(s):**
Why is the foundation an important part of the overall structure?	All forces within a structure are transmitted in a top down fashion to the foundation which ultimately transmits it into the earth
Demonstration of Learning:	**Pacing for Unit**
Formative and Summative Assessments	3 Block Periods
Family Overview (link below)	**Integration of Technology:**
Family Overview - Construction Technology Family Overview - Construction Technology - Spanish	N/A
Unit-specific Vocabulary:	**Aligned Unit Materials, Resources, and Technology (beyond core resources):**
Foundation Load Shallow Foundation Deep Foundation Slab on Grade Footing Frost Line Crawl Space Rebar Forming Concrete Curing	N/A
Opportunities for Interdisciplinary Connections:	**Anticipated misconceptions:**
• Safety knowledge can be important for other lab based courses such as Physics.	• Foundations do not need to go that deep. • All soil can support a building the same way. • A foundation will last forever.
Connections to Prior Units:	**Connections to Future Units:**
Foundations are the end of the line when forces are transferred from the various parts of a structure into the ground	A foundation acts as the initial building block for the framing for a structure (residential, commercial, or civil engineering structure)
Differentiation through *Universal Design for Learning*	
UDL Indicator & Teacher Actions	
Engagement • Use labeled diagrams, 3D models, and animations showing load paths in structures. • Utilize color-coded arrows to represent different types of forces (compression, tension, shear). • Use small physical models (e.g., Jenga blocks, foam board trusses) to show how forces move. • Create anchor charts with terms like "load," "foundation," "compression," and "distribution." • Use scaffolded note-taking sheets to map forces through structures. Representation • Use group design challenges (e.g., design a simple tower to withstand weight). • Use low-stakes exit tickets, Socratic questioning, or peer reviews to assess understanding regularly. • Allow use of CAD tools or AR apps to virtually dissect buildings and visualize internal forces. Action and Expression • Pose a design challenge: “How would you build a foundation for a structure in an earthquake zone?” • Connect to student interests (e.g., sports stadiums, roller coasters, treehouses). • Incorporate a simulation game where students must balance a budget while ensuring structural integrity.	

- Bring in a local architect or engineer (in-person or virtually) to explain how foundations are designed.
- Encourage students to keep a design journal to track their process and understanding of force flow.

Supporting Multilingual/English Learners

Related *CELP standards* aligned to Learning Targets:

CELP Level	LT 1	LT 2	LT 3
Emerging	I can say foundations hold up buildings.	I can name types like slab, crawlspace, and basement.	I can say soil and weather change how foundations are built.
Expanding	I can explain the structural role of foundations in distributing loads and preventing movement.	I can compare foundation types and explain why one may be chosen over another for a specific project.	I can explain how soil composition, moisture, and climate influence foundation depth, material, and design.
Bridging	I can describe how foundations support weight and keep buildings stable.	I can describe features of different foundation types and when they're used.	I can describe how different soils or weather need different types of foundations.

Lesson Sequence	Learning Target	Success Criteria/ Assessment	Resources
1	I can describe the purpose and function of a building foundation.	• I can explain how foundations support structures and distribute loads to the ground. • I can describe the relationship between the structure, the soil, and the foundation. • I can identify at least two consequences of poor foundation design or construction.	
2	I can identify and compare different types of foundations.	• I can define and distinguish between shallow foundations (e.g., slab, footing) and deep foundations (e.g., piles, caissons). • I can match different types of foundations to appropriate building scenarios. • I can list the pros and cons of at least two types of foundations.	
3	I can explain how soil and environmental conditions affect foundation design.	• I can describe how soil type, moisture, and the frost line influence foundation depth and type. • I can explain what "bearing capacity" means and why it matters. • I can identify environmental factors (e.g., water table, earthquakes) that must be considered when building a foundation.	

Unit Title:	
Unit 5: Residential Framing	
Relevant Standards: Bold indicates priority	
CCTC - AC- Use vocabulary, symbols and formulas common to architecture and construction. CCTC - AC- Read, interpret and use technical drawings, documents and specifications to plan a project. CCTC - AC- Compare and contrast the building systems and components required for a construction project. CCTC - AC- Demonstrate the construction crafts required for each phase of a construction project. CCTC - AC- Safely use and maintain appropriate tools, machinery, equipment and resources to accomplish construction project goals.	
Essential Question(s):	**Enduring Understanding(s):**
How has the design of a residential structure changed as a result of building codes, green architecture and a new generation of composite materials	Specific components are used in specific manner in residential framing to create floors, walls and roofing assemblies
Demonstration of Learning:	**Pacing for Unit**
• Written documents • Student created project demonstrating culmination of knowledge from unit • Formative and summative assessment	9 Block Periods
Family Overview (link below)	**Integration of Technology:**
Family Overview - Construction Technology Family Overview - Construction Technology - Spanish	N/A
Unit-specific Vocabulary:	**Aligned Unit Materials, Resources, and Technology (beyond core resources):**
Post and Beam, stick framing, joist, header, stud, jack stud/ trimmer, king stud, sill, sole plate, top plate, double top plate,	N/A
Opportunities for Interdisciplinary Connections:	**Anticipated misconceptions:**
Placement of components will require precise location requiring not only the use of measurement, but math such as geometry and/ or algebra.	Materials are randomly assembled and the framing techniques are different from structure to structure
Connections to Prior Units:	**Connections to Future Units:**
Along with safety and economic considerations, the manner which forces travel through a structure dictate modern construction techniques	The planning for the framing of a residential structure has to account for building systems which will be added later in the construction process such as HVAC, electrical and plumbing
Differentiation through *Universal Design for Learning*	
UDL Indicator & Teacher Actions	
Engagement • Begin with a virtual tour or video walkthrough of a house under construction. • Use local building codes or blueprints from community projects to relate content to their world. • Let students choose which system to explore first (floor, wall, or roof). • Offer role-based group tasks: "framing contractor," "building inspector," "apprentice." • Present a problem: “You’ve been hired to frame a tiny home with a flat roof. What components do you need, and how do you use them?” Representation • Diagrams of framing assemblies with labeled components (joists, studs, rafters, headers). • Color-coded framing plans and 3D models. • Use scale models or building kits to physically assemble sections of walls, floors, or roofs. • Introduce framing software (e.g., Chief Architect, SketchUp). • Use interactive simulations or augmented reality to explore how components connect. • Vocabulary lists with visuals.	

- Framing flow charts that show sequencing from subfloor to roof ridge.

Action and Expression

- Build a small wall section or roof truss using real or model materials.
- Create a time-lapse video of their construction process with voice-over explanations.
- Label diagrams of framed structures.
- Write a step-by-step process for assembling a framing system.
- Use software to virtually frame a basic residential floor plan.
- Submit screenshots and explanations of where each component is used and why.
- Journals: “What framing component do you think is most important and why?”
- Exit ticket: “Name one way wall and roof framing differ.”

Supporting Multilingual/English Learners

Related *CELP standards* aligned to Learning Targets:

CELP Level	LT 1	LT 2	LT 3	LT 4
Emerging	I can name parts like studs, joists, and plates.	I can say framing holds up the building.	I can measure and place studs with help.	I can wear PPE and listen to safety instructions.
Expanding	I can explain the function of each component in a wall, floor, or roof framing system.	I can explain how framing elements transfer loads through the structure to the foundation.	I can follow plans accurately and assemble framing using correct spacing and sequence.	I can follow safety rules and use tools carefully.
Bridging	I can describe where framing parts go and what they do.	I can describe how framing helps spread out the building’s weight.	I can measure, mark, and assemble framing with some guidance.	I can model safe behavior, identify hazards, and explain why safety procedures are important.

Lesson Sequence	Learning Target	Success Criteria/ Assessment
1	I can identify and describe the basic components of residential framing.	• I can correctly name framing parts such as **stud**, **joist**, **plate**, **header**, **truss**, and **rafter**. • I can describe the purpose and placement of each component. • I can label a wall, floor, and roof framing diagram accurately.
2	I can explain how framing supports the structure and distributes loads.	• I can describe how vertical loads transfer from the roof through walls to the foundation. • I can explain the role of sheathing, bracing, and fasteners in structural stability. • I can identify framing elements that resist lateral (sideways) forces, like wind or seismic activity.
3	I can follow proper procedures to layout and assemble framing components.	• I can use measuring and marking tools accurately for stud spacing (e.g., 16" or 24" on center). • I can explain or demonstrate how to build a framed wall or floor section using correct techniques. • I can follow a framing plan or blueprint with minimal guidance.
4	I can apply safety practices when working on or around framing structures.	• I wear proper PPE (e.g., safety glasses, gloves) and follow tool safety rules. • I recognize hazards such as pinch points, unstable frames, or tripping hazards. • I follow team communication protocols and lift/carry materials safely.

Unit Title:	
Unit 6: Building Systems	
Relevant Standards: Bold indicates priority	
CCTC - AC- Use vocabulary, symbols and formulas common to architecture and construction. CCTC - AC- Read, interpret and use technical drawings, documents and specifications to plan a project. CCTC - AC- Compare and contrast the building systems and components required for a construction project. CCTC - AC- Demonstrate the construction crafts required for each phase of a construction project. CCTC - AC- Safely use and maintain appropriate tools, machinery, equipment and resources to accomplish construction project goals. CCTC - AC - Evaluate the nature and scope of the Architecture & Construction Career Cluster and the role of architecture and construction in society and the economy.	
Essential Question(s):	**Enduring Understanding(s):**
• What are building systems and how are they used in buildings and houses? • What careers are offered in the various building systems?	• Students will understand the various building systems and how each of them work. • Students will also have a better understanding of the career choices offered for those interested in building systems.
Demonstration of Learning:	**Pacing for Unit**
• Written documents • Student created project demonstrating culmination of knowledge from unit • Formative and summative assessments	9 Block Periods
Family Overview (link below)	**Integration of Technology:**
Family Overview - Construction Technology Family Overview - Construction Technology - Spanish	N/A
Unit-specific Vocabulary:	**Aligned Unit Materials, Resources, and Technology (beyond core resources):**
Circuit Breaker Panel Meter Outlet Switch Thermostat Ventilation Supply Line Drain Trap Vent Stack	N/A
Opportunities for Interdisciplinary Connections:	**Anticipated misconceptions:**
• Electrical theory is often discussed in Science classes • Fluid dynamics is generally a component in high school Engineering and Physics classes	• Each building system works independently. • The structural system only supports • HVAC systems are just for heating and cooling. • Plumbing only involves water supply.
Connections to Prior Units:	**Connections to Future Units:**
Safety and the understanding of framing and loads on structures is important.	N/A
Differentiation through *Universal Design for Learning*	
UDL Indicator & Teacher Actions	
Engagement • Begin with a virtual tour of a home being built or renovated. • Pose a driving question: “How would you route HVAC, plumbing, and electrical systems in a two-story home without them interfering with each other?”	

- Bring in (or video call) guest speakers: HVAC techs, electricians, and plumbers.
- Include career videos with diverse professionals, especially from underrepresented groups.
- Use "Trade Wars" group roles: Each student represents a trade and must negotiate space in a structure for their system.

Representation

- Use clear diagrams or interactive 3D models to show where each system runs through floors/walls/ceilings.
- Display color-coded construction drawings for each system.
- Use simulation or CAD tools like SketchUp to show system pathways.
- Integrate virtual reality (if available) for immersive walkthroughs.
- Provide system flowcharts showing steps in installation and integration.
- Offer vocabulary sheets with images and simplified definitions (great for ELLs and students with IEPs).
- Show side-by-side layouts for HVAC, plumbing, and electrical systems and how they interconnect.
- Include charts for training paths, average salaries, and required certifications for each trade.

Action and Expression

- Design a section of a home and plan how the HVAC, plumbing, and electrical systems would fit into the framing.
- Create a layered drawing or model showing all three systems in a wall or floor assembly.
- Choose a trade and present the training, skills, and real-world applications.
- Options: slideshow, infographic, video, or mock podcast interview.
- Students reflect on integration challenges and trade overlaps.
- Include drawings, reflections, and notes on career insights.

Supporting Multilingual/English Learners

Related *CELP standards* aligned to Learning Targets:

CELP Level	LT 1	LT 2	LT 3	LT 4
Emerging	I can name systems like electrical, plumbing, and HVAC.	I can say systems work together.	I can use words like duct, breaker, and pipe.	I can say if something is safe or not.
Expanding	I can explain the role and importance of each building system in the function of a structure.	I can explain how building systems are coordinated and how changes in one affect others.	I can accurately use technical vocabulary to describe system components and functions.	I can assess building systems and explain how they meet or fail to meet safety and code standards.
Bridging	I can describe what each system does (e.g., plumbing carries water).	I can give examples of how systems connect (e.g., HVAC needs electricity).	I can use building system terms in conversation and writing.	I can describe problems with systems and how they may break rules.

Lesson Sequence	Learning Target	Success Criteria/Assessment
1	I can identify the major systems within a building and explain their basic functions.	• I can list and define the four main building systems: electrical, plumbing, HVAC, and structural. • I can describe what each system does and why it is essential for a building to function properly. • I can give examples of common components for each system (e.g., outlets, ducts, pipes, joists).
2	I can describe how building systems interact and depend on each other.	• I can explain how different systems are integrated (e.g., HVAC needs electrical power, plumbing vents must work with structural layout). • I can identify points in a building where multiple systems must work together. • I can discuss what might happen if one system fails and how it affects others.

3	I can use appropriate vocabulary when discussing building systems.	• I can correctly use terms like circuit, ductwork, load-bearing wall, and water heater in discussion or writing. • I can label key components of each building system on a diagram. • I can explain the function of at least three system components in my own words.
4	I can evaluate building systems for safety, efficiency, and code compliance.	• I can describe basic safety considerations for each system (e.g., grounding for electrical, backflow prevention for plumbing). • I can identify ways to improve energy or water efficiency in building systems. • I can explain the importance of following local building codes for systems installation.