

# STRANDS AND STANDARDS

## PLUMBING 1



### Course Description

This is the first course in a sequence that prepares individuals to apply technical knowledge and skill to lay out, assemble, install, and maintain piping, fixtures, and piping systems for steam, hot water, heating, cooling, draining, lubricating, sprinkling, and industrial processing systems. Includes instruction in material selection and use of tools to cut, bend, join, and weld pipes. This course is based on the current National Center for Construction Education and Research (NCCER) task list.

<b>Intended Grade Level</b>	10-12
Units of Credit	0.5
Core Code	40.08.00.00.100
Concurrent Enrollment Core Code	N/A
Prerequisite	None
Skill Certification Test Number	516
Test Weight	0.5
<b>License Type</b>	CTE and/or Secondary Education 6-12
<b>Required Endorsement(s)</b>	
Endorsement 1	Plumbing
Endorsement 2	N/A
Endorsement 3	N/A



## STRAND 1

**Students will receive an orientation to the plumbing trade.**

### Standard 1

Describe the history of the plumbing trade.

### Standard 2

Identify the stages of progress within the plumbing trade.

### Standard 3

Identify responsibilities of a person working in the construction industry.

### Standard 4

Explain the importance of safety in the construction industry.

### Performance Skill

Understand and demonstrate their knowledge of the plumbing trade.

- Describe the history of the plumbing trade.
- Identify the stages of progress within the plumbing trade.
- Identify responsibilities of a person working in the construction industry.
- Explain the importance of safety in the construction industry.

## STRAND 2

**Students will be able to understand and demonstrate the use of plumbing tools.**

### Standard 1

Identify the basic hand and power tools used in the plumbing trade.

### Standard 2

Demonstrate the proper maintenance procedures to be used for hand and power tools.

### Standard 3

Explain safety as it applies to plumbing tools.

### Performance Skill

Understand and demonstrate the use of plumbing tools.

- Identify the basic hand and power tools used in the plumbing trade.
- Demonstrate the proper maintenance procedures to be used for hand and power tools.
- Explain safety as it applies to plumbing tools.

## STRAND 3

**Students will be able to understand and demonstrate the use of plumbing math.**

### Standard 1

Identify the parts of a fitting and use common pipe measuring techniques.

### Standard 2

Use fitting dimension tables and a framing square to determine fitting allowances and pipe makeup.

### Standard 3

Calculate end-to-end measurements by figuring fitting allowances and pipe makeup.

### Standard 4

Use a framing square to find the center of fittings.

### Standard 5

Figure 45-degree offsets and travel using the Pythagorean Theorem.

### Standard 6

Figure 45-degree offsets and travel using a framing square or tape measure.

### Standard 7

Use a ruler or measuring tape to measure within a sixteenth ( $1/16$ ) of an inch.

### Performance Skill

Understand and demonstrate the use of plumbing math.

- Identify the parts of a fitting and use common pipe measuring techniques.
- Use fitting dimension tables and a framing square to determine fitting allowances and pipe makeup.
- Calculate end-to-end measurements by figuring fitting allowances and pipe makeup.
- Use a framing square to find the center of fittings.
- Figure 45-degree offsets and travel using the Pythagorean Theorem.
- Figure 45-degree offsets and travel using a framing square or tape measure.
- Use a ruler or measuring tape to measure within a sixteenth ( $1/16$ ) of an inch.

## STRAND 4

**Students will be able to understand and use plumbing drawings.**

### Standard 1

Identify pictorial (isometric and oblique), schematic, and orthographic drawings, and discuss how different views are used to depict information about objects.

### Standard 2

Explain the types of drawings that may be included in a set of plumbing drawings and the relationship between the different drawings.

## Standard 3

Interpret plumbing-related information from a set of plumbing drawings.

## Standard 4

Use an architect's scale to draw lines to scale and to measure lines drawn to scale.

## Standard 5

Discuss how local code requirements apply to certain drawings.

## Performance Skill

Understand and use plumbing drawings.

- Identify pictorial (isometric and oblique), schematic, and orthographic drawings, and discuss how different views are used to depict information about objects.
- Explain the types of drawings that may be included in a set of plumbing drawings and the relationship between the different drawings.
- Interpret plumbing-related information from a set of plumbing drawings.
- Use an architect's scale to draw lines to scale and to measure lines drawn to scale.
- Discuss how local code requirements apply to certain drawings.

## STRAND 5

**Students will be able to understand and demonstrate the use of plastic pipe and fittings.**

### Standard 1

Identify the common types of materials and schedules of plastic piping.

### Standard 2

Identify the common types of fittings used with plastic piping.

### Standard 3

Identify and determine the kinds of hangers and supports needed for plastic piping.

### Standard 4

Identify the various techniques used in hanging and supporting plastic piping.

### Standard 5

Demonstrate the ability to properly measure, cut, and join plastic piping.

### Standard 6

Follow basic safety precautions for the installation, operation, and maintenance of plastic tubing.

### Standard 7

Identify the hazards and safety precautions associated with plastic piping.

## Performance Skill

Understand and demonstrate the use of plastic pipe and fittings.

- Identify the common types of materials and schedules of plastic piping.
- Identify the common types of fittings used with plastic piping.
- Identify and determine the kinds of hangers and supports needed for plastic piping.
- Identify the various techniques used in hanging and supporting plastic piping.
- Demonstrate the ability to properly measure, cut, and join plastic piping.
- Follow basic safety precautions for the installation, operation, and maintenance of plastic tubing.
- Identify the hazards and safety precautions associated with plastic piping.

## STRAND 6

**Students will be able to understand and demonstrate the use of copper pipe and fittings.**

### Standard 1

Select the correct types of materials for copper piping systems.

### Standard 2

Identify types of fittings and valves and their uses.

### Standard 3

Select the correct hanger or support for the application.

### Standard 4

Select the appropriate personal protective equipment for working with copper piping.

### Standard 5

Correctly measure, cut, ream, and join copper piping.

## Performance Skill

Understand and demonstrate the use of copper pipe and fittings.

- Select the correct types of materials for copper piping systems.
- Identify types of fittings and valves and their uses.
- Select the correct hanger or support for the application.
- Select the appropriate personal protective equipment for working with copper piping.
- Correctly measure, cut, ream, and join copper piping.

## STRAND 7

**Students will be able to understand drain, waste, and vent (DWV) systems.**

### Standard 1

Explain how waste moves from a fixture through the drain system to the environment.

## Standard 2

Identify the major components of a drainage system and describe their functions.

## Standard 3

Identify types and parts of traps and explain the importance of traps and how traps lose their seals.

## Standard 4

Identify the various types of DWV fittings and describe their application.

## Performance Skill

Understand drain, waste, and vent (DWV) systems.

- Explain how waste moves from a fixture through the drain system to the environment.
- Identify the major components of a drainage system and describe their functions.
- Identify types and parts of traps and explain the importance of traps and how traps lose their seals.
- Identify the various types of DWV fittings and describe their application.

## STRAND 8

**Students will be able to understand water distribution systems.**

## Standard 1

Discuss how water moves from the source, through the water distribution system, and to the fixture.

## Standard 2

Identify the major components of water distribution systems and describe the function of each component.

## Standard 3

Explain the relationships between the components of a water distribution system.

## Performance Skill

Understand water distribution systems.

- Discuss how water moves from the source, through the water distribution system, and to the fixture.
- Identify the major components of water distribution systems and describe the function of each component.
- Explain the relationships between the components of a water distribution system.

## STRAND 9

**Students will be able to understand and demonstrate the use of fixtures and faucets.**

### Standard 1

Identify the basic types of materials used in the manufacture of plumbing fixtures.

### Standard 2

Discuss common types of sinks, lavatories, and faucets.

### Standard 3

Discuss common types of bathtubs, bath-shower modules, shower stalls, and shower baths.

### Standard 4

Discuss common types of toilets, urinals, and bidets.

### Standard 5

Discuss common types of drinking fountains and water coolers.

### Standard 6

Discuss common types of garbage disposals and domestic dishwashers.

### Performance Skill

Understand and demonstrate the use of fixtures and faucets.

- Identify the basic types of materials used in the manufacture of plumbing fixtures.
- Discuss common types of sinks, lavatories, and faucets.
- Discuss common types of bathtubs, bath-shower modules, shower stalls, and shower baths.
- Discuss common types of toilets, urinals, and bidets.
- Discuss common types of drinking fountains and water coolers.
- Discuss common types of garbage disposals and domestic dishwashers.

## STRAND 10

**Students will understand the importance of career readiness skills as it relates to the workplace and outlined in the SkillsUSA Framework – Level 1.**

### Standard 1

Understand and demonstrate the attitude of cooperation.

- Develop awareness of cultural diversity and equality issues.
- Demonstrate effective communication with others.
- Apply team skills to a group project.
- Identify and apply conflict resolution skills.

## Standard 2

Understand and demonstrate the ability of being resourceful and innovative.

- Discover self-motivation techniques and establish short-term goals.
- Measure/modify short-term goals.
- Review a professional journal and develop a three- to five-minute presentation.

## Standard 3

Plan for your future career.

- Complete a self-assessment and identify individual learning styles.
- Define future occupations.
- Identify the components of an employment portfolio.
- List proficiency in program competencies.
- Complete a survey for employment opportunities.
- Create a job application.
- Assemble your employment portfolio.
- Employability skills: evaluate program comprehension.

## Standard 4

Understand and demonstrate the ability to manage a project.

- Apply team skills to a group project.
- Observe and critique a meeting.
- Demonstrate business meeting skills.
- Explore supervisory and management roles in an organization.
- Identify and apply conflict resolution skills.
- Demonstrate evaluation skills.
- Manage a project and evaluate others.

## Skill Certificate Test Points by Strand

Test Name	Test #	Number of Test Points by Strand										Total Points	Total Questions
		1	2	3	4	5	6	7	8	9	10		
Plumbing I	516	7	7	7	4	10	9	7	8	8	1	68	65