

**PLUMBING APPRENTICE
TECHNICIAN
SKILLS STANDARDS**

OD33601



*ALIGNED WITH
NCCER
NATIONAL
STANDARDS*

COMPETENCY-BASED EDUCATION: OKLAHOMA'S RECIPE FOR SUCCESS

BY THE INDUSTRY FOR THE INDUSTRY

Oklahoma's *CareerTech* system of competency-based education uses industry professionals and certification standards to identify the knowledge and abilities needed to master an occupation. This industry input provides the foundation for development of instructional materials that help prepare the comprehensively trained, highly skilled employees demanded by our workplace partners.

TOOLS FOR SUCCESS

CareerTech relies on three basic instructional components to deliver competency-based instruction: skills standards, curriculum materials, and competency assessments.

Skills standards provide the foundation for competency-based instruction in Oklahoma's *CareerTech* system. The skills standards outline the knowledge, skills, and abilities needed to perform related jobs within an industry. Skills standards are aligned with national skills standards; therefore, a student trained to the skills standards possesses technical skills that make him/her employable in both state and national job markets.

Curriculum materials contain information and activities that teach students the knowledge and skills outlined in the skills standards. In addition to complementing classroom instruction, curriculum resources provide supplemental activities to enhance learning and provide hands-on training experiences.

Competency Assessments test the student over material outlined in the skills standards and taught using the curriculum materials. When used with classroom performance evaluations, written competency assessments provide a means of measuring occupational readiness.

Although each of these components satisfy a unique purpose in competency-based education, they work together to reinforce the skills and abilities students need to gain employment and succeed on the job.

MEASURING SUCCESS

Written competency assessments are used to evaluate student performance. Results reports communicate competency assessment scores to students and provide a breakdown of assessment results by duty area. The results breakdown shows how well the student has mastered skills needed to perform major job functions and identifies areas of job responsibility that may require additional instruction and/or training.

Group analysis of student results also provides feedback to instructors seeking to improve the effectiveness of career and technology training. Performance patterns in individual duties indicate opportunities to evaluate training methods and customize instruction.

TRUE TO OUR PURPOSE

"Helping Oklahomans succeed in the workplace" defines the mission of Oklahoma *CareerTech* and its competency-based system of instruction. Skills standards, curriculum, and assessments that identify and reinforce industry expectations provide accountability for programs and assure *CareerTech*'s continued role in preparing skilled workers for a global job market.

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**PLUMBING APPRENTICE TECHNICIAN
SKILLS STANDARDS
Frequency and Criticality Ratings**

- Duty A: Demonstrate Knowledge of the Plumbing Profession
- Duty B: Demonstrate Safety Skills
- Duty C: Identify and Safely Use Plumbing Tools
- Duty D: Perform Plumbing Math Calculations
- Duty E: Read and Interpret Blueprints and Plumbing Drawings
- Duty F: Demonstrate Knowledge of Plastic Pipe and Fittings
- Duty G: Demonstrate Knowledge of Copper Pipe and Fittings
- Duty H: Demonstrate Knowledge of Cast-Iron Pipe and Fittings
- Duty I: Demonstrate Knowledge of Carbon Steel Pipe and Fittings
- Duty J: Demonstrate Knowledge of Corrugated Stainless Steel Tubing
- Duty K: Identify, Install and Service Fixtures, Valves, and Faucets
- Duty L: Identify, Install, and Test Roof, Floor, and Area Drains and DWV Systems
- Duty M: Demonstrate Knowledge of Water Distribution Systems
- Duty N: Install and Test Water Supply Piping
- Duty O: Install Water Heaters
- Duty P: Demonstrate Knowledge of Fuel Gas Systems

Frequency: represents how often the task is performed on the job Frequency rating scales vary for different occupations The rating scale used in this publication is presented below:

- 1 = less than once a week
- 2 = at least once a week
- 3 = once or more a day

Criticality: denotes the level of consequence associated with performing a task incorrectly The rating scale used in this publication is presented below:

- 1 = slight
- 2 = moderate
- 3 = extreme

Duty A: Demonstrate Knowledge of the Plumbing Profession

CODE	TASK	F/C
	Level One (Introduction to the Plumbing Profession)	
A.01	Describe the history of the plumbing profession	1/1
A.02	Identify the responsibilities of a person working in the construction industry	2/2
A.03	State the personal characteristics of a professional	2/2
A.04	Identify the stages of progress within the plumbing profession and its positive impact on society	2/3

A.05	Demonstrate knowledge of state and local laws, rules, and statutes applicable to the plumbing profession	2/2
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Duty B: Demonstrate Safety Skills

CODE	TASK	F/C
	Level One (Plumbing Safety)	
B.01	Explain the role that safety plays in the construction crafts	3/3
B.02	Describe the meaning of job-site safety	3/3
B.03	Describe the characteristics of a competent person and a qualified person	3/3
B.04	Describe the common unsafe acts and unsafe conditions that cause accidents	3/3
B.05	Describe how to handle unsafe acts and unsafe conditions	3/3
B.06	Explain how the cost of accidents and illnesses affects everyone on site	3/3
B.07	Demonstrate the use and care of appropriate personal protective equipment. <ul style="list-style-type: none"> • safety goggles • hard hat • personal fall protection 	3/3
B.08	Identify job-site hazardous work specific to plumbers	3/3
B.09	Demonstrate the proper use of ladders and scaffolds	3/3
B.10	Describe and demonstrate knowledge of the basic rigging techniques used in the construction industry <ul style="list-style-type: none"> • slings and common rigging hardware • inspection techniques and rejection criteria • hitch configurations and connections • load handling safety practices • American National Standards Institute (ANSI) hand signals 	3/3
B.11	Demonstrate how to maintain power tools safely	3/3
B.12	Explain how to work safely in and around a trench	3/3
B.13	Describe and demonstrate knowledge of the Occupational Safety and Health Act (OSHA) <ul style="list-style-type: none"> • lockout/tagout procedures • HazCom and MSDS • electrical hazards • fire safety • lifting heavy objects • bloodborne pathogens 	3/3

Duty C: Identify and Safely Use Plumbing Tools

CODE	TASK	F/C
	Level One (Plumbing Tools)	
C.01	Identify the basic hand and power tools used in the plumbing trade	3/2
C.02	Demonstrate the proper use of plumbing tools	3/3
C.03	Demonstrate the ability to know when and how to select the proper tool(s) for tasks	3/2
C.04	Demonstrate the proper maintenance for caring for hand and power tools	3/2
C.05	Demonstrate how to prepare a surface for tool use	3/2
C.06	Describe the safety requirements for using plumbing tools	3/3

Duty D: Perform Plumbing Math Calculations

CODE	TASK	F/C
	Level One (Introduction to Plumbing Math)	
D.01	Add, subtract, multiply, and divide whole numbers	2/2
D.02	Add, subtract, multiply, and divide fractions	2/2
D.03	Add, subtract, multiply, and divide decimals	2/2
D.04	Convert decimals to percentages and percentages to decimals	1/1
D.05	Convert fractions to decimals and decimals to fractions	1/1
D.06	Recognize some of the basic shapes used in the construction industry, and apply basic geometry to measure them	2/2
D.07	Explain what the metric system is and how it is important in the plumbing trade	1/1
D.08	Recognize and use metric units of length, weight, volume, and temperature	1/1
D.09	Square various numbers and take square roots of numbers, with and without a calculator	1/1
D.10	Identify the parts of a fitting and use common pipe-measuring techniques	3/3
D.11	Use fitting dimension tables to determine fitting allowances and thread makeup	3/3
D.12	Calculate end-to-end measurements using fitting allowances and thread makeup	3/3
	Level Two (Intermediate Math)	
D.13	Lay out square corners using the 3-4-5 method	1/1
D.14	Use a folding rule to find given angles	1/1
D.15	Calculate 22-1/2, 45, and 90-degree simple offsets	1/1
D.16	Calculate 22-1/2, 45, and 90-degree parallel offsets	1/1
D.17	Calculate rolling offsets using constants for the angled fittings	1/1
D.18	Use a calculator to find a square root	2/2
D.19	Calculate rolling offsets using a framing square	1/1
D.20	Calculate 45-degree offsets around obstructions	2/2

Duty E: Read and Interpret Blueprints and Plumbing Drawings

CODE	TASK	F/C
	Level One (Introduction to Plumbing Drawings)	
E.01	Recognize and identify basic blueprint terms, components, and symbols	3/3
E.02	Relate information on blueprints to actual locations on the print	3/3
E.03	Recognize different classifications of drawings	3/3
E.04	Interpret and use drawing dimensions	3/3
E.05	Identify pictorial (isometric and oblique), schematic, and orthographic drawings, and discuss how different views are used to depict information about objects	3/3
E.06	Identify the basic symbols used in schematic drawings of pipe assemblies	2/2
E.07	Explain the types of drawings that may be included in a set of plumbing drawings and the relationship among the different drawings	2/2
E.08	Interpret plumbing-related information from a set of plumbing drawings	3/3
E.09	Sketch orthographic and schematic drawings	2/2
E.10	Use an architect's scale to draw lines to scale and to measure lines drawn to scale	3/3
E.11	Discuss how code requirements apply to certain drawings	2/2

	Level Two (Reading Commercial Drawings)	
E.12	Interpret information from given site plans	2/3
E.13	Verify dimensions shown on drawings and generate a Request for Information (RFI) when you find discrepancies	1/1
E.14	Locate plumbing entry points, walls, and chases	1/2
E.15	Create an isometric drawing	2/2
E.16	Do a material takeoff for drainage, waste, and vent (DWV) and water supply systems from information shown on drawings	1/1
E.17	Use cut sheets and floor plans to lay out fixture rough-ins	1/1

Duty F: Demonstrate Knowledge of Plastic Pipe and Fittings

CODE	TASK	F/C
	Level One (Plastic Pipe and Fittings)	
F.01	Identify types of materials and schedules of plastic piping	2/3
F.02	Identify proper and improper applications of plastic piping	2/2
F.03	Identify types of fittings and valves used with plastic piping	2/3
F.04	Identify and determine the kinds of hangers and supports needed for plastic piping	2/2
F.05	Identify the various techniques used in hanging and supporting plastic piping	2/2
F.06	Properly measure, cut, and join plastic piping	3/3
F.07	Explain proper procedures for the handling, storage, and protection of plastic pipes	3/3

Duty G: Demonstrate Knowledge of Copper Pipe and Fittings

CODE	TASK	F/C
	Level One (Copper Pipe and Fittings)	
G.01	Identify the types of materials and schedules used with copper piping	2/3
G.02	Identify the material properties, storage, and handling requirements of copper piping	2/2
G.03	Identify the types of fittings and valves used with copper piping	2/2
G.04	Identify the techniques used in hanging and supporting copper piping	2/2
G.05	Properly measure, ream, cut, and join copper piping	3/3
G.06	Identify the hazards and safety precautions associated with copper piping	3/3

Duty H: Demonstrate Knowledge of Cast-Iron Pipe and Fittings

CODE	TASK	F/C
	Level One (Cast-Iron Pipe and Fittings)	
H.01	Recognize proper and improper applications of cast-iron piping	1/2
H.02	Identify the material properties, storage, and handling requirements of cast iron piping	1/2
H.03	Identify the types of materials and schedules used in cast-iron piping	1/2
H.04	Identify the types of fittings used with cast-iron piping	1/2
H.05	Identify the various techniques used in handling and supporting cast-iron piping	1/2
H.06	Properly measure, cut, and join cast-iron piping	2/2

H.07	Identify the hazards and safety precautions associated with cast-iron piping	1/3
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Duty I: Demonstrate Knowledge of Carbon Steel Pipe and Fittings

CODE	TASK	F/C
	Level One (Carbon Steel Pipe and Fittings)	
I.01	Recognize proper applications of carbon steel piping	2/3
I.02	Identify the various techniques used in hanging and supporting carbon steel piping	2/2
I.03	Identify the material properties, storage, and handling requirements of carbon steel piping	2/2
I.04	Properly measure, cut, groove, thread, and join carbon steel piping	2/3
I.05	Identify the hazards and safety precautions associated with carbon steel piping	3/3

Duty J: Demonstrate Knowledge of Corrugated Stainless Steel Tubing

CODE	TASK	F/C
	Level One Corrugated Stainless Steel Tubing	
J.01	Identify the common manufacturers of corrugated stainless steel tubing	2/3
J.02	Recognize proper and improper applications of corrugated stainless steel tubing	2/3
J.03	Identify the various techniques used in hanging and supporting corrugated stainless steel tubing	2/3
J.04	Explain how to properly measure, cut, and join, corrugated stainless steel tubing	2/3
J.05	Identify the material properties, storage, and handling requirements of corrugated stainless steel tubing	2/2
J.06	Explain how to properly protect corrugated stainless steel tubing	2/3

Duty K: Identify, Install and Service Fixtures, Valves, and Faucets

CODE	TASK	F/C
	Level One (Fixtures and Faucets)	
K.01	Identify the basic types of materials used in the manufacture of plumbing fixtures	2/1
K.02	Discuss common types of sinks, lavatories, and faucets	2/1
K.03	Identify and discuss common types of bathtubs, bath-shower modules, shower stalls, and shower baths	2/1
K.04	Discuss common types of toilets, urinals, and bidets	2/1
K.05	Identify and describe common types of drinking fountains and water coolers	2/1
K.06	Discuss common types of garbage disposals and domestic dishwashers	2/1
	Level Two (Types of Valves)	
K.07	Identify the basic types of valves	2/3
K.08	Describe the differences in pressure ratings for valves	2/3
K.09	Demonstrate the ability to service various types of valves	1/1
	Level Two (Installing Fixtures, Valves, and Faucets)	
K.10	Describe the general procedures you should follow before installing any fixture	2/2
K.11	Demonstrate the ability to install bathtubs, shower stalls, valves, and faucets	2/2
K.12	Demonstrate the ability to install water closets and urinals	2/2

K.13	Demonstrate the ability to install lavatories, sinks, and pop-up drains	2/2
K.14	Demonstrate how to protect fixtures	2/2
Level Two (Servicing Fixtures, Valves, and Faucets)		
K.15	Identify common repair and maintenance requirements for fixtures, valves, and faucets	1/1
K.16	Identify the proper procedures for repairing and maintaining fixtures, valves, and faucets	1/1

Duty L: Identify, Install, and Test Roof, Floor, and Area Drains and DWV Systems (Level Two)

CODE	TASK	F/C
Level One (Introduction to Drain, Waste, and Vent [DWV] Systems)		
L.01	Explain how waste moves from a fixture through the drain system to the environment	1/1
L.02	Identify the major components of a drainage system and describe their functions	2/3
L.03	Identify the different types of traps and their components, explain the importance of traps, and identify the ways that traps can lose their seals	2/3
L.04	Identify the various types of drain, waste, and vent (DWV) fittings and describe their applications	3/3
L.05	Identify significant code and health issues, violations, and consequences related to DWV systems	3/3
Level Two (Installing and Testing DWV Piping)		
L.06	Develop a material takeoff from a given set of plans	1/1
L.07	Use plans and fixture rough-in sheets to determine location of fixtures and route of the plumbing	½
L.08	Demonstrate the ability to install a building sewer	½
L.09	Locate the stack within the structure	1/1
L.10	Demonstrate the ability to install a DWV system using appropriate hangers and correct grade	2/2
L.11	Demonstrate the ability to modify structural members using the appropriate tools without weakening the structure	2/3
L.12	Demonstrate the ability to test a DWV system	3/3
Level Two (Installing Roof, Floor, and Area Drains)		
L.13	Use a surveyor's level or transit level to set the elevation of a floor or area drain	½
L.14	Install a roof, floor, and area drain	½
L.15	Install waterproof membranes and flashing	½

Duty M: Demonstrate Knowledge of Water Distribution Systems

CODE	TASK	F/C
Level One (Water Distribution Systems)		
M.01	Describe the process by which water is distributed in municipal, residential, and private water systems	2/1
M.02	Identify the major components of a water distribution system, and describe the function of each component	2/2

M.03	Explain the relationships between components of a water distribution system	2/2
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Duty N: Install and Test Water Supply Piping

CODE	TASK	F/C
	Level Two (Install and Test Water Supply Piping)	
N.01	Develop a material takeoff from a given set of plans	1/1
N.02	Use plans and fixture rough-in sheets to determine the location of fixtures and the route of the water supply piping	1/2
N.03	Demonstrate the ability to locate and size a water meter	1/1
N.04	Demonstrate the ability to locate a water heater, water softener, and hose bibbs	1/1
N.05	Demonstrate the ability to install a water distribution system using appropriate hangers	2/2
N.06	Modify structural members, using the appropriate tools, without weakening the structure	2/3
N.07	Demonstrate the ability to safely size and install a water service line and provide for water hammer protection	1/1
N.08	Demonstrate the ability to test a water supply system	3/3
N.09	Demonstrate the ability to insulate pipe and to protect it from freezing	2/3

Duty O: Install Water Heaters

CODE	TASK	F/C
	Level Two (Install Water Heaters)	
O.01	Describe the basic operation of water heaters	2/3
O.02	Identify and explain the functions of the basic components of water heaters	2/3
O.03	Install an electric water heater	1/2
O.04	Install a gas water heater	1/2
O.05	Describe the safety hazards associated with water heaters	3/3

Duty P: Demonstrate Knowledge of Fuel Gas Systems

CODE	TASK	F/C
	Level Two (Fuel Gas Systems)	
P.01	Identify the major components of the following fuel systems and describe the function of each component: <ul style="list-style-type: none"> • Natural gas • LPG (liquefied petroleum gas) • Fuel oil 	3/3
P.02	Identify the physical properties of each type of fuel	3/3
P.03	Identify the safety precautions and potential hazards associated with each type of fuel and system	3/3
P.04	Properly connect appliances to the fuel gas system	3/3
P.05	Apply local codes to various fuel gas systems	3/3
P.06	Design, size, purge, and test fuel gas systems	1/3

**PLUMBING APPRENTICE TECHNICIAN
SKILLS STANDARDS
Curriculum & National Standard Crosswalk
Crosswalked to
Residential Plumbing from CIMC**

Duty A: Demonstrate Knowledge of the Plumbing Profession

CODE	TASK	Curriculum
	Level One (Introduction to the Plumbing Profession)	
A.01	Describe the history of the plumbing profession	
A.02	Identify the responsibilities of a person working in the construction industry	
A.03	State the personal characteristics of a professional	1A
A.04	Identify the stages of progress within the plumbing profession and its positive impact on society	
A.05	Demonstrate knowledge of state and local laws, rules, and statutes applicable to the plumbing profession	4C

Duty B: Demonstrate Safety Skills

CODE	TASK	Curriculum
	Level One (Plumbing Safety)	
B.01	Explain the role that safety plays in the construction crafts	
B.02	Describe the meaning of job-site safety	3A
B.03	Describe the characteristics of a competent person and a qualified person	
B.04	Describe the common unsafe acts and unsafe conditions that cause accidents	3A
B.05	Describe how to handle unsafe acts and unsafe conditions	3A
B.06	Explain how the cost of accidents and illnesses affects everyone on site	
B.07	Demonstrate the use and care of appropriate personal protective equipment.	3A
B.08	Identify job-site hazardous work specific to plumbers	
B.09	Demonstrate the proper use of ladders and scaffolds	
B.10	Describe and demonstrate knowledge of the basic rigging techniques used in the construction industry	
B.11	Demonstrate how to maintain power tools safely	
B.12	Explain how to work safely in and around a trench	
B.13	Describe and demonstrate knowledge of the Occupational Safety and Health Act (OSHA)	3A

Duty C: Identify and Safely Use Plumbing Tools

CODE	TASK	Curriculum
	Level One (Plumbing Tools)	
C.01	Identify the basic hand and power tools used in the plumbing trade	1B, 2B
C.02	Demonstrate the proper use of plumbing tools	1B, 2B
C.03	Demonstrate the ability to know when and how to select the proper tool(s) for tasks	1B, 2B

C.04	Demonstrate the proper maintenance for caring for hand and power tools	1B, 2B
C.05	Demonstrate how to prepare a surface for tool use	
C.06	Describe the safety requirements for using plumbing tools	1B, 2B

Duty D: Perform Plumbing Math Calculations

CODE	TASK	Curriculum
	Level One (Introduction to Plumbing Math)	
D.01	Add, subtract, multiply, and divide whole numbers	
D.02	Add, subtract, multiply, and divide fractions	1C
D.03	Add, subtract, multiply, and divide decimals	1C
D.04	Convert decimals to percentages and percentages to decimals	1C
D.05	Convert fractions to decimals and decimals to fractions	1C
D.06	Recognize some of the basic shapes used in the construction industry, and apply basic geometry to measure them	1C
D.07	Explain what the metric system is and how it is important in the plumbing trade	5C
D.08	Recognize and use metric units of length, weight, volume, and temperature	5C
D.09	Square various numbers and take square roots of numbers, with and without a calculator	
D.10	Identify the parts of a fitting and use common pipe-measuring techniques	1C
D.11	Use fitting dimension tables to determine fitting allowances and thread makeup	1C
D.12	Calculate end-to-end measurements using fitting allowances and thread makeup	1C
	Level Two (Intermediate Math)	
D.13	Lay out square corners using the 3-4-5 method	
D.14	Use a folding rule to find given angles	1C
D.15	Calculate 22-1/2, 45, and 90-degree simple offsets	
D.16	Calculate 22-1/2, 45, and 90-degree parallel offsets	
D.17	Calculate rolling offsets using constants for the angled fittings	
D.18	Use a calculator to find a square root	
D.19	Calculate rolling offsets using a framing square	
D.20	Calculate 45-degree offsets around obstructions	

Duty E: Read and Interpret Blueprints and Plumbing Drawings

CODE	TASK	Curriculum
	Level One (Introduction to Plumbing Drawings)	
E.01	Recognize and identify basic blueprint terms, components, and symbols	1C, 4E
E.02	Relate information on blueprints to actual locations on the print	1C
E.03	Recognize different classifications of drawings	1C
E.04	Interpret and use drawing dimensions	1C
E.05	Identify pictorial (isometric and oblique), schematic, and orthographic drawings, and discuss how different views are used to depict information about objects	1C, 2C
E.06	Identify the basic symbols used in schematic drawings of pipe assemblies	1C
E.07	Explain the types of drawings that may be included in a set of plumbing drawings	

	and the relationship among the different drawings	
E.08	Interpret plumbing-related information from a set of plumbing drawings	
E.09	Sketch orthographic and schematic drawings	
E.10	Use an architect's scale to draw lines to scale and to measure lines drawn to scale	1C
E.11	Discuss how code requirements apply to certain drawings	
	Level Two (Reading Commercial Drawings)	
E.12	Interpret information from given site plans	
E.13	Verify dimensions shown on drawings and generate a Request for Information (RFI) when you find discrepancies	
E.14	Locate plumbing entry points, walls, and chases	
E.15	Create an isometric drawing	2C
E.16	Do a material takeoff for drainage, waste, and vent (DWV) and water supply systems from information shown on drawings	1C
E.17	Use cut sheets and floor plans to lay out fixture rough-ins	3C

Duty F: Demonstrate Knowledge of Plastic Pipe and Fittings

CODE	TASK	Curriculum
	Level One (Plastic Pipe and Fittings)	
F.01	Identify types of materials and schedules of plastic piping	
F.02	Identify proper and improper applications of plastic piping	5D
F.03	Identify types of fittings and valves used with plastic piping	3D, 4D
F.04	Identify and determine the kinds of hangers and supports needed for plastic piping	1D
F.05	Identify the various techniques used in hanging and supporting plastic piping	1D, 3D
F.06	Properly measure, cut, and join plastic piping	3D
F.07	Explain proper procedures for the handling, storage, and protection of plastic pipes	2D

Duty G: Demonstrate Knowledge of Copper Pipe and Fittings

CODE	TASK	Curriculum
	Level One (Copper Pipe and Fittings)	
G.01	Identify the types of materials and schedules used with copper piping	3D
G.02	Identify the material properties, storage, and handling requirements of copper piping	
G.03	Identify the types of fittings and valves used with copper piping	3D, 4D
G.04	Identify the techniques used in hanging and supporting copper piping	1D, 4D
G.05	Properly measure, ream, cut, and join copper piping	3D
G.06	Identify the hazards and safety precautions associated with copper piping	

Duty H: Demonstrate Knowledge of Cast-Iron Pipe and Fittings

CODE	TASK	Curriculum
	Level One (Cast-Iron Pipe and Fittings)	
H.01	Recognize proper and improper applications of cast-iron piping	5D

H.02	Identify the material properties, storage, and handling requirements of cast iron piping	
H.03	Identify the types of materials and schedules used in cast-iron piping	3D
H.04	Identify the types of fittings used with cast-iron piping	3D, 4D
H.05	Identify the various techniques used in handling and supporting cast-iron piping	1D
H.06	Properly measure, cut, and join cast-iron piping	3D, 4D
H.07	Identify the hazards and safety precautions associated with cast-iron piping	

Duty I: Demonstrate Knowledge of Carbon Steel Pipe and Fittings

CODE	TASK	Curriculum
	Level One (Carbon Steel Pipe and Fittings)	
I.01	Recognize proper applications of carbon steel piping	3D, 5D
I.02	Identify the various techniques used in hanging and supporting carbon steel piping	1D
I.03	Identify the material properties, storage, and handling requirements of carbon steel piping	4D
I.04	Properly measure, cut, groove, thread, and join carbon steel piping	3D
I.05	Identify the hazards and safety precautions associated with carbon steel piping	

Duty J: Demonstrate Knowledge of Corrugated Stainless Steel Tubing

CODE	TASK	Curriculum
	Level One Corrugated Stainless Steel Tubing	
J.01	Identify the common manufacturers of corrugated stainless steel tubing	
J.02	Recognize proper and improper applications of corrugated stainless steel tubing	
J.03	Identify the various techniques used in hanging and supporting corrugated stainless steel tubing	1D
J.04	Explain how to properly measure, cut, and join, corrugated stainless steel tubing	3D
J.05	Identify the material properties, storage, and handling requirements of corrugated stainless steel tubing	
J.06	Explain how to properly protect corrugated stainless steel tubing	2D

Duty K: Identify, Install and Service Fixtures, Valves, and Faucets

CODE	TASK	Curriculum
	Level One (Fixtures and Faucets)	
K.01	Identify the basic types of materials used in the manufacture of plumbing fixtures	
K.02	Discuss common types of sinks, lavatories, and faucets	3F
K.03	Identify and discuss common types of bathtubs, bath-shower modules, shower stalls, and shower baths	
K.04	Discuss common types of toilets, urinals, and bidets	
K.05	Identify and describe common types of drinking fountains and water coolers	
K.06	Discuss common types of garbage disposals and domestic dishwashers	3F
	Level Two (Types of Valves)	
K.07	Identify the basic types of valves	2D

K.08	Describe the differences in pressure ratings for valves	
K.09	Demonstrate the ability to service various types of valves	
	Level Two (Installing Fixtures, Valves, and Faucets)	
K.10	Describe the general procedures you should follow before installing any fixture	3F
K.11	Demonstrate the ability to install bathtubs, shower stalls, valves, and faucets	3F
K.12	Demonstrate the ability to install water closets and urinals	1F, 3F
K.13	Demonstrate the ability to install lavatories, sinks, and pop-up drains	3F
K.14	Demonstrate how to protect fixtures	3F
	Level Two (Servicing Fixtures, Valves, and Faucets)	
K.15	Identify common repair and maintenance requirements for fixtures, valves, and faucets	
K.16	Identify the proper procedures for repairing and maintaining fixtures, valves, and faucets	1F, 2G

Duty L: Identify, Install, and Test Roof, Floor, and Area Drains and DWV Systems (Level Two)

CODE	TASK	Curriculum
	Level One (Introduction to Drain, Waste, and Vent [DWV] Systems)	
L.01	Explain how waste moves from a fixture through the drain system to the environment	1D
L.02	Identify the major components of a drainage system and describe their functions	1D, 3F, 4C
L.03	Identify the different types of traps and their components, explain the importance of traps, and identify the ways that traps can lose their seals	2F
L.04	Identify the various types of drain, waste, and vent (DWV) fittings and describe their applications	1F, 3D, 3F
L.05	Identify significant code and health issues, violations, and consequences related to DWV systems	1D, 1F, 3E, 3F, 4C
	Level Two (Installing and Testing DWV Piping)	
L.06	Develop a material takeoff from a given set of plans	5D
L.07	Use plans and fixture rough-in sheets to determine location of fixtures and route of the plumbing	3C
L.08	Demonstrate the ability to install a building sewer	1D
L.09	Locate the stack within the structure	1D
L.10	Demonstrate the ability to install a DWV system using appropriate hangers and correct grade	4C
L.11	Demonstrate the ability to modify structural members using the appropriate tools without weakening the structure	3C
L.12	Demonstrate the ability to test a DWV system	1D, 4E
	Level Two (Installing Roof, Floor, and Area Drains)	
L.13	Use a surveyor's level or transit level to set the elevation of a floor or area drain	1C
L.14	Install a roof, floor, and area drain	1D
L.15	Install waterproof membranes and flashing	3F

Duty M: Demonstrate Knowledge of Water Distribution Systems

CODE	TASK	Curriculum
	Level One (Water Distribution Systems)	
M.01	Describe the process by which water is distributed in municipal, residential, and private water systems	2D
M.02	Identify the major components of a water distribution system, and describe the function of each component	2D
M.03	Explain the relationships between components of a water distribution system	1F

Duty N: Install and Test Water Supply Piping

CODE	TASK	Curriculum
	Level Two (Install and Test Water Supply Piping)	
N.01	Develop a material takeoff from a given set of plans	
N.02	Use plans and fixture rough-in sheets to determine the location of fixtures and the route of the water supply piping	
N.03	Demonstrate the ability to locate and size a water meter	
N.04	Demonstrate the ability to locate a water heater, water softener, and hose bibbs	2D
N.05	Demonstrate the ability to install a water distribution system using appropriate hangers	1D, 2D
N.06	Modify structural members, using the appropriate tools, without weakening the structure	
N.07	Demonstrate the ability to safely size and install a water service line and provide for water hammer protection	2D
N.08	Demonstrate the ability to test a water supply system	2D
N.09	Demonstrate the ability to insulate pipe and to protect it from freezing	2D

Duty O: Install Water Heaters

CODE	TASK	Curriculum
	Level Two (Install Water Heaters)	
O.01	Describe the basic operation of water heaters	
O.02	Identify and explain the functions of the basic components of water heaters	
O.03	Install an electric water heater	2D
O.04	Install a gas water heater	2D
O.05	Describe the safety hazards associated with water heaters	2D

Duty P: Demonstrate Knowledge of Fuel Gas Systems

CODE	TASK	Curriculum
	Level Two (Fuel Gas Systems)	
P.01	Identify the major components of the following fuel systems and describe the function of each component: <ul style="list-style-type: none"> • Natural gas • LPG (liquefied petroleum gas) • Fuel oil 	4E

P.02	Identify the physical properties of each type of fuel	
P.03	Identify the safety precautions and potential hazards associated with each type of fuel and system	4E
P.04	Properly connect appliances to the fuel gas system	
P.05	Apply local codes to various fuel gas systems	2D
P.06	Design, size, purge, and test fuel gas systems	2D, 4E