Plumbing Apprenticeship Evaluation Tool

2020 Curricular Materials Review

Idaho CTE Trades and Industry (T&I) Plumbing Apprenticeship Program Standards[[1]](#footnote-1)[[2]](#footnote-2)[[3]](#footnote-3)[[4]](#footnote-4)

**Publisher information**

* Publisher Name:
* Title:
* Grade Level:
* ISBN #:
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# Instructions:

Complete the Publisher Standards Alignment Report below. Please provide written justification as to how the material meets the standard along with location references. If a justification requires additional space, please submit response on an additional document.

# Publisher STANDARDS ALIGNMENT Report:

## YEAR ONE Standard PLMB.1.0: Introduction to the Plumbing Profession

### YEAR ONE Performance Standard PLMB.1.1 Introduction to the Plumbing Profession

| Student Competencies by Performance Standard | Justification: Provide examples from materials as evidence to support each response for this section. Provide descriptions, not just page numbers. |
| --- | --- |
| CTE PLMB.1.1.1 Describe Idaho Plumbing Code and Administrative Rules requirements. |  |
| CTE PLMB.1.1.2 Identify the basic principles on which plumbing is based. |  |
| CTE PLMB.1.1.3 Identify and maintain licensing, certification, and industry credentialing requirements. |  |

## YEAR ONE Standard PLMB.2.0: Plumbing Safety

### YEAR ONE Performance Standard PLMB.2.1 Plumbing Safety

| Student Competencies by Performance Standard | Justification: Provide examples from materials as evidence to support each response for this section. Provide descriptions, not just page numbers. |
| --- | --- |
| CTE PLMB.2.1.1 Identify common unsafe acts and conditions common in plumbing that cause accidents and how to handle these situations to make them safer. |  |
| CTE PLMB.2.1.2 Identify job site hazards that are work specific for plumbers. |  |
| CTE PLMB.2.1.3 Complete First Aid and CPR Certification. |  |
| CTE PLMB.2.1.4 Use appropriate fire extinguishers and other safety devices. |  |

## YEAR ONE Standard PLMB.3.0: Introduction to Hand Tools and Power Tools

### YEAR ONE Performance Standard PLMB.3.1 Hand Tools

| Student Competencies by Performance Standard | Justification: Provide examples from materials as evidence to support each response for this section. Provide descriptions, not just page numbers. |
| --- | --- |
| CTE PLMB.3.1.1 Identify the types of hand tools used in the plumbing profession. |  |
| CTE PLMB.3.1.2 Demonstrate proper use and care of basic hand tools. |  |
| CTE PLMB.3.1.3 Identify the types of Personal Protective Equipment (PPE) required for hand tool use. |  |

### YEAR ONE Performance Standard PLMB.3.2 Power Tools

| Student Competencies by Performance Standard | Justification: Provide examples from materials as evidence to support each response for this section. Provide descriptions, not just page numbers. |
| --- | --- |
| CTE PLMB.3.2.1 Identify the types of power tools used in the plumbing profession. |  |
| CTE PLMB.3.2.2 Demonstrate proper use and care of basic power tools. |  |
| CTE PLMB.3.2.3 Identify the types of Personal Protective Equipment (PPE) required for power tool use. |  |

## YEAR ONE Standard PLMB.4.0: Fittings, Pipe, and Valves

### YEAR ONE Performance Standard PLMB.4.1 Fittings and Valves

| Student Competencies by Performance Standard | Justification: Provide examples from materials as evidence to support each response for this section. Provide descriptions, not just page numbers. |
| --- | --- |
| CTE PLMB.4.1.1 Identify the proper fittings and/or valves for specific systems. |  |
| CTE PLMB.4.1.2 Apply the various fittings and valves by type, size, materials, and application. |  |

### YEAR ONE Performance Standard PLMB.4.2 Types of Pipe

| Student Competencies by Performance Standard | Justification: Provide examples from materials as evidence to support each response for this section. Provide descriptions, not just page numbers. |
| --- | --- |
| CTE PLMB.4.2.1 Identify the common types of pipes. |  |
| CTE PLMB.4.2.2 Identify the proper pipes for specific systems. |  |

## YEAR ONE Standard PLMB.5.0: Industry Math

### YEAR ONE Performance Standard PLMB.5.1 Basic Mathematics

| Student Competencies by Performance Standard | Justification: Provide examples from materials as evidence to support each response for this section. Provide descriptions, not just page numbers. |
| --- | --- |
| CTE PLMB.5.1.1 Perform addition, subtraction, multiplication, and division calculations of whole numbers. |  |
| CTE PLMB.5.1.2 Perform addition, subtraction, multiplication, and division calculations of common fractions. |  |
| CTE PLMB.5.1.3 Perform addition, subtraction, multiplication, and division calculations of decimal fractions. |  |
| CTE PLMB.5.1.4 Perform ratio and proportion calculations. |  |
| CTE PLMB.5.1.5 Perform percent, percentage, and discount calculations. |  |
| CTE PLMB.5.1.6 Perform area calculations. |  |
| CTE PLMB.5.1.7 Perform volume calculations. |  |
| CTE PLMB.5.1.8 Solve basic equations. |  |
| CTE PLMB.5.1.9 Demonstrate the use of order of operations. |  |

## YEAR ONE Standard PLMB.6.0: The Uniform Plumbing Code (UPC)

### YEAR ONE Performance Standard PLMB.6.1 The Uniform Plumbing Code (UPC)

| Student Competencies by Performance Standard | Justification: Provide examples from materials as evidence to support each response for this section. Provide descriptions, not just page numbers. |
| --- | --- |
| CTE PLMB.6.1.1 Identify proper code terminology. |  |
| CTE PLMB.6.1.2 Identify general plumbing requirements for hanging and securing piping. |  |
| CTE PLMB.6.1.3 Identify plumbing fixtures. |  |
| CTE PLMB.6.1.4 Perform water heater sizing, combustion air calculations, vent sizing, and installation. |  |
| CTE PLMB.6.1.5 Perform water pipe sizing calculations.  |  |
| CTE PLMB.6.1.6 Explain when and what type of backflow prevention devices, assemblies, and methods are required. |  |
| CTE PLMB.6.1.7 Perform drain and waste pipe sizing calculations. |  |
| CTE PLMB.6.1.8 Perform indirect waste installation and usage. |  |
| CTE PLMB.6.1.9 Describe venting systems (e.g., horizontal, vertical wet venting). |  |
| CTE PLMB.6.1.10 Identify proper use of traps and interceptors. |  |
| CTE PLMB.6.1.11 Perform proper storm drain sizing and calculations. |  |
| CTE PLMB.6.1.12 Perform fuel gas sizing calculations. |  |
| CTE PLMB.6.1.13 Identify proper fire-stop installation. |  |
| CTE PLMB.6.1.14 Identify the proper use of gray water, reclaimed water, and rainwater systems. |  |
| CTE PLMB.6.1.15 Utilize UPC appendices and reference standards. |  |
| CTE PLMB.6.1.16 Apply IDAPA plumbing rules and statutes (Title 54). |  |

## YEAR ONE Standard PLMB.7.0: Construction Documents

### YEAR ONE Performance Standard PLMB.7.1 Isometric Drawings

| Student Competencies by Performance Standard | Justification: Provide examples from materials as evidence to support each response for this section. Provide descriptions, not just page numbers. |
| --- | --- |
| CTE PLMB.7.1.1 Identify various plumbing symbols and abbreviations. |  |
| CTE PLMB.7.1.2 Complete an isometric drawing with proper symbols. |  |
| CTE PLMB.7.1.3 Develop a materials list based on isometric drawings. |  |

## YEAR ONE Standard PLMB.8.0: Cut and Join Pipes

### YEAR ONE Performance Standard PLMB.8.1 Cut and Join Pipes

| Student Competencies by Performance Standard | Justification: Provide examples from materials as evidence to support each response for this section. Provide descriptions, not just page numbers. |
| --- | --- |
| CTE PLMB.8.1.1 Join different types of pipes including PVC, galvanized, steel, plastic, copper, and cast-iron pipes. |  |
| CTE PLMB.8.1.2 Measure, mark, and cut different types of pipes using various pipe cutters. |  |
| CTE PLMB.8.1.3 Thread a steel pipe with a power-driven vise stand or a pipe-threading machine. |  |

## YEAR TWO Standard PLMB.1.0: Introduction to the Plumbing Profession

### YEAR TWO Performance Standard PLMB.1.1 Introduction to the Plumbing Profession

| Student Competencies by Performance Standard | Justification: Provide examples from materials as evidence to support each response for this section. Provide descriptions, not just page numbers. |
| --- | --- |
| CTE PLMB.1.1.1 Describe Idaho Plumbing Code and Administrative Rules requirements. |  |
| CTE PLMB.1.1.2 Identify the basic principles on which plumbing is based. |  |
| CTE PLMB.1.1.3 Identify and maintain licensing, certification, and industry credentialing requirements. |  |

## YEAR TWO Standard PLMB.2.0: Plumbing Safety

### YEAR TWO Performance Standard PLMB.2.1 Plumbing Safety

| Student Competencies by Performance Standard | Justification: Provide examples from materials as evidence to support each response for this section. Provide descriptions, not just page numbers. |
| --- | --- |
| CTE PLMB.2.1.1 Complete OSHA 10 Certification. |  |
| CTE PLMB.2.1.2 Identify job site hazards that are work specific for plumbers. |  |
| CTE PLMB.2.1.3 Complete First Aid and CPR Certification. |  |
| CTE PLMB.2.1.4 Use appropriate fire extinguishers and other safety devices. |  |

## YEAR TWO Standard PLMB.3.0: Fittings, Pipe, and Valves

### YEAR TWO Performance Standard PLMB.3.1 Fittings and Valves

| Student Competencies by Performance Standard | Justification: Provide examples from materials as evidence to support each response for this section. Provide descriptions, not just page numbers. |
| --- | --- |
| CTE PLMB.3.1.1 Identify the proper fittings and/or valves for specific systems. |  |
| CTE PLMB.3.1.2 Apply the various fittings and valves by type, size, materials, and application. |  |

### YEAR TWO Performance Standard PLMB.3.2 Types of Pipe

| Student Competencies by Performance Standard | Justification: Provide examples from materials as evidence to support each response for this section. Provide descriptions, not just page numbers. |
| --- | --- |
| CTE PLMB.3.2.1 Identify the common types of pipes. |  |
| CTE PLMB.3.2.2 Identify the proper pipes for specific systems. |  |

## YEAR TWO Standard PLMB.4.0: Industry Math

### YEAR TWO Performance Standard PLMB.4.1 Applied Mathematics

| Student Competencies by Performance Standard | Justification: Provide examples from materials as evidence to support each response for this section. Provide descriptions, not just page numbers. |
| --- | --- |
| CTE PLMB.4.1.1 Determine center-to-center and end-to-end lengths for parallel offsets. |  |
| CTE PLMB.4.1.2 Calculate the travel for a rolling offset. |  |
| CTE PLMB.4.1.3 Solve for end-to-end lengths of pipe. |  |
| CTE PLMB.4.1.4 Calculate area, water volumes, weights, and gallons for various geometric shapes. |  |
| CTE PLMB.4.1.5 Explain pressure measurement in terms of Pounds per Square Inch (PSI) and inches of mercury. |  |
| CTE PLMB.4.1.6 Perform angular, length, and converted temperature measure calculations. |  |
| CTE PLMB.4.1.7 Calculate material expansion and/or volume related to heat. |  |

## YEAR TWO Standard PLMB.5.0: The Uniform Plumbing Code (UPC)

### YEAR TWO Performance Standard PLMB.5.1 The Uniform Plumbing Code (UPC)

| Student Competencies by Performance Standard | Justification: Provide examples from materials as evidence to support each response for this section. Provide descriptions, not just page numbers. |
| --- | --- |
| CTE PLMB.5.1.1 Identify proper code terminology. |  |
| CTE PLMB.5.1.2 Identify general plumbing requirements for hanging and securing piping. |  |
| CTE PLMB.5.1.3 Identify plumbing fixtures. |  |
| CTE PLMB.5.1.4 Perform water heater sizing, combustion air calculations, vent sizing, and installation. |  |
| CTE PLMB.5.1.5 Perform water pipe sizing calculations.  |  |
| CTE PLMB.5.1.6 Explain when and what type of backflow prevention devices, assemblies, and methods are required. |  |
| CTE PLMB.5.1.7 Perform drain and waste pipe sizing calculations. |  |
| CTE PLMB.5.1.8 Perform indirect waste installation and usage. |  |
| CTE PLMB.5.1.9 Describe venting systems (e.g., horizontal, vertical wet venting). |  |
| CTE PLMB.5.1.10 Identify proper use of traps and interceptors. |  |
| CTE PLMB.5.1.11 Perform proper storm drain sizing and calculations. |  |
| CTE PLMB.5.1.12 Perform fuel gas sizing calculations. |  |
| CTE PLMB.5.1.13 Identify proper fire-stop installation. |  |
| CTE PLMB.5.1.14 Identify the proper use of gray water, reclaimed water, and rainwater systems. |  |
| CTE PLMB.5.1.15 Utilize UPC appendices and reference standards. |  |
| CTE PLMB.5.1.16 Apply IDAPA plumbing rules and statutes (Title 54). |  |

## YEAR TWO Standard PLMB.6.0: Construction Documents

### YEAR TWO Performance Standard PLMB.6.1 Isometric Drawings

| Student Competencies by Performance Standard | Justification: Provide examples from materials as evidence to support each response for this section. Provide descriptions, not just page numbers. |
| --- | --- |
| CTE PLMB.6.1.1 Identify various plumbing symbols and abbreviations. |  |
| CTE PLMB.6.1.2 Complete an isometric drawing with proper symbols. |  |
| CTE PLMB.6.1.3 Develop a materials list based on isometric drawings. |  |

### YEAR TWO Performance Standard PLMB.6.2 Plan Reading

| Student Competencies by Performance Standard | Justification: Provide examples from materials as evidence to support each response for this section. Provide descriptions, not just page numbers. |
| --- | --- |
| CTE PLMB.6.2.1 Describe basic plumbing symbols, abbreviations, and specifications. |  |
| CTE PLMB.6.2.2 Explain how the specifications relate to the plan. |  |
| CTE PLMB.6.2.3 Identify the necessary requirements and locations to install the plumbing fixtures and plumbing appurtenances. |  |
| CTE PLMB.6.2.4 Describe the coordination of trades on the job site. |  |
| CTE PLMB.6.2.5 Identify site plan, floor plans, elevations, sectional views, details, and schedules. |  |
| CTE PLMB.6.2.6 Locate specific information on building plans. |  |

## YEAR TWO Standard PLMB.7.0: Knowledge of Related Industries

### YEAR TWO Performance Standard PLMB.7.1 Knowledge of Related Industries

| Student Competencies by Performance Standard | Justification: Provide examples from materials as evidence to support each response for this section. Provide descriptions, not just page numbers. |
| --- | --- |
| CTE PLMB.7.1.1 Explain how to use alternating-current meters and instruments in the pipe trades. |  |
| CTE PLMB.7.1.2 Apply basic building codes. |  |

## YEAR TWO Standard PLMB.8.0: Cut and Join Pipes

### YEAR TWO Performance Standard PLMB.8.1 Cut and Join Pipes

| Student Competencies by Performance Standard | Justification: Provide examples from materials as evidence to support each response for this section. Provide descriptions, not just page numbers. |
| --- | --- |
| CTE PLMB.8.1.1 Join different types of pipes including PVC, galvanized, steel, plastic, copper, and cast-iron pipes. |  |
| CTE PLMB.8.1.2 Measure, mark, and cut different types of pipes using various pipe cutters. |  |
| CTE PLMB.8.1.3 Thread a steel pipe with a power-driven vise stand or a pipe-threading machine. |  |

## YEAR TWO Standard PLMB.9.0: Maintenance and Repair

### YEAR TWO Performance Standard PLMB.9.1 Maintenance and Repair

| Student Competencies by Performance Standard | Justification: Provide examples from materials as evidence to support each response for this section. Provide descriptions, not just page numbers. |
| --- | --- |
| CTE PLMB.9.1.1 Diagnose water heater problems (e.g., gas, electric, tankless). |  |
| CTE PLMB.9.1.2 Identify repairs for residential fixtures. |  |
| CTE PLMB.9.1.3 Identify repairs for commercial fixtures. |  |

## YEAR THREE Standard PLMB.1.0: Introduction to the Plumbing Profession

### YEAR THREE Performance Standard PLMB.1.1 Introduction to the Plumbing Profession

| Student Competencies by Performance Standard | Justification: Provide examples from materials as evidence to support each response for this section. Provide descriptions, not just page numbers. |
| --- | --- |
| CTE PLMB.1.1.1 Describe Idaho Plumbing Code and Administrative Rules requirements. |  |
| CTE PLMB.1.1.2 Identify the basic principles on which plumbing is based. |  |
| CTE PLMB.1.1.3 Identify and maintain licensing, certification, and industry credentialing requirements. |  |

## YEAR THREE Standard PLMB.2.0: Plumbing Safety

### YEAR THREE Performance Standard PLMB.2.1 Plumbing Safety

| Student Competencies by Performance Standard | Justification: Provide examples from materials as evidence to support each response for this section. Provide descriptions, not just page numbers. |
| --- | --- |
| CTE PLMB.2.1.1 Complete OSHA 10 Certification. |  |
| CTE PLMB.2.1.2 Identify common unsafe acts and conditions that cause accidents and how to handle these situations to make them safer. |  |
| CTE PLMB.2.1.3 Identify job site hazards that are work specific for plumbers. |  |
| CTE PLMB.2.1.4 Complete First Aid and CPR Certification. |  |
| CTE PLMB.2.1.5 Use appropriate fire extinguishers and other safety devices. |  |

## YEAR THREE Standard PLMB.3.0: Fittings, Pipe, and Valves

### YEAR THREE Performance Standard PLMB.3.1 Fittings and Valves

| Student Competencies by Performance Standard | Justification: Provide examples from materials as evidence to support each response for this section. Provide descriptions, not just page numbers. |
| --- | --- |
| CTE PLMB.3.1.1 Identify the proper fittings and/or valves for specific systems. |  |
| CTE PLMB.3.1.2 Apply the various fittings and valves by type, size, materials, and application. |  |

### YEAR THREE Performance Standard PLMB.3.2 Types of Pipe

| Student Competencies by Performance Standard | Justification: Provide examples from materials as evidence to support each response for this section. Provide descriptions, not just page numbers. |
| --- | --- |
| CTE PLMB.3.2.1 Identify the common types of pipes. |  |
| CTE PLMB.3.2.2 Identify the proper pipes for specific systems. |  |

## YEAR THREE Standard PLMB.4.0: Industry Math

### YEAR THREE Performance Standard PLMB.4.1 Applied Mathematics

| Student Competencies by Performance Standard | Justification: Provide examples from materials as evidence to support each response for this section. Provide descriptions, not just page numbers. |
| --- | --- |
| CTE PLMB.4.1.1 Determine center-to-center and end-to-end lengths for parallel offsets. |  |
| CTE PLMB.4.1.2 Calculate the travel for a rolling offset. |  |
| CTE PLMB.4.1.3 Solve for end-to-end lengths of pipe. |  |
| CTE PLMB.4.1.4 Calculate area, water volumes, weights, and gallons for various geometric shapes. |  |
| CTE PLMB.4.1.5 Explain pressure measurement in terms of Pounds per Square Inch (PSI) and inches of mercury. |  |
| CTE PLMB.4.1.6 Perform angular, length, and converted temperature measure calculations. |  |
| CTE PLMB.4.1.7 Calculate material expansion and/or volume related to heat. |  |

## YEAR THREE Standard PLMB.5.0: The Uniform Plumbing Code (UPC)

### YEAR THREE Performance Standard PLMB.5.1 The Uniform Plumbing Code (UPC)

| Student Competencies by Performance Standard | Justification: Provide examples from materials as evidence to support each response for this section. Provide descriptions, not just page numbers. |
| --- | --- |
| CTE PLMB.5.1.1 Identify proper code terminology. |  |
| CTE PLMB.5.1.2 Identify general plumbing requirements for hanging and securing piping. |  |
| CTE PLMB.5.1.3 Identify plumbing fixtures. |  |
| CTE PLMB.5.1.4 Perform water heater sizing, combustion air calculations, vent sizing, and installation. |  |
| CTE PLMB.5.1.5 Perform water pipe sizing calculations.  |  |
| CTE PLMB.5.1.6 Explain when and what type of backflow prevention devices, assemblies, and methods are required. |  |
| CTE PLMB.5.1.7 Perform drain and waste pipe sizing calculations. |  |
| CTE PLMB.5.1.8 Perform indirect waste installation and usage. |  |
| CTE PLMB.5.1.9 Describe venting systems (e.g., horizontal, vertical wet venting). |  |
| CTE PLMB.5.1.10 Identify proper use of traps and interceptors. |  |
| CTE PLMB.5.1.11 Perform proper storm drain sizing and calculations. |  |
| CTE PLMB.5.1.12 Perform fuel gas sizing calculations. |  |
| CTE PLMB.5.1.13 Identify proper fire-stop installation. |  |
| CTE PLMB.5.1.14 Identify the proper use of gray water, reclaimed water, and rainwater systems. |  |
| CTE PLMB.5.1.15 Utilize UPC appendices and reference standards. |  |
| CTE PLMB.5.1.16 Apply IDAPA plumbing rules and statutes (Title 54). |  |

## YEAR THREE Standard PLMB.6.0: Construction Documents

### YEAR THREE Performance Standard PLMB.6.1 Isometric Drawings

| Student Competencies by Performance Standard | Justification: Provide examples from materials as evidence to support each response for this section. Provide descriptions, not just page numbers. |
| --- | --- |
| CTE PLMB.6.1.1 Identify various plumbing symbols and abbreviations. |  |
| CTE PLMB.6.1.2 Complete an isometric drawing with proper symbols. |  |
| CTE PLMB.6.1.3 Develop a materials list based on isometric drawings. |  |

### YEAR THREE Performance Standard PLMB.6.2 Plan Reading

| Student Competencies by Performance Standard | Justification: Provide examples from materials as evidence to support each response for this section. Provide descriptions, not just page numbers. |
| --- | --- |
| CTE PLMB.6.2.1 Describe basic plumbing symbols, abbreviations, and specifications. |  |
| CTE PLMB.6.2.2 Explain how the specifications relate to the plan. |  |
| CTE PLMB.6.2.3 Identify the necessary requirements and locations to install the plumbing fixtures and plumbing appurtenances. |  |
| CTE PLMB.6.2.4 Describe the coordination of trades on the job site. |  |
| CTE PLMB.6.2.5 Identify site plan, floor plans, elevations, sectional views, details, and schedules. |  |
| CTE PLMB.6.2.6 Locate specific information on building plans. |  |

## YEAR THREE Standard PLMB.7.0: ADA Guidelines

### YEAR THREE Performance Standard PLMB.7.1 ADA Guidelines

| Student Competencies by Performance Standard | Justification: Provide examples from materials as evidence to support each response for this section. Provide descriptions, not just page numbers. |
| --- | --- |
| CTE PLMB.7.1.1 Identify the necessary requirements according to ADA standards. |  |

## YEAR THREE Standard PLMB.8.0: Knowledge of Related Industries

### YEAR THREE Performance Standard PLMB.8.1 Knowledge of Related Industries

| Student Competencies by Performance Standard | Justification: Provide examples from materials as evidence to support each response for this section. Provide descriptions, not just page numbers. |
| --- | --- |
| CTE PLMB.8.1.1 Explain how to use alternating-current meters and instruments in the pipe trades. |  |
| CTE PLMB.8.1.2 Apply basic building codes. |  |

## YEAR THREE Standard PLMB.9.0: Cut and Join Pipes

### YEAR THREE Performance Standard PLMB.9.1 Cut and Join Pipes

| Student Competencies by Performance Standard | Justification: Provide examples from materials as evidence to support each response for this section. Provide descriptions, not just page numbers. |
| --- | --- |
| CTE PLMB.9.1.1 Join different types of pipes including PVC, galvanized, steel, plastic, copper, and cast-iron pipes. |  |
| CTE PLMB.9.1.2 Measure, mark, and cut different types of pipes using various pipe cutters. |  |
| CTE PLMB.9.1.3 Thread a steel pipe with a power-driven vise stand or a pipe-threading machine. |  |

## YEAR THREE Standard PLMB.10.0: Maintenance and Repair

### YEAR THREE Performance Standard PLMB.10.1 Maintenance and Repair

| Student Competencies by Performance Standard | Justification: Provide examples from materials as evidence to support each response for this section. Provide descriptions, not just page numbers. |
| --- | --- |
| CTE PLMB.10.1.1 Diagnose water heater problems (e.g., gas, electric, tankless). |  |
| CTE PLMB.10.1.2 Identify repairs for residential fixtures. |  |
| CTE PLMB.10.1.3 Identify repairs for commercial fixtures. |  |

## YEAR FOUR Standard PLMB.1.0: Introduction to the Plumbing Profession

### YEAR FOUR Performance Standard PLMB.1.1 Introduction to the Plumbing Profession

| Student Competencies by Performance Standard | Justification: Provide examples from materials as evidence to support each response for this section. Provide descriptions, not just page numbers. |
| --- | --- |
| CTE PLMB.1.1.1 Describe Idaho Plumbing Code and Administrative Rules requirements. |  |
| CTE PLMB.1.1.2 Identify the basic principles on which plumbing is based. |  |
| CTE PLMB.1.1.3 Identify and maintain licensing, certification, and industry credentialing requirements. |  |

## YEAR FOUR Standard PLMB.2.0: Plumbing Safety

### YEAR FOUR Performance Standard PLMB.2.1 Plumbing Safety

| Student Competencies by Performance Standard | Justification: Provide examples from materials as evidence to support each response for this section. Provide descriptions, not just page numbers. |
| --- | --- |
| CTE PLMB.2.1.1 Complete OSHA 10 Certification. |  |
| CTE PLMB.2.1.2 Identify common unsafe acts and conditions that cause accidents and how to handle these situations to make them safer. |  |
| CTE PLMB.2.1.3 Identify job site hazards that are work specific for plumbers. |  |
| CTE PLMB.2.1.4 Complete First Aid and CPR Certification. |  |
| CTE PLMB.2.1.5 Use appropriate fire extinguishers and other safety devices. |  |

## YEAR FOUR Standard PLMB.3.0: Fittings, Pipe, and Valves

### YEAR FOUR Performance Standard PLMB.3.1 Fittings and Valves

| Student Competencies by Performance Standard | Justification: Provide examples from materials as evidence to support each response for this section. Provide descriptions, not just page numbers. |
| --- | --- |
| CTE PLMB.3.1.1 Identify the proper fittings and/or valves for specific systems. |  |
| CTE PLMB.3.1.2 Apply the various fittings and valves by type, size, materials, and application. |  |

### YEAR FOUR Performance Standard PLMB.3.2 Types of Pipe

| Student Competencies by Performance Standard | Justification: Provide examples from materials as evidence to support each response for this section. Provide descriptions, not just page numbers. |
| --- | --- |
| CTE PLMB.3.2.1 Identify the common types of pipes. |  |
| CTE PLMB.3.2.2 Identify the proper pipes for specific systems. |  |

## YEAR FOUR Standard PLMB.4.0: Industry Math

### YEAR FOUR Performance Standard PLMB.4.1 Applied Mathematics

| Student Competencies by Performance Standard | Justification: Provide examples from materials as evidence to support each response for this section. Provide descriptions, not just page numbers. |
| --- | --- |
| CTE PLMB.4.1.1 Determine center-to-center and end-to-end lengths for parallel offsets. |  |
| CTE PLMB.4.1.2 Calculate the travel for a rolling offset. |  |
| CTE PLMB.4.1.3 Solve for end-to-end lengths of pipe. |  |
| CTE PLMB.4.1.4 Calculate area, water volumes, weights, and gallons for various geometric shapes. |  |
| CTE PLMB.4.1.5 Explain pressure measurement in terms of Pounds per Square Inch (PSI) and inches of mercury. |  |
| CTE PLMB.4.1.6 Perform angular, length, and converted temperature measure calculations. |  |
| CTE PLMB.4.1.7 Calculate material expansion and/or volume related to heat. |  |

## YEAR FOUR Standard PLMB.5.0: The Uniform Plumbing Code (UPC)

### YEAR FOUR Performance Standard PLMB.5.1 The Uniform Plumbing Code (UPC)

| Student Competencies by Performance Standard | Justification: Provide examples from materials as evidence to support each response for this section. Provide descriptions, not just page numbers. |
| --- | --- |
| CTE PLMB.5.1.1 Identify proper code terminology. |  |
| CTE PLMB.5.1.2 Identify general plumbing requirements for hanging and securing piping. |  |
| CTE PLMB.5.1.3 Identify plumbing fixtures. |  |
| CTE PLMB.5.1.4 Perform water heater sizing, combustion air calculations, vent sizing, and installation. |  |
| CTE PLMB.5.1.5 Perform water pipe sizing calculations.  |  |
| CTE PLMB.5.1.6 Explain when and what type of backflow prevention devices, assemblies, and methods are required. |  |
| CTE PLMB.5.1.7 Perform drain and waste pipe sizing calculations. |  |
| CTE PLMB.5.1.8 Perform indirect waste installation and usage. |  |
| CTE PLMB.5.1.9 Describe venting systems (e.g., horizontal, vertical wet venting). |  |
| CTE PLMB.5.1.10 Identify proper use of traps and interceptors. |  |
| CTE PLMB.5.1.11 Perform proper storm drain sizing and calculations. |  |
| CTE PLMB.5.1.12 Perform fuel gas sizing calculations. |  |
| CTE PLMB.5.1.13 Identify proper fire-stop installation. |  |
| CTE PLMB.5.1.14 Identify the proper use of gray water, reclaimed water, and rainwater systems. |  |
| CTE PLMB.5.1.15 Utilize UPC appendices and reference standards. |  |
| CTE PLMB.5.1.16 Apply IDAPA plumbing rules and statutes (Title 54). |  |

## YEAR FOUR Standard PLMB.6.0: Construction Documents

### YEAR FOUR Performance Standard PLMB.6.1 Isometric Drawings

| Student Competencies by Performance Standard | Justification: Provide examples from materials as evidence to support each response for this section. Provide descriptions, not just page numbers. |
| --- | --- |
| CTE PLMB.6.1.1 Identify various plumbing symbols and abbreviations. |  |
| CTE PLMB.6.1.2 Complete an isometric drawing with proper symbols. |  |
| CTE PLMB.6.1.3 Develop a materials list based on isometric drawings. |  |

### YEAR FOUR Performance Standard PLMB.6.2 Plan Reading

| Student Competencies by Performance Standard | Justification: Provide examples from materials as evidence to support each response for this section. Provide descriptions, not just page numbers. |
| --- | --- |
| CTE PLMB.6.2.1 Describe basic plumbing symbols, abbreviations, and specifications. |  |
| CTE PLMB.6.2.2 Explain how the specifications relate to the plan. |  |
| CTE PLMB.6.2.3 Identify the necessary requirements and locations to install the plumbing fixtures and plumbing appurtenances. |  |
| CTE PLMB.6.2.4 Describe the coordination of trades on the job site. |  |
| CTE PLMB.6.2.5 Identify site plan, floor plans, elevations, sectional views, details, and schedules. |  |
| CTE PLMB.6.2.6 Locate specific information on building plans. |  |

## YEAR FOUR Standard PLMB.7.0: ADA Guidelines

### YEAR FOUR Performance Standard PLMB.7.1 ADA Guidelines

| Student Competencies by Performance Standard | Justification: Provide examples from materials as evidence to support each response for this section. Provide descriptions, not just page numbers. |
| --- | --- |
| CTE PLMB.7.1.1 Identify the necessary requirements according to ADA standards. |  |

## YEAR FOUR Standard PLMB.8.0: Knowledge of Related Industries

### YEAR FOUR Performance Standard PLMB.8.1 Knowledge of Related Industries

| Student Competencies by Performance Standard | Justification: Provide examples from materials as evidence to support each response for this section. Provide descriptions, not just page numbers. |
| --- | --- |
| CTE PLMB.8.1.1 Explain how to use alternating-current meters and instruments in the pipe trades. |  |
| CTE PLMB.8.1.2 Apply basic building codes. |  |

## YEAR FOUR Standard PLMB.9.0: Cut and Join Pipes

### YEAR FOUR Performance Standard PLMB.9.1 Cut and Join Pipes

| Student Competencies by Performance Standard | Justification: Provide examples from materials as evidence to support each response for this section. Provide descriptions, not just page numbers. |
| --- | --- |
| CTE PLMB.9.1.1 Join different types of pipes including PVC, galvanized, steel, plastic, copper, and cast-iron pipes. |  |
| CTE PLMB.9.1.2 Measure, mark, and cut different types of pipes using various pipe cutters. |  |
| CTE PLMB.9.1.3 Thread a steel pipe with a power-driven vise stand or a pipe-threading machine. |  |

# Indicators of quality Rubric:

Standards aligned and Integrated Curriculum:

| Standards | Justification: Provide examples from materials as evidence to support each response for this section. Provide descriptions, not just page numbers. |
| --- | --- |
| 1. The curriculum is based on industry-validated technical standards and competencies.
 |  |
| 1. The curriculum is aligned with relevant content and standards for core subjects, such as reading, math and science, including federal, state and/or local standards, as appropriate.
 |  |
| 1. The curriculum incorporates employability skill standards that help students succeed in the workplace, such as problem solving, critical thinking, teamwork, communications and workplace etiquette.
 |  |
| 1. The curriculum allows for student application of integrated knowledge and skills in authentic scenarios.
 |  |
| 1. Materials used reflect current workplace, industry and/or occupational practices and requirements.
 |  |

Access and Equity:

| Standards | Justification: Provide examples from materials as evidence to support each response for this section. Provide descriptions, not just page numbers. |
| --- | --- |
| 1. Materials are provided in a way that ensures all students have the opportunity to achieve success in the program of study, including by meeting Title IX, Americans with Disabilities Act and other accessibility requirements.
 |  |
| 1. Materials and assessments are free from bias, inclusive and non-discriminatory, and offered in a way that ensures all students have the opportunity to achieve success in the program of study.
 |  |
| 1. Contains guidance to support differentiated and culturally responsive (i.e., purposefully represents diverse cultures, linguistic backgrounds, learning styles and interests) instruction in the classroom so that every student’s need are addressed by including:
	1. Suggestions for how to promote equitable instruction by making connections to culture, home, neighborhood, and community as appropriate.
	2. Appropriate scaffolding, interventions, and supports, including integrated and appropriate reading, writing, listening, and speaking alternatives (e.g., translations, picture support, graphic organizers) that neither sacrifice content nor avoid language development for English language learners, special needs, or below grade level readers.
	3. Digital and print resources that provide various levels of readability.
	4. Modifications and extensions for all students, including those performing above their grade level, to deepen understanding of the content.
	5. Materials in multiple language formats.
 |  |

Student Focus:

| Standards | Justification: Provide examples from materials as evidence to support each response for this section. Provide descriptions, not just page numbers. |
| --- | --- |
| 1. The material supports the sequential and cumulative development of foundational skills and progresses in specificity to build students’ depth of knowledge and skills. Those skills are necessary for a student’s independent comprehension of grade-level complex texts and mastery of tasks called for by the standards.
 |  |
| 1. Content and standards within the program of study are non-duplicative and vertically aligned to prepare students to transition seamlessly to the next level of education.
 |  |
| 1. The material provides many and varied opportunities for students to work with each standard within the grade level.
 |  |
| 1. The material cross-refers and integrates other content areas.
 |  |
| 1. The material has a balance of text types and lengths that encourage close, in-depth reading and rereading, analysis, comparison, and synthesis of texts.
 |  |
| 1. The material includes sufficient supplementary activities or assignments that are appropriately integrated into the text.
 |  |
| 1. The material has activities and assignments that develop problem-solving skills and foster synthesis and inquiry at both an individual and group level.
 |  |
| 1. The material has activities and assignments that reflect varied learning styles of students.
 |  |
| 1. The material includes appropriate instructional strategies.
 |  |
| 1. Project-based learning and related instructional approaches, such as problem-based, inquiry-based and challenge-based learning, are fully integrated into the material.
 |  |

Pedagogical Approach:

| Standards | Justification: Provide examples from materials as evidence to support each response for this section. Provide descriptions, not just page numbers. |
| --- | --- |
| 1. Provides guidance for teachers throughout for how learning experiences build on each other to support students in developing a deep understanding of the content.
 |  |
| 1. Provides scaffolded supports for teachers to facilitate learning of the content so that students are increasingly responsible for making sense of the content.
 |  |
| 1. The material provides opportunities for supporting English language learners to regularly and actively participate with grade-level text.
 |  |
| 1. The material gives clear and concise instruction to teachers and students. It is easy to navigate and understand.
 |  |
| 1. Includes appropriate academic and content-specific vocabulary in the context of the learning experience that is accessible, introduced, reinforced, reviewed, and augmented with visual representations when appropriate.
 |  |
| 1. Allows teachers to access, revise, and print form digital resources (e.g., readings, labs, assessments, rubrics).
 |  |
| 1. Uses varied modes (selected, constructed, project-based, extended response, and performance tasks) of instruction-embedded pre-, formative, summative, peer, and, self-assessment measures of learning.
 |  |
| 1. Includes editable and aligned rubrics, scoring guidelines, and exemplars that provide guidance for assessing student performance and to support teachers in planning instruction and providing ongoing feedback to students.
 |  |
| 1. Provides multiple opportunities for students to demonstrate and receive feedback on performance of practices connected with their understanding of concepts.
 |  |

Presentation and Design:

| Standards | Justification: Provide examples from materials as evidence to support each response for this section. Provide descriptions, not just page numbers. |
| --- | --- |
| 1. The material has an aesthetically appealing appearance.
 |  |
| 1. Digital and print materials are consistently formatted, visually focused, and uncluttered for efficient use.
 |  |
| 1. The material has a reasonable and appropriate balance between text and illustration. The material has grade-appropriate font size.
 |  |
| 1. The illustrations clearly cross-reference the text, are directly relevant to the content (not simply decorative), and promote thinking, discussion, and problem solving.
 |  |
| 1. Non-text content (performance clips, images, maps, globes, graphs, pictures, charts, databases, and models) are accurate and well integrated into the text.
 |  |

Technology:

| Standards | Justification: Provide examples from materials as evidence to support each response for this section. Provide descriptions, not just page numbers. |
| --- | --- |
| 1. Technology and digital media support, extend, and enhance learning experiences.
 |  |
| 1. The material has “platform neutral” technology (i.e., cloud based) and availability for networking.
 |  |
| 1. The material has a user-friendly and interactive interface allowing the user to control (shift among activities).
 |  |

For Questions Contact

Content & Curriculum

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1. [Idaho T&I Plumbing Apprenticeship Year 1 Program Standards](https://cte.idaho.gov/wp-content/uploads/2019/11/Plumbing-Apprenticeship-Year-1-Standards.pdf) [↑](#footnote-ref-1)
2. [Idaho T&I Plumbing Apprenticeship Year 2 Program Standards](https://cte.idaho.gov/wp-content/uploads/2019/11/Plumbing-Apprenticeship-Year-2-Standards.pdf) [↑](#footnote-ref-2)
3. [Idaho T&I Plumbing Apprenticeship Year 3 Program Standards](https://cte.idaho.gov/wp-content/uploads/2019/11/Plumbing-Apprenticeship-Year-3-Standards.pdf) [↑](#footnote-ref-3)
4. [Idaho T&I Plumbing Apprenticeship Year 4 Program Standards](https://cte.idaho.gov/wp-content/uploads/2019/11/Plumbing-Apprenticeship-Year-4-Standards.pdf) [↑](#footnote-ref-4)