






Unit/Standard Number	<div><div>pennsylvania DEPARTMENT OF EDUCATION</div></div> <div><u>High School Graduation Years 2017, 2018 and 2019</u></div> <div>Plumbing Technology/Plumber CIP 46.0503 Task Grid</div>	Proficiency Level Achieved: (X) Indicates Competency Achieved to Industry Proficiency Level
	Secondary Competency Task List	
100	DEMONSTRATE PERSONAL SAFETY IN THE TRAINING LABORATORY	
101	Demonstrate and follow rules for fire safety.	
102	Demonstrate and follow rules for housekeeping safety.	
103	Demonstrate and follow shop rules.	
104	Demonstrate and follow rules for material handling safety.	
105	Demonstrate and follow rules for eye protection.	
106	Demonstrate and follow rules for hearing protection.	
107	Demonstrate and follow rules for respiratory protection.	
108	Demonstrate and follow rules for hand tool safety.	
109	Demonstrate and follow rules for power equipment safety.	
110	Demonstrate and follow rules for portable electric hand tool safety.	
111	Demonstrate and follow rules for SDS Safety.	
112	Demonstrate and follow safety rules as they relate to E.C.P. (Exposure Control Procedures: blood borne pathogens, etc.).	
113	Demonstrate knowledge of the Occupational Safety Health Act (OSHA) and state its purposes.	
200	RESERVED	
201	RESERVED	
202	RESERVED	
203	RESERVED	
300	READ BLUEPRINTS AND SKETCHING OF PIPE SYSTEMS	
301	Identify types of drawings.	
302	Identify the various lines used on drawings.	
303	Interpret specifications, and dimensions.	
304	Identify the three basic views of a drawing.	
305	Identify piping systems according to color-coding.	
400	DEMONSTRATE KNOWLEDGE OF PIPE SPECIFICATIONS AND SYSTEMS	
401	Identify pipe and connections according to specification.	
402	Demonstrate knowledge of plumbing standards, codes and specifications.	

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403	Read and interpret plumbing specifications.	
404	RESERVED	
405	Explain the effects and corrective measures for thermal expansion in piping system.	
406	Explain types and applications of pipe insulation.	
407	Identify various metals and specification process used in the plumbing and heating industry.	
500	DEMONSTRATE USE OF HAND AND POWER TOOLS	
501	Identify basic hand tools, state their uses, and use them in the trade.	
502	Identify, safely use, and maintain power tools.	
600	IDENTIFY AND INSTALL VALVES	
601	Identify usage and installation of backflow prevention devices	
602	Identify and install types of valves that start and stop flow.	
603	Identify and install types of valves that regulate flow.	
604	Identify valves that relieve pressure.	
605	Explain the factors that influence valve selection.	
606	Disassemble and assemble various types of valves (such as gate valve, globe valve, and flush valve)	
700	DEMONSTRATE SKILL IN WORKING WITH COPPER PIPE	
701	Demonstrate skills in joining, cutting and bending various types of copper pipe tubing: solder, compression, flare, swage, press fit.	
702	Demonstrate skills in compression flaring, swaging and press fitting copper pipe.	
703	Prepare and braze a joint.	
704	Perform tests on soldered and brazed joints according to plumbing code.	
800	DEMONSTRATE SKILL IN VARIOUS TYPES OF PLASTIC PIPE AND TUBING	
801	Measure , cut and assemble PVC, CPVC, and ABS.	
802	Measure, cut and assemble PEX plastic tubing and PE and HDPE.	
803	Fabricate a crimp joint connection.	
804	Fabricate a tubing type joint.	
900	INSTALL PIPE HANGERS AND SUPPORTS	
901	Use hangers to secure horizontal and vertical pipe lines to masonry, metal and wood.	
902	Layout, anchor, install various carrier fixture.	

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1000	INSTALL WATER DISTRIBUTION LINES	
1001	Perform a tests on water distribution lines that meets plumbing code.	
1002	Rough-in water supply lines for bathtubs, wall mounted urinals, water closets, clothes washer, kitchen sink, lavatories according to manufacturer sheet.	
1003	Demonstrate knowledge of a water distribution whirlpool tub installation.	
1100	DEMONSTRATE SKILL IN WORKING WITH STEEL PIPE	
1101	Thread steel pipe with an adjustable die, power threading machine, non-adjustable die.	
1102	Measure, cut, ream, assemble, and test various types of steel piping.	
1103	Adapt steel pipe to other piping materials.	
1200	DEMONSTRATE SKILL IN WORKING WITH CAST IRON PIPE	
1201	Identify and use tools for working with cast iron pipe.	
1202	Measure and cut cast iron soil pipe with a chain cutter.	
1203	Assemble cast iron to various pipe types with no hub, Fernco, rubber gasket joints	
1300	DEMONSTRATE KNOWLEDGE OF A BUILDER LEVELER	
1301	Identify and set up a builder's level.	
1302	Set up the level shoot elevations and grade pipe.	
1400	BUILD DRAINS AND SEWERS	
1401	Lay out and establish grade/slope for drain lines.	
1402	Install backwater prevention valves.	
1403	Test a drain and sewer according to plumbing code.	
1404	Install air admittance valves.	
1405	Rough-in waste lines and vents for bathtubs, lavatories, dishwashers, water closets, showers, bidets and urinals according to manufacturers specification.	
1500	INSTALL FIXTURES	
1501	Install tank-type water closets.	
1502	Install bathtubs.	
1503	Install wall mounted lavatories.	
1504	Install wall mounted urinals.	
1505	Install kitchen sink.	

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1506	Install prefabricated shower base drains.	
1507	Install built-in lavatories.	
1508	Install flush valve-type water closets.	
1509	Install traps and cleanouts.	
1600	INSTALL APPLIANCES	
1601	Describe the installation of a dishwasher.	
1602	Describe the installation of an electric water heater.	
1603	Describe the installation of a gas water heater.	
1604	Describe the installation of a clothes washing machine.	
1605	Describe the installation of other water heaters (for example, oil, tankless, or heat pump).	
1606	Describe the installation of a water re-circulating pump.	
1607	Describe the installation of a garbage disposal unit.	
1608	Describe the installation of a sump pump.	
1609	Describe the installation of a sewerage pump.	
1700	INSTALL VENTS	
1701	Install soil or waste back vents	
1702	Install soil or waste loop vents.	
1703	Demonstrate knowledge for installation of a vent terminals (roof-flashing).	
1800	MAINTAIN PLUMBING SYSTEMS	
1801	Clear obstructions from lavatory drains.	
1802	Remove obstructions from main drain lines.	
1803	Remove obstructions from water closets	
1804	Repair/replace lavatory trap drains, and leaking water faucets or valves.	
1805	Repair leaking shower valves.	
1806	Repair water flush valves on water closets.	
1807	Replace a damaged section of galvanized water plumbing system.	
1808	Explain how to thaw frozen pipes.	
1809	Disassemble "P" traps to clear lavatory drains.	
1810	Repair/replace any type of water closets.	
1811	Replace all components in a tank style toilet.	
1900	PERFORM TESTS ON PIPING SYSTEMS	

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1901	Perform head pressure tests.		
1902	Perform hydrostatic tests.		
1903	Perform leak tests on gas supply lines.		
2000	PERFORM ADVANCED PIPE FABRICATION		
2001	Calculate simple piping offsets.		
2002	Calculate three-line, 45° equal-spread offsets around a vessel.		
2003	Calculate three-line, 45° unequal-spread offsets.		
2004	Convert center, back throat, and/or face measurement to an end measurement.		
2100	WORK WITH PRESSURE BOILERS		
2101	Identify and explain various boiler fittings and accessories, including thermal expansion devices.		
2102	Discuss the various types of boilers.		
2103	Identify and explain various boiler, steam, and hot water fittings and piping.		
2104	Identify and explain feed water accessories.		
2105	Identify and explain steam and hot water accessories.		
2106	Explain the operation of a boiler and its various controls.		
2107	Explain the operation of the draft controls.		
2108	Identify and explain boiler safety.		
2200	WORK WITH HYDRONIC HEATING SYSTEM		
2201	Describe and design a hydronic heating systems.		
2202	Describe and design a primary and secondary loops.		
2203	Calculate lay-out and design a radiant floor system.		
2300	DEMONSTRATE SAFE USE OF LADDERS AND SCAFFOLDS		
2301	Identify the different types of ladders and scaffolds used on a worksite.		
2302	Properly set up, inspect, and use stepladders, extension ladders, and scaffolding.		