



Department of Teaching & Learning
Parent/Student Course Information

Plumbing
(VO 8522)
Three Credits, One Year
Grades 10 - 12

Counselors are available to assist parents and students with course selections and career planning. Parents may arrange to meet with the counselor by calling the school's guidance department.

COURSE DESCRIPTION

In this program students learn to safely assemble, install, and repair pipes and fittings, and are introduced to installing fixtures of heating, water and drainage systems, according to specification and plumbing codes. Students learn to use, care for and safely handle the tools, machinery, equipment and materials commonly found in the plumbing trade.

CERTIFICATION

Skills Connect Assessment: Plumbing

STUDENT ORGANIZATION

SkillsUSA is a co-curricular organization for all students enrolled in trade and industrial education programs. SkillsUSA is a partnership of students, teachers and industry working together to ensure America has a skilled workforce. SkillsUSA helps students excel by providing educational programs, events and competitions that support career and technical education (CTE) in the nation's classrooms. Students are highly encouraged to participate.

PREREQUISITE

Construction Technology

OPTIONS FOR NEXT COURSE

None

REQUIRED STUDENT TEXTBOOK

None

COMPETENCIES FOR PLUMBING

Demonstrating Workplace Readiness Skills: Personal Qualities and People Skills

- 1 Demonstrate positive work ethic.
- 2 Demonstrate integrity.
- 3 Demonstrate teamwork skills.
- 4 Demonstrate self-representation skills.
- 5 Demonstrate diversity awareness.
- 6 Demonstrate conflict-resolution skills.
- 7 Demonstrate creativity and resourcefulness.

Demonstrating Workplace Readiness Skills: Professional Knowledge and Skills

- 8 Demonstrate effective speaking and listening skills.
- 9 Demonstrate effective reading and writing skills.
- 10 Demonstrate critical-thinking and problem-solving skills.
- 11 Demonstrate healthy behaviors and safety skills.
- 12 Demonstrate an understanding of workplace organizations, systems, and climates.
- 13 Demonstrate lifelong-learning skills.
- 14 Demonstrate job-acquisition and advancement skills.
- 15 Demonstrate time-, task-, and resource-management skills.
- 16 Demonstrate job-specific mathematics skills.
- 17 Demonstrate customer-service skills.

Demonstrating Workplace Readiness Skills: Technology Knowledge and Skills

- 18 Demonstrate proficiency with technologies common to a specific occupation.
- 19 Demonstrate information technology skills.
- 20 Demonstrate an understanding of Internet use and security issues.
- 21 Demonstrate telecommunications skills.

Examining All Aspects of an Industry

- 22 Examine aspects of planning within an industry/organization.
- 23 Examine aspects of management within an industry/organization.
- 24 Examine aspects of financial responsibility within an industry/organization.
- 25 Examine technical and production skills required of workers within an industry/organization.
- 26 Examine principles of technology that underlie an industry/organization.
- 27 Examine labor issues related to an industry/organization.
- 28 Examine community issues related to an industry/organization.
- 29 Examine health, safety, and environmental issues related to an industry/organization.

Addressing Elements of Student Life

- 30 Identify the purposes and goals of the student organization.
- 31 Explain the benefits and responsibilities of membership in the student organization as a student and in professional/civic organizations as an adult.
- 32 Demonstrate leadership skills through participation in student organization activities, such as meetings, programs, and projects.
- 33 Identify Internet safety issues and procedures for complying with acceptable use standards.

Applying Basic Construction Safety Standards (Core Safety)

- 34 Comply with federal, state, and local safety legal requirements, including OSHA, VOSHA, and EPA.
- 35 Inspect and maintain a safe working environment.

- 36 Explain safe working practices around electrical hazards.
- 37 Identify emergency first aid procedures.
- 38 Identify the types of fires and the methods used to extinguish them.
- 39 Identify PPE (personal protective equipment) requirements.
- 40 Inspect course-specific hand and power tools to visually identify defects.
- 41 Demonstrate lifting and carrying techniques.
- 42 Demonstrate safe laddering techniques.
- 43 Demonstrate safe scaffolding techniques.
- 44 Report injuries.
- 45 Report personal, environmental, and equipment safety violations to the appropriate authority.
- 46 Earn the OSHA 10 card.
- 47 Pass safety exam.

Focusing on the Plumbing Trade

- 48 Describe the functions of water supply and sewage treatment systems.
- 49 Identify trenching techniques and safety precautions related to excavations.

Applying Basic Math to the Plumbing Trade

- 50 Measure various pipe dimensions.
- 51 Perform mathematical calculations using feet and inches as the unit of measure, including addition, subtraction, and conversion (feet to inches, inches to feet).
- 52 Calculate the area of a room and volume of a tank.
- 53 Calculate fitting allowance.

Reading Drawings for the Plumbing Occupation

- 54 Identify fixtures depicted on a blueprint.
- 55 Develop an overhead and an isometric drawing.
- 56 Develop fitting/material lists based on drawings.

Performing Pipe Cutting and Joining

- 57 Cut cast iron pipe with chain cutter.
- 58 Join cast iron pipe using rubber-type seal and no-hub connectors.
- 59 Join plastic pipe (tubing) to fittings using solvent method.
- 60 Join copper pipe (tubing) using various non-solder fittings.
- 61 Join copper pipe (tubing) to fittings using flare method.
- 62 Join PEX pipe (tubing) to fittings using crimp ring method.
- 63 Join pipe with Fernco couplings.
- 64 Join dissimilar materials.

Supporting and Hanging Pipe

- 65 Identify various types of anchors and straps.
- 66 Install backing and ledger supports for various plumbing fixtures.
- 67 Install pressure piping using various supports, including wire pipe hooks, tube talon, or tube straps.
- 68 Install DWV pipe, using various types of supports (e.g., perforated strap, pipe hooks, and riser clamps).
- 69 Describe the correct installation of pipe sleeves through a concrete or masonry wall.

Installing Waste and Soil Pipes

- 70 Construct a no-hub cast iron pipe assembly.
- 71 Rough-in a DWV assembly of PVC/ABS, for the following: water closet, lavatory, bathtub, shower, kitchen or bar sink, washing machine, indirect waste.

- 72 Calculate and set waste and soil pipes to level and gradient.
- 73 Install water closet flange.
- 74 Describe the use of a backwater valve.
- 75 Demonstrate boring and notching of structural members of the building.
- 76 Test drainage system by performing a standing water test.
- 77 Install various types of bathtubs, shower stalls, and shower pans.

Roughing-in Water Distribution Components

- 78 Rough-in a water distribution system of harddrawn copper, CPVC (chlorinated polyvinyl chloride), and PEX (cross-linked polyethylene) for the following fixtures: washing machine, lavatory, kitchen sink, tank-type water closet, bathtub and/or shower, ice maker, hose bibb.
- 79 Identify procedures and materials for installing a building's water service.
- 80 Identify types of main shutoff valves.
- 81 Install main shutoff valve.
- 82 Perform air- or water-pressure test.
- 83 Insulate water lines.
- 84 Identify the need for backflow prevention devices.
- 85 Install nail guards for protection of piping.

Installing Fixtures and Trim

- 86 Trim out and install lavatory (wall hung and cabinet installation).
- 87 Trim out and install tank-type water closet.
- 88 Trim out and install a kitchen sink.
- 89 Install a garbage disposal.
- 90 Hook up a dishwasher.
- 91 Install a gas water heater.
- 92 Install an electric water heater.
- 93 Trim a tub and shower valve.
- 94 Install various fixture shutoff valves.
- 95 Connect ice maker lines.
- 96 Install kitchen sink continuous waste.

Servicing and Repairing Plumbing and Fixtures

- 97 Replace and adjust water closet fill valve.
- 98 Troubleshoot a flushometer.
- 99 Repair or replace two-handled faucet, both compression and washerless types.
- 100 Repair or replace various single-lever faucets.
- 101 Repair or replace tub diverter.
- 102 Troubleshoot gas or electric water heater.

Installing Natural Gas Piping Systems

- 103 Identify the local gas code for installation requirements.
- 104 Identify the different types of natural gas distribution materials.
- 105 Describe testing and purging procedures.
- 106 Describe gas appliance installation.

Aaron C. Spence, Ed.D., Superintendent
Virginia Beach City Public Schools
2512 George Mason Drive, Virginia Beach, VA 23456-0038

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For further information please call (757) 263-1070.

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