



EDUCATIONAL FOUNDATION

**PHCC Educational
Foundation
Plumbing Year 2**

General Assessment Information

Blueprint Contents

General Assessment Information
Written Assessment Information

Specific Competencies Covered in the Test
Sample Written Items

Test Type: This PHCC Educational Foundation certification assessment is a customized assessment for the Plumbing-Heating-Cooling Contractors (PHCC). This assessment measures technical skills at the occupational level and includes items which gauge factual and theoretical knowledge. This assessment offers a written component and can be used at the secondary and post-secondary levels. This assessment can be delivered in an online or paper/pencil format.

Revision Team: The assessment content is based on input from plumbing contractors, inspectors, and educators from the states of Maryland, New Jersey, Nevada, Ohio, Tennessee, and Virginia.



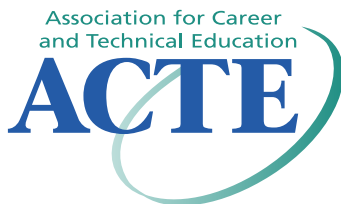
46.0503 – Plumbing
Technology/Plumber



Career Cluster 2 - Architecture
and Construction



47-2152.02 – Plumbers



The Association for Career and Technical Education (ACTE), the leading professional organization for career and technical educators, commends all students who participate in career and technical education programs and choose to validate their educational attainment through rigorous technical assessments. In taking this assessment you demonstrate to your school, your parents and guardians, your future employers and yourself that you understand the concepts and knowledge needed to succeed in the workplace. Good Luck!

Written Assessment

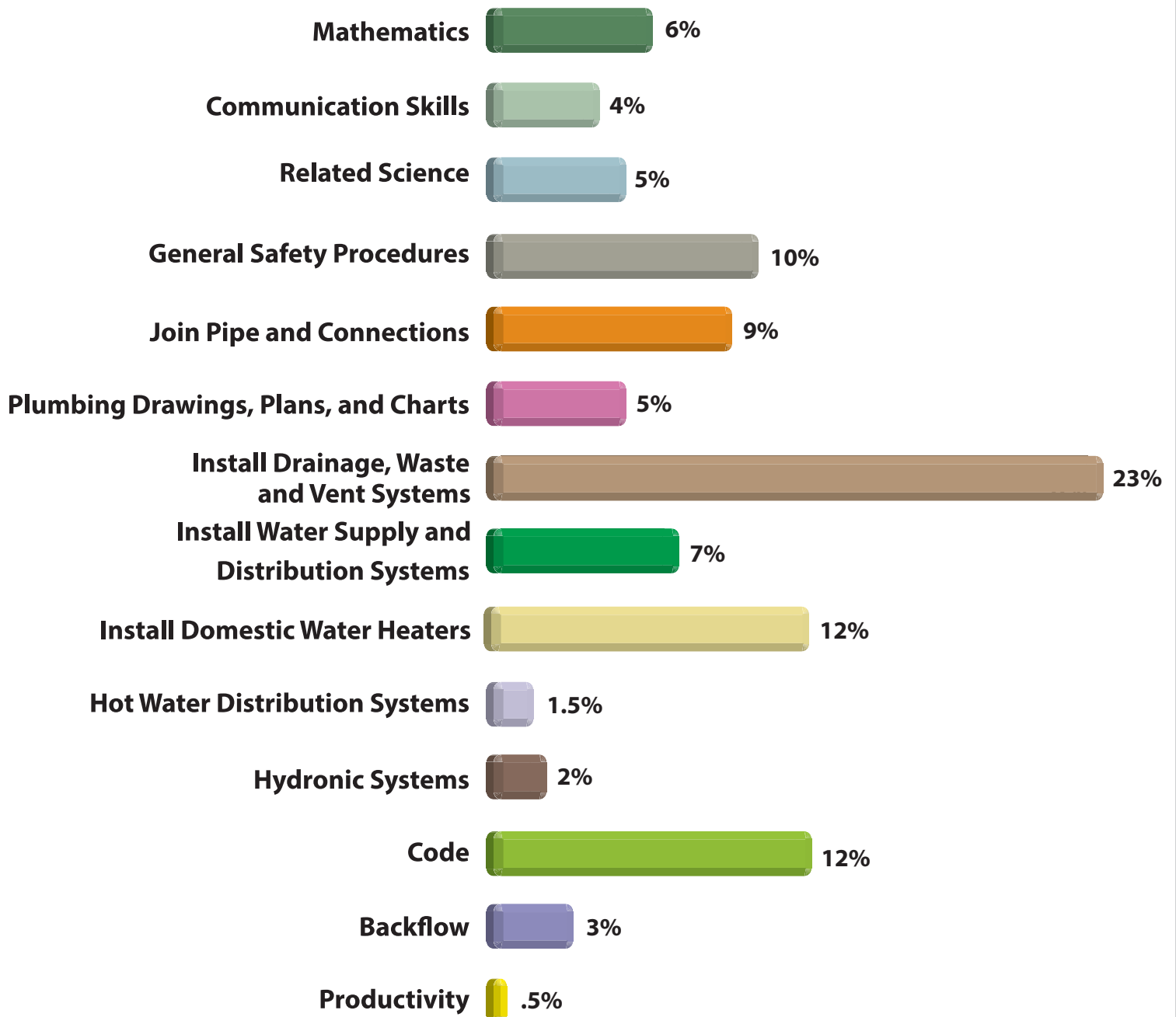
This written assessment consists of questions to measure an individual's factual theoretical knowledge.

Administration Time: 3 hours

Number of Questions: 200

Number of Sessions: This assessment may be administered in one, two, or three sessions.

Areas Covered



Specific Competencies and Skills Tested in this Assessment

Mathematics

- Measure and calculate linear distances, circles, angles, and radii
- Identify common geometric shapes and compute volumes using basic geometry
- Calculate end-to-end and center-to-center measurements

Communication Skills

- Communicate with customers
- Display professionalism

Related Science

- Define goals of plumbing, water sources and waste disposal
- Understand and apply basic principles of matter, mass, and weight

General Safety Procedures

- Understand and apply OSHA regulations that cover plumbing practices
- Understand and apply EPA and DOT regulations that cover water quality and venting
- Apply OSHA ladder, scaffold, and man lift safety and maintenance procedures
- Apply PPE including safety glasses, electrical protection, shoes, hardhat, and other practices
- Use safe methods for lifting/moving materials and equipment to prevent personal injury/property damage
- Apply brazing and soldering safety procedures to prevent fires and personal injury
- Apply safety requirements for working in confined spaces

Join Pipe and Connections

- Describe and apply proper procedures for measuring and fabricating copper pipe
- Describe and apply proper procedures for measuring and fabricating and testing
- Describe and apply proper procedures for steel pipe joined with thread sealant
- Describe and apply proper procedures for measuring, fabricating, and testing cast iron pipe
- Describe and apply proper procedures for measuring, fabricating, and testing flexible gas pipe

(Continued on the following page)

Specific Competencies and Skills (continued)

Plumbing Drawings, Plans and Charts

- Interpret symbols, dimensions and placement of plumbing fixtures and piping on isometric drawing
- Sketch plan view and isometric drawings using standard plumbing fixture and piping symbols
- Read plan view and isometric drawings using standard plumbing fixture and piping symbols

Install Drainage, Waste, and Vent Systems

- Layout and size the drainage systems
- Excavation and grade
- Install building drains
- Change of directions/fitting uses
- Soil and waste stacks, vent stacks, and stack vents
- Fixture venting
- Traps, cleanouts, and interceptors
- Floor drains
- Air admittance valves
- Fixture supports
- Testing drainage systems
- Building sewer and public tie-ins (at curb)
- Diagnosing and repairing drainage and vent systems



(Continued on the following page)

Specific Competencies and Skills (continued)

Install Water Supply and Distribution Systems

- Sizing the water supply systems
- Roughing-in for water supply and distribution systems
- Cross connections
- Water hammer arrestors
- Water and hydrostatic pressure testing
- Diagnosing and repairing water distribution systems

Install Domestic Water Heaters

- Domestic water heater components and operation
- Gas water heaters
- Electric water heaters
- Oil water heaters
- Point-Of-Use water heaters
- Tankless water heaters and systems
- Solar water heaters
- Domestic hot water boilers
- Indirect fired water heaters

Hot Water Distribution Systems

- Mixing and tempering valves

Hydronic Systems

- Principles of hydronic systems
- Install hydronic heating systems
- Test integrity of hydronic heating water circuits

(Continued on the following page)

Specific Competencies and Skills (continued)

Code

- Administration and basic principles, plumbing code definitions and general regulations
- Materials
- Joints and connections, fittings and appurtenances
- Plumbing fixtures and minimum fixture requirements
- Hangers and supports, indirect waste piping and special waste
- Water supply and distribution
- DWV and storm drain systems
- Tests and maintenance
- Individual sewage disposal systems
- Potable water supply systems

Backflow

- Define backflow
- Describe mechanical equipment for cross-connection control

Productivity

- Identify factors that enhance productivity



Sample Questions

If one-half the radius equals 3-1/2 inches, what is the diameter of the circle?

- A. 7 inches
- B. 10-1/2 inches
- C. 14 inches
- D. 15 inches

After replacing worn or broken faucet parts, the plumber should

- A. not tell the customer what was replaced
- B. hide the worn or broken parts out of sight
- C. only show the customer the new parts
- D. ask the customer if he/she wants to see the worn or broken parts

One foot of vertical water column is equal to

- A. .0361 psig
- B. .433 psig
- C. 2.31 psig
- D. 4.33 psig

Primary treatment uses the _____ process to remove solid material.

- A. filtration
- B. aeration
- C. sedimentation
- D. disinfection

What is the main reason for the taper on a pipe thread?

- A. eliminate use of couplings
- B. insure progressively tighter fit
- C. allow for tolerance on length
- D. simplify assembly

(Continued on the following page)

Sample Questions (continued)

The angle formed between the axes in isometric drawings is

- A. 45 degrees
- B. 90 degrees
- C. 120 degrees
- D. 180 degrees

When backfilling a trench, the soil should be

- A. shoveled only
- B. combined with sand
- C. compacted in layers
- D. free of any rocks

When lacking a sufficient quantity of air, an air chamber is termed

- A. hammered
- B. undersized
- C. waterlogged
- D. tapped

The preferred method to join galvanized steel to copper is

- A. dielectric union
- B. Teflon tape
- C. iron pipe adapter
- D. copper adapter

A plumbing permit is required in order to

- A. replace faucet washers
- B. clear drain line stoppages
- C. clean hot water tanks
- D. replace plumbing fixtures

