Test Type: The Plumbing assessment is included in NOCTI’s Job Ready industry-based credential battery. Job Ready assessments measure technical skills at the occupational level and include items which gauge factual and theoretical knowledge. Job Ready assessments typically offer both a written and performance component and can be used at the secondary and post-secondary levels. Job Ready assessments can be delivered in an online or paper/pencil format.

Revision Team: The assessment content is based on input from secondary, post-secondary, and business/industry representatives from the states of Connecticut, Michigan, Pennsylvania, and Tennessee.
NOCTI written assessments consist of questions to measure an individual’s factual theoretical knowledge.

**Administration Time:** 3 hours  
**Number of Questions:** 173  
**Number of Sessions:** This assessment may be administered in one, two, or three sessions.

### Areas Covered

- **Safety** 8%
- **Plumbing Math** 10%
- **General Plumbing Practices** 24%
- **Joining Pipes and Fittings** 9%
- **Drainage** 8%
- **Vent Installation** 4%
- **Water Supply and Distribution** 7%
- **Hot Water Systems** 6%
- **Traps** 8%
- **Installing Fixtures** 7%
- **Plumbing Service and Repair** 9%
Specific Standards and Competencies Included in this Assessment

Safety
- Demonstrate personal safety, including personal protective equipment (PPEs)
- Demonstrate work environment safety
- Demonstrate tool safety
- Demonstrate proper trenching methods

Plumbing Math
- Use formulas
- Add, subtract, multiply, and divide whole numbers and fractions
- Convert measurements
- Calculate slope and angles with a builder’s level/laser
- Size drain/waste lines and storm drains

General Plumbing Practices
- Identify and use plumbing tools
- Demonstrate blueprint reading
- Interpret an isometric view of a drain, waste, and vent (DWV) system
- Identify plumbing materials and fittings
- Identify plumbing pipe protection methods (i.e., fire caulk, nail plates)
- Interpret and comply with general plumbing practices
- Interpret manufacturer’s specifications
- Testing of plumbing systems
- Identify plumbing terminology
- Identify plumbing symbols

Joining Pipes and Fittings
- Join copper pipe, tubes, and fittings
- Join plastic pipes, tubes, and fittings
- Join steel pipes and fittings
- Join cast iron pipes and fittings
- Join dissimilar materials

(Continued on the following page)
Specific Standards and Competencies (continued)

Drainage
- Install drain/waste lines and storm drains (i.e., interior and exterior)
- Describe sizing of basic drainage systems
- Calculate proper pitch
- Describe purpose and appropriate locations for clean-out

Vent Installation
- Install a vent system for soil or waste drainage
- Differentiate between types of vents and venting systems

Water Supply and Distribution
- Lay out/rough-in water service and distribution lines
- Install water lines, including water hammer arrestors and/or air chambers
- Identify various valve types and required locations
- Identify cross-connection and back-flow devices and functions

Hot Water Systems
- Install basic types of water heaters (i.e., electric and gas)
- Install and identify purpose of pressure/temperature relief valve on a water heater
- Identify water heater components (i.e., electric and gas)
- Display proper venting of a gas water heater
Specific Standards and Competencies (continued)

Traps
- Exhibit knowledge of trap function, installation, and placement
- Distinguish between approved and non-approved traps
- Identify trap components
- Identify causes and prevention for trap seal loss

Installing Fixtures
- Install kitchen and lavatory fixtures
- Install water closets
- Install bathtub/shower
- Install faucets
- Install urinals

Plumbing Service and Repair
- Repair washer and washerless type faucets
- Display ethical practices in service and repair
- Replace ball cocks and flush valves
- Unclog drains and traps
- Replace kitchen plumbing appliances
Sample Questions

The weight of a cubic foot of water is
A. 6.24 pounds
B. 8.33 pounds
C. 27 pounds
D. 62.4 pounds

PVC and ABS are what type of pipe material?
A. steel
B. plastic
C. copper
D. brass

PVC cement joints shall be made while the cement is
A. dry
B. partially dry
C. wet
D. heated

Clean outs are used at the base of a stack to
A. make the turn more gradual
B. let the plumber know where the stack base is located
C. allow the cleaning of a blockage
D. check for effluent leakage

Water hammer arrestors have a cushion of air or gas to absorb
A. sediment
B. moisture
C. shock
D. bacteria

(Continued on the following page)
Sample Questions (continued)

If a drain pipe is 28 feet long, calculate the total drop at 1/8-inch fall per foot.
A. 3 inches
B. 3-1/2 inches
C. 8 inches
D. 8-1/2 inches

The minimum size drain pipe for a residential gravity-flush water closet is
A. 2 inches
B. 3 inches
C. 4 inches
D. 6 inches

DWV piping systems operate on gravity, a drop of _____ is considered adequate.
A. 1/8 to 1/2 inch per foot
B. 1/4 to 1 inch per foot
C. 1/2 to 3/4 inch per foot
D. 3/4 to 2 inches per foot

When installing a main water shut-off valve in a water service line, the plumber should first
A. make sure that the trench is straight and deep
B. have the water main turned off
C. have the water main turned on
D. install insulation around the pipe

The anode rod prevents _____ in a domestic hot water heater.
A. overheating
B. corrosion
C. a downdraft
D. soot accumulation
NOCTI performance assessments allow individuals to demonstrate their acquired skills by completing actual jobs using the tools, materials, machines, and equipment related to the technical area.

**Administration Time:** 3 hours  
**Number of Jobs:** 2

**Areas Covered:**

**50% Install and Prepare to Leak Test a DWV System**  
Participants will select tools and materials and safely handle them to rough in lavatories 1 & 2, properly join pipe and fittings, install accurate fittings, leave workstation in good condition, adhere to the local plumbing code and perform a leak test.

**50% Install and Prepare to Leak Test a Water Supply System**  
Participants will select tools and materials and safely handle them to rough in lavatories 1 & 2, properly join pipe and fittings, install accurate fittings, leave workstation in good condition, adhere to the local plumbing code and perform a leak test.
Sample Job

Install and Prepare to Leak Test a Water Supply System

**Maximum Time:** 1 hour and 30 minutes

**Participant Activity:** The participant will study a rough-in sketch and drawings to install a water supply system, measure and cut the pipe to correct size, connect all pipe and fittings per rough-in dimensions, install appropriate nail plates, and prepare the system for leak testing.