

**CONTENT STANDARD 1.0: TRADE MATH****Performance Standard 1.1: Basic Math**

- 1.1.1 Perform addition, subtraction, multiplication, and division calculations of whole numbers.
- 1.1.2 Perform addition and subtraction calculations of common fractions.
- 1.1.3 Perform multiplication and division calculations of common fractions.
- 1.1.4 Perform addition, subtraction, multiplication, and division calculations of decimal fractions.
- 1.1.5 Perform ratio and proportion calculations.
- 1.1.6 Perform percent, percentage, and discount calculations.
- 1.1.7 Perform angular, length, and converted temperature measure calculations.
- 1.1.8 Perform area calculations.
- 1.1.9 Perform volume calculations.
- 1.1.10 Solve basic equations.
- 1.1.11 Demonstrate the use of order of operations.

**CONTENT STANDARD 2.0: GENERAL SAFETY****Performance Standard 2.1: Workplace Safety**

- 2.1.1 Describe potential excavation site hazards.
- 2.1.2 Explain proper personal protective equipment (PPE) use.
- 2.1.3 Describe proper material handling, storage, use, and disposal.
- 2.1.4 Describe ladder, stairway, and scaffold hazards and proper use.
- 2.1.5 Describe jobsite electrical hazards and proper lockout/tagout use.
- 2.1.6 Describe proper refrigerant and pressure vessel usage and storage.
- 2.1.7 Identify safety data sheets (SDS) properties of chemicals specific to HVAC.
- 2.1.8 Identify and describe environmental hazards (e.g. lead, silica, asbestos, carbon monoxide).
- 2.1.9 Identify the hazards associated with confined spaces.
- 2.1.10 Use appropriate fire extinguishers and other such safety devices.
- 2.1.11 Identify the importance safety procedures for brazing and soldering.

**CONTENT STANDARD 3.0: TOOLS AND MATERIALS****Performance Standard 3.1: Power and Hand Tool Use**

- 3.1.1 Describe proper hand tool use.
- 3.1.2 Describe proper power tool use.
- 3.1.3 Identify proper use of various types of torches.
- 3.1.4 Identify proper use of piping and tubing fabrication tools.

**Performance Standard 3.2: Tubing and Piping**

- 3.2.1 Identify the purpose of the piping, tubing and fittings used in the heating, air-conditioning, and refrigeration industry.
- 3.2.2 Identify appropriate brazing and soldering alloys and materials.
- 3.2.3 Explain the purposes and procedures for protecting piping materials and fabrication, such as valves, fittings, and products from heat.

## **CONTENT STANDARD 4.0: ENERGY SOURCES**

### **Performance Standard 4.1: Energy Sources**

- 4.1.1 Explain natural, LP gas, and fuel oil combustion characteristics.
- 4.1.2 Describe the application of geothermal systems.
- 4.1.3 Describe the application of renewable energy systems.
- 4.1.4 Describe the application of electric production systems.

## **CONTENT STANDARD 5.0: BASIC SYSTEMS OVERVIEW**

### **Performance Standard 5.1: Basic Systems Overview**

- 5.1.1 Describe fossil-fuel and electrical furnace operations.
- 5.1.2 Describe the typical configuration of residential split air conditioning systems.
- 5.1.3 List various types of commercial air conditioning systems and their application.
- 5.1.4 Describe the configuration of common duct systems.

## **CONTENT STANDARD 6.0: INTRO TO APPLIED SCIENCE**

### **Performance Standard 6.1: Intro to Applied Science**

- 6.1.1 Perform energy conversion calculations.
- 6.1.2 Perform sensible, latent, and total heat calculations.
- 6.1.3 Differentiate between saturated, superheated, and subcooled refrigerant.
- 6.1.4 Explain atmospheric, absolute, and gauge pressure relationship.
- 6.1.5 Convert gauge pressure, absolute pressure, and vacuum.
- 6.1.6 Diagram a basic refrigeration cycle identifying pressure, temperature, and state of refrigerant.
- 6.1.7 List the type and function of the four major refrigeration components.
- 6.1.8 Describe the methods of heat transfer.