SECTION 12    FIRE BEHAVIOR (FIRE SCIENCE)

Live Fire Prerequisite

12-I.01 Trainee shall define heat and fire.
   **NFPA 1001 5.3.10, 5.3.11, 5.3.12**

12-I.02 Trainee shall define the fire triangle and tetrahedron.
   **NFPA 1001 5.3.10, 5.3.11, 5.3.12**

12-I.03 Trainee shall identify two (2) chemical, mechanical, and electrical energy heat sources.
   **NFPA 1001 5.3.10, 5.3.11, 5.3.12**

12-I.04 Trainee shall define the following:
   **NFPA 1001 5.3.10, 5.3.11, 5.3.12**
   A. incipient  E. steady state
   B. flame spread  F. clear or free burning
   C. hot smoldering  G. back draft explosion
   D. flashover

12-I.05 Trainee shall define the four (4) methods of heat transfer.
   **NFPA 1001 5.3.10, 5.3.11, 5.3.12**
   A. Conduction
   B. Convection
   C. Radiation
   D. Direct Flame Impingement

12-I.06 Trainee shall define the three (3) physical states of matter in which fuels are commonly found.
   **NFPA 1001 5.3.10, 5.3.11, 5.3.12**
   A. solid
   B. liquid
   C. gaseous

12-I.07 Trainee shall define the hazard of finely divided fuels as they relate to the combustion process.
   **NFPA 1001 5.3.10, 5.3.11, 5.3.12**

12-I.08 Trainee shall define:
   **NFPA 1001 5.3.10, 5.3.11, 5.3.12**
   A. flash point
   B. fire point
   C. ignition temperature
   D. upper and lower explosive limits

12-I.09 Trainee shall define concentrations of oxygen in air as it affects combustion.
   **NFPA 1001 5.3.10, 5.3.11, 5.3.12**

12-I.10 Trainee shall identify three (3) products of combustion commonly found in structural fires which create a life hazard.
   **NFPA 1001 5.3.10, 5.3.11, 5.3.12**

12-I.11 Trainee shall identify characteristics of water as it relates to its fire extinguishing potential.
   **NFPA 1001 5.3.10, 5.3.11, 5.3.12**
12-I.12 Trainee shall define the following units of measurements:

**NFPA 1001 5.3.10, 5.3.11, 5.3.12**

A. British Thermal Unit (BTU)
B. Fahrenheit (F°)
C. Celsius (C°)
D. Calorie (C)
E. Joule, the SI unit for energy

12-I.13 Trainee shall define thermal balance and imbalance.

**NFPA 1001 5.3.10, 5.3.11, 5.3.12**

12-I.14 Trainee shall identify chemical by-products of combustion.

**NFPA 1001 5.3.10, 5.3.11, 5.3.12**

12-I.15 Trainee shall define the fire extinguishment theory.

**NFPA 1001 5.3.10, 5.3.11, 5.3.12**

12-I.16 Trainee shall identify pressure and velocity.

**NFPA 1001 5.3.10, 5.3.11, 5.3.12**

*Firefighter I - There are no objectives required for this certification level.*

*Firefighter II - There are no objectives required for this certification level.*