

Florida Juvenile Fire Safety “Fire Safety Begins with ME” Program

FIRE SCIENCE CONCEPTS – “Breaking It Down”

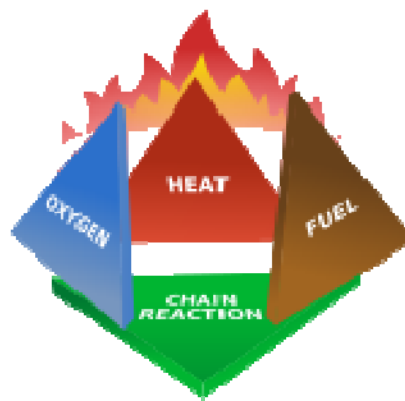
Fire Concepts – Fire Triangle

Fires start when a flammable and/or a combustible material with an adequate supply of oxygen or another oxidizer is subjected to enough heat and is able to sustain a chain reaction. This is commonly called the fire tetrahedron. Fire cannot exist without all of these elements being in place.

Once ignited, a chain reaction must take place whereby fires can sustain their own heat by the further release of heat energy in the process of combustion and may propagate, provided there is a continuous supply of an oxidizer and fuel.

Fire can be extinguished by removing any one of the elements of the fire tetrahedron. Fire extinguishing by the application of water acts by removing heat from the fuel faster than combustion generates it. Application of carbon dioxide is intended primarily to starve the fire of oxygen. A forest fire may be fought by starting smaller fires in advance of the main blaze, to deprive it of fuel. Other gaseous fire suppression agents, such as halon or HFC-227, interfere with the chemical reaction itself.

The fire triangle also known as the fire tetrahedron:



Source: Wikipedia



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Fire Triangle – 3 Sources

Fire Triangle: There must be 3 combining sources for fire to occur:

1. There must be a source of oxygen. Approximately 16% oxygen is required for fire. Normal air contains 21% oxygen.
2. There must be a source of heat to reach ignition temperature, such as;
 - a. Open flame
 - b. The sun
 - c. Electrical energy
 - d. Sparks
 - e. Compressed gases
 - f. Arcs
 - g. Lightening
 - h. Friction
 - i. Chemical reaction
3. There must be a source of fuel such as:
 - a. Gases: natural gas, propane, butane, hydrogen, etc.
 - b. Liquids: gasoline, kerosene alcohol, paint, etc.
 - c. Solids: wood, paper, hay, dried plants, synthetics, plastics, cloth, etc.



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Summary

Uses of Fire: Fire is a very important part of our daily lives. We use fire for cooking, heating, transportation, celebrations, holiday ceremonies and in industry and technology. Along with these proper uses of fire, also come fire abuses. Many of these fire “abuses” result in property loss, injury, and death. Unfortunately, youth Firesetters are responsible for a large number of these fire abuses, especially on school campuses.

Source: FEMA

