

## Brookings Fire Department

# What is Fire?

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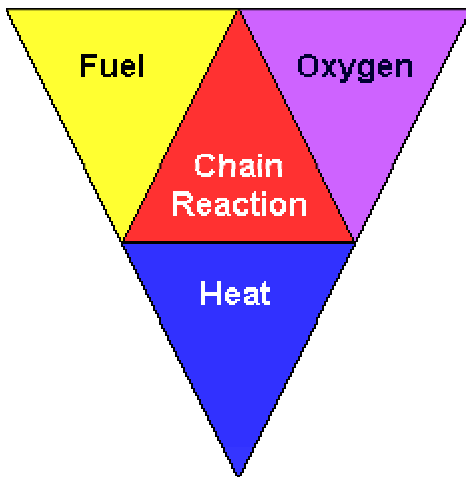
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## What is Fire?



Fire is the rapid oxidation of a substance often with the evolution of heat and light in varying degrees of intensities.

Often a misconception is fire burns the actual chair or piece of wood. It is the gasses given off by an object that burns. Heat causes objects to give off these flammable gasses. When the gasses reach their ignition temperature you see the light given off during the oxidation known as fire. Fire itself generates more heat to the object and thus an endless cycle begins until all of the gasses have been exhausted from an object. Then the remaining particles or ash are what is left.

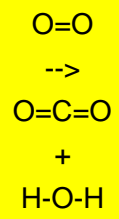


Take a look at the flame on the candle. You can see the wick is burning. But again, it is not really the wick burning. Notice that there is no flame in the immediate area surrounding the wick. A cross-sectional view would show this better. The gasses around the wick are in too much concentration to allow them to ignite. In other words, there is not enough oxygen to support combustion. As the gasses spread away from the wick, they ignite due to the already present heat being generated by the fire.

To better understand the properties of fire we can examine extinguishment techniques. The following image is known to fire fighters as the fire tetrahedron. It is very similar to the fire triangle which does not represent the chemical chain reaction. The fire tetrahedron is based on the components of extinguishing a fire. Each component represents a property of flaming fire; fuel,







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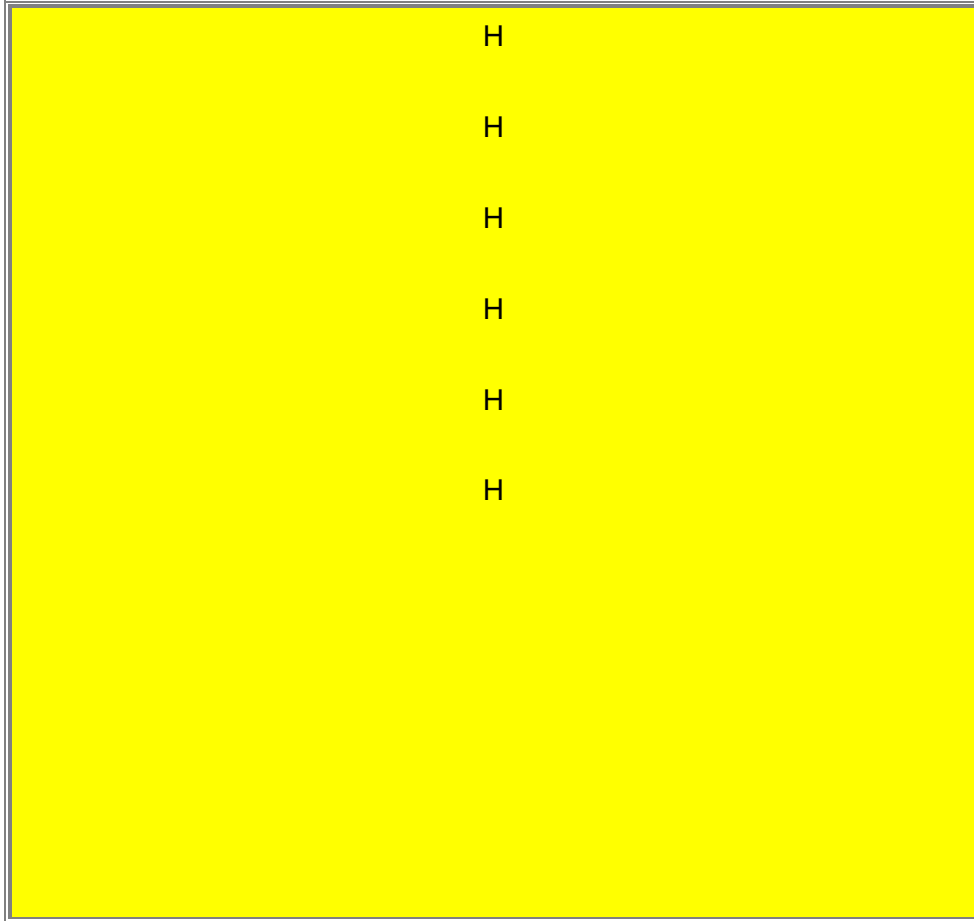
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### ***Common Fire Definitions***

- **Backdraft** -- The beginning of a backdraft occurs from a fire in a structure being deprived of necessary oxygen. The fire smolders giving off unburned carbon particles and other flammable products. Then, suddenly the smoldering fire is given a sudden influx of oxygen causing combustion to restart possibly at devastating speeds consistent with an explosion.
- **Fire Point** -- The temperature at which a liquid fuel will produce sufficient vapors to support continuous combustion once ignited.
- **Flash Over** -- Flash over occurs due to the heat buildup from a fire when the gasses reach their ignition temperature and flames flash over the entire surface of a room or area.
- **Flash Point** -- The minimum temperature at which a liquid fuel gives off sufficient vapors to form an ignitable mixture with the air near the surface. At this temperature, the ignited vapors will flash but will not continue to burn.

- **Ignition Temperature** -- The minimum temperature to which a fuel in air must be heated to start self sustained combustion without a separate ignition source. 🔥