

Lab Safety: Fire Properties and Use in Science



No one knows exactly when or under what circumstances man first tamed and harnessed the power of fire. From familiar uses like cooking food and providing warmth in our homes to extracting metals from their ores and powering automobile engines, applications of fire are all around us.



The most common use for fire in the science lab is as a heat source for an experiment, usually in the form of some type of burner. Sometimes a problem ensues as a result of the burner tipping over or too much heat being applied to something during a lab activity or demonstration. Knowing what to do in such a situation depends on a number of factors which we will examine now in detail.



alcohol burner

A-To make fire you need three things:

- 1-Heat, to allow the fuel to reach its ignition temperature.
- 2-Oxidizer, usually oxygen, to react with the fuel molecules, and in the process of doing so, releases more heat.
- 3-Fuel, a solid, liquid or gaseous substance able to burn or combust.

B-To put out a fire, you must remove or eliminate one or more of the three requirements for a fire.



1-One of the oldest techniques to put out a fire involves pouring water on it. This lowers the temperature of the fuel to below its ignition temperature.

However, do not use water for electrical or flammable liquid fires.

2-Secondly, try to remove the source of oxygen by covering/ smothering the fire. Sand, dirt or a dry chemical extinguisher containing an inert solid powder can be used to smother the fire. The powder is usually either sodium bicarbonate (baking soda), potassium bicarbonate, or monoammonium phosphate. When using a fire extinguisher aim it at the base of the fire and sweep back and forth. You'll only have from 5-15 seconds to use it before it's empty so make it count.

Do not use a dry chemical extinguisher on a person. Instead use a fire blanket, and cover/roll the blanket around them. Don't wrap the blanket in such a way as to make a vertical cylinder around the person that's open at the top. This will create a 'chimney' effect, and will increase the fire's intensity. Remember the phrase "Stop, Drop and Roll" and get the person on the ground and wrapped with the blanket to smother the fire.

3-The third way to put out a fire is the hardest to do since you have to remove all possible sources of fuel from the area of the fire.

Use the back of this page for fire safety demonstrations.

