

A group of firefighters in full protective gear, including helmets and oxygen tanks, are working to extinguish a large fire at night. A powerful stream of water is being directed at the flames. The scene is illuminated by the fire and the ambient light of dusk or dawn.

# Fire Chemistry and Suppression

# Ignition

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## The Fire Triangle

In order for combustion to occur all elements of the “Fire Triangle” must be present.



# Chemical Reaction

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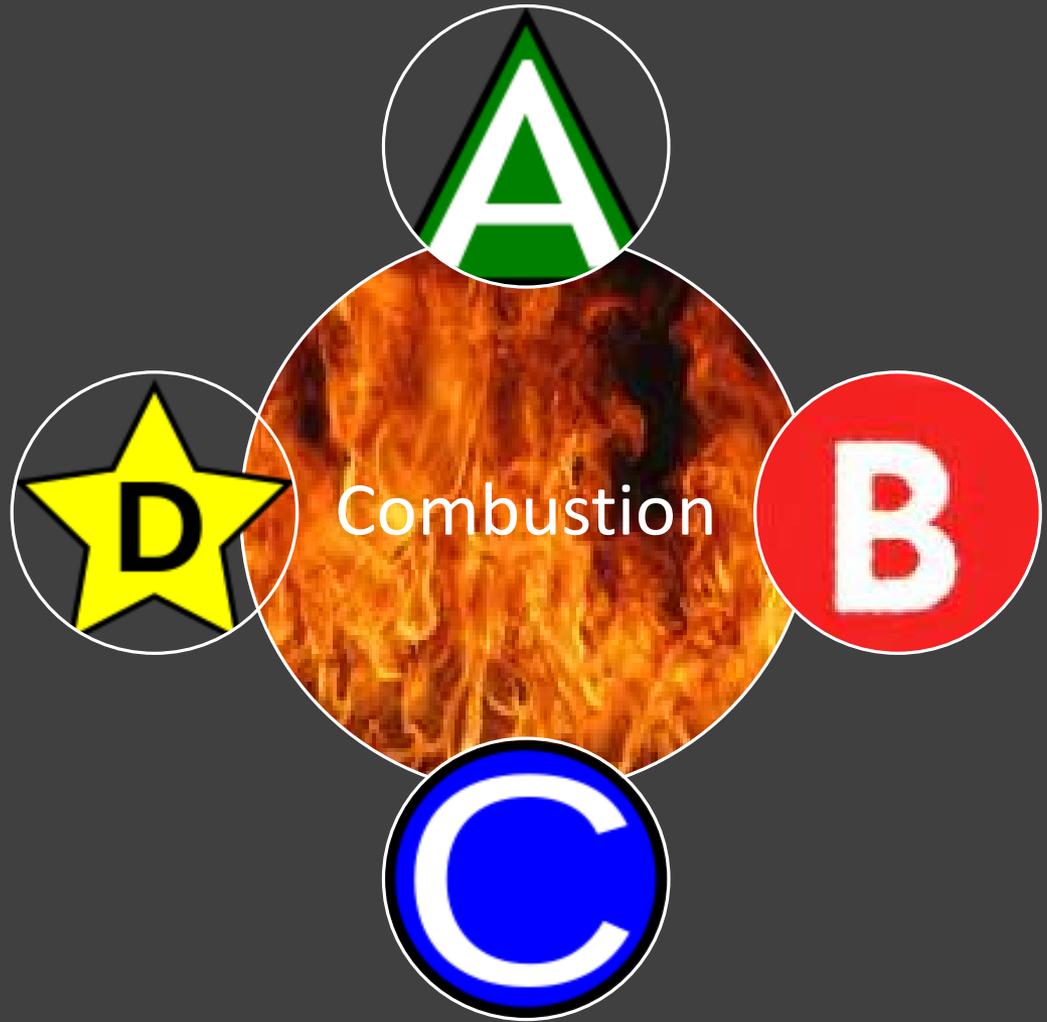
- ❖ In essence Fire Suppression is about controlling the chemical reaction of the fire.
- ❖ This can be accomplished by affecting 1 of the elements of the Fire Triangle.
- ❖ If 1 of the components can be affected or removed the fire can be extinguished.

# Classification of a Fire

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- ❖ Fires are classified based upon the fuel source
- ❖ Fire extinguishers are designed for specific fire classifications.
- ❖ It is important to be able to recognize the fire classification because.....
- ❖ The **WRONG** extinguisher on the **WRONG** fire classification can be **FATAL**.

# Fire Extinguishers



# Class A



Wood

Paper

Cloth



# Class B



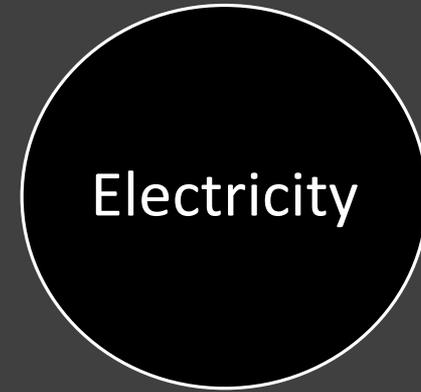
Gas

Liquid

Oil



# Class C



# Class D



Potassium

Aluminum

Magnesium

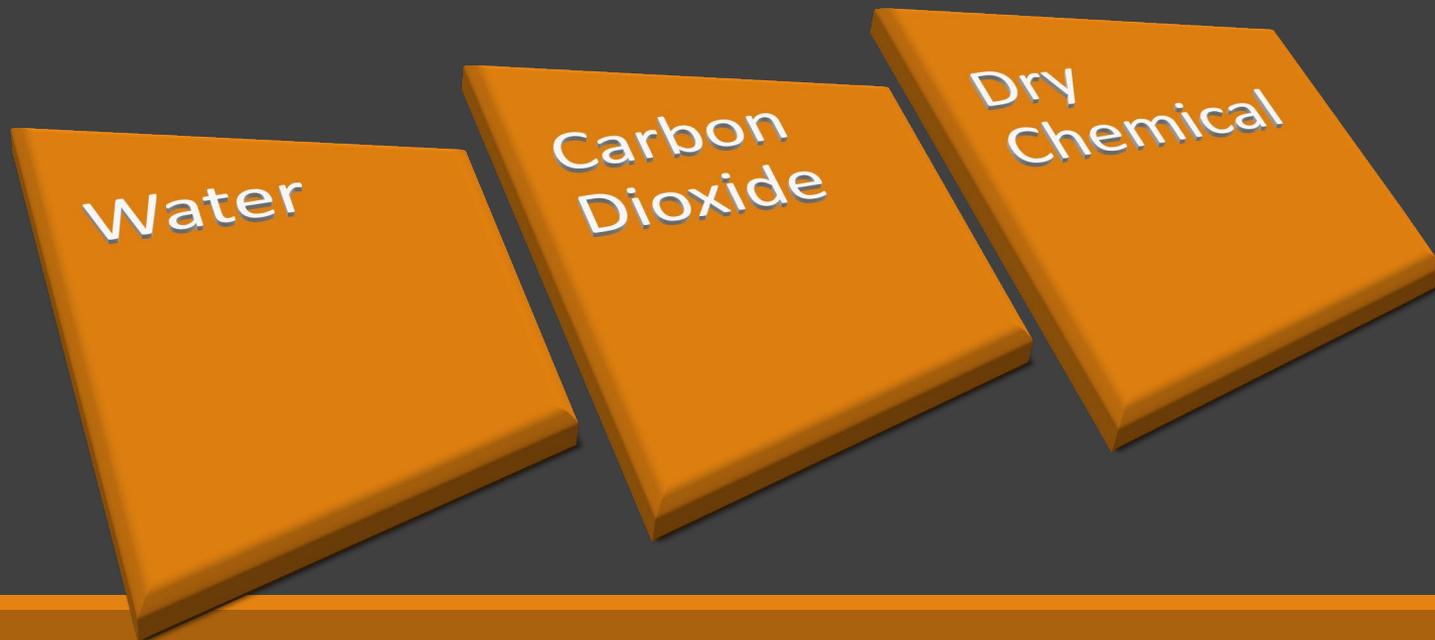


# Fire Extinguisher Types:

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## Right Extinguisher for the Right Fire!

3 Most Common Types:



# Air Pressurized Water Extinguisher

Usually large containers ( approx. 2 feet tall) and weight about 25 pounds when full.

Ordinary water inside a pressurized container.

Best used on Solid materials Class A fires.

Using on liquids can cause fire to spread.

Using on electrical fires can increase risk of electrocution.

Many Class D fires are water reactive and will increase the chemical reaction, often times violently.

Removes HEAT from the reaction



# Carbon Dioxide Extinguisher



- ❖ Range in size from 5 to 100 lbs.
- ❖ Larger sizes have heavy “horn” at time of nozzle.
- ❖ Due to pressure inside bits of dry ice can shoot out from nozzle.
- ❖ Best used on Class B and Class C fires.
- ❖ CO<sub>2</sub> is a non-flammable gas which displaces the oxygen in the chemical reaction.

# Why wouldn't a CO2 extinguisher work on a Class A fire effectively?

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- ❖ Reduces Oxygen , not heat, will not be able to displace enough O2 to be effective
- ❖ Class A fires may have smoldering embers which can re-ignite the fire

# Dry Chemical

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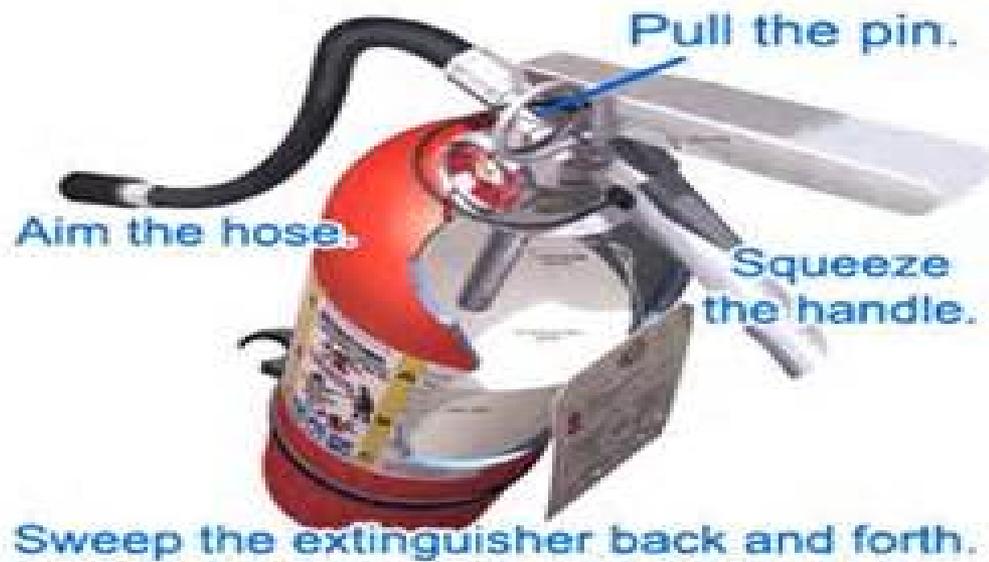
Labeled:

❖ DC

❖ ABC

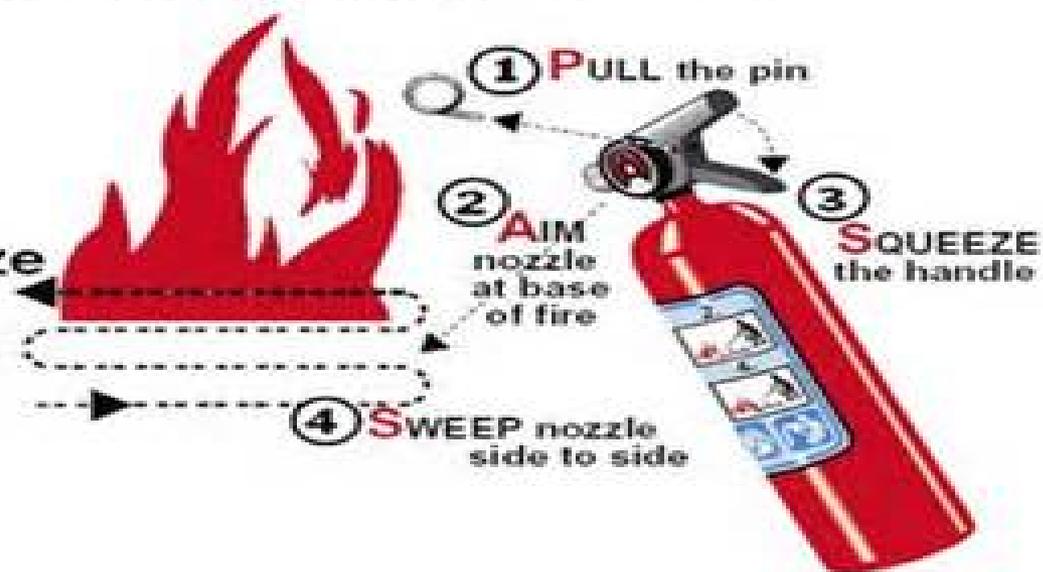
❖ BC

- ❖ Dry Chemical coats the fuel with a thin layer of dust.
- ❖ Interrupts the chemical process
- ❖ Highly effective for fire suppression



To operate an extinguisher: *(Check your fire extinguisher's label for detailed instructions.)*

**P**ull  
**A**im  
**S**queeze  
**S**weep



# Things to Think About

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- ❖ What is Burning? ( Do I have the right tool? )
- ❖ How fast is it spreading? ( Do I have time to escape if I need to?)
- ❖ Where is it burning? ( Do I have an escape route?)

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If the answer is **NO** to any of the questions then **DO NOT** attempt to extinguish the fire.

**SAFETY  
FIRST!!!!!!!!!!!!**

# Questions?

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THANK YOU!