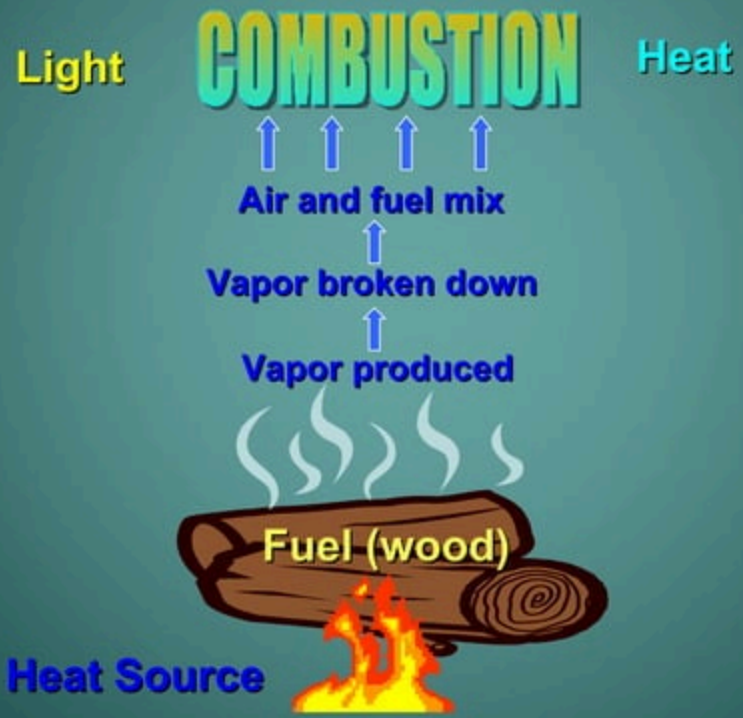
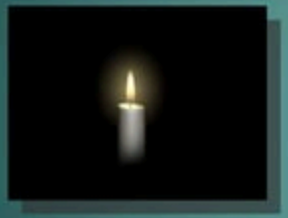

FIRE and its
COMPONENTS

THE COMBUSTION PROCESS



FIRE AND COMBUSTION

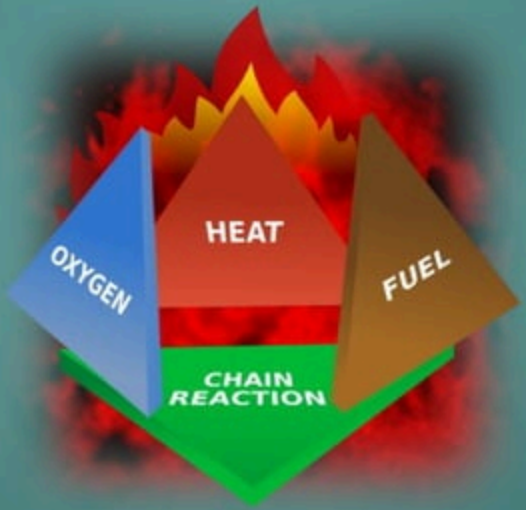
FIRE - is a rapid oxidation with the evolution of heat and light



COMBUSTION - is a self-sustaining chemical reaction yielding energy or products that cause further reactions of the same kind.

FIRE TETRAHEDRON

The components of fire tetrahedron



FIRE TETRAHEDRON

Oxidizing Agent (oxygen)

Those materials that yield oxygen or other Oxidizing gases during the course of a chemical reaction.

Fuel

The material or substance being oxidized or Burned in the combustion process.

FIRE TETRAHEDRON

Heat

Heat is the energy component of the fire tetrahedron. When heat comes into contact with a fuel, the energy support the combustion reaction.

HEAT AND TEMPERATURE

Heat

energy in transit

Temperature

An indicator of heat and is a measure of the warmth or coldness of an object based on standard arbitrary unit.

TYPES OF FUELS

Solid Fuels

Liquid Fuels

Gaseous Fuels

TYPES OF FUELS

Liquid Fuels

Flammable gases are generated by vaporization.

TYPES OF FUELS

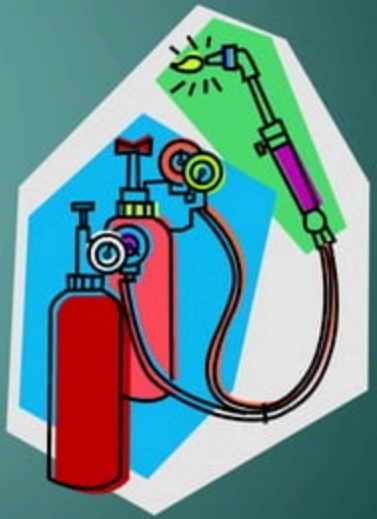
Solid Fuels

When heated to a certain temperature will produce combustible vapor. The actual position also affect the way it burns.

TYPES OF FUELS

Gaseous Fuels

The most dangerous of all fuel types because they are already in the natural state required for ignition.



CLASSES OF FIRE

HOW TO EXTINGUISH?

CLASSES OF FIRE

Class A Fires

wood

cloth

paper

rubber

plastics

Fires that involves ordinary combustible materials such as wood, cloth, paper, rubber, and many plastics.

CLASSES OF FIRE

Class B Fires

Gases

Oil

Motor spirit

Paints

Fires that involves flammable and combustible liquids and gases.

CLASSES OF FIRE

Class C Fires

Fires involving energized electrical equipment

CLASSES OF FIRE

Class D Fires

Fires that involves metals

CLASSES OF FIRE

Class K

Class K is for fires in unsaturated cooking oils in well insulated cooking appliances in commercial kitchens.

Class A - Wood, paper, cloth, carpets, trash, plastics

Solid combustible materials that are not metals. (Class **A** fires generally leave an **A**sh.)

Class B - Flammable liquids: gasoline, oil, petrol, diesel, grease, acetone

Any non-metal in a liquid state, on fire. This classification also includes flammable gases. (Class **B** fires generally involve materials that **B**oil or **B**ubble.)

Class C - Flammable Gases: Methane, Propane

or your Domestic LPG Gas cylinders, it would be considered a class C fire.

Class D - Metals: potassium, sodium, aluminum, magnesium

Unless you work in a laboratory or in an industry that uses these materials, it is unlikely you'll have to deal with a Class D fire. It takes special extinguishing agents (Metal-X, foam) to fight such a fire

Class E - Electrical Started Fire

TRANSMISSION OF HEAT

- CONDUCTION
- CONVECTION
- RADIATION

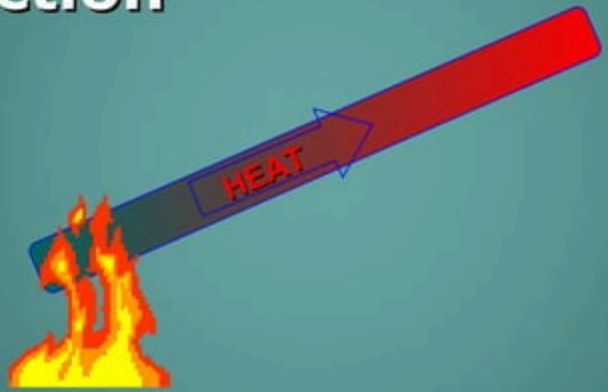
TRANSMISSION OF HEAT

Convection

Convection is the transfer of heat energy by the movement of heated fluids.

TRANSMISSION OF HEAT

Conduction



Conduction is the point-to-point transmission of heat energy.

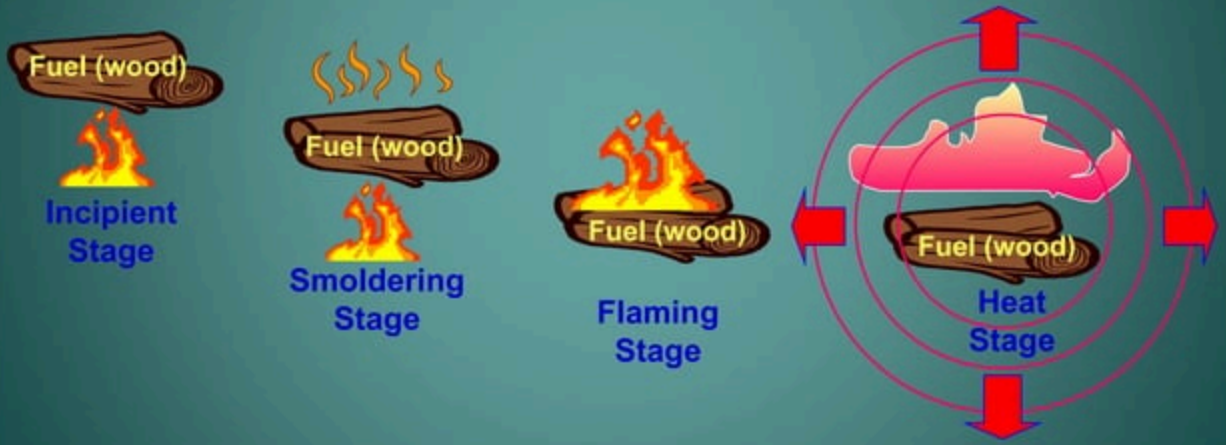
TRANSMISSION OF HEAT

Radiation

Radiation is the transmission of heat energy through electromagnetic wave.

FIRE DEVELOPMENT

Atmospheric condition



FIRE DEVELOPMENT

Confined Space

Ignition – *describes the period when the four elements of fire tetrahedron come together and combustion begins.*

Growth – *fire plume begins to form above the burning fuel.*

Flashover – *transition between the growth and fully developed fire.*

Fully developed – *all the combustible materials in the confined space are involved in fire.*

Decay – *the rate of heat releases begins to decline.*

FIRE DEVELOPMENT

Confined Space