FIRE FIGHTING MEDIUMS:
In this section we will discuss various fire extinguishing agents, and how they work.

Wet Chemical:
Wet Chemical agents are solutions of water mixed with potassium acetate, potassium carbonate, potassium citrate or combinations thereof. They are specifically designed for Class "F" fires. These agents are used in both hand portable extinguishers and pre-engineered fixed systems. (Already pre-mixed. Do not water down)

HOW IT WORKS
Wet Chemical extinguishers work on Class "F" fires through two methods. The solution is alkaline in nature and therefore reacts with the free fatty acids in the cooking medium to form a soapy foam on top of the burning material. This secures the vapours and cools the cooking medium as the foam drains out and converts to steam. This reaction is called saponification. In addition to saponification, the medium is discharged as a fine mist. This mist does not submerge below the surface of the cooking medium (preventing a steam explosion) but rather it converts to steam on the surface pulling heat out of the material. Cooking media fires must be cooled below their auto ignition point in order to successfully extinguish the fire.

The requirement for cooling the cooking media below its auto-ignition temperature stresses the importance of automatic shut off of heat sources to appliances when pre-engineered systems activate. Without removal of the heat source to the appliance,
The fire will re-flash.
On Class "A" fires, the Wet Chemical works much like water only more efficiently. The fine mist spray cools the Class "A" fire more efficiently and the addition of the chemical breaks down the surface tension of the water for better penetration and less "run-off".

Water Mist:
The Water Mist extinguisher uses de-ionized water that is discharged as a fine spray onto the burning material. It is designed as an alternative to halon in areas where contamination must be kept to a minimum without the expense of halon substitutes. The nozzle uses a wide spray pattern with fine droplets to give a soft and controlled discharge pattern. This extinguisher has passed the UL test for electrical conductivity, and water agent must have a conductivity rating of 1 microsiemen or less.

<u>This extinguisher does not form part of the Building Regulations</u>

HOW IT WORKS
The cooling power of Mist Systems is based on the process of atomizing water droplets to a size that can quickly evaporate. Water is forced through a specially designed high pressure nozzle to create an ultra-fine fog that rapidly absorbs heat and cools surrounding air as it evaporates.

Dry Chemical:

Dry Chemical agents have unique properties for fire extinguishing applications. On class B fires they demonstrate superior "flame knock-down" over other available agents.

HOW IT WORKS

For class B fires, all dry chemicals rely on particle size and decomposition to accomplish extinguishment. Theoretically, the smaller the particle size, the more effective the chemical will be as an extinguishing agent. Particle sizes on the average of 20 to 25 microns are said to be best, however, smaller particles pack too easily and are not practical for use in a hand portable. Dry Chemicals can be found with particle sizes ranging from 10 to 75 microns. The relationship of particle size to extinguishing effectiveness implies that the surface area of Dry Chemical agents plays a key role in extinguishing a fire.

Some "smothering" action occurs when Dry Chemical is decomposed in a flame front and produces CO_2. It is generally recognized that while CO_2 is formed during the extinguishment process, however, the quantity of CO_2 being generated is as small as to be insignificant in comparison with other factors. Cooling also takes place as the Dry Chemical decomposes. Water vapour is formed as a product of decomposition and the solid particles act as a barrier between the fuel surface and the radiant heat formed by the flames in the vapour space above the liquid fuel. This barrier prevents the radiant heat from returning to the fuel surface and continuing ignition. As with the "smothering" action, while some cooling is taking place through the formation of water vapour and the creation of a particle barrier, this cooling action alone is not considered significant enough to extinguish the fire.

Similar in theory to halogenated agents, the primary mechanism through which Dry Chemicals extinguish a class B fire is a "chain breaking" action.

Mono-ammonium Phosphate or "ABC" or "Multi-Purpose" Dry Chemical is acidic in nature. In addition to similar effectiveness on class B and C fires. Mono-ammonium phosphate has unique effectiveness on class A fires. When it contacts the burning surface of an ordinary combustible, a molten residue (meta phosphoric acid) is formed. This residue coats the burning ember and excludes oxygen. Mono-ammonium phosphate will not saponify (convert fat to a soap) when used on hot cooking grease and will cause corrosion if not thoroughly removed from most surfaces

Presented By: Name:_____	Date _____	Signature _____

NAME	SIGNATURE	NAME	SIGNATURE