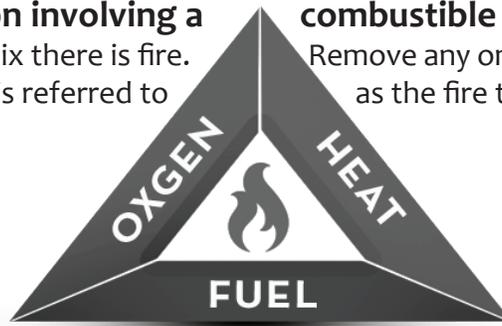


Fire Safety

THE NATURE OF FIRE

Fire is a chemical reaction involving a combustible material, heat, and oxygen.
When all three of these items mix there is fire. This is referred to as the fire triangle.
Remove any one of the three to extinguish the fire.



In order for fire to occur, enough heat must be available to produce vapor from the combustible material involved. Flame is produced when the vapor mixes with oxygen in the presence of adequate heat. The area of combustion is the point just above the fuel where vapor mixes with oxygen.

ONCE THE FIRE HAS STARTED, IT WILL POSSESS THE FOLLOWING CHARACTERISTICS:

- Heat:** as hot as 1000 degrees Fahrenheit.
- Smoke:** may produce large quantities of dark smoke.
- Flame:** the flame itself is bright; however, depending on the area of smoke, can be pitch black.
- Gases:** toxic gases will either rise to ceiling or sink to floor.

A fire's life has 3 stages. The incipient stage is when the fuel is being heated to the point of ignition. The freeburning stage is when much flame and heat are produced. The smoldering stage occurs as heat and oxygen are depleted, causing much smoke and gases. Smoldering is generally the most dangerous due to the depletion of oxygen and formation of gases.

CLASSES OF FIRE

A fire's class is determined by the material that is burning. The class will determine the method of extinguishment. The four classes of fire are:

-
- Class A:** Wood; Paper; Grass; Trash

 - Class B:** Flammable liquids; Gasoline; Grease; Oil; Paint

 - Class C:** Electrical Equipment or Lines; (TV; toaster; VCR)

 - Class D:** Flammable Metals

THE APPROPRIATE METHODS OF EXTINGUISHMENT ARE:

-
- Class A:** Cool with water

 - Class B:** Remove source of oxygen (smother); never use water as it will spread the flames

 - Class C:** Extinguish with non-conductive material (sand; not water); remove source of electricity

 - Class D:** Extinguish with specifically designed material

SMOKE

Smoke is a combination of gases and particles given off by the combustible material.

Smoke in a fire will normally include the following:

- 1 Carbon monoxide
- 2 Carbon dioxide
- 3 Hydrogen cyanide
- 4 Sulphur dioxide
- 5 Ammonia Gas

Smoke has the following characteristics:

- 1 **Smoke rises:** Smoke will rise to fill the uppermost sections of a room, and then begin to lower as the volume of smoke increases.
- 2 **Smoke follows the path of least resistance:** Smoke will continue to travel down a hallway as opposed to seeping through a closed door. Therefore, know your building and predict how smoke will travel.
- 3 **Smoke asphyxiates:** Smoke is the number one cause of death in a fire. Even a single gulp of smoke will impair your ability to reason and make decisions. Avoid smoke filled areas and never reenter a burning building.
- 4 **Smoke stratifies:** Smoke will rise to the ceiling and begin to bank down. Certain toxic gases are heavier than air and tend to form a layer just above the floor. This will leave you with a working area between the two layers that will be safe. The safe area will decrease as the volume of the smoke increases. This principle is called the thermal barrier. In a fire, keep windows closed to maintain the thermal barrier and reduce oxygen to the fire.

THERMAL BARRIER

SMOKE AND GASES

THERMAL BARRIER

HEAVY INVISIBLE TOXIC GASES 12 INCHES

Prevention

FIRE SYSTEMS: HOW FIRE SYSTEMS WORK

- 1 **Smoke detectors:** Smoke detectors are the best method for early warning in case of fire. Detectors are either electric or battery operated, and emit a warning sound when they detect smoke. Since smoke rises, smoke detectors should always be located on the ceiling and never on the wall. Also, smoke detectors should be at least six inches from the wall and at least two feet from corners. Most smoke detectors have a red light that flashes every ten seconds, and that light will remain lit if the detector detects smoke.
- 2 **Heat detectors:** Work the same as smoke detectors, but are tripped by excessive heat.

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- 3 Sprinkler system:** In order to obtain maximum efficiency, there should never be anything stored within eighteen (18) inches of the ceiling in a room with sprinkler heads. Sprinkler heads have a small piece of gel that will melt when the temperatures in the room reaches 180 degrees Fahrenheit. Once the gel melts, water will come out of the sprinkler. Only the sprinklers in the area of the heat will go off, thus preventing unnecessary damage.
- 4 Automatic closing doors:** An automatic closing door will close on its own once the fire alarm is set off. These doors are hooked to a magnet that releases the door once the alarm sounds. These doors are specially designed to prevent a fire from spreading for up to two hours. It is imperative that these doors never be propped open or blocked in any way.
- 5 Fire extinguishers:** To properly use a fire extinguisher, remember: **PASS**

P	A	S	S
PULL THE PIN	AIM THE NOZZLE	SQUEEZE THE TRIGGER	SWEEP THE NOZZLE BACK AND FORTH TO COVER THE BASE OF THE FIRE
<i>Fire extinguishers must be inspected monthly to maintain their charge. If you are unable to extinguish the fire with thirty (30) seconds, abandon all attempts to extinguish and evacuate.</i>			

- 6 Emergency Lights:** Many programs have emergency lights that will light and stay lit for up to two (2) hours in case of a fire or power outage.

Hazardous Situations

Fire prevention activities involve both the inside and outside of the building. Common sense can go a long way in preventing fires, as well as ensuring safe evacuation in case of a fire. Discuss the following hazardous situations. Ask trainees why these situations are hazardous and what can be done to prevent these situations. Some examples of unsafe/hazardous situations:

- 1 Ceramic or Styrofoam ashtrays:** ceramic gets hot quickly; styrofoam burns.
- 2 Holes in floor or ceiling:** allows fires to move quickly from room to room.
- 3 Shrubbery under a window:** increases the amount of time needed to escape.
- 4 Locking bedroom doors:** prevents escape.
- 5 Cluttered smoking rooms:** fuel for fires.
- 6 Smoking in bed:** fall asleep and drop cigarette.
- 7 Beds against an electrical outlet:** wears wire.
- 8 Wires run under rugs:** wears wire.
- 9 Smoke detector mounted on a wall:** smoke rises to highest point.
- 10 Half tank of gas stored in basement:** flammable/more room for vapor.
- 11 Using candles in a blackout:** trip and fall/forget to extinguish when power restored.
- 12 Long term use of three (3) prong adapters or extension cords:** not designed for longterm use.
- 13 Storing boxes in hallways or narrow doorways:** hazard to escape.
- 14 Curtains or bedspread against heating unit:** catch on fire.
- 15 Snow or ice on exit path:** prevents escape.
- 16 Fire doors propped open:** door cannot close when alarm goes off/fire will spread.

Electricity

Electricity is extremely dangerous because it cannot be seen or observed. Even the smallest amount of electricity can cause severe injury or death by entering the blood stream and seizing the heart.

- 1 Anyone receiving an electrical shock should be observed to ensure no ill effects were incurred. Even if the heart does not stop immediately, the heartbeat may become irregular, eventually causing the heart to stop.
- 2 At no time should an electrical wire be handled unless the power is off. Since liquids are excellent conductors, areas which contain wires that are wet must be avoided. Interaction with a live conductor is just as dangerous as touching the source of electrical currents.
- 3 When attempting to assist someone who has been electrocuted, turn the power off before assisting them; people make excellent conductors.
- 4 Remember when dealing with electricity: **STOP! TURN THE POWER OFF!!**

Evacuation

RACE: when evacuating, remember:

R Rescue or retrieve anyone close to the fire.

A Alarm: Make sure everyone in house knows there is a fire.

C Contain the fire by closing doors and windows as possible.

E Evacuate the building and go to designated meeting place.

- 1 **Meeting Place:** Chances are that in a fire not everyone will get out together. It may be necessary for people to evacuate through different exits. At these times, it is necessary for staff to complete head counts and communicate with each other to ensure the safety of all the individuals. Once out of the building, everyone should head directly to a prearranged meeting place. The meeting place should be a safe distance from the fire, and should allow ample space for the fire department.
- 2 **Evacuation responsibilities:** The evacuation plan will be determined by staff responsibilities, meeting places and any special considerations (i.e., an individual is blind). All staff must be familiar with the evacuation plan and be able to execute the plan without reference.
- 3 **Communication:** Communication during a fire is extremely important. It will be hard to hear with the alarms sounding and the noise of the fire itself. Therefore, do not talk unless absolutely necessary. It is important for staff to communicate to ensure accountability of all. Head counts should be completed regularly to ensure everyone is present.
- 4 **Staff should never put their own lives at risk** to attempt rescue of an unconscious or disoriented individual. This is the responsibility of trained and appropriately equipped firemen.
- 5 **Rules during evacuation:** Close doors behind you. Exit in an orderly manner.



Name _____

Date _____

Fire Safety Curriculum Assessment

1. What are the three (3) critical elements required for fire to burn?
 1. _____
 2. _____
 3. _____

2. Why should doors and windows always be kept closed in a fire emergency?

3. Which one of the following statements is NOT a characteristic of how smoke travels in a fire? (circle one)
 - a. Smoke always rises and seeks its own path of least resistance.
 - b. Positive pressure created by rising smoke causes heavy pockets of smoke in the corners of a room.
 - c. Smoke tends to fill the upper sections of a room and bank down as its volume increases.

4. Why should an individual keep their face at least one foot from the floor while crawling out of a smoke-filled building? (circle one)
 - a. Carpeting can ignite and cause severe facial burns.
 - b. Certain synthetic furnishings produce toxic gases that are heavier than air near the floor.
 - c. The air one foot from the floor is cooler.

5. Which two elements of the fire triangle can be controlled to prevent fires? (circle one)
 - a. oxygen and heat
 - b. oxygen and water
 - c. heat and fuel
 - d. fuel and oxygen

6. When responding to a fire, you must: (circle one)
 - a. Go to the meeting place.
 - b. Perform a head count.
 - c. Stay calm.
 - d. All of the above.

7. When responding to a fire, RACE stands for:
R- _____
A- _____
C- _____
E- _____

8. Electricity is dangerous because: (choose one)
- a. It cannot be seen.
 - b. It moves through the bloodstream to the heart.
 - c. It conducts easily through liquids.
 - d. All of the above.
9. Which of the following provides the best early detection of fire? (choose one)
- a. Smoke detectors.
 - b. Fire extinguishers.
 - c. Manual pull stations.
 - d. Staff making regular checks of the residence.
10. Which of the following is the most important reason for conducting regular fire drills? (choose 1)
- a. To meet State and Federal regulation requirements.
 - b. To give staff the opportunity to practice fire safety techniques.
 - c. To ensure that the building alert system is in working order.
 - d. To continually reinforce and enhance the evacuation skills of everyone in the building.
11. When extinguishing a fire, **PASS** stands for:
- P- _____
- A- _____
- S- _____
- S- _____
12. Fire prevention activities involve both the inside and outside of a building or home.
- a. True
 - b. False
13. For the following questions, indicate: H = Hazard or S = Safe:
- a. Bed against baseboard heater or electric outlet ____
 - b. Holes in floor or ceiling ____
 - c. Wires running under rugs/carpets ____