The Fire Fighting Formula is used to provide direction to fire fighters, company officers and chief officers as to the priorities and operational principles used in the Cincinnati Fire Department during structural fire fighting operations. The Fire Fighting Formula relates to both strategy and tactics:

Strategy = Incident Action Plan, what is the over all plan for the incident? Example; Put the fire out, mitigate the chemical release etc.

Tactic = Specific, company assignment, who is going to put the fire out? "Engine Company 1" is taking an attack line to the second floor….

Fire Fighting Formula

Formula:

1. **SIZE UP**
2. **SAVE LIVES**
3. **COVER EXPOSURES**
4. **CONFINE THE FIRE**
5. **EXTINGUISH THE FIRE**
6. **OVERHAUL**
7. **VENTILATE**
8. **SALVAGE**

1. SIZE UP:

Conditions that exist at each incident must be estimated and analyzed in order to determine the best course of action. Situations may change rapidly. Size up will be an ongoing process. All members responding on an alarm should conduct their own size-up, regardless of rank or assignment. Each member should use his or her own personal size up to guide them as they perform their assigned tasks, or as they direct others to perform tasks.

The following factors should be considered during size up:

a.) Facts: time, exposures, life hazards, personnel location, volume of fire, location of the fire, building type i.e. building classification
b.) Probabilities: standpipe, sprinklers, bystanders

c.) Your own situation: available resources, staffing, apparatus, water supply etc. The use of a **thermal imaging camera** and a 360° walk-around of the fire building are highly encouraged!
d.) Decisions: [based on knowledge] or past experience
e.) Plan of operation: issue orders and assure proper supervision for the operation

The first-arriving company should take the size up information and communicate this information to all other arriving companies. This creates the basis for the size-up conducted by the firefighters who arrive after you do.

2. SAVE LIVES:

Many questions should be answered when life safety becomes a strategic consideration.

a.) Is there anyone in the building?
b.) Are they in imminent danger?
c.) Have there been cries for help?
d.) Can they be rescued?
e.) How can they be rescued?
f.) Have occupants that have escaped offered any information?
g.) What is the age and physical condition of the trapped occupants?
h.) What type of equipment do I need to affect a rescue?
i.) Who is trained to operate said equipment?
j.) Is appropriate medical personnel available?

3. COVER EXPOSURES:

Exposures are ignited by conduction, convection and radiation. Fire can spread vertically as well as through horizontal openings.

a.) Interior Exposures: other rooms, other floors toward the origin of the fire, be advised that an internal exposure cover six sides i.e. left, right, front, back as well as top and bottom
b.) Exterior Exposures: other properties, vehicles adjacent to the structure; wires, property of fire origin, verbal description i.e. sides “A” alpha, “B” bravo, “C” Charlie and “D” delta. It is possible to have more than one exposure to any one side. Example: a building next to “B” bravo would be described as “B1” or in the case of several buildings to the left of the building of fire origin “B2”, “B3” etc……

4. CONFINE THE FIRE:

It is important to assure that the fire be confined to the smallest area possible.

a.) Attack the fire from the unburned side if possible or at least with the wind behind you
b.) Proper ventilation, horizontal versus vertical, making absolutely certain the ventilation operation is coordinated with interior crews
c.) Water curtains where appropriate be advised, fire can penetrate through a water curtain, so the exposure should be doused with copious amounts of water

5. EXTINGUISH THE FIRE:

a.) A fire attack must be coordinated to be successful.
b.) Ventilation can aid in suppressing the fire timing is important!
c.) The most efficient use of water should be considered
    1.) Direct attack is the most preferred
    2.) Indirect attack, if fire conditions indicate
    3.) Combination attack may be used
    4.) Use of the proper stream during water application

6. OVERHAUL:

Overhauling is an ongoing process during the fire and is performed in order to extinguish remaining embers and to place the premises in a safe condition, whenever possible. It also prevents rekindle. Overhaul and salvage go hand in hand. Overhauling principles include the following:

a.) Going completely around the area
b.) Check all concealed spaces
c.) Check all avenues of extension
d.) Remove broken glass from all windows
e.) Preserve all evidence of arson
f.) Eliminate all unsafe conditions, or place a **guard**
g.) Place the building in the best possible condition
h.) Advise the owner of precautions to be taken
i.) If possible, place the sprinkler system back in service
j.) Treat the property as if it were your own
k.) Leave fire fighters at the scene, to check the area, if necessary
l.) USE THERMAL IMAGING CAMERA

7. VENTILATION:

Ventilation in a fire situation means to furnish a vent or opening that will release accumulated superheated gases and/or smoke. This release will replace those gases with cool, fresh air so that fire fighters can have better access to the seat of the fire. This action can save lives and conserve property.

Principles of Ventilation

a.) Heated air decreases in weight
b.) Heated air rises, sometimes carrying burning debris
c.) Gases and heat accumulate in roof areas, mushrooming and stratifying smoke
d.) Relief is usually accomplished by coordinated strategic ventilation, i.e. the high point of the building

Reasons for Ventilation

a.) Poisonous gases and heat are released, protecting lives
b.) Reduces the chance of back draft/flashover
c.) Assist in the advancement toward the seat of the fire
d.) Reduces smoke and water damage, thus aiding with salvage operations

Safety when Ventilating

a.) Ensure a means of egress
b.) Have extinguishing agent ready
c.) Vent from the top first
d.) Vent over the fire
e.) Stay to the windward side
f.) Be cautious of exposures when venting, i.e. a taller structure
g.) Open the ceiling from below
h.) Use caution when venting a weak roof
i.) Vent truss roofs from aerial device
j.) Use roof ladder on commercial roofs for support, due to distance between roof supports, i.e. “bar joist” spans
k.) GET OFF THE ROOF ONCE YOUR HOLE IS CUT!!!!!!!

8. SALVAGE:

Salvage is defined as the process of eliminating **unnecessary** damage due to smoke, water or falling debris.

Residential Operations:

a.) Arrange furniture in one part of the room
b.) If valuables are found, notify the incident commander immediately
c.) Use salvage covers when necessary
d.) Keep contents from beneath light fixtures
e.) Remove large amounts of water

Industrial Establishments:

a.) Keep contents above the floor level
b.) Give special care to records and filing cabinets
c.) Be aware of electrical equipment, pay close attention to computers and servers, information could be extremely valuable

Mercantile Operations:

a.) Use enough covers to properly cover larger objects
b.) Improvise chutes and drains where necessary
c.) Be cautious of display cases or fragile items when pulling ceilings