

Fire

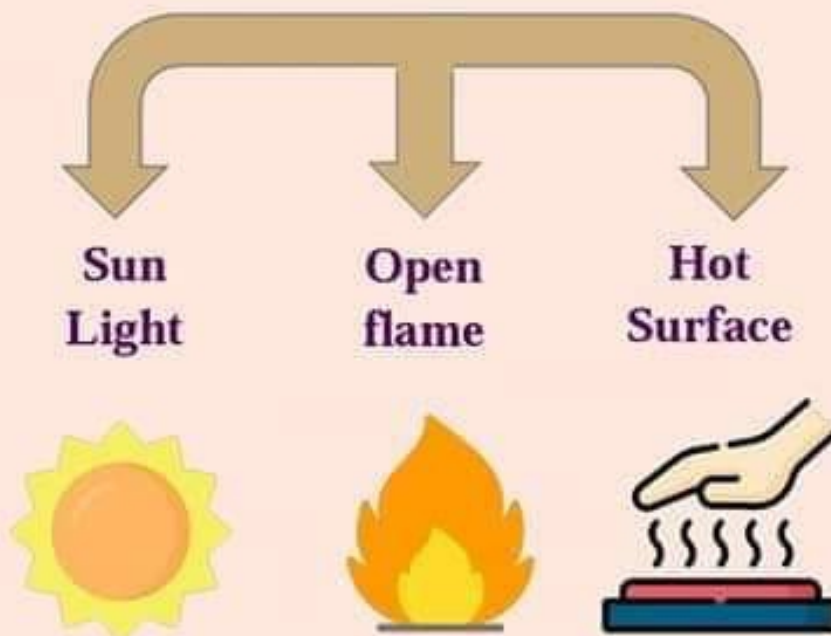
Fire Definition

- A rapid chemical reaction involving Four elements produce heat & light in the form of flame

Fire Elements

- Heat, Spark, Chemical reaction & Oxygen Gas

Source of Heat



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Fire Triangle

Fire requires Four main elements to occur:

- Heat / Spark → To start or ignite the fire
- Fuel → Combustible Materials to feed the Fire
- Oxygen Gas → To Sustain Combustion
- Chemical Reaction → Exothermic Reaction (Fire)

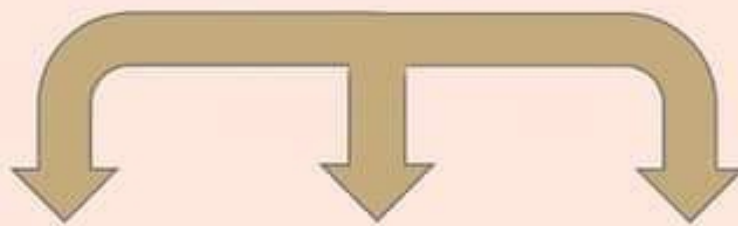


Note

All above 3 elements must present to start a fire, If one element is missing the fire will not occur.

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Flammable Material



Solid



Liquid



Gaseous



Atmospheric level Gases:

- Nitrogen (N_2) $\longrightarrow$ 78 %
- Oxygen (O_2) $\longrightarrow$ 21 %
- Argon (Ar) $\longrightarrow$ 0.9 %
- Other gases $\longrightarrow$ 0.1 %



Fire Classifications

Fire can be Classified into Five categories:

1. Class A → Combustible Materials

- Examples → Wood, Cloth, Papers, and Plastics.



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Fire Classes

2. Class B → Flammable Liquids

- Examples → Oil, Gasoline, Petrol, and Paint.





Fire Classes

3. Class C → Electrical Equipment's

- Examples → Air Conditioner, Refrigerator, Computer and Any Equipment required Electricity.



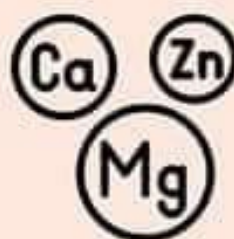
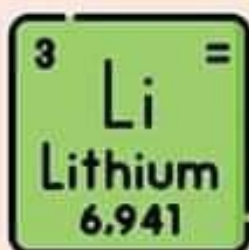
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Fire Classes

4. Class D $\longrightarrow$ Combustible Metals

- Examples $\longrightarrow$ Magnesium, Potassium, Sodium, and Lithium.





Fire Classes

5. Class K or F → Cooking Media

- Examples → Cooking Oils & Fats.



Extinguishment Methods

Fire to Occur Must present all 3 elements & Fire
EXT. working by taking away one or more
elements



1. Smothering → Removing Oxygen
gas



2. Starvation → Removing Fuel



3. Cooling → Removing Heat



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Fire Extinguishers

Different types of fire extinguishers are designed to fight different classes of fire

Water Fire Extinguisher

- Label → **Blue** or **White**
- Element → **Removing Heat (cooling)**
- Classes → **A**
- Used mostly → **School / Offices / Wood Industries**



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Fire Extinguishers

Foam Fire Extinguisher

- Label → **Yellow** or **Beige**
- Element → Removing Heat & Separate O₂ from Fuel (Cooling)
- Classes → A & B
- Used mostly → Paints / Restaurants



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Fire Extinguishers

Carbon Dioxide (CO₂)

Fire Extinguisher

- Label → **Black**
- Element → Removing O₂
(Smothering)
- Classes → B & C
- Used mostly → Airports / Power
Station / Control room



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Fire Extinguishers

Dry Chemical or Powder Fire Extinguisher

- Label → **Blue**
- Element → Separate Fuel from O₂
(Smothering)
- Classes → A, B, C & D
- Used mostly → Home / Offices
/ Refinery



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Fire Extinguishers

Fire Blanket

- Label → **Red Box**
- Element → Removing O₂
(Smothering)
- Classes → K or F
- Used mostly → Restaurants /
/ Chemical Labs



Fire Extinguishers

Fire Extinguishers working by removing one element (fire elements) to stop spreading the fire flames.

Fire Extinguishers Anatomy



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Fire Extinguishers

Extinguishing Method

**P
A
S
S**

Pull the Safety Pin

**Aim the Nozzle to the
Fire**

**Squeeze the Handle
Discharge**

**Sweep side to side of
Fire**

Remember

- Safe Distance between you & the fire Flames is 6-8 feet

Remember

- **DO NOT** fight fire if
 - ❖ The fire is spreading very fast
 - ❖ Ignorance / Not knowing what is burning
 - ❖ Might inhale Toxic Smoke
 - ❖ Don't have appropriate equipment

NOTE

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CO₂ Fire Extinguisher

- Very cold gas; can cause cold burns to the skin
- Cannot be used in open places; easy Volatile.

Water Fire Extinguisher

- Never use water to extinguish flammable liquid fires.

Powder Fire Extinguisher

- Can be used for all types of fire.
- Most common used fire extinguisher
- Not recommended for closed places (without ventilation); The powder causes suffocation

Internal Fire Fighting

- keep the door in your BACK in case the fire increased or extinguisher malfunction; you can evacuate easily.

External Fire Fighting

- Keep yourself with the wind direction & NEVER fight the fire against wind direction.

Fire Class EXT.	Class A	Class B	Class C	Class D	Class F / K
Water	✓	✗	✗	✗	✗
Foam	✓	✓	✗	✗	✗
Powder	✓	✓	✓	✓	✓
CO ₂	✗	✓	✓	✗	✗