



## Ch 6: Combustion and Flame

Vocabulary: ( write in Sticky Notes)

1. Combustion
2. Ignition temperature
3. Inflammable substances
4. Rapid combustion
5. Spontaneous combustion
6. Explosion
7. Fire Extinguisher
8. Flame
9. Calorific value
10. Kilojoules
11. SPM (Suspended Particulate Matter)

1. Define Calorific Value:

Calorific value of a fuel is the amount of heat liberated when one kilogram of the fuel is completely burnt in sufficient supply of oxygen.

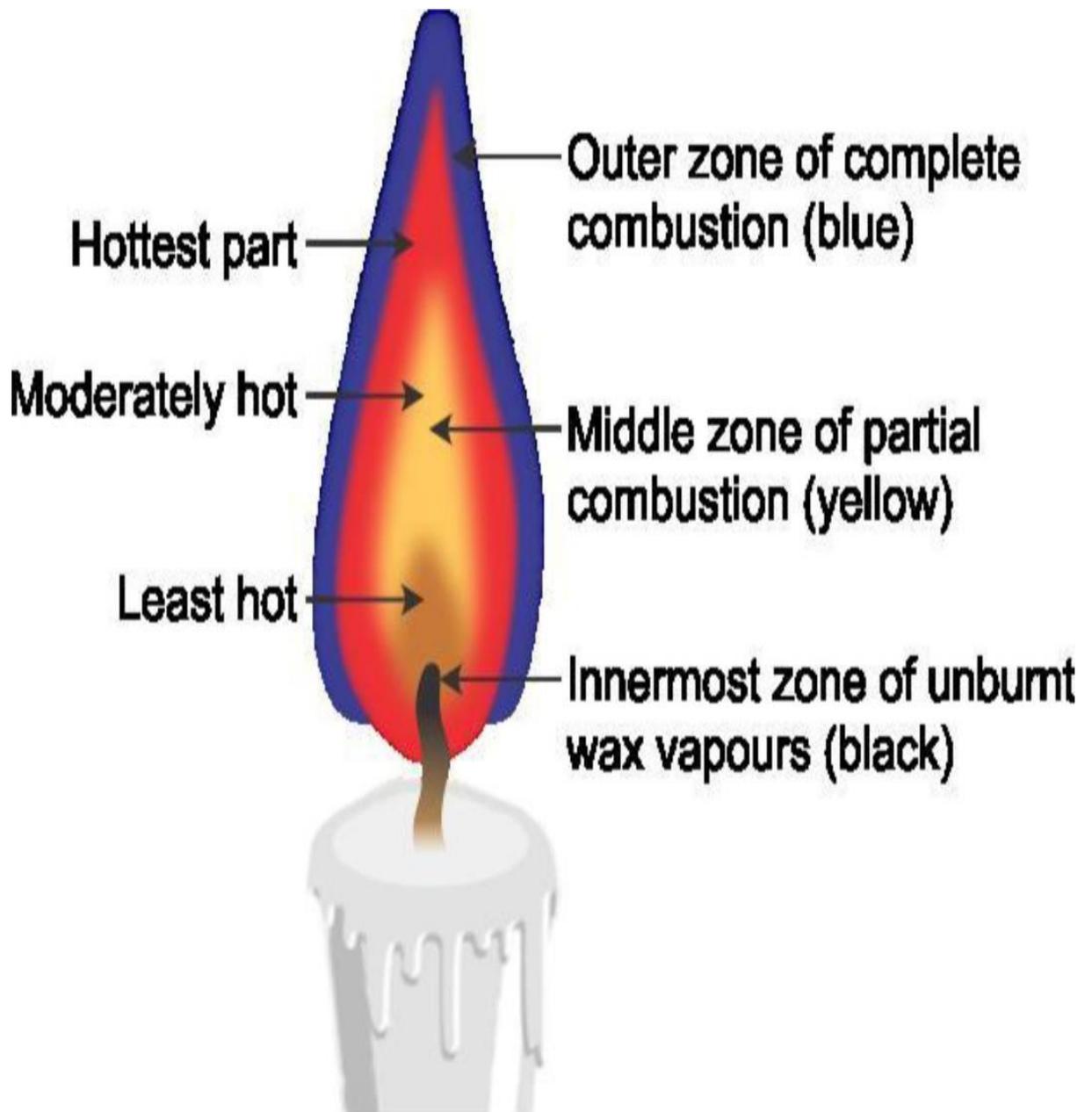
2. Define Flame:

Flame is the zone of combustion of a combustible substance.

Substances which vapourise during burning produce flames. Eg: kerosene, wax..

Substances which do not vapourise during burning do not produce flames. Eg:- Coal, Charcoal..

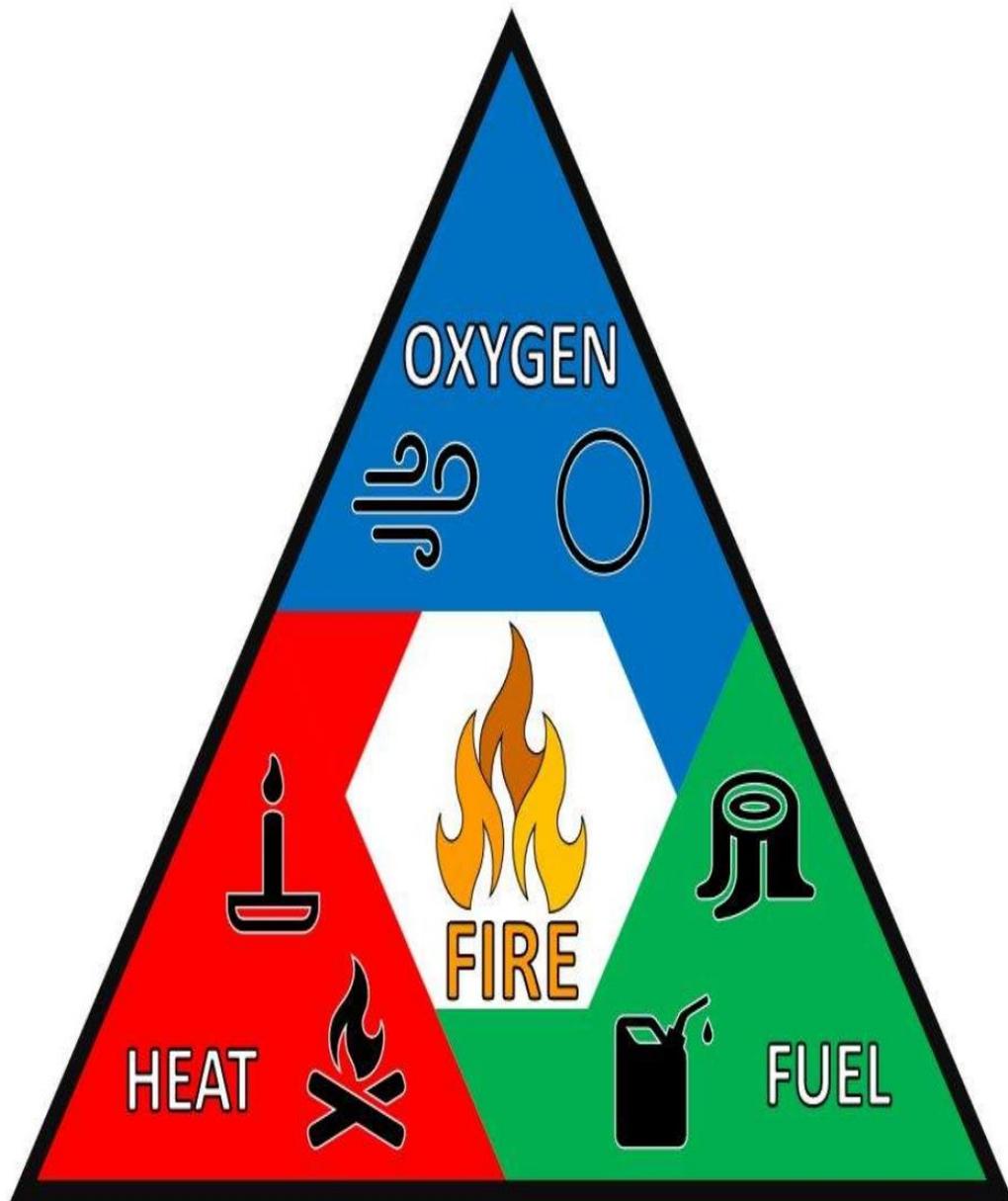
3. Draw the structure of a candle flame:



4. Differentiate spontaneous combustion, rapid combustion and explosion.

<b>Spontaneous combustion</b>	<b>Rapid combustion</b>	<b>Explosion</b>
The combustion in which substances suddenly burst into flames, without the application of any apparent cause is called spontaneous combustion.	The combustion in which substances burn rapidly to produce heat and light is called rapid combustion. In rapid combustion, external heat must be supplied so that the substances can burn.	The combustion in which sudden reactions take place on ignition of some substances to produce heat, light, and sound is called explosion.
For example, sodium and phosphorus burn spontaneously in air, even when no external heat is provided to them.	For example, when a burning matchstick is brought near a gas stove (with its knob turned on), LPG burns rapidly to produce heat and light.	For example, fireworks on ignition produce heat, light, and sound.

Fire Triangle: (To understand the conditions necessary for combustion)



# THE FIRE TRIANGLE

Differentiate combustion and Respiration:

## Respiration

Respiration is a cellular process

Respiration is a controlled biological process

Energy is released in a stepwise manner with different biochemical reactions

Less than half of energy is liberated as heat

Temperature is not allowed to rise and controlled otherwise it can damage the cell

Adenosine triphosphate is formed during this process. On breakage of the molecular bond, energy is released for physiological processes.

Oxidation occurs at the end of the reaction between oxygen and reduced coenzymes in the electron transport chain

Enzymes are required for the process of respiration

Example: Aerobic respiration  
SCREENCASTOMATIC

## Combustion

Combustion does not occur inside the living cell

Combustion is an uncontrolled process

Energy is released in a single step

Energy is released as heat. It can get hot enough to produce incandescent light.

The temperature during combustion is very high.

Adenosine triphosphate is not formed.

Substrates are directly oxidised in the combustion process

Enzymes are not required for combustion as it is a non-cellular process

Example: Combustion of oxygen and hydrogen into water vapor

### **Assertion-Reason questions:**

1. **Assertion-** Acid rain is harmful for the crops, buildings and soil.

**Reason-** the PH of Acid rain is 4.

**Ans:** Assertion and reason both are correct statement and reason is correct explanation for assertion.

2. **Assertion** – water can be used to control fire equipment or oil.

**Reason-** water is commonly used to control fire.

**Ans:** Assertion is wrong statement but reason is correct statement.

### **HOTS:**

1. Why do we wrap a blanket around a person whose clothes have caught fire?

**Ans:** we wrap a blanket around a person whose clothes have caught fire to cut off the supply of oxygen which eventually extinguishes the fire. However, the blanket must be removed immediately after the fire is extinguished so that the body can cool. Otherwise it will lead to severe burns.

2. Why is it easier to burn dry leaves but not green leaves?

**Ans:** It is easier to burn dry leaves but not green leaves as green leaves contain water whereas dry leaves do not.