



CLASS: VIII DIVISION: _____

SUBJECT: SCIENCE

PREPARED BY: Prathibha Hebbar

LESSON: 3 – COMBUSTION AND FLAMES

I. KEY WORDS:

1. Acid rain
2. Calorific value
3. Combustion
4. Deforestation
5. Explosion
6. Fire extinguisher
7. Fuel efficiency
8. Global warming
9. Ideal fuel
10. Ignition temperature
11. Inflammable substances

PRE ACTIVITY:

Draw Different zones of candle flame. (pg. 48)

Q1. Explain how the use of CNG in automobiles has reduced pollution in our cities.

Ans: CNG produces very small amounts of harmful products like Sulphur dioxide, oxides of nitrogen, oxides of sulphur etc. CNG is a cleaner fuel.

Q2. Name the unit in which the calorific value of a fuel is expressed.

Ans: The calorific value of a fuel is expressed in a unit called kilojoule per kg (kJ/kg).

Q3. Explain how CO₂ is able to control fires.

Ans: CO₂, being heavier than oxygen, covers the fire like a blanket. Since the contact between the fuel and oxygen is cut off, the fire is controlled.

Q4. It is difficult to burn a heap of green leaves but dry leaves catch fire easily. Explain.

Ans: The ignition temperature of green leaves is higher than that of the dry leaves, so dry leaves catch fire easily.

Q5. List conditions under which combustion can take place.

Ans: Conditions under which combustion can take place are as follows:

- Presence of combustible substance.
- Presence of a supporter of combustion i.e oxygen
- Attainment of ignition temperature of a combustible substance.

Q6. Which zone of a flame does a goldsmith use for melting gold and silver? Why?

Ans: Goldsmith uses the outermost zone of the flame for melting gold and silver because it is the hottest zone and has higher oxygen content due to adequate supply of air.

Q7. Compare LPG and wood as fuels.

Properties	LPG	Wood
1. Energy/unit mass	Produces more energy	Produces less energy
2. Pollution	Less pollution	More pollution
3. Residue	Leave no residue	Leave ash as residue
4. Storage/Transport	Easy to store & transport	Need more space to store

Q8. In an experiment 4.5 kg of a fuel was completely burnt. The heat produced was measured to be 180,000 kJ. Calculate the calorific value of the fuel.

Ans: $Calorific\ Value = \frac{Heat\ Produced\ (in\ kJ)}{Mass\ of\ Fuel\ (in\ kg)}$
 $= 180,000\ kJ / 4.5\ kg$
 $= 1800000 / 4.5$
 $= 40000\ kJ/kg$

Q9. Can the process of rusting be called combustion? Discuss.

Ans: No, as rusting is a very slow process, compared to combustion and the heat evolve in combustion is much more than rusting. Rusting can take place at room temperature, but combustion need an ignition temperature.

Q10. Abida and Ramesh were doing an experiment in which water was to be heated in a beaker. Abida kept the beaker near the wick in the yellow part of the candle flame. Ramesh kept the beaker in the outermost part of the flame. Whose water will get heated in a shorter time?

Ans: The outermost part of the flame is the hottest one, so Rakesh's water will get heated in a shorter time.

Q11. Give reasons:

- Water is not used to control fires involving electrical equipment.
- LPG is a better domestic fuel than wood.
- Paper by itself catches fire easily whereas a piece of paper wrapped around an aluminium pipe does not.

Ans: (a) Water is not used to control fires involving electrical equipment because it may conduct electricity and harm those trying to douse the fire.

(b) LPG is a good fuel as compared to wood as it readily available and it is cheap. It burns easily in air at a moderate rate and it produces a large amount of heat. It does not leave behind any undesirable substances.

(c) Paper by itself catches fire easily whereas a piece of paper wrapped around an aluminium pipe does not because the ignition temperature of paper is low as compare to the paper wrapped around an aluminium.

Q12. Hydrogen has the highest calorific value, why is it not used as a domestic fuel?

Ans: Hydrogen has the highest calorific value but it cannot be used as domestic fuel. Since it is highly combustible and explodes. Safe storage of hydrogen is also difficult.

Q13. What are the good qualities of a good fuel?

Ans: A good fuel should

- Have a high calorific value.
- Have a definite ignition temperature (well above the room temperature & not too high)
- Be least polluting.
- Be easy and safe to handle.
- Have low content of non-combustible substance and burn completely.
- Be easy to transport.
- Be cheap should be easily available.

POST ACTIVITY: Draw a table 4.4 which shows calorific value of different fuels.

Subject Tr

HOD

Co Ordinator

Principal