

Pre- Content/Content / Post –content	Learning Outcome/ Objectives	
<u>Pre –Content:</u>	General	Specific
Students know about substances like coal, petrol, diesel, kerosene and natural gas, LPG-collectively known as fuels. By burning a fuel, we obtain heat, often accompanied by light. We use different kinds of fuels for various purposes at homes, in industries and for running automobiles. <u>Content :</u> - Combustion and its types - Flame - Fuel and calorific values <u>Post Content :</u> the students at the end of this chapter should be able to comprehend concepts of Combustion as a Chemical Reaction, Its types, structure of a flame. Define Fuel, Identify an Ideal Fuel and discuss the post effects of Combustion of Fuel.	Students will be able to :- discuss about chemical process of combustion and different kinds of combustion. draw different zones of flame and will be able to determine the zones on the basis of combustion. evaluate the different types fuel on the basis of their efficiency. list the harmful products formed while burning fuel. explain to extinguish different types of fire.	Students will be able to :- develop the concept of Combustion and define it. differentiate between combustible and non-combustible substances. list the combustible and non combustible substances. list the necessary conditions for combustion. differentiate and identify the different zones of a candle. list the substances that burn with flame and without flame. categorize the fuel into solid, liquid and gases interpret the calorific values of solid, liquid and gaseous fuels. discuss the importance of calorific value in selecting fuel. list the characteristics of an ideal fuel. list the harmful effects of burning fuel on environment. adopt different ways to extinguish fire by removing one of the necessary conditions required for burning.

Home Work / Assignments

- Exercise questions
- Extra questions
- Worksheets and assignments

Teacher's Activity	Student's Activity	Teacher's Observation and Remedial action taken
Teacher will: <u>ANNEXURE 6(A) :</u> collect a few samples and try to burn them to show that a few substances are combustible and a few are Non-Combustible in nature. <u>ANNEXURE6 (B) :</u> demonstrate an activity to show the oxygen (air) is necessary for combustion of a substance. <u>ANNEXURE 6 (C) :</u> demonstrate an activity to show that fuel/substance should be heated to its ignition temperature to make it burn. <u>ANNEXURE 6 (D) :</u> demonstrate an activity to prove that the innermost zone of a candle flame has unburnt wax. <u>ANNEXURE 6 (E) :</u> demonstrate an activity to prove that the outermost non-luminous zone of a candle flame has high temperature. <u>ANNEXURE6 (F)</u> initiate discussion about the various types of fuels with the help of ICR content	Students will: <u>ANNEXURE 6 (a)</u> observe the activity and tabulate the observations in their notebook. <u>ANNEXURE6 (b)</u> perform the activity in a group with teacher's assistance and record observations in their notebooks. <u>ANNEXURE6 (c)</u> perform the activity in a group with teacher's assistance and record observations in their notebooks <u>ANNEXURE6 (d)</u> perform the activity in a group with teacher's assistance and record observations in their notebooks <u>ANNEXURE6 (e)</u> perform the activity in a group with teacher's assistance and record observations in their notebooks <u>ANNEXURE 6(f)</u> students will survey the various fuels in the nearby locality and make the following table in their notebook.	

Teaching Aids – Active Inspire boards, ICR, Material required for activities, worksheets and textbook.

Methodology / Innovative Methods: Activity based teaching, Know to Unknown, Discussions, Deductive Activity method, brainstorming sessions.

Interdisciplinary Links – Geography – conservation of fossil fuel, judicious use of petroleum products.

English – It will improve the power of expression while explaining the activity and also vocabulary.

Art – Neatness in making diagrams.

HOD

Coordinator

Vice-Principal

Principal

➤ **ANNEXURE6(A)**

Teacher will collect a few samples and try to burn them to show that a few substances are combustible and a few are Non-Combustible in nature.

➤ **ANNEXURE6(a)**

Students will observe the activity and fill the table given below.

Material	Combustible	Non-combustible
Wood		
Paper		
Iron nails		
Kerosene oil		
Stone		
Straw		
Matchsticks		
Glass		

ANNEXURE 6(B), 6(b)

Activity - Oxygen is necessary for combustion

Chapter- Combustion and Flame

Class: VIII

Duration: 30 minutes

Nature of the activity: Group

Learning Outcome: Students will be able to perform an activity to understand the importance of oxygen in the process of combustion.

What we have to do?

Show that oxygen is necessary for the combustion of a substance.

What do we require?

Two candles, match box, glass jar or a beaker.

What do we need to know?

Combustion is a chemical process by which an object catches fire in the presence of air. For combustion to take place, fuel, oxygen and heat are the necessary things.

How do we proceed?

➤ **Teacher's activity:**

Teacher will arrange activity kits. The activity has to be done under teacher's supervision and in chemistry lab.

➤ **Student's activity:**

1. Light the two candles and fix them on a table
2. Let both the candles burn for some time.
3. Now cover one of the candles with a glass jar or beaker and observe it for some time.

What do we observe?

What have we learnt?

1. Is combustion a physical change or a chemical change?

2. Name a gas which helps in extinguishing fire?

3. If you cover a burning kerosene lamp with a jar, will it also stop giving light after some time? Justify your answer.

4. Why do we cover a person with blanket when his/her clothes catch fire?

What more can we do?

The teacher helps the students to understand how fire extinguisher works. She also guided the student on how to perform the activity.

Carbon dioxide extinguishes fire. Perform an activity to show it. Prepare carbon dioxide gas by adding half tea-spoon of baking soda (sodium hydrogen-carbonate) in a test tube filled one-third with vinegar. Now bring an ignited match stick to the mouth of the test tube. The flame will be extinguished at once.

ANNEXURE 6 (C), 6 (c)
ACTIVITY NO. 6 – A SURPRISING FACT

Subject	Science
Class	VIII
Chapter/Unit	Combustion and Flame
Topic	Ignition Temperature
Time	30 minutes
Nature of Activity	Pair work

What will I learn (Learning Outcome)?

Will experimentally learn about the concept of ignition temperature of fluids.

Skills: Applying and Analyzing

What I have to do?

To show that fuel/substance should be heated to its ignition temperature to make it burn.

What do I require?

Paper, candle, water, match box

What do I need to know?

Combustion is a chemical process in which a substance burns in the presence of air or oxygen, with release of heat and light.

➤ **Teacher's Activity**

Teacher will-

1. explain the topic
2. make arrangements for this activity.
3. make pairs of the students and will explain the steps of the activity.
4. ensure that each participant of the pair performs the activity on his/her own.
5. help the students in lighting candle and be cautious.

How will I proceed?

➤ **Student's Activity**

1. Make two paper cones.
2. Heat one empty paper cone on the flame of candle and observe.
3. Fill the other paper cone one-third with water and heat it on the flame and observe.

What have I observed?

Tick the correct one-

Observation	Paper cup with water	Paper cup without water
Which will burn first?		

What have I learnt?

Things do not burn unless they are heated to a certain temperature which is called the _____ of a combustible substance. In the above activity, the water in the paper cone _____ heat from the candle flame and thus _____ paper to reach its _____.

What am I curious to learn?

- Let us try to burn paper, wood and card board. Note the time taken by the substances to catch fire. Which of these substances has lowest ignition temperature?

Let me evaluate myself

1. What do you mean by the term ignition temperature?

2. Why is it difficult to burn a heap of green leaves, but dry leaves catch fire easily?

3. Why do we pour water on the fire caused by non-electrical appliance?

4. A piece of paper wrapped around an aluminium pipe does not catch fire easily. Why?

5. The ignition temperature of four substances P, Q, R and S are 125°C , 270°C , 155°C and 310°C respectively. Which of the following pairs of substances catches fire at 250°C ? Give reason for your answer.

➤ **ANNEXURE6(D)**

AIM: To prove that the innermost zone of a candle has unburnt wax

MATERIAL REQUIRED: candle, match box, tongs and a glass slide

PROCEDURE: The teacher will lit a candle with a matchstick. Instruct One of the students place a glass plate into the luminous zone flame of the candle with the help of tongs. Hold it there for ten seconds and observe.

➤ **ANNEXURE6(d)**

Students will observe a circular blackish ring is formed on the glass plate/slide. They concluded the deposition of unburnt carbon particles present in the luminous zone of the flame.

➤ **ANNEXURE6(E)**

AIM: To show that Non-Luminous zone of the candle has the highest temperature

MATERIAL REQUIRED: Candle, match box and Copper wire

PROCEDURE: Introduce the copper wire into the Non-Luminous zone of the flame and make observations.

➤ **ANNEXURE6(e)**

Students observed that the portion of copper wire which is introduced into the non-luminous zone becomes red. This indicates that the outermost portion of the flame is the hottest.

➤ **ANNEXURE6 (F)**

The teacher will discuss the various types of fuels.

➤ **ANNEXURE6 (f)**

Students will survey the various fuels in the nearby locality and make the following table in their notebook.

S.No.	Type of Fuel	Cost/kg	Calorific Value
