

Coal, Petroleum, Combustion and Flame

Science · Class 8 · Topic-wise Practice Worksheet

TIME 45 minutes	QUESTIONS 18	TOTAL MARKS 24	MAX. SCORE ___ / 24
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Name: _____ Class/Sec: _____ Date: _____

INSTRUCTIONS

- There are **18 questions** in this worksheet. All questions are compulsory.
- Each question has four options (A), (B), (C) and (D). Exactly **one** option is correct.
- Questions 1–15 carry **1 mark** each. Questions 16–18 (Achievers Section) carry **3 marks** each.
- There is no negative marking. Study every diagram and table carefully.

Section A — Scientific Reasoning

Q1–Q8 · 1 mark each

- Coal, petroleum and natural gas are called _____ fuels.

(A) Fossil
(B) Renewable

(C) Synthetic
(D) Nuclear
- The slow process by which dead vegetation buried under the earth turned into coal is called _____.

(A) Distillation
(B) Refining

(C) Carbonisation
(D) Combustion
- The separation of petroleum into its useful constituents is called _____.

(A) Refining
(B) Carbonisation

(C) Combustion
(D) Galvanisation
- Which of these is **not** a condition necessary for combustion?

(A) A combustible substance
(B) The presence of water

(C) Attainment of the ignition temperature
(D) A supply of air (oxygen)
- The lowest temperature at which a substance catches fire is called its _____.

(A) Melting point
(B) Boiling point

(C) Ignition temperature
(D) Calorific value
- Which zone of a candle flame is the **hottest**?

(A) The dark innermost zone
(B) The luminous yellow zone

(C) All zones are equally hot
(D) The outermost non-luminous blue zone
- The amount of heat energy produced on completely burning 1 kg of a fuel is called its _____.

(A) Calorific value
(B) Ignition temperature

(C) Melting point
(D) Flash point
- Why is water **not** used to put out an oil fire?

(A) Water makes oil burn brighter
(B) Oil floats on water and keeps burning, spreading the fire

(C) Water reacts chemically with oil
(D) Water has a high ignition temperature

9. In the table below, which row is **incorrectly** matched?

Row	Type of combustion	Example
(A)	Rapid combustion	Burning of LPG in a stove
(B)	Spontaneous combustion	Forest fire started by heat alone
(C)	Explosion	Bursting of a firecracker
(D)	Slow combustion	Burning of a magnesium ribbon

Table 9.1 — Types of combustion

- (A) Row (A)

- (B) Row (B)

- (C) Row (C)

- (D) Row (D)

10. Why does a candle flame go out when a glass jar is placed over it?

- (A) The wax runs out

- (B) The jar cools the flame instantly

- (C) The oxygen inside the jar is used up, so combustion stops

- (D) Carbon dioxide is used up

11. Why is a carbon dioxide extinguisher preferred for fires involving electrical equipment?

- (A) It is cheaper than water

- (B) CO_2 burns the fuel completely

- (C) CO₂ makes the equipment work better

- (D) CO₂ does not conduct electricity and it smothers the fire without damaging equipment

12. A yellow candle flame deposits black soot on a plate held in it, but the blue flame of a gas stove does not. Why?

- (A) The yellow flame shows incomplete combustion, leaving unburnt carbon particles

- (B)** The candle contains more carbon dioxide

- (C) The gas stove is hotter, so soot melts

- (D) Soot only forms in cold air

13. Why are the products of burning fossil fuels a major cause of **acid rain**?

- (A) They release carbon dioxide only

- (B) They release sulphur dioxide and nitrogen oxides, which dissolve in rain to form acids

- (C) They release oxygen

- (D) They release water vapour

14. CNG is increasingly used in vehicles instead of petrol or diesel. What is its main advantage?

- (A) It is cheaper to transport

- (B) It has a lower calorific value

- (C) It burns more completely, producing far less smoke and harmful gases

- (D) It can be stored without a cylinder

15. Why is it advised to keep the burner's air holes clean on a gas stove?

- (A) To make the stove look neat

- (B) To reduce the calorific value of the gas

- (C) To make the flame yellow

- (D) Blocked holes reduce the oxygen supply, causing incomplete combustion, a yellow smoky flame and wasted fuel

16. Consider the following statements.

- (i) Fossil fuels are renewable resources.
- (ii) The innermost dark zone of a candle flame is the coolest.
- (iii) A good fuel should have a high calorific value and leave little residue.

Which of the statements is/are correct?

- (A) (i) and (ii) only
- (B) (ii) and (iii) only
- (C) (i) and (iii) only
- (D) All three

17. A burning candle is covered with a jar and the flame goes out after some seconds. When the same experiment is repeated with a larger jar, the flame burns for longer. What does this show?

- (A) The duration depends on the amount of oxygen available, confirming that oxygen is needed for combustion
- (B) Larger jars are colder
- (C) Wax burns faster in small jars
- (D) Glass affects the ignition temperature

18. Paper by itself catches fire easily, but a paper cup filled with water does not burn even when held over a flame. Why?

- (A) Wet paper cannot burn at all
- (B) The water absorbs the heat and keeps the paper below its ignition temperature
- (C) Water reacts chemically with paper
- (D) The flame cannot touch the cup

Answer Key

1	A	2	C	3	A	4	B	5	C
6	D	7	A	8	B	9	D	10	C
11	D	12	A	13	B	14	C	15	D
16	B	17	A	18	B				

Solutions

1. Answer: (A) Fossil

Fossil fuels were formed from the remains of organisms buried millions of years ago. They are non-renewable, since they cannot be replaced within our lifetime.

2. Answer: (C) Carbonisation

Carbonisation is the slow conversion of buried plant matter into coal under high pressure and temperature over millions of years.

3. Answer: (A) Refining

Refining separates crude petroleum into petrol, diesel, kerosene, lubricating oil and other fractions, using their different boiling points.

4. Answer: (B) The presence of water

Combustion needs fuel, oxygen and the ignition temperature. **Water is not needed** — in fact water is commonly used to put fires out, by cooling the fuel below its ignition temperature.

5. Answer: (C) Ignition temperature

The **ignition temperature** is the lowest temperature at which a substance catches fire. A substance below its ignition temperature will not burn however much oxygen is available.

6. Answer: (D) The outermost non-luminous blue zone

The **outermost blue zone** has the freest supply of oxygen, so combustion there is complete and the temperature is highest. Goldsmiths direct this part of the flame onto metal.

7. Answer: (A) Calorific value

The **calorific value** is measured in kilojoules per kilogram (kJ/kg). Hydrogen has the highest calorific value of any fuel.

8. Answer: (B) Oil floats on water and keeps burning, spreading the fire

Oil is lighter than water, so it floats on top and goes on burning, and the spreading water carries the burning oil further. Oil fires are smothered with foam or carbon dioxide instead.

9. Answer: (D) Row (D)

A magnesium ribbon burns with a dazzling flame in seconds, so that is **rapid** combustion, not slow. Rusting and respiration are examples of slow combustion or slow oxidation. The other three rows are correct.

10. Answer: (C) The oxygen inside the jar is used up, so combustion stops

Combustion needs oxygen. Once the jar is placed over the candle, **the limited oxygen inside is used up** and the flame goes out. The carbon dioxide produced also settles around the flame and helps smother it.

11. Answer: (D) CO₂ does not conduct electricity and it smothers the fire without damaging equipment

Carbon dioxide does not conduct electricity, so there is no risk of shock, and being heavier than air it forms a blanket that cuts off the oxygen. It also leaves no residue, so delicate equipment is not damaged — unlike water or powder.

12. Answer: (A) The yellow flame shows incomplete combustion, leaving unburnt carbon particles

The yellow luminous zone has a limited oxygen supply, so combustion is incomplete and **unburnt carbon particles glow yellow and settle as soot**. In a gas stove the air holes let in plenty of oxygen, giving complete combustion and a clean blue flame.

13. Answer: (B) They release sulphur dioxide and nitrogen oxides, which dissolve in rain to form acids

Coal and petroleum contain sulphur and nitrogen compounds. Burning them **releases sulphur dioxide and nitrogen oxides, which dissolve in rain droplets to form sulphuric and nitric acids**. The resulting acid rain damages crops, buildings and aquatic life.

14. Answer: (C) It burns more completely, producing far less smoke and harmful gases

Compressed natural gas **burns more completely, producing far less smoke, unburnt carbon and harmful gases** than petrol or diesel. This makes it a much cleaner fuel for cities, which is why buses and taxis in many Indian cities run on it.

15. Answer: (D) Blocked holes reduce the oxygen supply, causing incomplete combustion, a yellow smoky flame and wasted fuel

The air holes mix air with the gas before it burns. If they are blocked, **less oxygen reaches the flame, combustion becomes incomplete** — the flame turns yellow and smoky, less heat is produced and carbon monoxide may form.

16. Answer: (B) (ii) and (iii) only

Statement (i) is false — fossil fuels took millions of years to form and cannot be replaced in our lifetime, so they are **non-renewable**. Statement (ii) is true; the dark zone is unburnt wax vapour with almost no combustion. Statement (iii) is true. Hence **(ii) and (iii)**.

17. Answer: (A) The duration depends on the amount of oxygen available, confirming that oxygen is needed for combustion

The only variable changed is the volume of trapped air. Since a larger jar holds more oxygen and the flame lasts proportionally longer, **the duration depends on the amount of oxygen available** — which confirms that oxygen is essential for combustion. Timing several jar sizes turns this into a quantitative experiment.

18. Answer: (B) The water absorbs the heat and keeps the paper below its ignition temperature

A substance burns only when it reaches its ignition temperature. **The water conducts the heat away and absorbs it as it warms, keeping the paper below that temperature**, so the cup does not catch fire until the water has boiled away.