



Lesson 2

Chemistry of Fire

Acronyms

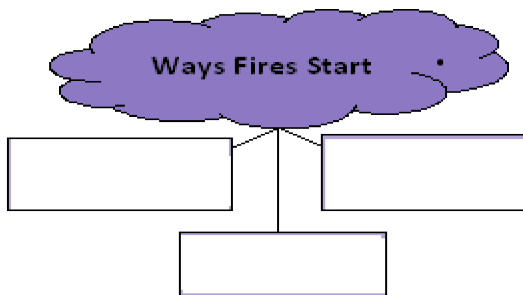
Write what the acronyms in the table stand for in the white column:

BLEVE	
CAAM	
CO	
EAC	
HAZCHEM	
HCN	
LEL	
NADOPOD	
NFPA	
WHO	

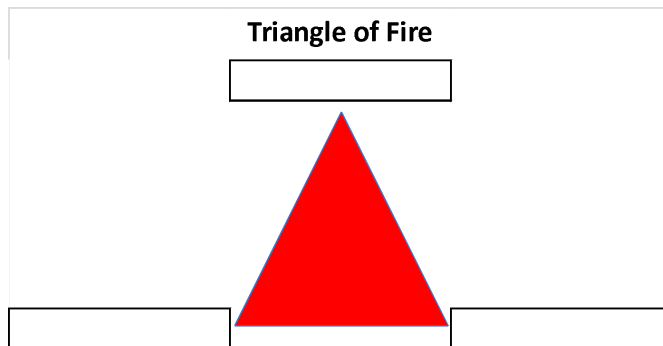
Topic 1: Chemistry of Fire

Fill in the blanks

- 1) There are three (3) states of matter, which are ①_____, ②_____ and ③_____.
- 2) Fill in the box on the ways a fire starts

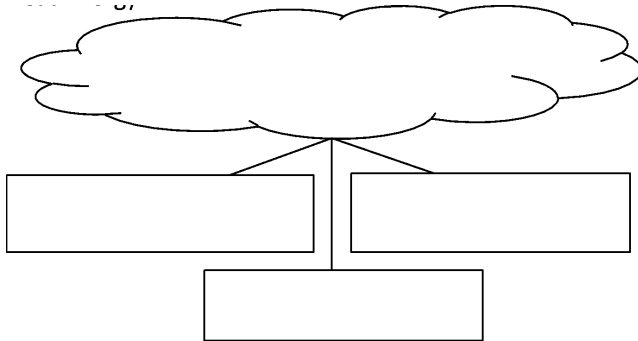


- 3) ① _____ heat energy can be frictional heat, frictional sparks, or heat of compression
- 4) Fill in the empty boxes in this diagram, the “Triangle of Fire.”



- 5) Fire occurs when a substance combines with ① _____ and has adequate ② _____. It gives off heat, ③ _____, and ④ _____.
- 6) for a fire to exist, a ① _____ substance must be present, the temperature must be high enough to cause ② _____, and enough ③ _____ must be present to sustain rapid combustion.
- 7) Fire gives out heat and light because the chemical reaction producing the flames is ① _____.
- 8) Name the five (5) types of combustion:
- ① _____ ④ _____
- ② _____ ⑤ _____
- ③ _____

9) Fill in the empty boxes the three general categories of heat energy.



10) The three (3) fire extinguishing techniques are:

- ① _____ ③ _____
② _____

Topic 2: Classes of Fire

1) When dealing with fires, it is essential to be able to distinguish one type of fire from another so that _____
_____.

2) The six (6) classes of fire recognized in Malaysia are:

- ① _____ ④ _____
② _____ ⑤ _____
③ _____ ⑥ _____

3) Malaysia primarily uses the ① _____ Standard to classify fire.

4) ① _____ fires are the easiest to extinguish as dousing them with water will cool the fire, removing the ② _____ supply which is essential for fire to burn.

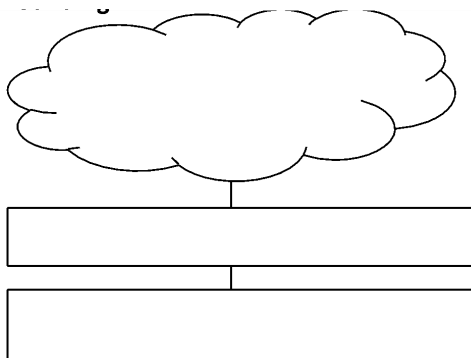
5) The two major asphyxiant gases are ① _____ and ② _____.

- 6) Smoke is an unwanted by-product of fire. It occurs during ① _____ combustion, which is when there is not enough ② _____ to burn the fuel completely.
- 7) Flammable liquids are those that have an ignition temperature of less than _____ degree centigrade.
- 8) The best way to extinguish a Class B fire is to use a _____ fire extinguisher.
- 9) Flammable gases such as ① _____, ② _____ and ③ _____ gases have the potential to create an explosion, if triggered by a single spark.
- 10) The LEL states the ① _____ concentration of flammable gas that will burn in air. This is usually around ② _____ percent.

Topic 3 : Smoke Hazards

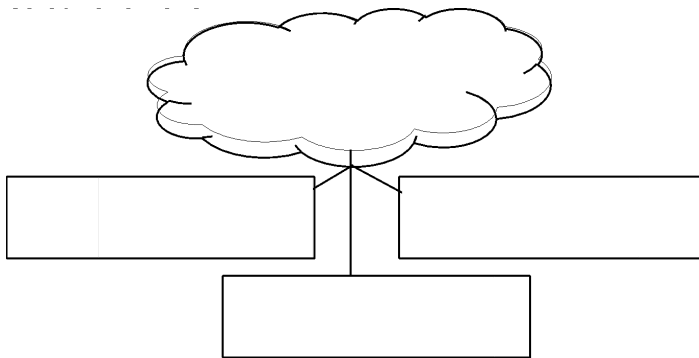
Fill in the blanks

- 1) _____ times more fire victims die from the effects of smoke and gas than from flames.
- 2) Fill in the empty boxes in the diagram below



- 3) The only possible way to ensure complete fire safety of a building's environment, without the consideration of ① _____ toxicity, would be to prescribe the use of only ② _____ products.

- 4) To avoid excessive smoke inhalation, which can cause health problems besides death, during a fire, you should ①_____ and ②_____.
- 5) An important factor in predicting fire behaviour is the colour of the smoke emitted. Fill in the boxes in the diagram below.



- 6) What is Smoke is made up of ?
- ① _____ ③ _____
- ② _____
- 7) All solid materials normally give off _____ smoke when first heated.
- 8) At times, black smoke can be a sign that ①_____ material is the thing burning, like ②_____.
- 9) Grey smoke can mean that the fire is _____.
- 10) There is no connection whatsoever between the colour of the smoke and the risk of flashovers. Is this statement true or false?
- Tick the appropriate box True False

Topic 4: Dangerous Goods and Hazardous materials

1) Name the nine (9) classes of dangerous goods.

Class 1: _____ Class 6: _____

Class 2: _____ Class 7: _____

Class 3: _____ Class 8: _____

Class 4: _____ Class 9: _____

Class 5: _____

2) Hazardous substances may cause immediate or long-term health effects. Exposure could result in:

① _____ ⑤ _____

② _____ ⑥ _____

③ _____ ⑦ _____

④ _____

3) Class 1.6: Explosives are: _____
_____.

4) Class 6.2: Biohazardous substances; World Health Organization (WHO) divides this class into two categories. Category A: ① _____; and Category B: ② _____
_____.

5) Toxic substances which are liable to cause death or serious injury to human health if inhaled, swallowed or by skin absorption, such as ① _____,
② _____.

6) Class 9, Miscellaneous dangerous goods are substances and articles which during transport presents _____.

- 7) Packing groups are used to determine the degree of protective packaging required for dangerous goods during transportation. Group I presents ①_____.
_____. Some combinations of different classes of dangerous goods on the same vehicle or in the same container are forbidden if one of the goods is Group ②_____.
- 8) The number leading the EAC indicates the type of fire-extinguishing agent that should be used to prevent or extinguish a fire caused by the chemical. The number One (1) indicates that the agent used should be ①_____ and the number Two (2), indicates ②_____ should be used.

- 9) The picture on the right shows a Hazchem Warning Plate System. Explain to us what the sections on the plate refers to:



Top-left : _____

Middle-left: _____

Lower-left : _____

- 10) Occupational Safety and Health Act of 1994 (Act 514) require an employer to:
