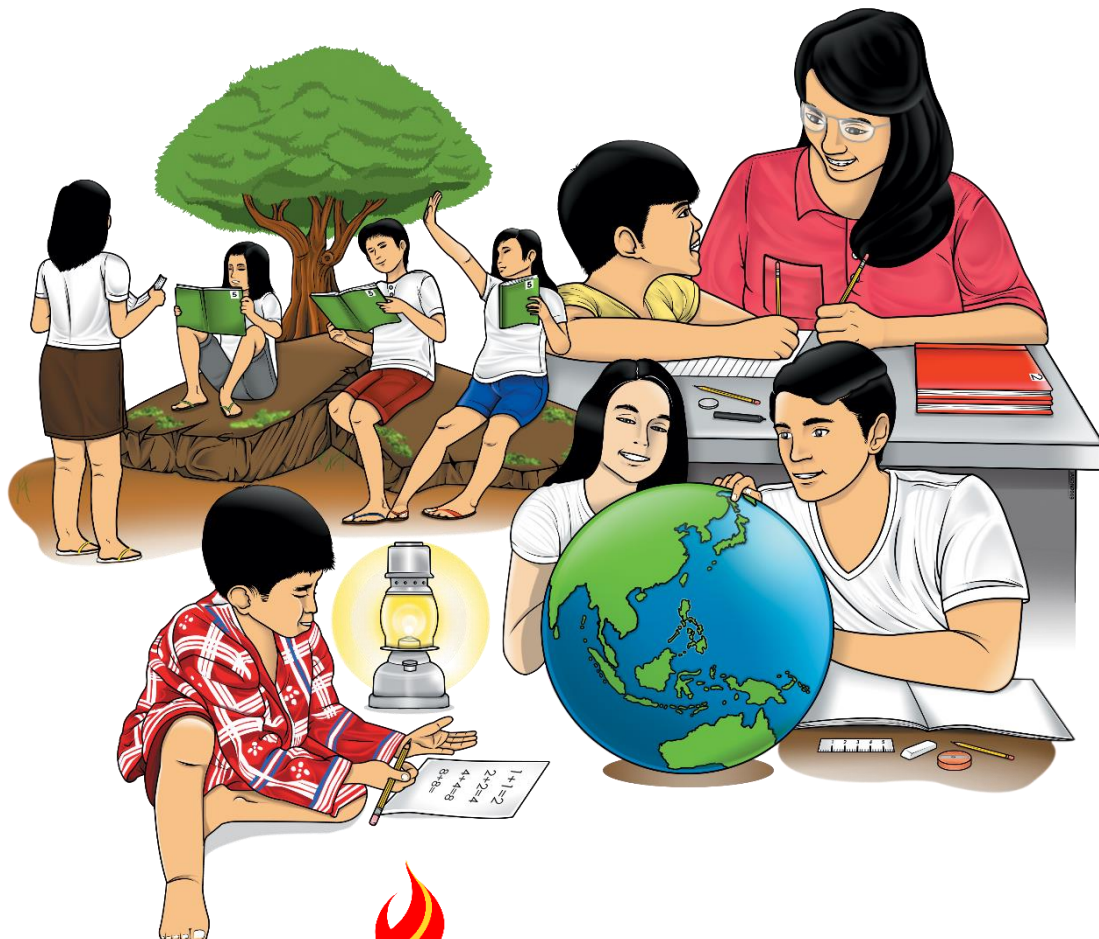


Disaster Readiness and Risk Reduction

Quarter 2 – Module 10: Fire Hazards: Concepts and Causes



Disaster Readiness and Risk Reduction
Alternative Delivery Mode
Quarter 2 – Module 10: Fire Hazards: Concepts and Causes
First Edition, 2021

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Disaster Readiness and Risk Reduction

Quarter 2 – Module 10: Fire Hazards: Concepts and Causes

Introductory Message

This Self-Learning Module (SLM) is prepared so that you, our dear learners, can continue your studies and learn while at home. Activities, questions, directions, exercises, and discussions are carefully stated for you to understand each lesson.

Each SLM is composed of different parts. Each part shall guide you step-by-step as you discover and understand the lesson prepared for you.

Pre-tests are provided to measure your prior knowledge on lessons in each SLM. This will tell you if you need to proceed on completing this module or if you need to ask your facilitator or your teacher's assistance for better understanding of the lesson. At the end of each module, you need to answer the post-test to self-check your learning. Answer keys are provided for each activity and test. We trust that you will be honest in using these.

In addition to the material in the main text, Notes to the Teacher are also provided to our facilitators and parents for strategies and reminders on how they can best help you on your home-based learning.

Please use this module with care. Do not put unnecessary marks on any part of this SLM. Use a separate sheet of paper in answering the exercises and tests. And read the instructions carefully before performing each task.

If you have any questions in using this SLM or any difficulty in answering the tasks in this module, do not hesitate to consult your teacher or facilitator.

Thank you.



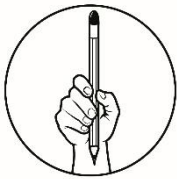
What I Need to Know

In this module, the learner will be able to know the different causes of fire and to analyze how these factors can trigger fire and pose danger to the community. By knowing the different causes of fire, the community will be able to plan and prevent fire or lessen the severity of its effect. The learners will also learn how to distinguish natural cause from human made cause of fire.

The module is intended to equip you with knowledge concerning fire and its causes.

After going through this module, you are expected to:

1. identify and define the different causes of fire;
2. understand and determine the difference between natural and human-made causes of fire;
3. be observant at all times to avoid natural or human made cause of fire; and
4. apply and suggest ways to prevent man-made causes of fire.



What I Know

Choose the letter of the best answer. Write the chosen letter on a separate sheet of paper.

1. Among the given causes of fire, which of these is **NOT** a product of human error?
 - a. gas leaks
 - b. faulty electrical wirings
 - c. unattended ignition sources
 - d. lightning
2. Which of the following may NOT be a cause of fire?
 - a. animal activities
 - b. natural phenomenon
 - c. amount of heat decreased
 - d. change of weather condition

3. It is the main reason why kitchen fires are the most common type of fire at home.
 - a. Stoves are dangerous.
 - b. Cooking is left unattended.
 - c. Children tend to knock things over
 - d. Smoke alarms are not installed in kitchen.
4. The following can cause fire incidents due to spontaneous combustion EXCEPT_____.
 - a. stacked grasses undergo bacterial fermentation
 - b. burning of dried leaves in the garden
 - c. dried hay stacked together in the barn
 - d. greased clothes left in the garage
5. Which of the following is not a cause of wildfire or grassfire?
 - a. improper disposal of lit cigarettes
 - b. use of electronic chainsaw in cutting trees
 - c. letting the animals graze in the dried grasses
 - d. pyroclastic materials from the volcanoes getting in contact with a nipa hut
6. Cigarettes can cause fire when _____.
 - a. it radiates heat
 - b. it is being rubbed together
 - c. it is carelessly thrown away
 - d. it undergoes spontaneous combustion
7. The following are improper handling of electric cords EXCEPT_____.
 - a. should be immersed in water while plugged in
 - b. should be hang up by the cord when not in use
 - c. should be covered with towels or blankets all the time
 - d. should be thrown away when the cord is cracked, frayed or discolored
8. Spontaneous combustion can occur when_____.
 - a. grease is used for cooking
 - b. portable heaters tip over on a carpet
 - c. candles are used without a glass cover
 - d. oil-soaked rags are left clumped together
9. The following can be the most common causes of household fires EXCEPT_____.
 - a. candles
 - b. stacks of hay
 - c. faulty wirings
 - d. curious children

10. Where is the safest place to store matches at home?
- in the playroom
 - on the coffee table
 - in a locked cabinet
 - in the drawer near the stove
11. The following events are human-error-induced fire EXCEPT_____.
- leaking LPG tank
 - electrical overload
 - grassfire due to drought
 - burning candle near curtains
12. Determine which event is due to machine error.
- | | |
|------------------------|--------------------------------|
| I. electrical overload | III. smoking in the bedroom |
| II. leaking LPG tank | IV. unattended burning griller |
- I and II
 - I and III
 - III and IV
 - II only
13. High rise buildings are built in with lightning rod, a metal wherein its tip is found on top of the building while its bottom part is embedded into the ground. What is the main purpose of the rod?
- to avoid lightning
 - to prevent electrical overload
 - to lessen the lightning that would strike the building.
 - to prevent fire due to lightning when it hits the building
14. Determine which event is due to human error.
- | | |
|------------------------|--------------------------------|
| I. electrical overload | III. smoking in the bedroom |
| II. leaking LPG tank | IV. unattended burning griller |
- I and II
 - I and III
 - III and IV
 - II and IV
15. What part of the house is the most vulnerable to fire hazard?
- kitchen
 - bedroom
 - dining area
 - comfort room

Lesson 1

Analyze the Different Causes of Fire

In this lesson you will be able to understand that fire incidents can be caused by natural phenomena or man-made incidents. Natural phenomena such as lightning that strikes any combustible material and even volcanic activities could cause fire. While man-made causes of fire are those products of human errors or machine failures.



What's In

Direction: Take look at the given illustrations/images about fire hazards below. Identify 3 fuel sources and 3 ignition or heat sources. Write the answers on the table given for each illustration. Place your answer on a separate sheet of paper.



IMAGE 1

SPOT THE HAZARDS, *Occupational Health and Safety*, Ghana, June 2014,
https://jojoesafety.files.wordpress.com/2014/06/1_spotthehazards.gif

Source of Fuel	Source of ignition/heat



IMAGE 2

“BRITS 'PLATING WITH FIRE' By Overloading Sockets And Abandoning Burning Candles, *SWNS Digital*, November 4, 2016, <https://www.swnsdigital.com/2016/11/brits-playing-with-fire-by-overloading-sockets-and-abandoning-burning-candles/>

Source of Fuel	Source of ignition/heat



IMAGE 3

“FIRE SAFETY FOR SCHOOLS AND COLLEGES”, Realsense, Date Accessed: June 9, 2020, <https://www.realsense-learning.co.uk/courses-health-safety-environment-hr-scorm/courses/fire-safety-schools>

Source of Fuel	Source of ignition/heat



IMAGE 4

Bernd, Lee, “DRIED GRASS UNDER BLUE SKY”, *Unsplash*, November 14, 2018, <https://unsplash.com/photos/GATT5vvEbGw>

Source of Fuel	Source of ignition/heat



Notes to the Teacher

There are several possible answers. Consider answers that are relevant to the questions and could have been a possible answer but not included in the answer key.



What's New

Direction: Answer the following questions. Write your answer on a separate sheet.

1. How can you say your house is safe or not from fire hazard?

2. List down at least 10 possible causes of house fires.

3. Based from your answers in number 2, which do you think is caused by:

3.1. human error

3.2. machine error

3.3. nature



What is It

Fire may start due to natural cause or human-made incidents.

I. Natural causes of fire such as:

- A. **Lightning** that strikes any combustible material which can set trees on fire that might eventually result to forest fire or wildfire. This is the most common natural cause of fire.
- B. **Volcanic activities** could also cause fire. During volcanic activity, it spews hot gases, ash and lava and when these hot materials get in contact with flammable materials it might start a wildfire.
- C. **Spontaneous combustion** is another natural cause of fire. This happens when a hydrocarbon substance unexpectedly creates fire without apparent cause. Pyrophoric substances ignite spontaneously in air at or below 54°C or within 5 minutes after getting into contact with air. Examples of pyrophoric substances are iron sulfide, plutonium and uranium.

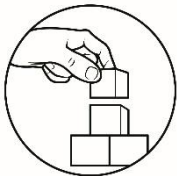
Sometimes, it is also due to combustion of dry fuel such as sawdust, dried leaves and grasses. Spontaneous combustion can arise in the presence of substances with low ignition temperature (requires a not too high temperature to be ignited) like hay, straw and other types of grasses. When these dried grasses stacked together, it releases heat and in the presence of oxygen and moisture or even bacterial fermentation will spontaneously produce fire.

- II. Human-made causes of fire are those products of human errors or machine failures. Wildfires or forest fires caused by human activities such as machinery sparks when cutting logs in the forest, cast-away cigarette butts in dried grasses and sometimes due to kaingin or even arson (human inflicted fire by directly setting the area to burn).

Housefire is a fire incident that is generally caused by human and machine error. The following are common causes of housefire:

- 1. **Cooking equipment.** Pots and pans can be overheated when a person gets distracted while cooking or leaves cooking unattended. This is the most common cause of housefire.
- 2. **Heaters.** Portable heaters can cause fire when it is placed near objects that can easily burn like curtains and laundry clothes.

3. **Smoking in bedrooms.** A cigarette that is not put out properly can cause fire as the cigarette butts can continuously burn in a few hours. It can also immediately cause fire when get in contact with flammable materials.
4. **Candles.** It is not actually a hazard but when left unattended it can easily burst into flames and cause fire.
5. **Curious children.** Kids can sometimes cause fire out of curiosity, so they wanted to see what would happen if they set fire to an object.
6. **Faulty wiring.** Homes with insufficient wiring can cause fires from electrical hazard. Signs that you can observe if you have faulty wirings are: lights dim if you use another appliance; for an appliance to work, you have to disconnect another; and fuse blow or trip the circuit breaker frequently.
7. **Barbeques.** This is a great outdoor activity or one of the famous street foods in the Philippines. Avoid doing this activity near tablecloths, trees or even plants.
8. **Flammable liquids.** Petrol, kerosene or other methylated substances are the most common flammable liquids found at home that can cause fire if not properly stored. Always store in cool, dry place.
9. **Lighting.** Lamp shades and light fittings can build heat if they are very close to light bulbs. Too much heat can eventually ignite the materials and result to fire incident.



What's More

Direction: Identify the following scenario whether the cause of fire is Natural or Human caused. Write N for natural and H for human caused.

1. Burning tree because it is struck by lightning.
2. Dried grass burned due to cigarette butt.
3. Leakage of LPG that might lead to explosion.
4. Charging of phones on top of the bed.
5. Forest fire due to absence of rain during El Niño Phenomenon.
6. Unattended grilling of chicken
7. Overheated car engine.
8. Farmland burned due to pyroclastic flow of volcanic rocks.
9. Burning candles left on top of the bookshelves.
10. Children playing with a lighter that they found on top of the coffee table.



What I Have Learned

Direction: Read the news clip about Ozone Disco and answer the questions given below. Write your answers on a separate sheet of paper.

Remember the 1996 Ozone Disco fire?

MANILA, Philippines (UPDATED) – What was supposed to be a fun night for most students and some professionals who went to Ozone Disco in Quezon City 21 years ago, turned out to be the greatest tragedy of their lives.

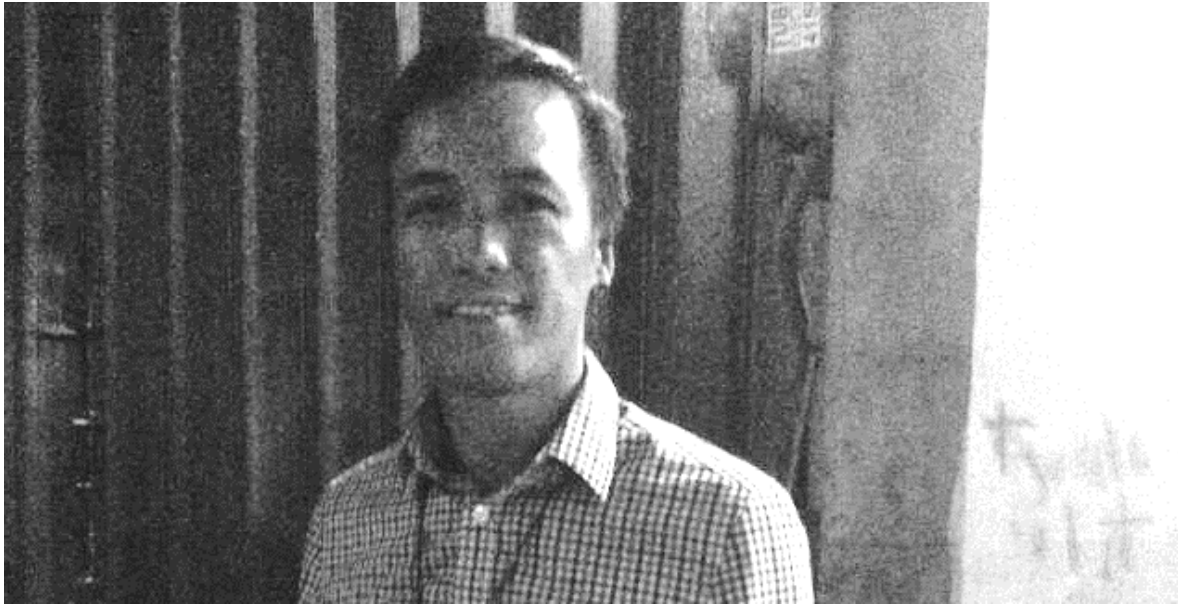
It was on a Monday night of March 18, 1996, when most students were celebrating the end of their classes, that Ozone Disco Club offered a 50% discount promo for guests.

But for Jhunie Mallari, a dancer and a regular customer of the disco back then, it was supposed to be a normal party with his cousin and dance group.

It was indeed an unusual night as the disco club was jam-packed. There were more than 300 people there, when the room could only accommodate about a hundred.



DISCO INFERNO. In this file photo, firefighters and investigators inspect the debris-strewn dance floor following a deadly fire which turned the packed Ozone Disco into an inferno, killing over 150 teenagers in 1996. File photo by Agence France-Presse



SURVIVOR. Jhunie Mallari is among the 93 survivors of the Ozone Disco Fire. Photo by Gwen de la Cruz/Rappler

He was on a ledge just in front of the DJ's booth dancing along with his friends, unaware of the tragedy that was about to happen.

Shortly before midnight, there was a spark at the booth. Then a fire broke and spread through the ceiling.

While some people thought it was part of the disco's "special effects", Mallari already knew something was wrong.

Someone shouted there was a fire. Then there was commotion.

He jumped and rushed towards the door, which was already full of people trying to get out of the room.

The fire engulfed the whole room really fast, he said. And as people tried pushing their way through the door, the harder it was to get out because the door could only be opened inwards.

"Nakikipagsiksikan ako. Hanggang sa hindi ko na kaya, huminto na kami kasi hindi na... trapped na kami," he said. (I pushed myself through the thick crowd until I couldn't anymore. We stopped because we were already trapped.)

Dela Cruz, Gwen. "Remember the 1996 Ozone Disco fire?" Rappler, March 21, 2015.
<https://www.rappler.com/move-ph/issues/disasters/knowledge-base/87521-1996-ozone-disco-club-fire>.

Questions:

1. The incident is evidently a fire caused by human. Is that human error or an error in the machine /facility? Explain your answer.

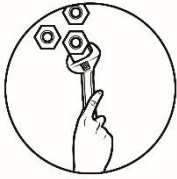
2. Recognize the fire triangle in this incident and illustrate it.



3. Is this kind of incident can be prevented? How?

4. If you belong to the group of victims that were able to survive, what do you think are the reasons why they were able to escape from the fire incident?

5. What are the lessons did you learn after reading the news clip that can be helpful for you if in case you meet an accident similar to the Ozone Disco Tragedy?



What I Can Do

Bahay Mo Ba 'To?

Direction: Study the structure of your house and answer the following questions.

1. Do you think your house is fire resistant or not? Yes or No? Explain your answer.

2. What are the things you would add to improve fire safety in your house?

3. What are the things that you need to reduce/remove to make it free from fire hazard?

4. If there is a part of your house that needs restructuring, what would it be? Explain your answer.



Assessment

Choose the letter of the best answer. Write the chosen letter on a separate sheet of paper.

1. The following events are human-error-induced fire EXCEPT _____.
 - a. leaking LPG tank
 - b. electrical overload
 - c. grassfire due to drought
 - d. burning candle near curtains

2. Determine which event is due to machine error.

I. Electrical overload	III. Smoking in the bedroom
II. Leaking LPG tank	IV. Unattended burning griller

 - a. II only
 - b. I and III
 - c. III and IV
 - d. II and IV

3. High rise buildings are built in with lightning rod, a metal wherein its tip is found on top of the building while its bottom part is embedded into the ground. What is the main purpose of the rod?
 - a. to avoid lightning
 - b. to prevent electrical overload
 - c. to lessen the lightning that would strike the building
 - d. to prevent fire due to lightning when it hits the building

4. Determine which event is due to human error.

I. Electrical overload	III. Smoking in the bedroom
II. Leaking LPG tank	IV. Unattended burning griller

 - a. I and II
 - b. I and III
 - c. III and IV
 - d. II and IV

5. What part is the most vulnerable to fire hazard?
 - a. kitchen
 - b. bedroom
 - c. dining area
 - d. comfort room

6. Among the given causes of fire, which of these is **NOT** a product of human error?
- gas leaks
 - faulty electrical wirings
 - low condition motor vehicles
 - lightning
7. Which of the following may NOT be a cause of fire?
- amount of heat
 - animal activities
 - change of weather condition
 - natural phenomena
8. It is the main reason why kitchen fire is the most common type of fire at home.
- stoves are dangerous
 - cooking is left unattended
 - children tend to knock things over
 - smoke alarms are not installed in kitchen
9. The following can cause fire incidents due to spontaneous combustion EXCEPT_____.
- greased clothes left in the garage
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14. The following can be the most common causes of household fires EXCEPT_____.
- a. candles
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 - d. curious children
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- a. in the playroom
 - b. on the coffee table
 - c. in a locked cabinet
 - d. in the drawer near the stove.

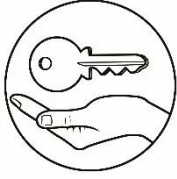


Additional Activities

They always say that “your best friend could be sometimes your best enemy,” the same is true with fire. Fire is considerably a best friend of human race but once fire is not controlled, it could be one of our worst enemies. Disaster is a product of carelessness, so you take great responsibility when dealing with fire as you take care of your best friend and all your loved ones. How can you deal with fire as you take care of your best friend or love ones? Complete the table.

I can deal with fire just like how I take care of my friend or love ones by

Because



Answer Key

What I Know	1. D 2. C 3. B 4. D 5. C 6. C 7. D 8. D 9. B 10. C 11. C 12. D 13. D 14. C 15. A
What's More	1. N 2. H 3. H 4. H 5. N 6. H 7. H 8. N 9. H 10. H
Assessment	1. C 2. A 3. D 4. C 5. A 6. D 7. B 8. B 9. A 10. C 11. C 12. D 13. D 14. D 15. C

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