

# Disaster Readiness and Risk Reduction

## Quarter 2 – Module 11: Fire Hazards and Related Concepts



**Disaster Readiness and Risk Reduction  
Alternative Delivery Mode  
Quarter 2 – Module 11: Fire Hazards and Related Concepts  
First Edition, 2021**

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Published by the Department of Education  
Secretary: Leonor Magtolis Briones  
Undersecretary: Diosdado M. San Antonio

**Development Team of the Module**

<b>Writers:</b>	Melencia Rosario D. Coronel
<b>Editors:</b>	Aries B. Manalo Riza Mae S. Sanchez
<b>Reviewers:</b>	Desiree D. Vista
<b>Illustrator:</b>	Leumel M. Cadapan; Jomar D. Flores; Delle Celeste M. Sepagan Romalyn D. Rana; Yumi Angela S. Santos
<b>Layout Artist:</b>	Dyessa Jane P. Calderon; Ma. Elinor E. Hemedes Ren Mac Mac G. Motas
<b>Management Team:</b>	Francis Cesar B. Bringas Job S. Zape Jr. Eugenio S. Adrao Elaine T. Balaogan Fe M. Ong-ongowan Susan DL Oribiana Jaypee E Lopo Dolorosa S. De Castro Cristeta M. Arcos

Printed in the Philippines by \_\_\_\_\_

**Department of Education – Region IV-A CALABARZON**

Office Address: Gate 2 Karangalan Village, Barangay San Isidro  
Cainta, Rizal 1800  
Telefax: 02-8682-5773/8684-4914/8647-7487  
E-mail Address: region4a@deped.gov.ph

# **Disaster Readiness and Risk Reduction**

**Quarter 2 – Module 11:**

**Fire Hazards and  
Related Concepts**

## **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 ways on how to prevent fire incidents and how to escape if it is already happening.

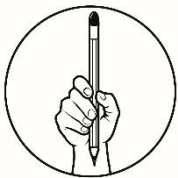
After learning all the process of preventing fire incidents, the learner will be able to formulate an escape plan.

The module comprises one lesson:

Observe precautionary measures and proper procedures in addressing a fire incident. **DRR11/12-II-e-f-39**

After going through this module, you are expected to:

1. identify precautionary measures to prevent fire incidents;
2. describe the different control or preventive measures in order to be prepared during fire incidents; and
3. create a contingency plan for the family.



## ***What I Know***

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

1. Smoke alarms can be very useful when\_\_\_\_\_.
  - A. It is properly working.
  - B. If you keep a working battery in them
  - C. Tested every month to ensure they are working
  - D. All of the above
2. Replace power strip electrical cords when\_\_\_\_\_.
  - A. You've used every outlet on them.
  - B. They show any sign of discoloring.
  - C. You change your smoke alarm battery.
  - D. They have been on the floor for more than a month.

3. What is prevention?
  - A. Supervising safety at work
  - B. Extending help during the event
  - C. Taking precautions to reduce risks
  - D. Investigating accidents and incidents
  
4. What must be present in an analysis of a task that involves risks?
  - A. An action plans for taking precautions
  - B. The time dedicated in preparing the report
  - C. The empathy of the employer and provision of hazard pay
  - D. Assessment of the risks together with preventive measures
  
5. What is the main cause of accidents in a workplace?
  - A. Lack of hazard benefits
  - B. Lack of financial resources
  - C. Lack of precautionary measures
  - D. Lack of support from the employers
  
6. What is most likely the cause of tripping?
  - A. Too little lighting
  - B. Reduction of a person's vision
  - C. Loose objects on the work floor
  - D. Absence of protective personal equipment
  
7. What colors are used on signs for firefighting equipment?
  - A. Black pictogram on a yellow background
  - B. Black pictogram on a red background
  - C. White pictogram on a green background
  - D. White pictogram on a red background
  
8. What shape does warning sign have?
  - A. Diamond
  - B. Rectangular
  - C. Round
  - D. Triangular
  
9. What is needed to allow a fire to happen?
  - A. Oxygen, a catalyst and a correct mixture ratio
  - B. Oxygen, flammable substance and ignition energy
  - C. A catalyst and ignition source that come in contact
  - D. Flammable substance, carbon dioxide and ignition button

10. What should you do first if you discover that your house is on fire?
- A. Ensure your safety.
  - B. Open the doors and windows.
  - C. Warn all your family members.
  - D. Call the Bureau of Fire Protection.
11. Why you should not use water to extinguish fire all the time?
- A. Extinguishing with water is comparatively dangerous.
  - B. The burning substance may react with water violently.
  - C. Water may not be present where fire accident is happening.
  - D. Firefighters might have a problem in dealing with smoke produced.
12. Class A fire can be put out by the following EXCEPT\_\_\_\_\_.
- A. Carbon dioxide
  - B. Dry chemicals
  - C. Water and foam
  - D. Wet chemicals
13. What chemical should be used when Class K fire accidents occur?
- A. Carbon dioxide
  - B. Dry chemicals
  - C. Water and foam
  - D. Wet chemicals
14. Fire accidents caused by paint and oil can be put out by the following EXCEPT\_\_\_\_\_.
- A. Carbon dioxide
  - B. Clean agent
  - C. Dry chemical
  - D. Dry powder
15. What does BLUE color sign mean in Fire Safety Signs?
- A. Fire exit
  - B. Firefighting equipment
  - C. Mandatory action
  - D. Prohibition

**Lesson**  
**1**

**Precautionary Measures and  
Proper Procedures in  
Addressing a Fire Incident**

This lesson will provide knowledge on how to make precautionary measures to prevent fire incidents at home, school and workplace. It is also necessary to learn the types of fire, what type of fire extinguisher is appropriate for every types of fire and some fire safety signs. Having all these knowledge, the learner will be equipped to avoid fire incidents and prevent further injuries during the event.



***What's In***

“Fire is a good servant but a bad master”. It can be controlled and prevented but when it takes over and causes fire it will result to a massive damage to lives and properties.

List 5 measures that can be taken to prevent fire in terms of the fire triangle.

1. To prevent ignition

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2. To reduce the risk associated with the source of fuel

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3. To reduce the risk associated with the source of oxygen

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***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.



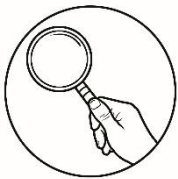
***What's New***

**Suspect and Inspect, But Do Not Neglect!**

Most of the incidents caused by fire are due to inability of the family or the community to prepare for the possibility. To make our family prepared we should start to assess our house and identify things that can be hazardous that might result to fire incident.

Tour around your house and take note of the things that you think are necessary to be considered as fire hazard or not. Then fill up the table provided. If compliant put check on “yes”, if non-compliant put check on “no” and explain what can be done to remedy the problem.

<b>Observation</b>	<b>Yes</b>	<b>No</b>	<b>What can be done?</b>
Do family members know what to do in the event of fire?			
Did the family members have a scape plan?			
Do you have suitable facility for storage of flammable materials?			
Are all sources of heat like electric heaters switched off when not in use?			
Are wastes removed regularly and stored away from your house?			
Are escape route visible and with signs?			
Are all paths, stairs and emergency route free of obstructions?			
Do your doors can be opened outward?			
Did you designate a family meeting place in case of fire event?			
Do all family members know about the meeting place?			



## ***What is It***

There is a saying that “It is better to be robbed than to lose all your belongings or assets because of fire incident.” In order to prevent this from happening, you should know the main cause of fire and fire hazards and to learn how to deal with it. From this knowledge you are now equipped to make a contingency plan for your family and community.

### **1. Cooking Safety**

Cooking is the #1 cause of home fires, and unattended cooking is the top contributing factor (Bitonio 2013). Since kitchen is the most used part of the house and is most vulnerable to fire, it is very important to know the most appropriate actions to be done when kitchen fire starts.

Many cooking fire injuries occur when people respond to kitchen fires with inappropriate actions.

These are the following things to do and not to do in dealing with cooking fire:

*Things to do to prevent cooking fire:*

- Do not leave your cooking unattended.
- Keep handles of pots and pans turned in.
- Don't put anything that catches fire near your stove or burner.

*Things to do to control cooking fire:*

- Cover the fire by placing a lid over the pan.
- Turn off the burner or stove.
- In case of oven fire, turn off the heat and keep the door closed.
- In case of microwave fire, unplug the power source and keep the door closed.

## **2. Cigarettes**

Cigarettes are the leading causes of fire deaths in city, state, and national level (Bitonio 2013). The fire victims include not only the smokers but their families, friends and neighbors. Mostly, cigarette fires are due to improper disposal of cigarette butts that are still lit. Normally, it will start outdoor then spread out until it reaches some structures nearby. In some cases, house fire due to cigarettes is caused by human negligence like falling asleep while smoking or smoking near flammable materials.

Fires from smoking material can be prevented by following these tips:

- Do not smoke in bed or anywhere that you might fall asleep.
- If you smoke, do it outside.
- Do not discard cigarettes in potted plants, landscaping vegetation or bark dust – they can easily catch fire.
- Use a deep, sturdy ashtray or a non-combustible container that cannot be tipped over.
- Before throwing away butts or ashes, douse in water or sand.
- Never smoke in a home where oxygen is used.

## **3. Electrical Safety**

Electrical problem is one of the causes of structure fires and fire deaths. Fire incidents due to electrical wiring are caused by faulty wiring and faulty equipment or appliances.

Fires caused by electric can be prevented by the following appropriate actions.

- Avoid overloading outlets. One outlet is to one high-wattage appliance at a time.
- Don't use an extension cord with a major appliance like television, air conditioner and refrigerator. Plug it in a major power outlet.
- In case a fuse blows or a circuit breaker trips often, light became dim, or outlets or switches became heated, call a qualified electrician to inspect and fix the problem.
- Before using a lamp bulb check the box or label first; the wattage of the bulb should match the recommendation set by the lamp manufacturer.
- Power strips with circuit breakers can be useful tools to temporarily plug several items into an electrical outlet, but if used incorrectly they can cause a fire. The use of power strips and multi-plug outlets increases the draw of electricity through your home's wiring. Before creating additional electrical demand, ensure that your wiring is in good repair and capable of carrying the additional load (Bitonio 2013).
- Make sure your home has ground fault circuit interrupters (GFCIs) in the kitchen, bathroom(s), laundry, basement, and outdoor areas, to reduce the risk of electric shock (Bitonio 2013).
- Arc-fault circuit interrupters (AFCIs) should be installed in your home to protect electrical outlets, and prevent fires due to arcing (Bitonio 2013).
- Do not place extension cords under carpets or mattresses because it will heat up and cause fire.
- Do regular checking of electrical cords and replace immediately if damaged.

#### **4. Candle Safety**

During brown out or power outage, candles are the most popular source of light because it is always available even in sari-sari stores.

The following are the safety tips on how to prevent candle fire from happening.

- Use candle holders that are stable to prevent the candle from falling into the floor or near something that is flammable or easily burn.
- Keep candles at least 12 inches away from anything that can burn.
- Blow out candles when you leave the room or go to bed; avoid the use of candles in rooms where people may fall asleep.
- Never burn a candle if medical oxygen or any flammable substance is nearby.











#### **5. Spontaneous Combustion**

Spontaneous combustion happens when a material can produce or accumulate its own heat and can cause increase in temperature without drawing heat from its surroundings. If the material reaches its ignition temperature, it will start to burn without any source of fire and that is called spontaneous combustion. Examples of materials that are prone to spontaneous combustion include: oily rags, hay, and other agricultural products (Bitonio 2013).

In house fires, oily rags are the most common item ignited by spontaneous combustion and the garage is the most common area of fire origin (Bitonio 2103). Oily rags left clumped together can heat up and catch fire. To prevent these fires at home, store oily rags in non-combustible (e.g. metal) container with lid closed. Prior to disposal, soak rags in water then spread them out in a safe outdoor area to dry.

There are different types of fire and should be controlled differently when trying to extinguish. Some chemicals that can extinguish one type of fire can cause violent reaction when used with other types. One good example is, when fire is caused by faulty electrical wirings, water and foam could create some explosions or can increase the intensity of fire.

The table below shows the classification of fire and their respective sources and symbols.

Classes of Fire	Sources of Fire	Symbol	Pictogram
A	wood, paper, cloth, trash and other ordinary materials		
B	gasoline, oil, paint and other flammable liquids		
C	live electrical equipment or wirings		
D	combustible metals and combustible metal alloys		
K	cooking media (vegetable or animal oils and fats)		

Source: Learn about portable fire extinguishers, June 8, 2017, Connected Fire Safety Services, Accessed June 14, 2020, Retrieved from <https://connectedfire.com/index.php/16892-017/06/08/portable-fire-extinguishers-101>

Before using a fire extinguisher, examine the label first to determine whether it can be used to the class of fire you are dealing with.

## **Types of Fire Extinguisher**

1. Water and Foam – only used to put out class A fires
2. Carbon Dioxide – can be used to put out class B and C fires
3. Dry Chemical – can be used to put out class A, B and C fires
4. Wet Chemical – can be used to put out class A and K fires
5. Clean Agent – also known as halogenated extinguishers, can be used to put out class A, B and C fires
6. Dry Powder – only used to put out class D fires
7. Water Mist - can be used to put out class A and C fires











## **Fire Safety Signs**

Fire safety signs are color coded for easier identification and determination which is mandatory and which should be avoided. It is very important to be knowledgeable or to be familiar with the color and the corresponding meaning of the picture presented.

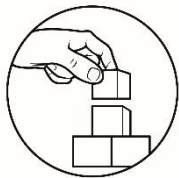
Fire exit signs are colored green and white as this color combination means a safe condition. Normally fire exit signs show rapidly walking man and an arrow. However, some fire exit signs just show 'fire exit' text in lower case letters.

Blue fire safety signs are used to indicate a mandatory action or a must do action. These blue signs mean that you need to do the appropriate action for your safety. Blue fire safety signs are circular in shape and feature a white graphic or white text.

Red fire safety signs are used to indicate prohibition or you must not go on that location because it might pose danger or harm. It also signifies the location of fire equipment and supplementary information. When it means prohibition, it is circular with a red border, white background and black image. Fire equipment signs are square with red background and white images and are used to tell you where to find the location of fire-fighting equipment.

COLORS	GEOMETRIC SHAPE	MEANING	PICTOGRAM COLOR
		Fire-fighting equipment	White
		Safe condition	White
		Prohibition	Black
		Warning	Black
		Mandatory	White

**Source:** Learn about portable fire extinguishers, June 8, 2017, *Connected Fire Safety Services*, Accessed June 14, 2020, Retrieved from <https://connectedfire.com/index.php/blog/2017/06/08/portable-fire-extinguishers-101>



## ***What's More***

### **Safety Ever, Fires Never!**

True or False. Write TRUE if the sentence is an appropriate action during fire event or a precautionary measure and FALSE if otherwise.

1. Smoking should not be done inside the bedroom.
2. Burning pan should not be covered with lid, instead pour water.
3. Oily rags can undergo spontaneous combustion, so store it in a cool and dry place.
4. Use extension cord for your television when it is too far from the main outlet.
5. Candles should be placed near the windows with curtains so that it will light brightly.

6. To look for firefighting equipment in an establishment, look for a square or rectangular signage with white pictogram in a red background.
7. In case of fire, you may not follow the circular signage with white pictogram in a blue background.
8. Fire exit can be color red or green depending on the establishment.
9. Class A fires can be put out by carbon dioxide.
10. During microwave fire, the best thing to do is unplug or cut off the power and do not open the door or the windows.

Direction: Identify the class of fire and what type of extinguisher should be used.

Source of fire	Classes of fire	Fire extinguisher
11. Petroleum		
12. Wood		
13. Electrical wiring		
14. Cooking oil		
15. Frying pan		



## ***What I Have Learned***

### **Fire Safety Inspection**

Complete the second column of the table by providing appropriate control measures to keep fire risk at an acceptable level.

Fire hazards	Control measures
Overflowing waste paper bins	
Leaking fire extinguisher in the main office.	



People smoking in the office	
Storage of cleaning materials in the kitchen	
The venue receives a lot of visitors that are unfamiliar with the premises	
One of the employees has hearing difficulties	
One employee is a polio victim and use crutches	
Matches and lighter are within children's reach	
Students were burning dried leaves near the school building	
No visible emergency exits for students, teachers and staff	

Questions:

1. Based from your answers in the table given, what do you think is the importance of identifying fire hazards?

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2. What are the bases of your answers from all the situations given?

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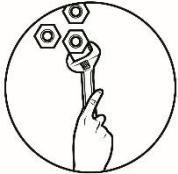
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3. Being familiar with your previous school, how will you warn your schoolmates regarding the fire hazards present and the appropriate preventive measures? Give at least 5 hazards and 5 preventive measures for every hazard.

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## ***What I Can Do***

### **My Own Contingency Plan**

If there will be an occurrence of fire in your residence, do you think that the members of your household are prepared and knowledgeable on what to do? Based from what you have learned about fire hazards, create your own **Contingency Plan** or household preparedness plan.

Use the space provided below.

<b>MY OWN CONTINGENCY PLAN</b>	
A. What to prepare:	C. What to remember in case fire:
<hr/> <hr/> <hr/> <hr/> <hr/> <hr/>	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/>
B. What to do in case of fire:	D. Where to go:
<hr/> <hr/> <hr/> <hr/> <hr/> <hr/>	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/>

<b>Rubrics</b>			
<b>Contingency Plan</b>	<b>Meets Expectations</b>	<b>Needs Improvement</b>	<b>Not Visible</b>
	<b>91%-100%</b>	<b>81%-90%</b>	<b>70%-80%</b>
	The plan created provides all the essential details, understandable, and realistic.	The plan created provides all the essential details but some points need to be clarified and not so realistic.	The plan created lacks almost all the necessary details needed (e.g. evacuation area, where to exit, even emergency hotlines)



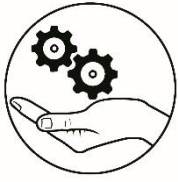
## **Assessment**

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

1. What is most likely the cause of tripping?
  - A. Too little lighting
  - B. Reduction of a person's vision
  - C. Loose objects on the work floor
  - D. Absence of protective personal equipment
  
2. What colors are used on signs for firefighting equipment?
  - A. Black pictogram on a yellow background
  - B. Black pictogram on a red background
  - C. White pictogram on a green background
  - D. White pictogram on a red background
  
3. What shape does warning sign have?
  - A. Diamond
  - B. Rectangular
  - C. Round
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4. What is needed to allow fire to happen?
  - A. Oxygen, a catalyst and a correct mixture ratio
  - B. Oxygen, flammable substance and ignition energy
  - C. A catalyst and ignition source that come in contact
  - D. Flammable substance, carbon dioxide and ignition button
  
5. What must you do first if you discover that your house is on fire?
  - A. Ensure your safety.
  - B. Open the doors and windows
  - C. Warn all your family members
  - D. Call the Bureau of Fire Protection
  
6. Smoke alarms can be very useful when\_\_\_\_\_
  - A. It is properly working.
  - B. If you keep a working battery in them
  - C. Tested every month to ensure they are working
  - D. All of the above
  
7. Replace power strip electrical cords when\_\_\_\_\_
  - A. You've used every outlet on them.
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  - D. They have been on the floor for more than a month.
  
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  - D. Lack of support from the employers

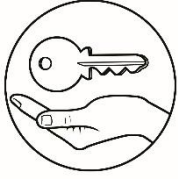
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  - B. The burning substance may react with water violently.
  - C. Water may not be present where fire accident is happening.
  - D. Firefighters might have a problem in dealing with smoke produced.
12. Class A fire can be put out by the following EXCEPT\_\_\_\_\_.
- A. Carbon dioxide
  - B. Dry chemicals
  - C. Water and foam
  - D. Wet chemicals
13. What chemical should be used when Class K fire accidents occur?
- A. Carbon dioxide
  - B. Dry chemicals
  - C. Water and foam
  - D. Wet chemicals
14. Fire accidents caused by paint and oil can be put out by the following EXCEPT\_\_\_\_\_.
- A. Carbon dioxide
  - B. Clean agent
  - C. Dry chemical
  - D. Dry powder
15. What does BLUE color sign mean in Fire Safety Signs?
- A. Fire exit
  - B. Firefighting equipment
  - C. Mandatory action
  - D. Prohibition



## ***Additional Activities***

Use the contingency plan you made in the activity “What can I do?”

1. Discuss your contingency plan with your family.
2. Let all the family members comment on your plan.
3. Revisions and improvements should be noted.
4. Let all the family members agree with your new or revised contingency plan. Let it be implemented.
5. Make the revised Contingency Plan using the format used in the activity “What can I do?”
6. Rubrics provided in the previous activity will be used again for the evaluation.



## **Answer Key**

<b>Assessment</b>	<b>What's More</b>	<b>What I Know</b>
1. C	1. TRUE	1. D
2. D	2. FALSE	2. B
3. D	3. TRUE	3. C
4. B	4. FALSE	4. D
5. C	5. FALSE	5. C
6. D	6. TRUE	6. C
7. B	7. FALSE	7. D
8. C	8. FALSE	8. D
9. D	9. FALSE	9. B
10. C	10. TRUE	10. C
11. B	11. B - CARBON DIOXIDE	11. B
12. A	12. A - WATER DIOXIDE	12. A
13. D	13. C - CARBON DIOXIDE	13. D
14. D	14. K - WET CHEMICAL DIOXIDE	14. D
15. C	15. D - DRY POWDER	15. C

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**For inquiries or feedback, please write or call:**

Department of Education - Bureau of Learning Resources (DepEd-BLR)

Ground Floor, Bonifacio Bldg., DepEd Complex  
Meralco Avenue, Pasig City, Philippines 1600

Telefax: (632) 8634-1072; 8634-1054; 8631-4985

Email Address: [blr.lrqad@deped.gov.ph](mailto:blr.lrqad@deped.gov.ph) \* [blr.lrpd@deped.gov.ph](mailto:blr.lrpd@deped.gov.ph)