

Disaster Readiness and Risk Reduction

First Quarter-Module 8

Concept and Types of Hazards

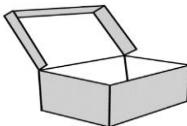


Jeofrey F. Robles



City of Good Character
DISCIPLINE • GOOD TASTE • EXCELLENCE

Government Property
NOT FOR SALE



What I Need to Know

This module was designed and written with you in mind. It is here to help you understand the concept and types of hazard. The scope of this module permits it to be used in many different learning situations. The language used recognizes the diverse vocabulary level of students.

The module includes only one lesson which is the Concept and Types of Hazards.

After going through this module, you are expected to **define and cite examples of the types of hazards. DRR11/12-Ie-14;DRR11/12-Ie-15**

Specifically, you should be able to

1. define hazard;
 2. identify the different types of hazards; and
 3. cite examples of the types of hazards.



What I Know

Read each statement carefully. Then, encircle the letter of the correct answer.



4. Which of the following is a type of hazards caused by technological or industrial conditions, such as accidents, dangerous procedures, and infrastructure failures?
- Natural hazard
 - Hydrometeorological hazard
 - Common hazard in workplace
 - Man-made and technological hazard
5. Which of the following types of natural hazards is defined as the process or phenomenon of organic origin or carried by biological agents, such as pathogenic microorganisms, virus, and bioactive substances?
- Biological hazard
 - Geological hazard
 - Hydrometeorological hazard
 - Common hazard in workplace
6. Which of the following types of natural hazards is defined as a geologic process or phenomenon that originates from the geosphere such as volcanic eruption and earthquake?
- Biological hazard
 - Geological hazard
 - Hydrometeorological hazard
 - Common hazard in workplace
7. Which of the following types of natural hazards is defined as the process or phenomenon of atmospheric, hydrological, or oceanographic nature such as tornado, flood, and typhoon?
- Biological hazard
 - Geological hazard
 - Hydrometeorological hazard
 - Common hazard in workplace
8. Which of the following is an example of a geological hazard?
- Ground shaking
 - Exposure to pathogenic microorganisms
 - Ballistic projectiles or rocks from an erupting volcano
 - Both A and C
9. Which of the following is **NOT** an example of hydrometeorological hazard?
- Flood
 - Tornado
 - Typhoon
 - Oil and chemical spills



10. Which of the following **DOES NOT** explain why fire hazard can be considered both natural and man-made?
- Fire hazard depends on what originally causes it.
 - Fire hazard is always caused by natural phenomena and never by human activities.
 - Fire may be caused by lightning at the same time fire may also be caused by leaky LPG tank.
 - Forest fire may start from human activities like kaingin, as well as spontaneous combustion of dry leaves.
11. Which of the following is **NOT** a type of natural hazard?
- Biological hazard
 - Geological hazard
 - Hydrometeorological hazard
 - Common hazard in workplace
12. What type of hazard is caused by human intervention?
- Natural hazard
 - Hydrometeorological hazard
 - Common hazard in workplace
 - Man- made and technological hazard
13. Which of the following is the cause of the COVID-19 pandemic, a biological hazard?
- Bacteria
 - Fungi
 - Rabies
 - Virus
14. What type of natural hazard comes from the Greek word "hydro" which means water and "meteoros" which means sky?
- Biological hazard
 - Geological hazard
 - Hydrometeorological hazard
 - Common hazard in workplace
15. All are examples of hazards **EXCEPT** one. Which one is it?
- Ladder
 - Chemical
 - Electricity
 - None of the above



Lesson

The Concept of Hazard and Types of Hazards

(Science Direct 2014) states that "**hazard** is an inherent physical or chemical characteristic that has the potential for causing harm to people, property, or the environment". For some people, when they talk about hazard, they always relate it to danger and risk. And they are really interrelated with each other. How about you? Can you explain and discuss more about hazard? What is your understanding of what hazard is all about? Do you also associate it with danger and risk? This module will help you understand more about hazard is and its types.



What's In

In module 3, you learned the difference between disaster and hazard, while in module 7 you identified the differences among hazards, exposure, and vulnerabilities as well their relationship. Before you proceed to the lesson of this module, take time to recall the information below related to this lesson.

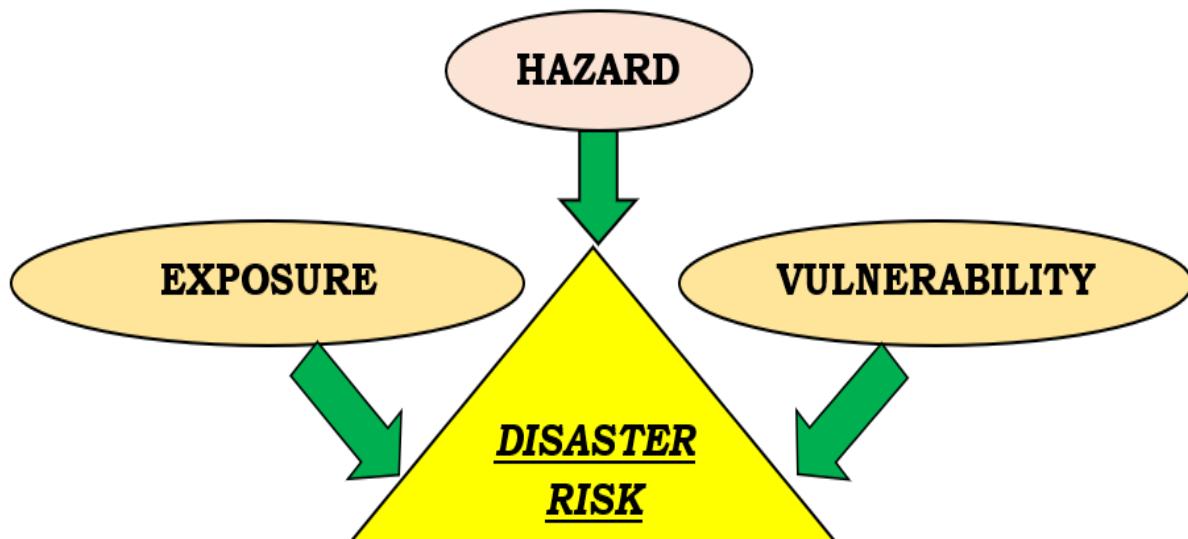


Figure 1.1. Representation of Disaster Risk



What's New

Concept and Types of Hazard

To understand more about this lesson, accomplish the activity on the next page. Decode the following sets of letters and write your answer above the given letters. Use the cryptogram below, to unlock the sets of letters into decoded words.

Activity 1. Cryptogram

Decode the message by finding each substitute letter. The letter above will be the basis in decoding words.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
B	X	F	E	P	T	H	Z	K	C	L	Y	W	M	A	R	S	O	N	U	I	Q	J	V	G	D

— Q — K — O — I — N —

— U — A — V — K — M —

— N — Y — K — R — R — P — O — G — T — Y — A — A — O — N —

— R — A — A — O — E — P — N — K — H — M — A — T — P — S — I — K — R — W — P — M — U —

— W — P — M — U — B — Y — Z — P — B — Y — U — Z —

— X — A — E — K — Y — G — T — Y — I — K — E — N —

— P — V — R — A — N — P — E — J — K — O — P — N —

— W — I — N — F — I — Y — A — N — L — P — Y — P — U — B — Y — K — M — C — I — O — K — P — N —

— X — B — F — U — P — O — K — B —

— U — A — X — B — F — F — A — N — W — A — L — P —

Example:

— F — P — Y — Y —



The decoded word is **CELL** because F corresponds to C, P corresponds to E and Y corresponds to L.

I know you are excited to do this activity. Start answering and have fun!!

Decoded Phrases:

- | | |
|----|-----|
| 1. | 6. |
| 2. | 7. |
| 3. | 8. |
| 4. | 9. |
| 5. | 10. |



What Is It

Concept and types of hazards

Decoded words in the previous activity are some of the examples and effects of the types of hazards. Previous modules mentioned about hazards. It is often defined as potential source of harm to human being or any organism in the environment. For now, read additional information below about this topic before accomplishing your next activity.

The information below is based on CHED, The Teaching Guide for Senior High School DISASTER READINESS AND RISK REDUCTION, A Guide to the Most Common Workplace Hazards from High Speed Training, and Types of Hazards by Eric Gislason of National Association of Safety Professionals.

According to United Nations Office for Disaster Risk Reduction (UNDRR) (2009), formerly known as UNISDR (adapted by Philippines DRR Law, 2010), **hazard** is a dangerous phenomenon, substance, human activity or condition that may result to loss of life, injury or other health problems. It can also cause the loss of livelihoods, house and other property damage, and services, social and economic disruption, or environmental damage.

In general, hazard is divided into two: the natural and man-made hazard but for some, common hazards in workplace maybe included. In CHED, The Teaching Guide for Senior High School DISASTER READINESS AND RISK REDUCTION 2016, **natural hazard** is defined as a naturally occurring physical phenomenon caused either by rapid or slow onset events. On the other hand, **man-made and technological hazard** is a type of hazard caused by technological



or industrial conditions, such as accidents, dangerous procedures, infrastructure failures, or specific human activities, oil and chemical spill, forest fire, industrial pollution.

Natural hazard can be classified into three (3): biological, geological, and hydrometeorological hazard. **Biological hazard** is a process or phenomenon of organic origin or carried by biological vectors/ agents like pathogenic microorganisms, toxins, and bio active substances. Other examples include Ebola virus, flu virus, and rabies. The situation with COVID-19 is different even if the problem is caused by a virus (COVID-19). Since the problem now is at global level, a pandemic, it has become a disaster and no longer a hazard. **Geological hazard** is a geologic process or phenomenon such as natural process that originates from the geosphere such as ballistic projectiles (rocks from an erupting volcano), ground shaking, landslide, lava flow, liquefaction, tsunami.

Hydrometeorological hazard comes from the Greek word "hydor" which means water and "meteoros" which means sky. It is a process or phenomenon of atmospheric, hydrological, or oceanographic nature such as tornado, flood, typhoon, forest fire, or tsunami.



Figure 1. Sample biological hazard



Figure 2. Liquefaction



Figure 3. Tornado

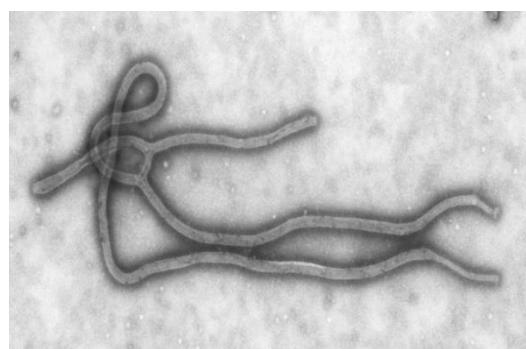


Figure 4. Ebola Virus

Source:

(1) pixabay. Accessed August 11, 2020. <https://pixabay.com/photos/pandemic-danger-spread-4809257/>.



- (2) Perduta. "Liquefaction.JPG." 2011. Accessed August 11, 2020. -virus-
<https://commons.wikimedia.org/wiki/File:Liquefaction.JPG>.
- (3) Hobson, Justin. "F5 tornado Elie Manitoba 2007.jpg." 2007. Accessed August 11, 2020.
https://commons.wikimedia.org/wiki/File:F5_tornado_Elie_Manitoba_2007.jpg
- (4) Goldsmith, Cynthia. "Ebola Virus TEM PHIL1832 lores.jpg." Accessed August 11, 2020.
https://commons.wikimedia.org/wiki/File:Ebola_Virus_TEM_PHIL_1832_lores.jpg.

Note: Fire hazard may be natural or man-made hazard depending on what originally caused this type of hazard. Lightning may cause a natural fire while leaked gas or faulty mechanical equipment and forest fire may consider a man-made since it is caused by humans. Any hazard if there is human intervention is included in man-made or technological hazard.

In addition, (Martinelli 2019), in her article entitled, “A Guide to the Most Common Workplace Hazard” stated some other common hazards in a workplace.

1. **Chemical hazards** are hazardous substances such as muriatic acid, that can cause skin irritation, respiratory system problem, and blindness, they can also cause corrosion, and explosions.



Figure 5. Sample Chemicals

Source: Murphy VII, Tom. "EWM paint 2007.jpg." 2017. Accessed August 11, 2020. https://commons.wikimedia.org/wiki/File:EWM_paint_2007.jpg.

2. **Physical hazards** are environmental factors that can cause harm to anyone without necessarily touching them such as noise, radiation, and pressure.
3. **Safety hazards** are hazards that can result in an unsafe working condition to the environment such as exposed wires or damaged carpet that might cause a tripping accident. Sometimes, they are also considered in physical hazards.





Figure 6. Exposed Wires

Source: Cutler, Paul. "Three light switches with exposed wiring.jpg." 2005. Accessed August 11, 2020.
https://commons.wikimedia.org/wiki/File:Three_light_switches_with_exposed_wiring.jpg.

4. **Ergonomic hazards** are results of physical factors that can cause a musculoskeletal injury because of poor workstation setup in an office. A poorly-setup workstation can result in poor workplace.
5. **Psychosocial hazards** include those that can influence mental health or well-being on any individual. These include sexual harassment, mistreatment, stress, and workplace violence. Although this is not directly related to disaster readiness and risk reduction, still it is categorized as a hazard that may harm the safety of an individual.



Figure 7. Harassment Bully Work Workplace Discrimination

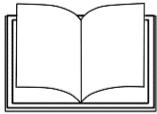
Source: "Harassment Bully Work Workplace Discrimination." Max Pixel. n.d.
<https://www.maxpixel.net/Harassment-Bully-Work-Workplace-Discrimination-3233568>.

REMEMBER!!

(Worksmart nd) defined that **hazard** is anything that can cause harm to everyone such as chemicals, electricity, working up a ladder, noise, a keyboard, a bully at work, stress, etc. On the other hand, **risk** is how great the chance is that someone will be harmed by any type of hazard.

Consider how working alone away from your office can be a hazard. The risk of personal danger may be high. Electric cable is a hazard. If it is cut by a sharp object, the exposed wiring places the cable in a 'high-risk' category.





What's More

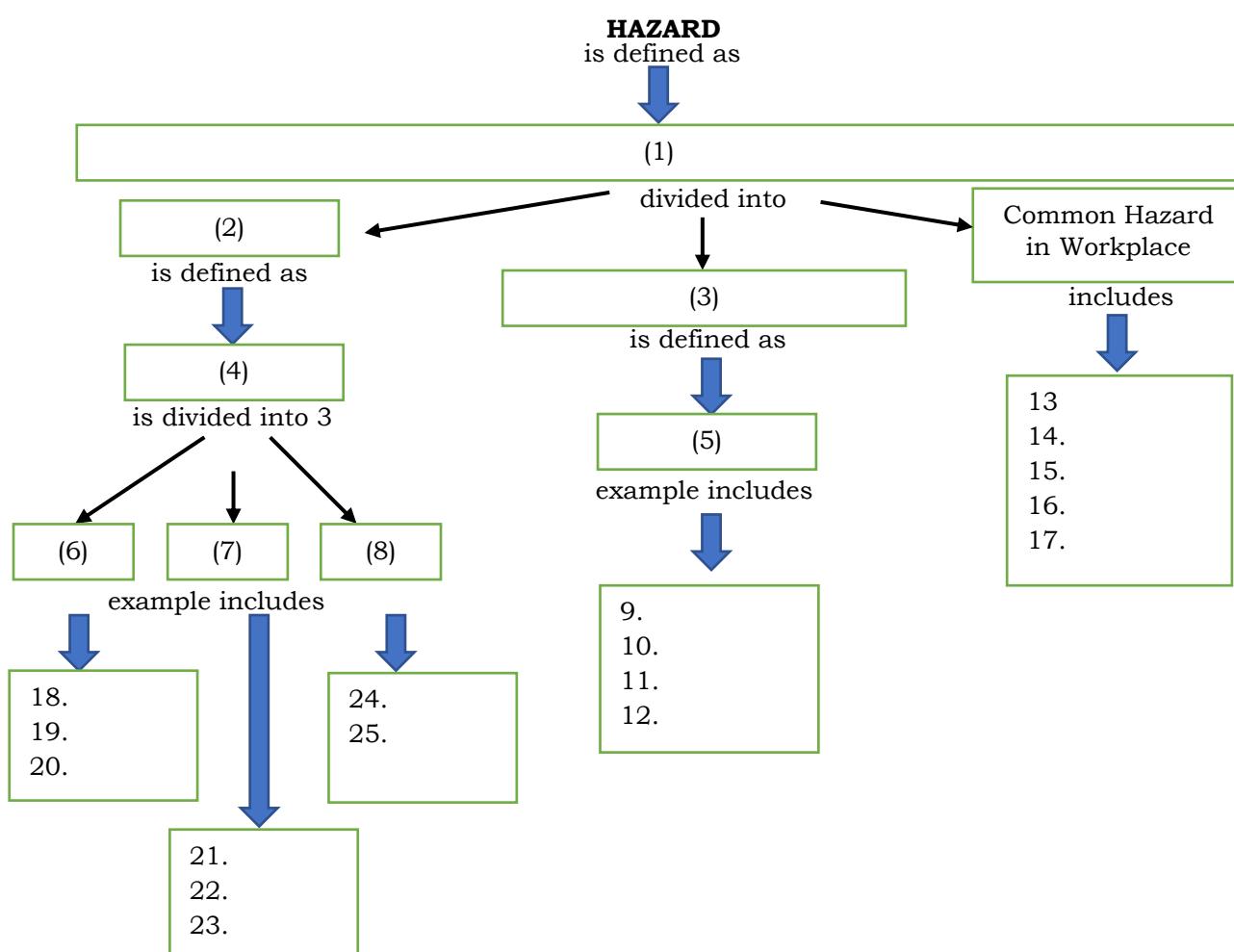
Activity 2

Complete the concept map by filling up the boxes with the appropriate words or phrase. Choose your answers from the box below. For parts in the concept map that need definition, you must give the definition yourself.

Natural hazard
Man- made hazard
Biological
Ground shaking
oil and chemical spill
Industrial pollution
Chemical hazard
Flood

Geological
Hydrometeorological
Liquefaction
Infrastructures
Lava flow
Ergonomic hazard
Physical hazard

Accidents
Rabie
Safety
Psychological
Ebola
Tornado
Virus





What I Have Learned

Activity 3

Fill in the blanks with the words or phrase to check what you have learned in this lesson. Write your answers on the space provided for each item.

1. According to United Nations Office for Disaster Risk Reduction (UNDRR) (2009), formerly known as UNISDR (adapted by Philippines DRR Law, 2010), _____ is a dangerous phenomenon, substance, human activity or condition that may result to loss of life, injury or other health problems.
2. _____ is defined as naturally-occurring physical phenomena caused either by rapid or slow onset events while _____ is a type of hazard caused by technological or industrial conditions, such as accidents, dangerous procedures, infrastructure failures, or specific human activities, oil and chemical spill, forest fire, industrial pollution.
3. Natural Hazard is divided into three (3), biological hazard, geological hazard and _____.
4. _____ may be natural or man-made hazard, depending on what originally caused this type of hazard
5. Some _____ includes chemical hazards, safety, physical hazards, ergonomic hazards, psychosocial hazards.



What I Can Do

Activity 4

Since you know already about the concept and types of hazards, let us check if you can transfer your new knowledge or skills into real life situations or concerns.

You will do it by pair. Ask any members of your family like mother, father, sister, brother etc., to be your partner in doing this activity. Write at least two (2) sentences per column on the importance of knowing the concept and types of hazard in your workplace, house, school, and community. In the workplace part, imagine that you are working in any company so that you can answer the second column of the activity. You can express your answer in Filipino, English, or local dialect, but you are encouraged to state your answer in English.



SCORING RUBRIC:

NOTE: This rubric will be used in checking each column including the conclusion part of the activity below.

Criterion	Excellent (4 pts)	Good (3 pts)	Approaching standard (2 pts)	Needs Improvement (1pt)
Ideas and Content	What you are writing about is clear and well-expressed, including specific examples to demonstrate what you learned. Well done	What you are writing is clear. You answered the question. Some support may be lacking, or your sentences may be a bit awkward. Overall a decent job.	You put thought into this, but there is no real evidence of learning. More specific information is needed, or you need to follow the directions more closely.	There is no clear or specific explanation in answer to the question.
Use of terms	Your answer included all the terms from the lesson that applied to the question asked. All terms are fully defined and used in the proper context.	Your answer included several terms from the lesson, demonstrating adequate understanding of the material.	Only one term from the lesson is used in the answer. Try for a few more, next time.	No terms from the lesson are used.
Sentence fluency	Sentences are complete and they are read out loud. Your writing flows.	Sentences are complete and able to be understood.	Some sentences are complete and easy to understand. Others require some work.	Sentences are incomplete or too long. It makes reading them difficult.
Conventions	No punctuation or structural mistakes. No spelling errors. Your writing shows full awareness of the rules of English use.	Use of punctuation marks and capitals as well as spelling is mostly correct. Few errors exist in your answer.	Mistakes using end marks or capitals as well as spelling mistakes make writing hard to read.	Few end marks or capital letters. Answers contain numerous spelling or structural errors.

Source: Reazon System, Inc. 2020. Accessed August 9, 2020.

<https://www.rcampus.com/rubricshowc.cfm?code=U66W43&sp=yes&>



IMPORTANCE OF KNOWING HAZARD AND ITS' TYPE

	IN YOUR Workplace (Job Location)	IN YOUR House	IN YOUR School	IN YOUR Community
YOUR PARTNER				
YOU				
Conclusion				



Posttest

Read each statement carefully. Then, encircle the letter of the correct answer.

1. Which of the following is **NOT** an example of geological hazard?
 - A. Lava flow
 - B. Tornado
 - C. Ground shaking
 - D. Ballistic projectiles or rocks from an erupting volcano

2. Which of the following is defined as naturally occurring physical phenomena caused either by rapid or slow onset events?
 - A. Natural hazard
 - B. Hydrometeorological hazard
 - C. Common hazard in workplace
 - D. Man- made and technological hazard



3. Which of the following types of natural hazard is defined as the process or phenomenon of atmospheric, hydrological, or oceanographic nature such as tornado, flood, and typhoon?
 - A. Biological hazard
 - B. Geological hazard
 - C. Hydrometeorological hazard
 - D. Common hazard in workplace
4. All analogies about common hazard in workplace are correct **EXCEPT** one. Which one is it?
 - A. Safety hazard: stress
 - B. Physical hazard: pressure
 - C. Chemical hazard: muriatic acid
 - D. Ergonomic hazard: poor workstation setup in an office
5. Which of the following is a type of hazard caused by technological or industrial conditions, such as accidents, dangerous procedures, and infrastructure failures?
 - A. Natural hazard
 - B. Hydrometeorological hazard
 - C. Common hazard in workplace
 - D. Man-made and technological hazard
6. Which of the following **DOES NOT** explain why fire hazard can be considered natural and man-made hazard?
 - A. Fire hazard depends on what originally causes it.
 - B. Fire hazard is always caused by natural phenomena and never by human activities.
 - C. Fire may be caused by lightning at the same time fire may also be caused by leaky LPG tank.
 - D. Forest fire may start from human activities like kaingin, as well as spontaneous combustion of dry leaves.
7. Which of the following types of natural hazard is defined as the process or phenomenon of organic origin or carried by biological vectors/ agents, such as exposure to pathogenic microorganisms, virus, and bio active substances?
 - A. Biological hazard
 - B. Geological hazard
 - C. Hydrometeorological hazard
 - D. Common hazard in workplace



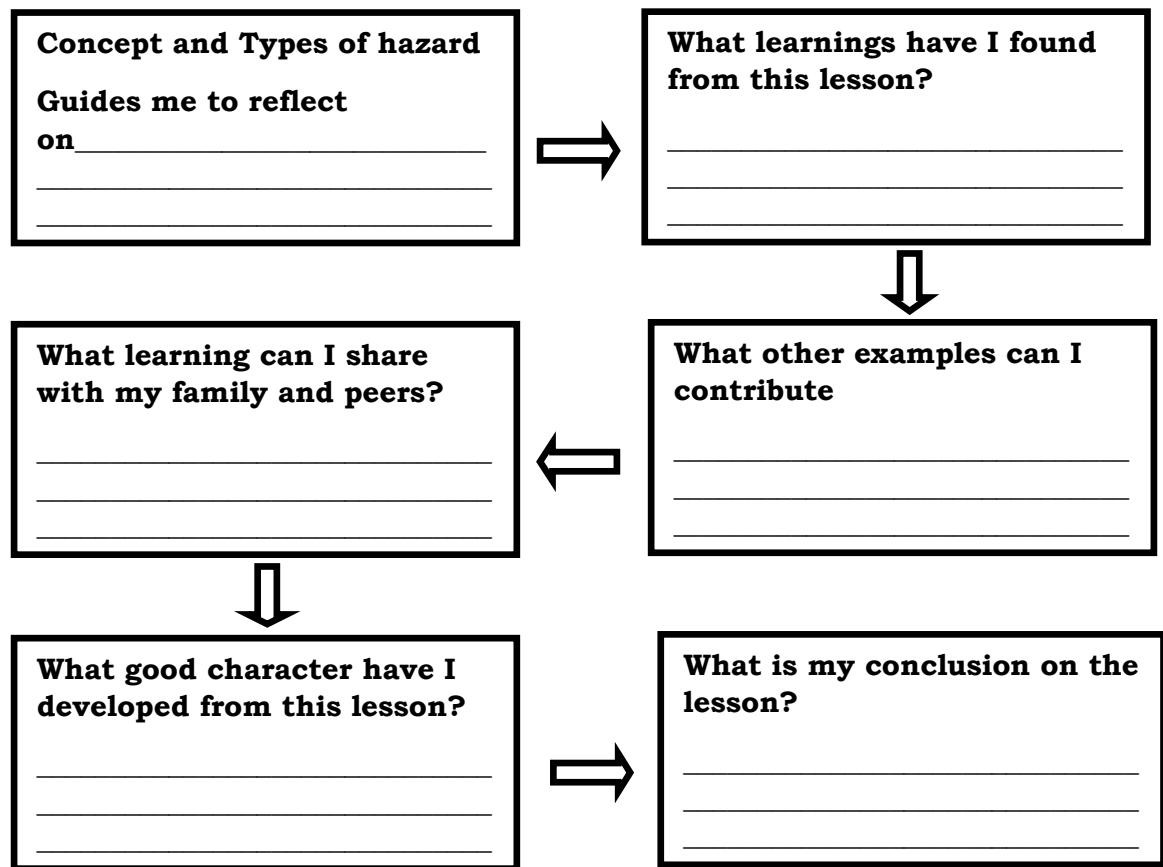
8. Which of the following types of natural hazard is defined as geologic process or phenomenon such as natural process that originates from the solid earth-geosphere such as ballistic projectile or rocks from an erupting volcano, and ground shaking?
- A. Biological hazard
 - B. Geological hazard
 - C. Hydrometeorological hazard
 - D. Common hazard in workplace
9. Which of the following is **NOT** an example of hydrometeorological hazard?
- A. Flood
 - B. Tornado
 - C. Typhoon
 - D. Oil and chemical spill
10. Which of the following is defined as a dangerous phenomenon, substance, human activity, or condition that may result to loss of life, injury or other health problems, and loss of livelihoods?
- A. Hazard
 - B. Natural
 - C. Man- made
 - D. Both B and C
11. All are examples of hazard **EXCEPT** one. Which one is it?
- A. Ladder
 - B. Chemical
 - C. Electricity
 - D. None of the above
12. Which of the following is the cause of the COVID-19 pandemic, a biological hazard?
- A. Bacteria
 - B. Fungi
 - C. Rabies
 - D. Virus
13. What type of hazard is being described if it is caused by human intervention?
- A. Natural hazard
 - B. Hydrometeorological hazard
 - C. Common hazard in workplace
 - D. Man- made and technological hazard
14. Which of the following is **NOT** a type of natural hazard?
- A. Biological hazard
 - B. Geological hazard
 - C. Hydrometeorological hazard
 - D. Common hazard in workplace
15. What type of natural hazard comes from the Greek word "hydor" which means water and "meteoros" which means sky?
- A. Biological hazard
 - B. Geological hazard
 - C. Hydrometeorological hazard
 - D. Common hazard in workplace





Additional Activities

Write your reflection on the concept and types of hazards by answering the questions inside the box. Have fun and enjoy!



SCORING RUBRIC

NOTE: This rubric will be used in checking the answers in additional activities.

Criterion	Excellent (4 pts)	Good (3 pts)	Approaching standard (2 pts)	Needs Improvement (1pt)
Ideas and Content	What you are writing about is clear and well-expressed, including specific examples to demonstrate what you learned. Well done	What you are writing is clear. You answered the question. Some support may be lacking, or your sentences may be a bit	You put thought into this, but there is no real evidence of learning. More specific information is needed, or you need to follow	There is no clear or specific explanation in answer to the question.



		awkward. Overall a decent job.	the directions more closely.	
Use of terms	Your answer included all the terms from the lesson that applied to the question asked. All terms are fully defined and used in the proper context.	Your answer included several terms from the lesson, demonstrating adequate understanding of the material.	Only one term from the lesson is used in the answer. Try for a few more, next time.	No terms from the lesson are used.
Sentence fluency	Sentences are complete and they are read out loud. Your writing flows.	Sentences are complete and able to be understood.	Some sentences are complete and easy to understand. Others require some work.	Sentences are incomplete or too long. It makes reading them difficult.
Conventions	No punctuation or structural mistakes. No spelling errors. Your writing shows full awareness of the rules of English use.	Use of punctuation marks and capitals as well as spelling is mostly correct. Few errors exist in your answer.	Mistakes using end marks or capitals as well as spelling mistakes make writing hard to read.	Few end marks or capital letters. Answers contain numerous spelling or structural errors.

Source: Reazon System, Inc. 2020. Accessed August 9, 2020.
<https://www.rcampus.com/rubricshowc.cfm?code=U66W43&sp=yes&>



References

- (1) "Introduction to Hazard Studies." Practical Hazops, Trips and Alarms. Newnes, September 2, 2007.
<https://www.sciencedirect.com/science/article/pii/B978075066271500016>.
- (2) Martinelli, Katie. "Hazards in the Workplace: 6 Categories of Hazards." The Hub High Speed Training. High Speed Training, June 19, 2020.
<https://www.highspeedtraining.co.uk/hub/hazards-in-the-workplace/>.
- (3) Gislason, Eric. National Association of Safety Professionals, January 30, 2019. <https://naspweb.com/types-of-hazards/>.



- (4) CHED. Teaching Guide for Senior High School DISASTER READINESS AND RISK REDUCTION. Commission on Higher Education, 2016.
file:///C:/Users/user/Desktop/Module/DRRR.pdf.
- (5) "The Tragic Effects of Man-Made Disasters." EKU Online. Last modified November 28, 2018. <https://safetymanagement.eku.edu/blog/the-tragic-effects-of-man-made-disasters>.
- (6) Welcome to Discovery Education's Puzzlemaker! Create Crossword Puzzles, Word Searches, Mazes, and Other Puzzles for Your Classroom Today!. Accessed July 17, 2020.
<https://puzzlemaker.discoveryeducation.com/>.
- (7) "What is the Difference Between a 'hazard' and a 'risk'?" WorkSmart: The Career Coach That Works for Everyone. Accessed July 7, 2020.
<https://worksmart.org.uk/health-advice/health-and-safety/hazards-and-risks/what-difference-between-hazard-and-risk>.
- (8) "Words into Action Guideline: Man-made/technological Hazards." PreventionWeb - Knowledge Platform for Disaster Risk Reduction. Accessed July 4, 2020.
<https://www.preventionweb.net/publications/view/54012>.
- (9) UCLG - United Cities and Local Governments. Accessed July 23, 2020.
https://www.uclg.org/sites/default/files/7817_unisdrterminologyeng



Development Team of the Module

Writer: Jeofrey F. Robles (FHS)

Editors: Maria Carmina R. Martin (MHS)
Reynald Alfred A. Recede (MHS)
Russel S. Berador (SEHS)
Emily G. Santos, (PSDS)
Jessica S. Mateo (EPS – Science)

Illustrator/

Layout Artists: Christine Ann G. Faraon (BNHS)
Jemwel Dela Paz (CISSL)

Management Team:

Sheryll T. Gayola

Assistant Schools Division Superintendent
OIC, Office of the Schools Division Superintendent

Elisa O. Cerveza

Chief, Curriculum Implementation Division
OIC, Office of the Assistant Schools Division Superintendent

Ivy Coney A. Gamatero

Education Program Supervisor – Learning Resource Management Section

For inquiries or feedback, please write or call:

Schools Division Office- Marikina City

191 Shoe Ave., Sta. Elena, Marikina City, 1800, Philippines

Telefax: (02) 8682-2472 / 8682-3989

Email Address: sdo.marikina@deped.gov.ph



City of Good Character
DISCIPLINE • GOOD TASTE • EXCELLENCE