DepED
DEPARTMENT OF EDUCATION

Earth and Life Science
Quarter 1 – Module 18:
Hydrometeorological Phenomena and Hazards

ALTERNATIVE DELIVERY MODE
ADM

Earth and Life Science
Alternative Delivery Mode
Quarter 1 – Module 18: Hydrometeorological Phenomena and Hazards
First Edition, 2021

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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

This module was designed and written with you in mind. It is here to help you master the nature of Earth and Life Science. 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 lessons are arranged to follow the standard sequence of the course. But the order in which you read them can be changed to correspond with the textbook you are now using.

The module has one lesson:

- Lesson 1 – Hydrometeorological Phenomena and Hazards

After going through this module, you are expected to:

1. identify places in the Philippines that are prone to hydrometeorological hazards like tropical cyclones, monsoons, floods, or *ipo-ipo* using hazard map; and

2. explain why it is important to identify places that are prone to hydrometeorological hazards.
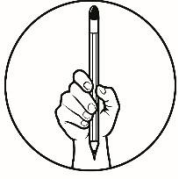
What I Know

Directions. Read the following questions and choose the letter of the best answer. Write the chosen letter on a separate sheet of paper.

1. What is the highest signal number that can be found on PAG-ASA's revised storm earning system?
    A. 3
    B. 5
    C. 7
    D. 9

2. What is the English term for *bagyo*?
    A. storm
    B. typhoon
    C. thunderstorm
    D. tropical depression

3. Which of the following is NOT included in the group?
    A. flood
    B. tornado
    C. typhoon
    D. tsunami

4. What is described as the region of the calmest weather at the center of a tropical cyclone?
    A. epicenter
    B. eye
    C. eye wall
    D. inner bands

5. What do you call the cyclones occurring in the North Atlantic Ocean?
    A. hurricanes
    B. thunderstorm
    C. tornado
    D. typhoon

6. When does the Southwest Monsoon usually occur in the Philippines?
    A. March - May
    B. June – September
    C. July - December
    D. October - March

7. What is the main cause of tornadoes?
    A. Floods
    B. Hurricanes
    C. Thunderstorm
    D. Tropical Storm

8. Which among the following is the MOST damaging result of a tropical cyclone?
   - A. flood
   - B. high winds
   - C. rain
   - D. storm surge

9. What year did typhoon Haiphong land in the Philippines?
   - A. 1867
   - B. 1881
   - C. 1991
   - D. 2013

10. Which region in the Philippines is the most exposed to tropical cyclones?
    - A. Region I
    - B. Region III
    - C. Region V
    - D. Region XI

11. Which of the following reasons makes Pampanga the province that is most prone to flood?
    - A. low lying area
    - B. highly populated
    - C. facing towards the sea
    - D. composed of mountains

12. Which of the following places is LEAST likely at risk for typhoons?
    - A. Albay
    - B. Batangas
    - C. Cagayan
    - D. Sorsogon

13. What makes the BICOL region prone to typhoons?
    - A. facing towards the Pacific Ocean
    - B. composed of mountains
    - C. has lots of rivers
    - D. low lying areas

14. If you would like to settle in a province that is least prone to typhoons and floods, which among the following provinces will be a good option?
    - A. Albay
    - B. Maguindanao
    - C. Negros Oriental
    - D. Tarlac

15. What year did typhoon Yolanda land in the Philippines?
    - A. 2000
    - B. 2013
    - C. 2015
    - D. 2018

Lesson 1 — Hydrometeorological Phenomena and Hazards

The Philippines has a tropical and maritime climate. Annually, the country is visited by an average of 20 typhoons, five to nine of which are highly destructive. The Philippines is situated in the Pacific typhoon belt thus, the country is highly prone to hydrometeorological hazards.

What's In

Previously, we learned that geologic processes cause different hazards such as earthquakes, volcanic eruptions and landslides. These have caused unimaginable impact to people and their properties. The Philippines is also a tropical country with only wet and dry seasons.

Activity 1: Find Me

Directions. Locate and encircle words that are related to human activities that speed up or trigger landslides. Terms can be found horizontally, vertically, diagonally or even backward.

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

Find these words:
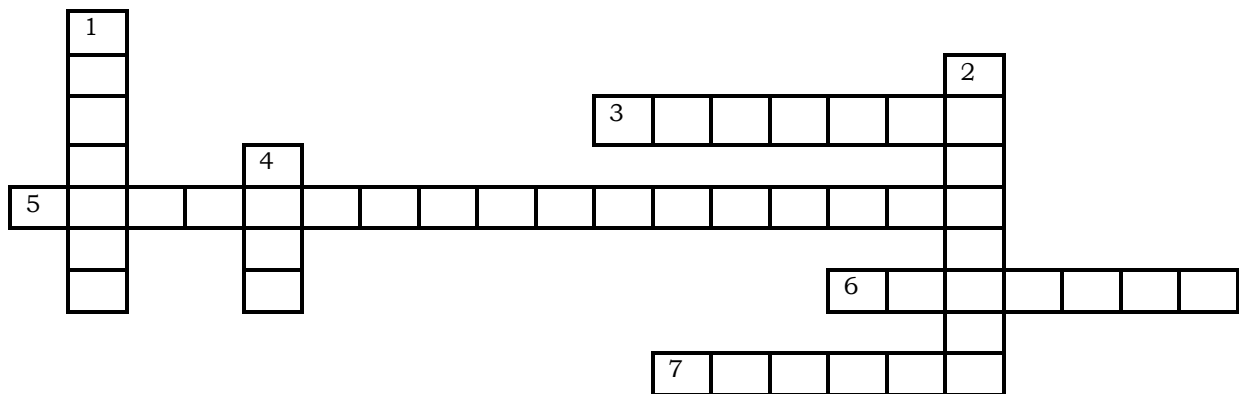|		
mining	*land use*	*excavation*
quarrying	*land pollution*	*overloading slopes*

What's New

Activity 2: Decode Me

Directions. Presented below is a crossword puzzle. Using the jumbled letters as clues, rearrange them to decipher a term that fits in the corresponding boxes across and down.

Down

1. An agent that has the potential to harm individuals, property, or the environment.
2. Is a seasonal shift in the direction of a region's dominant, or strongest, winds
4. Situation in which there is a high likelihood of danger.

Across

3. In English, it translated as tornado
5. Is a rapidly spinning storm that originates over tropical oceans and takes its energy from there
6. It describes a period of no precipitation during which the water content of the soil is reduced to the point that trees are unable to draw enough water for basic life functions.
7. Is an overflow of water that submerges normally dry land

What is It

Hydrometeorological hazards

They are brought by extreme meteorological and climate phenomena that include tropical cyclones, thunderstorms, tornadoes *(ipo-ipo)*, drought, and floods.

Tropical cyclones

Tropical cyclones are known in various names depending on the country where you live. In the Western North Pacific around the Philippines, Japan, and China the storms are known as typhoons, while in the North Atlantic Ocean and the Eastern North Pacific they are referred to as hurricanes. Here are the top five destructive typhoons to ever hit the country: Typhoon Haiphong (1881), Typhoon Haiyan (Yolanda) (2013), Tropical storm Thelma (Uring) (1991), Typhoon Bopha (Pablo) (2012), and Typhoon Angela (1867).

Monsoons

A monsoon is a seasonal wind and rain pattern, and the word "monsoon" is believed to have originated from the Arabic word *mawsim* (season), via Portuguese and the Dutch *monsun*. There are two known monsoons in the Philippines that occur every year: Summer Southwest (*Habagat*) and Winter Northeast Monsoon (*Amihan*).

1. *Amihan*: brings cloudless skies and nippy mornings during the dry season (October to late March)
2. *Habagat*: brings heavy rains and some deadly typhoons (June to September)

Floods

Flood is an abnormal progressive rise in the water level of a stream that may result in the overflow by the water of the normal confines of the stream. A flood can vary in size, speed of water, and duration.
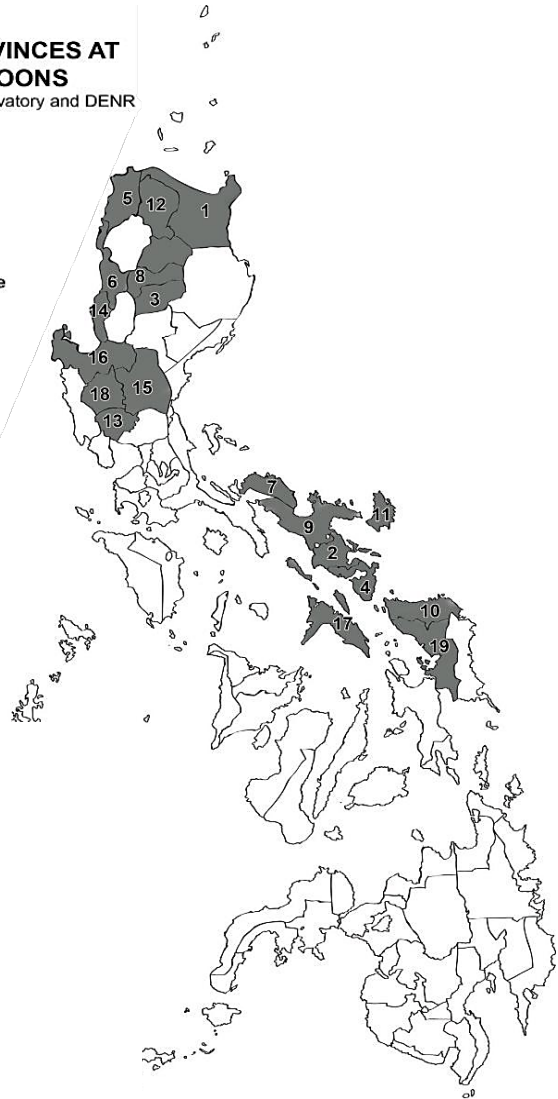
Tornado (*Ipo-ipo*)

A tornado is a narrow, violently rotating column of air that extends from a thunderstorm to the ground. The main cause of tornadoes are thunderstorms though tornadoes are not common in the Philippines, still it can occur at any time of the year.

Northern Luzon, Southeastern Luzon and Eastern Visayas are the areas highly at risk to the occurrence of tropical depressions, tropical storms, typhoons and super typhoons.

Did you know?

Typhoon Haiphong in 1881, ranks as number one deadliest typhoon that crossed the Philippines.

Haiyan (Yolanda) in 2013 is known as deadliest typhoon in modern year.

THE TOP PROVINCES AT RISK TO TYPHOONS
Source: Manila Observatory and DENR

1. Cagayan
2. Albay
3. Ifugao
4. Sorsogon
5. Ilocos Sur
6. Ilocos Norte
7. Camarines Norte
8. Mountain Province
9. Camarines Sur
10. Northern Samar
11. Catanduanes
12. Kalinga Apayao
13. Pampanga
14. La Union
15. Nueva Ecija
16. Pangasinan
17. Masbate
18. Tarlac
19. Western Samar

TOP 10 FLOOD PRONE PROVINCES
Source: Manila Observatory and DENR

1. Pampanga
2. Nueva Ecija
3. Pangasinan
4. Tarlac
5. Maguindanao
6. Bulacan
7. Metro Manila
8. North Cotabato
9. Oriental Mindoro
10. Ilocos Norte
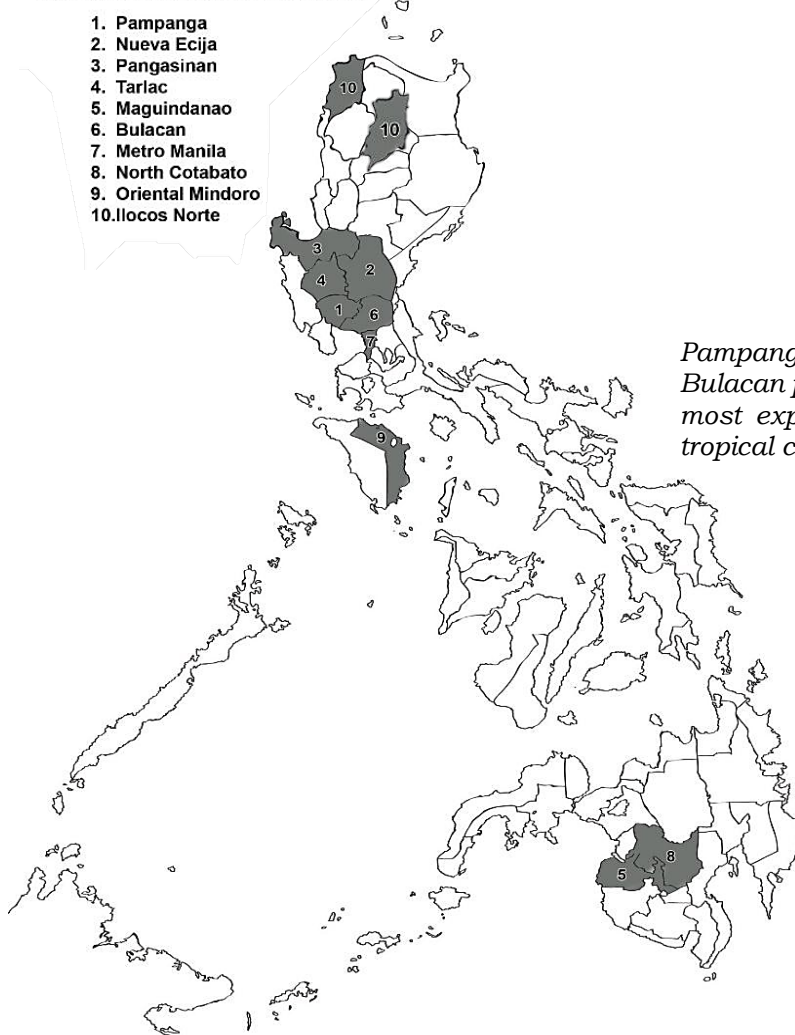
Pampanga, Nueva Ecija, Tarlac, and Bulacan provinces make Region III as the most exposed region in the country to tropical cyclones.
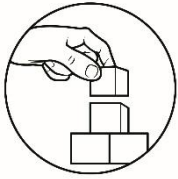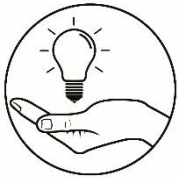
What's More

Activity 3: Identify me

Directions. Familiarize yourself with the hazard map from the previous page and answer the following questions.

1. Identify the places in the Philippines that are both prone to typhoons and floods. Justify your answers.
2. What is the importance of using hazard maps?

Refer to scoring rubrics for short answer question.

What I Have Learned

Activity 4: Complete me

Directions. Read the following statements. Complete them by filling in the blanks with the correct term or phrases.

1. Seasonal wind and rain pattern phenomena are referred to as _____.
2. On average, _____ typhoons visit the Philippines every year.
3. In the Philippines, tropical cyclones are popularly known as _____.
4. In 1988 the deadliest typhoon ever hit in the Philippines was _____.
5. The most flood-prone province in the Philippines is _____.
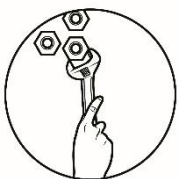
What I Can Do

Activity 5: Hazard identification

Directions. Identify the situation that put humankind at risk on the following locations:

1. Home
2. Classroom
3. Community (e.g., barangay, municipality or provinces)

The answer must be something similar to this:

   In the community: mining and quarrying may speedup landslides

Refer to scoring rubrics for short answer question.

Assessment

Directions. Read the following questions and choose the letter of the correct answer. Write your answer on a separate sheet of paper.

1. What is the name of the deadliest typhoon ever to hit the Philippines in 1881?
   A. *Angela*
   B. *Haiphong*
   C. *Thelma*
   D. *Uring*

2. What monsoon brings cloudless skies and nippy mornings during the dry season?
   A. easterlies
   B. summer southwest
   C. winter northeast
   D. low pressure area

3. What are the two seasons in the Philippines?
   A. wet and dry
   B. hot and cold
   C. summer and winter
   D. autumn and spring

4. Which of the following is the MOST exposed region in the country to tropical cyclones?
   A. Region I
   B. Region II
   C. Region III
   D. Region IV

5. What ocean is located in the eastern part of the Philippines in which most typhoons originate?
   A. Arctic
   B. Atlantic
   C. Indian
   D. Pacific

6. Which of the following is an EXCEPTION on the variation of flood?
   A. color
   B. duration
   C. size
   D. speed

7. Which of the following is NOT a hydrometeorological hazard?
   A. cyclone
   B. tsunami
   C. monsoon
   D. typhoon

8. What is the highest category in the typhoon warning signal system in the Philippines?
   A. 2
   B. 3
   C. 4
   D. 5

9. What is the usual movement of a typhoon that is coming from the Pacific Ocean?
   A. northwest
   B. northern
   C. southwest
   D. southern

10. Which among the following provinces has a high risk of typhoons?
    A. Albay
   B. Masbate
    C. Pampanga
    D. Sorsogon

11. Which among the following provinces has a low risk of flooding?
    A. Bulacan
    B. Maguindanao
    C. Marinduque
    D. Tarlac

12. What makes Palawan an ideal province to live in relation to hydrometeorological hazard?
    A. high risk both in typhoon and flood
    B. low risk both in typhoon and flood
    C. high risk in typhoon but low risk in flood
    D. low risk in typhoon but high risk in flood

13. Which of the following is MOST likely to be affected by a typhoon that originated from the West Philippine Sea and is moving northeast?
    A. Albay
    B. Palawan
    C. Zamboanga
    D. Negros Occidental

14. Why is the Philippines frequently visited by typhoons all year-round? Because it is
    A. highly populated
    B. composed mostly of islands
    C. located near the Pacific Ocean
    D. near the western hemisphere

15. Samer would like to settle in a province that is LEAST prone to typhoons and floods, which among the following provinces will be a good option?
    A. Albay
    B. Palawan
    C. Tarlac
    D. Pampanga
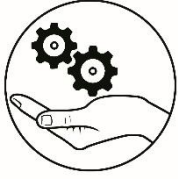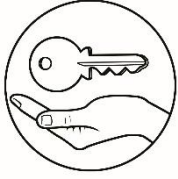
Additional Activities

Activity 6: Interview me

Directions. Interview a family member, a relative, neighbor or anyone who experienced hazards and answer the questions below. Limit your answer in 2-3 sentences.

1. Have you ever experienced any form of hydrometeorological hazards such as tropical cyclones, monsoons, floods and *ipo-ipo*? How did you feel? What did you do during and after the situation?

   _____
   _____
   _____

2. If you have never experienced any form of hydrometeorological hazards, look for someone who was able to witness and experience it first-hand. Ask them their feelings and thoughts during and after the hazard event. Also, ask them the things they did during and after the scenario.

   _____
   _____
   _____

Refer to scoring rubrics for short answer question.

Answer Key

What's In

Activity 1

Possible answers

Mining, Land use, excavation, quarrying, land pollution and overloading slopes.

What I Know

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

What's New

Activity 2

Down

1 hazard
2 monsoons
4 risk

Across

3 ipo-ipo
5 tropical cyclones
6 drought
7 floods

What's more

Activity 3

Pampanga, Nueva Ecija and Tarlac

Answers may vary among students

What I have Learned

Activity 4

1. Monsoons
2. 20
3. Hydrometeorological
4. Haiphong
5. Pampanga

What I Can Do

Activity 5

Answers may vary among students

Assessment

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

Additional activities

Answers may vary among students

Rubrics for short answer

CRITERIA	3 Above Expectation	2 Meets Expectation	1 Below Expectation
Analysis	Response provide an in-depth analysis of the questions given. Shows an understanding of the lesson content. Examples were given to explain the concept presented.	Response provides an analysis of the questions given. Shows a little understanding of the lesson content. Examples were not given to explain the concept presented.	Response does not provide an analysis of the questions given. Shows no understanding of the lesson content. Examples were not given to explain the concept presented
Clarity	The thoughts were clearly expressed. The organization of words in a sentence was clearly exemplified.	The thoughts were slightly clear. The organization of words in a sentence was not exemplified clearly.	The thoughts were unclear. There is no organization of words in a sentence.
Writing Skills	Clear writing, complete sentence, no errors in grammar and spelling	Clear writing, complete sentence with minimal errors in grammar and spelling	Unclear writing, incomplete sentence, ample errors in grammar and spelling

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