

# Earth and Life Science Quarter 1 – Module 17: Geologic Processes and Hazards



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# **Earth and Life Science** Quarter 1 – Module 17: Geologic Processes and Hazards



## **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-bystep 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 covers:

Lesson 3: Geologic Processes and Hazards

After going through this module, you are expected to:

- 1. identify human activities that speed up or trigger landslides;
- 2. explain why it is important to identify human activities that speed up or trigger landslides; and
- 3. cite some precautionary measures in preparing for the landslides.



### 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 refers to the movement of rock down a slope?
  - A. debris
  - B. landslide
  - C. tsunami
  - D. wave
- 2. Which among the following human activities DOES NOT speed up or trigger landslide?
  - A. displacement of rock or excavation
  - B. mining
  - C. overloading slopes
  - D. planting of trees
- 3. Which of the following can trigger a landslide?
  - A. car accident
  - B. earthquake
  - C. fire in a house
  - D. wind howl
- 4. What refers to the exposure, processing and recording of archaeological remains?
  - A. excavation
  - B. land pollution
  - C. mining
  - D. quarrying
- 5. What do you call the human activity that trigger landslides using explosives?
  - A. excavation
  - B. land use
  - C. mining
  - D. quarrying
- 6. What can you hear when there is a sudden landslide?
  - A. explosives
  - B. loud noise
  - C. rainwater
  - D. rolling thunder

- 7. What makes road construction a possible cause of a landslide?
  - A. lack of personal safety gears
  - B. poor sanitation among workers
  - C. slope excavation
  - D. use of heavy equipment
- 8. Which of the following is NOT an example of land use?
  - A. farming
  - B. house construction
  - C. quarrying
  - D. surfing
- 9. What should be the initial reaction when there is a landslide?
  - A. call the emergency hotline
  - B. move away from the slope
  - C. scream loudly
  - D. take a picture and post in internet
- 10. Which among the following can trigger a landslide even if there is no human activity present in an area?
  - A. forest fire
  - B. gravity
  - C. lighting
  - D. thunder
- 11. How does a community in an urbanized area speed up landslide?
  - A. planting trees
  - B. catching of wild animals
  - C. converting forest into farms
  - D. increasing the human population
- 12. Which among the following factors contributed MOST to a landslide during quarrying?
  - A. blasting of rocks
  - B. polluting the rivers
  - C. use of heavy equipment
  - D. use of a variety of manpower
- 13. What makes a landslide dangerous to human lives?
  - A. It is fast and unpredictable.
  - B. It can slowly diminish population.
  - C. It is as powerful as typhoon.
  - D. It can be avoided by running.

14. How can a community avoid the occurrence of a landslide in the future?

- A. avoid creating loud noises
- B. call the emergency hotline
- C. plant more trees in the slope
- D. construct more buildings

15. Which among the following human activities can trigger a landslide?

- I. musical concert
- II. building being demolished
- III. woman dancing on top of a pole
- IV. team of construction workers clearing trees for a new road
  - A. I and III
  - $B. \ II \ and \ IV$
  - C. II, III and IV
  - D. I, II, III and IV

## Lesson Geo Haz

# Geologic Processes and Hazards

Landslide is the movement of rock down a slope where human activities play an important role in speeding up or triggering its occurrences. This module will help determine and cite some human activities that may speed up or trigger landslides.



### Activity 1: Loop Me In

What are the human activities that speed up or trigger landslides? Can you name some?

**Directions**. Encircle the word or group of words that speed up or trigger landslides

0	0	L	А	Ν	D	U	S	Е	Е
С	V	G	R	G	S	V	L	Х	S
U	E	E	U	R	Т	W	0	Р	Ν
Т	G	Х	R	L	С	Х	Р	L	0
Т	Ν	С	Н	Н	0	Y	E	0	Ι
Ι	Ι	А	Ι	F	Ν	А	S	S	Т
Ν	Ν	V	В	Κ	S	Z	D	Ι	А
G	Ι	А	Κ	L	Т	R	Н	V	V
Т	Μ	Т	L	0	R	Е	V	E	А
R	0	Ι	Μ	Р	U	S	Ι	S	С
E	R	0	0	Q	С	Т	J	Т	Х
E	Е	Ν	Ν	R	Т	U	М	R	Е

Find the following:			
excavation	explosives	land use	
	mining	slopes	



Landslide is an occurrence in which soil, rocks and vegetal debris are transported suddenly or slowly down a slope due to insufficient stability. It may happen when there is continuous rainfall, earthquakes and/or volcanic eruption accompanied by a very loud noise

Landslide can be resulted from the failure of the materials to make up the hill slope, and get driven by the force of gravity. Landslide is also known as landslips, slumps or slope failure.



Below is an image of landslide due to human activities:

Figure 1. An illustration of landslide occurrence

Listed below are some of the human activities that speed up or trigger landslide:

- a. Overloading slopes
- b. Mining which uses explosives underground
- c. Excavation or displacement of rocks.
- d. Land use such as modification of slopes by construction of roads, railways, buildings, houses, etc.
- e. Quarrying which includes excavation or pit, open to the air, from which building stone, slate, or the like is obtained by cutting, blasting, etc.
- f. Land pollution which is the degradation of earth's land surface, exploitation of minerals and improper use of soil by inadequate agricultural practices.
- g. Excavation which pertains to exposure, processing, and recording of archaeological remains
- h. Cutting Trees that can lead to deforestation and may encourage landslide

Due to these human activities, several effects of landslides were noted. These cause property damage, injury and death and adversely affect a variety of resources. For example, water supplies, fisheries, sewage disposal systems, forests, dams and roadways can be affected for years after a slide event. The negative economic effects of landslides include the cost to repair structures, loss of property value, disruption of transportation routes, medical costs in the event of injury, and indirect costs such as lost timber and lost fish stocks. Water availability, quantity and quality can be affected by landslides. Geotechnical studies and engineering projects to assess and stabilize potentially dangerous sites can be costly.

Are we prepared in case of landslides? These are some precautionary measures to observe and follow in preparing for landslides:

- a. Stay alert and awake. Many debris-flow fatalities occur when people are sleeping.
- b. If you are in areas susceptible to landslides and debris flows, consider leaving if it is safe to do so.
- c. Listen for any unusual sounds that might indicate moving debris, such as trees cracking or boulders knocking together.
- d. If you are near a stream or channel, be alert for any sudden increase or decrease in water flow and for a change from clear to muddy water.
- e. Be especially alert when driving. Bridges may be washed out, and culverts overtop.
- f. Be aware that strong shaking from earthquakes can induce or intensify the effects of landslides.



#### Activity 2: List and Describe

**Directions**. On the box provided below, list two (2) human activities that cause landslides. Describe each one how they contribute to the cause of such hazardous event.

HUMAN ACTIVITIES	DESCRIPTION



What's More

#### Activity 3: Share It

**Directions**. Have you experienced landslide in your community? What are the causes of such event? Share your experience. If not, kindly interview a person who has a first-hand experience to landslides and ask his feelings, thoughts and actions toward the event.

Refer to scoring rubrics for short answer question.



What I Have Learned

#### Activity 4: My Take in Landslides

**Directions**. In a short bond paper, prepare a poster showing human actions to be conducted to mitigate the hazards posed by landslides.

The following criteria will be used to evaluate the output:

Connection to the topic	5 points
Layout and design	5 points
Neatness of output	5 points
Organization	5 points
TOTAL	20 points

#### Activity 5: My Share

**Directions**. People must be mindful and careful enough in doing activities that may lead to the occurrence of landslides. As a student, how will you do your part in preventing landslides as to information dissemination, awareness and mitigation planning? Write your answer in your answer sheet.

Refer to scoring rubrics for short answer question.



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

- 1. Which of the following is NOT an effect of landslide?
  - A. damage to property
  - B. death
  - C. extreme heat
  - D. injury
- 2. What refers to the use of explosives underground?
  - A. excavation
  - B. land pollution
  - C. mining
  - D. quarrying
- 3. What refers to the movement of rock down a slope?
  - A. debris
  - B. landslide
  - C. tsunami
  - D. wave
- 4. What will you do when there is a sudden landslide?
  - A. stay cool
  - B. wait for the rescue
  - C. call the neighbor
  - D. stay alert and awake
- 5. What makes railway and building construction a possible cause of a landslide?
  - A. slope excavation
  - B. use of heavy equipment
  - C. lack of personal safety gears
  - D. poor sanitation among workers
- 6. Which among the following human activities speed up or trigger landslide?
  - A. cooking
  - B. mining
  - C. planting of trees
  - D. watering the plants

- 7. Which of following is the human activity that trigger landslides using excavation or pit?
  - A. excavation
  - B. land use
  - C. mining
  - D. quarrying
- 8. Which of the following is an example of land use?
  - A. construction of houses
  - B. parasailing
  - C. scuba
  - D. surfing
- 9. What should be the initial reaction when there is a landslide?
  - A. scream loudly
  - B. move away from the slope
  - C. call the emergency hotline
  - D. take a picture and post in internet
- 10. Which among the following can trigger a landslide even if there is no human activity present in an area?
  - A. forest fire
  - B. gravity
  - C. lighting
  - D. thunder
- 11. How does a deforestation speed up landslide?
  - A. due to the planting trees
  - B. due to the cutting of trees
  - C. catching of wild animals
  - D. increasing the human population
- 12. Which among the following factors contributed MOST to a landslide during land pollution?
  - A. blasting of rocks
  - B. improper use of soil
  - C. use of heavy equipment
  - D. use of a variety of manpower
- 13. What makes a landslide dangerous to human lives?
  - A. It is fast and unpredictable.
  - B. It can slowly diminish population.
  - C.
  - D. It is as powerful as typhoon.
  - E. It can be avoided by running.

14. Which among the following human activities can trigger a landslide?

- I. building being demolished
- II. musical concert
- III. team of construction workers clearing trees for a new road
- IV. woman dancing on top of a pole
  - A. I and III
  - B. II and IV
  - C. II, III and  $\ensuremath{\text{IV}}$
  - D. I, II, III and IV
- 15. How can a community avoid the occurrence of a landslide in the future?
  - A. avoid creating loud noises
  - B. call the emergency hotline
  - C. plant more trees in the slope
  - D. construct more buildings



**Directions.** Look for a news article concerning the occurrence of landslides. Identify the following elements in the news article: Write your answer in your answer sheet.

Title:	
Author:	
Basic Information:	
What?	
Who?	
When?	
Where?	
Why?	
How?	

If you are in the position of the authorities, youth leaders or community members, what preventive measures will you implement to address the problems presented in the article?



## Answer Key

		sjobes
		ash puel
		nonsverse
		sənısordxə
Answers may vary		Possible answers
·		Activity 1
		m s'jshw
Additional Activities		d'ot
	Alex New Sigmsury	891
19. C	Z vtivit2A	14.C
14. A	Answers may vary	A.E1
A .61	Activity 4	12.C
12. B		a.ll
11. B	What I Have Learned	10.B
10 <sup>.</sup> B		9. В
6 B		8. D
Ø ∀ 8	Answers may vary	Т. Б
д D 9. В	Activity 3	9. В
с Б Р. В		p. C
	atoM s'tedW	¥ .4
3' B		<b>3</b> . B
5' C	Answers may vary	с с л. т.
J. C	Activity 2	J D I
JUJUISSASSW		
4	+1 51 +0 4M	1 40 qm

#### 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 soelling	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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