



Prayer

# Recall

*What is the geologic  
time scale?*



# Learning Objectives

- ✓ Describe the various hazards that may happen in the event of earthquakes, volcanic eruptions, and landslides
- ✓ Using hazard maps, identify areas prone to hazards brought about by earthquakes, volcanic eruptions, and landslides
- ✓ Identify human activities that speed up or trigger landslides

# **Activity**

## *“Draw Me”*

*Directions.* In a piece of paper draw an erupting volcano. Based on your drawing, can you name five geologic hazards posed by an erupting volcano.




# ***Geological Processes and Hazards***

Geological processes are naturally occurring events that directly or indirectly impact the geology of the Earth. Examples of geological processes include events such as plate tectonics, weathering, earthquakes, volcanic eruptions, mountain formation, deposition, erosion, droughts, flooding, and landslides.



Geological processes affect every human on the Earth all of the time, but are most noticeable when they cause loss of life or property. These threatening processes are called natural disasters.

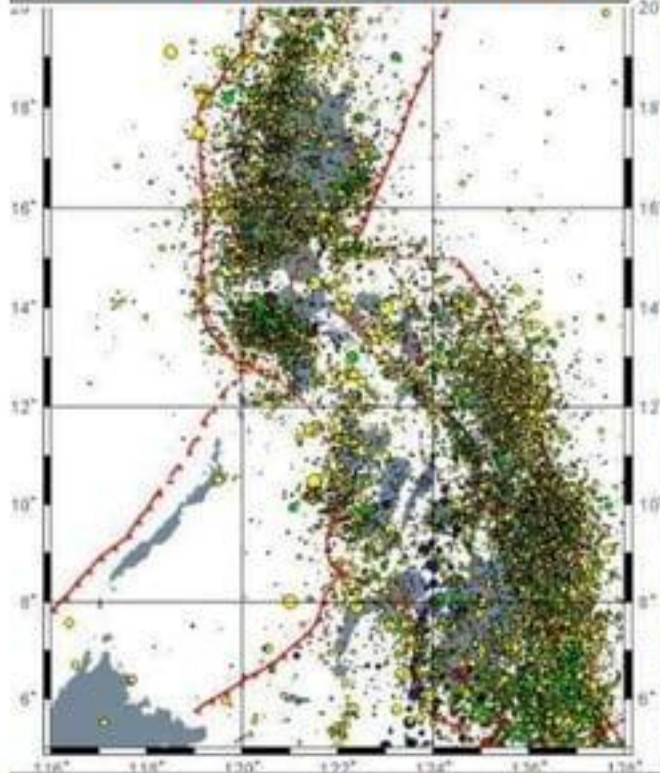
The bottom of the slide features a decorative design with overlapping geometric shapes. On the left, there is a dark blue triangle pointing towards the center. To its right is a larger, lighter blue triangle. The background of the bottom section is a solid light blue color.

## *What is a geological hazard?*

- an extreme natural event in the crust of the earth that poses a threat to life and property.
- these hazards can cause immense damage, loss of property, and sometimes life.



## Geological Hazards




July 16, 1990; Intensity 8  
1,666 dead – 3,500 injured  
P11B cost of damage in property  
P1.2B in agriculture




## a. Earthquake

## **a. Earthquake**

- An earthquake is a shaking of the ground caused by sudden slippage of rock masses below or at the surface of the earth.
  - It is a wave-like movement of the earth's surface.
- 
- Decorative geometric shapes in orange, blue, and teal at the bottom of the slide.

# ***Hazards caused by an Earthquake***

1. *Ground Shaking*
  2. *Surface Faulting*
  3. *Landslide*
  4. *Liquefaction*
  5. *Tsunamis*
- 
- Decorative geometric shapes in orange, blue, and teal at the bottom of the slide.



**Geological Hazards  
(Effect of an Earthquake)**

# TSUNAMI

**Affects the country's coastal areas up to four meters above sea level. The coastal areas of southwest Mindanao are most vulnerable**

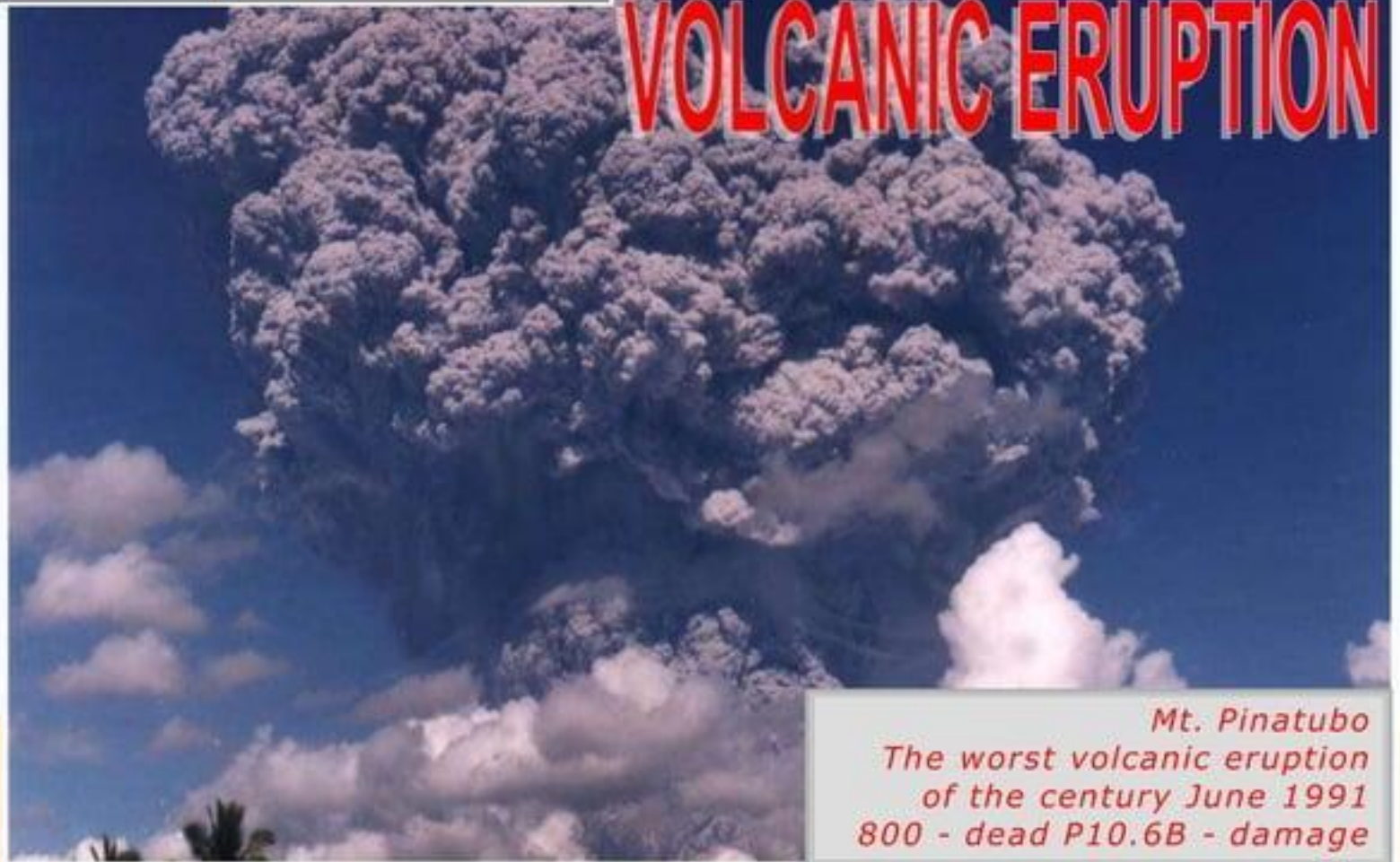
# TSUNAMI

- Tsunamis are giant sea waves generated by under-the sea earthquakes and volcanic eruptions.

Not all submarine earthquakes, however, can cause the occurrence of tsunamis.

## Geological Hazards

# VOLCANIC ERUPTION




*Mt. Pinatubo  
The worst volcanic eruption  
of the century June 1991  
800 - dead P10.6B - damage*

## b. Volcanic Eruption



## **b. Volcanic Eruption**

-occurs when magma is released from a volcano. Volcanic eruptions are major natural hazards on Earth. Volcanic eruptions can have a devastating effect on people and the environment.

The bottom of the slide features a decorative graphic consisting of several overlapping triangles in shades of orange, teal, and light blue.

# ***Hazards caused by Volcanic Eruption***


1. *Tephra*
2. *Pyroclastic Flow*
3. *Lahar*
4. *Flood*
5. *Lava Domes*
6. *Poisonous Gases*

The Philippines has suffered from an inexhaustible number of deadly typhoons, earthquakes, volcanic eruptions and other natural disasters. This is due to its location along the Ring of Fire, or typhoon belt – a large Pacific Ocean region where many of Earth's volcanic eruptions and earthquakes occur.

# ***Top 10 Provinces at Risk of Earthquakes***

1. *Surigao Del Sur*
2. *La Union*
3. *Benguet*
4. *Pangasinan*
5. *Pampanga*
6. *Tarlac*

# ***Top 10 Provinces at Risk of Earthquakes***

- 7. Ifugao*
  - 8. Davao Oriental*
  - 9. Nueva Vizcaya*
  - 10. Nueva Ecija*
- 

# ***Top 10 Provinces at Risk of Volcanic Eruptions***

1. *Camiguin*
2. *Sulu*
3. *Biliran*
4. *Albay*
5. *Bataan*
6. *Sorsogon*



# ***Top 10 Provinces at Risk of Volcanic Eruptions***

7. *South Cotabato*

8. *Laguna*

9. *Camarines Sur*

10. *Batanes*



# ***Top 10 Most Landslide Prone Provinces in the Philippines***

1. *Marinduque*
2. *Rizal*
3. *Cebu*
4. *La Union*
5. *Southern Leyte*
6. *Benguet*

# ***Top 10 Most Landslide Prone Provinces in the Philippines***

*7. Nueva Vizcaya*

*8. Batangas*

*9. Mountain Province*

*10. Romblon*



*San Francisco, S. Leyte,  
Dec.15-23, 2003  
207 dead – 54 injured – 1 missing  
P508.4M - cost of damage*



## Geological Hazards



# Landslide



***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.

## *Human Activities that trigger landslides:*

- 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

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.



# **Let's Apply!**

## ***“Be Prepared”***

Directions. Hazards may pose danger to our lives. Let us be prepared and protect ourselves. As students, how are you going to protect your lives in times of hazards? Write a step-by-step procedure of preparing and protecting yourselves in times of geologic hazards.



# Present Your Work



*What are your realizations for the day?*



Let us assess what you learned

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