

Disaster Readiness and Risk Reduction

FIRST QUARTER

LEARNING ACTIVITY SHEET



DISASTER READINESS AND RISK REDUCTION

Name of Learner: _____ Grade Level: _____
Section: _____ Date: _____

LEARNING ACTIVITY SHEET

Potential Earthquake Hazards and Its Effects

Background Information for Learners

Hazards are events or phenomena that may cause loss of life, injury or other health impacts, property damage, loss of livelihood and services, social and economic disruption, or environmental damage. The most common earthquake-related hazards include: ground rupture, ground shaking, liquefaction, tsunami, and earthquake-induced landslides.



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- I. **Ground shaking-** This is characterized with a disruptive up-down and sideways movement or motion experienced during an earthquake.

- A. Strong ground shaking can cause objects to fall, break windows among others.
- B. Strong ground shaking can also result to minor damages to buildings and worse, cause collapse of a structure.(e.g. collapse of Hyatt Hotel, Baguio City after the 16 July 1990 Luzon Earthquake).

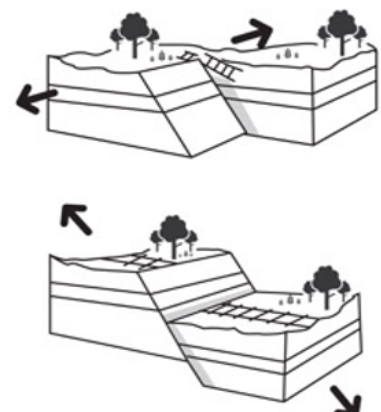


Disaster Readiness & Risk Reduction Teacher's Guide by Bagtasa, Gerry et.al. page 41

- C. Most parts of the Philippines will experience shaking at different degrees depending on the magnitude of earthquake, distance of one's location from the fault that moved, local below surface conditions, etc).

- II. **Ground rupture-** It is the displacement on the ground due to movement of fault.

- A. This will be experienced by areas where fault passes through (note not all cracks on the ground that people see after a strong earthquake are faults, some may just be surficial cracks because of ground failure).
- B. The movement may have vertical and horizontal component and may be as small as less than 0.5 meters (Masbate 1994



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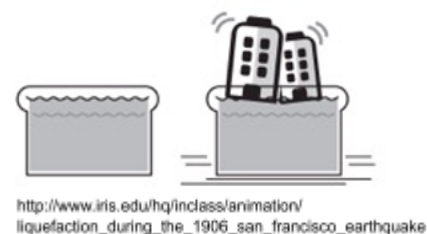
earthquake) to as big as 6 meters (16 July 1990 Earthquake).

III. Tsunami- These are sea waves resulting from the disturbance of ocean floor.

- A. This is a series of giant sea waves commonly generated by under-the-sea earthquakes and whose heights could be greater than 5 meters.
- B. Examples of recent tsunami events in the Philippines are the August 1976 Moro Gulf Earthquake and Tsunami and the November 1994 Oriental Mindoro Earthquake and Tsunami, December 2004 Banda Aceh Earthquake (Indonesia), and March 2011 Eastern Japan.

III. Liquefaction- This is a process that transforms the behavior of a body of sediments from that of a solid to that of a liquid when subjected to extremely intense shaking.

- A. As a result, any heavy load on top of the sediment body will either sink or tilt as the sediment could no longer hold the load, such as what happened in Dagupan City during the 16 July 1990 earthquake. (e.g. San Francisco 1906:)



IV. Earthquake-induced landslide- These are failures in steep or hilly slopes triggered by an earthquake.

- A. Loose thin soil covering on the slopes of steep mountains are prone to mass movement, especially when shaken during an earthquake.
- B. Many landslides occur as a result of strong ground shaking such as those observed on the mountainsides along the National Highway in Nueva Ecija and the road leading up to Baguio City during the 16 July 1990 earthquake.



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Learning Competency with Code

Analyze the effects of the different earthquake hazards (DRR11/12-If-g-19)

Activity 1: Name That Quake!

Search via internet. Download stories, read news articles, watch video clippings or interview an adult about a certain earthquake event in the Philippines. (Suggested Local events: 16 July 1990 Luzon Earthquake, 1976 Moro Gulf Earthquake, 2013 Bohol Earthquake, 2012 Negros Earthquake, Eastern Samar

Earthquake). Take note of important facts then answer the questions that follow:
(See attached news article in the next page)

Deadly Philippine quake hits Bohol and Cebu

15 October 2013 <https://www.bbc.com/news/world-asia>

At least 93 people have been reported dead after a magnitude 7.2 earthquake hit the central Philippines. The quake happened at 08:12 (00:12 GMT) on a national holiday. The US Geological Survey said it struck below the island of Bohol, where officials reported most casualties. People were also killed in the province of Cebu. Historic churches were among the many damaged buildings, and stampedes were reported in two cities.

At least 69 of those confirmed dead were from Bohol, according to reports citing disaster management officials. Fifteen people are known to have been killed in Cebu, and another was reported dead on the neighbouring island of Siquijor.

Dozens of others are also being treated for injuries. Search and rescue operations are being conducted, with rescuers finding themselves hampered by damaged roads. At least five

people died when part of a fishing port collapsed in Cebu, and two others were also reported dead when a roof fell at a market. At least three people also died during a stampede at a sports complex in Cebu, provincial disaster chief Neil Sanchez said.

"There was panic when the quake happened and there was a rush toward the exit," he told AFP. The tremor triggered power cuts in parts of Bohol, Cebu and neighbouring areas, say reports citing the country's disaster management agency. Officials from Bohol and Cebu have declared a state of emergency in their respective provinces, local media say. An official from the government agency which monitors earthquake activity was quoted as saying that this was the strongest tremor felt in the area in the last 23 years. President Benigno Aquino is expected to visit the affected areas on Wednesday.



Note: Practice Personal Hygiene Protocols at all Times

A 7.2 quake struck underneath Bohol island, damaging structures like this old church in Loboc town.

Edgardo Chatto, the governor of Bohol, said a city hall building was damaged on the island. Heavy damage to roads, bridges and historic churches, some dating back to the Spanish colonial period in the 1500s and the 1600s, was also reported in Bohol and Cebu. British man David Venables, who has lived in Cebu for seven years, said it was the strongest quake he had experienced.

Question:

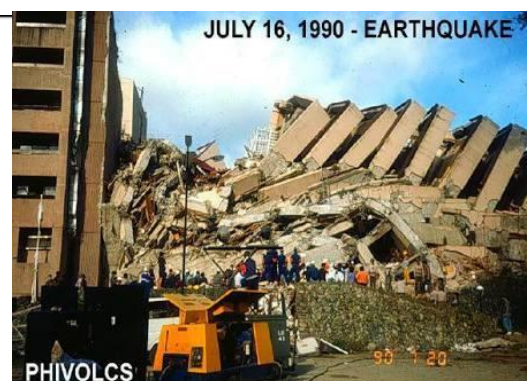
1. Write specific impacts or effects of earthquake hazards based on descriptions from stories downloaded, read news articles, watched video clippings or from descriptions of the adults interviewed. Identify at least 10.

2. Why are these earthquake events remembered?

Activity 2: Shaken To The Core!

Directions: Below are photos of impacts of an earthquake. What earthquake-related hazards can be seen in the picture?

1. July 16, 21990 Luzon Earthquake



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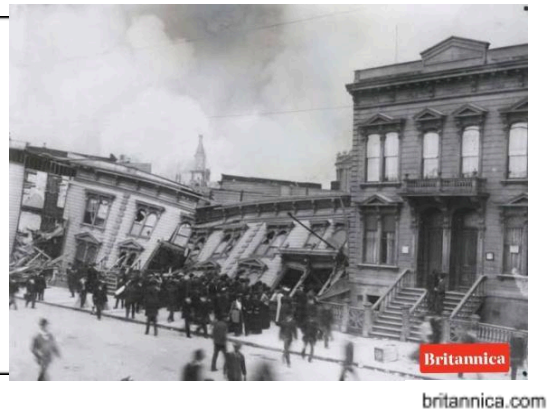
2. August 18, 2020 Masbate Earthquake



3. March 2011 Great East Japan Earthquake



4. 1906 San Francisco Earthquake



5. October 2019 Cotabato Earthquakes



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Activity 3: Fill That Impact!

Directions: Complete the table below by writing impacts of earthquake- related hazards. (You may read background information for learners or you may refer to you answers in activity 1 and 2.)

Ground shaking	Ground Rapture	Liquefaction	Earthquake-induced Landslide	Tsunami

Note: Practice Personal Hygiene Protocols at all Times

Activity 4: Printed Quakes!

Directions: Read the news article below. Identify all impacts of earthquake. In which earthquake-related hazards do these impact fall? Write your answer on the space provided.

Example: building damage- due to ground shaking

PHILIPPINES EARTHQUAKE : Eight deaths reported on Luzon

April 23, 2019

BBC News

A powerful earthquake has struck the main Philippines island of Luzon, killing at least 11 people. The magnitude [6.1](#) tremor hit at 17:11 local time (09:11 GMT) on Monday, the Philippines Institute of Volcanology and Seismology reports. An airport was seriously damaged and at least two buildings were destroyed. Less than 24 hours later, a second powerful earthquake measuring [6.4](#) struck further south, in the central Visayas region.

A BBC correspondent in Manila said the worst hit areas include Tacloban City, Leyte, and Catbalogan City in Samar. Social media posts on Tuesday showed buildings swaying and large cracks forming in roads, but it was not clear if there were any casualties. Tacloban City and the surrounding region were devastated by Typhoon Haiyan in [2013](#). Following the first earthquake, authorities said dozens of people could still be trapped underneath a collapsed building in the province of Pampanga, north-west of the capital Manila.

The province is believed to be the worst-hit area. Its governor, Lilia Pineda, told Reuters news agency that 20 people had been injured there. "They can be heard crying in pain," she said of those trapped under the rubble. "It won't be easy to rescue them. Ms Pineda told ABS-CBN television that three bodies had been pulled out of a shop following the earthquake, while a woman and her grandchild were found dead in the town of Lubao.

Twenty people have so far been rescued and taken to hospital, she added. The earthquake was felt in Manila, where skyscrapers were seen swaying for several minutes in the business district. Clark International Airport, located about an hour's drive north of the capital, suffered major damage, with at least seven people injured.

Activity 5: What Can I Do?

Directions: Think of your home. What are the possible impacts/ effects of the 5 earthquake hazards to your home/s?

What are the potential hazards that can affect me, my home, and my community?(check all that apply)

Earthquake-Related hazard	Yes	No
Ground Rupture (only if a fault passes through my home) (Note: This will be important for areas with known presence of faults)		
Ground shaking		
Liquefaction (Note: only for areas near rivers and coastal areas underlain by soft sediments or water-saturated materials)		
Earthquake-induced landslide (if my home is near/ at the base or on the slope of a mountain side)		
Tsunami (if my home is near the coast)		

Those I have checked are the hazards I need to prepare for.

Note: This part shall be linked with DRR11/12-If-g-20- Different earthquake hazards maps- activity will validate answers to this enrichment section.

Reflection

1. *I learned that*

2. *I enjoyed most on*

3. *I want to learn more on*

References for Learners

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PHIVOLCS 200x. Earthquake hazards poster (link to be provided later)

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Answer Key

Activity 1: (Answers may Vary)

1. 93 people have been reported dead, historic churches were among many damaged buildings, dozens of others were treated for injuries, five people died when part of fishing ports collapsed, two were reported dead when a roof of a market fell
2. This earthquake event was remembered due to its various impacts in the people of Bohol and Cebu.

Activity 2: (1. Ground shaking 2. Ground Rupture 3. Tsunami
4. Liquefaction 5. Earthquake- Induced landslide)

Activity 3: (Answers may Vary)

Possible answers

Ground shaking	Ground Rapture	Liquefaction	Earthquake-induced Landslide	Tsunami
Objects fall	Displacement of ground	Sinking of heavy loads	Mass movement of soil from hilly or steep areas	Disturbance of ocean floor

Activity 4: (Answers may Vary)

Buildings swaying- due to ground shaking

Large cracks forming in roads- due ground rupture

Activity 5: (Answers may Vary)

Sample only

Earthquake-Related hazard	Yes	No
Ground Rupture (only if a fault passes through my home) (Note: This will be important for areas with known presence of faults)	√	
Ground shaking	√	
Liquefaction (Note: only for areas near rivers and coastal areas underlain by soft sediments or water-saturated materials)		√
Earthquake-induced landslide (if my home is near/ at the base or on the slope of a mountain side)		√
Tsunami (if my home is near the coast)		√

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