



School:		Grade Level:	7
Teacher:		Learning Area:	Science
Teaching Dates and Time:		Quarter:	Fourth
		Week:	Week 2-Day 4

I. CONTENT, STANDARDS AND LEARNING COMPETENCIES		ANNOTATIONS
A. CONTENT STANDARDS	The learners learn that the damage or effects on communities depend on the magnitude of and distance from an earthquake.	
B. PERFORMANCE STANDARDS	By the end of the Quarter, learners will appreciate the value of using systems to analyze and explain natural phenomena and demonstrate their understanding of the dynamics of faults and earthquakes. They are confident in identifying and assessing the earthquake risk for their local communities using authentic and reliable secondary data. They use the country's disaster awareness and risk reduction management plans to identify and explain to others what to do in the event of an earthquake. Learners explain the cause and effects of secondary impacts that some coastal communities may experience should a tsunami be produced by either local or distant earthquake activity. Learners use reliable scientific information to identify and explain how solar energy influences the atmosphere and weather systems of the Earth and use such information to appreciate and explain the dominant processes that influence the climate of the Philippines.	
C. LEARNING COMPETENCIES	Learning Competencies: 1. Describe how the effects of earthquakes on communities depend on their magnitude; 2. Use the PHIVOLCS Fault Finder or other reliable information source to identify where the nearest fault system is located from their community and assess the risk of earthquakes to their local community Learning Competency: Make models of fault scenarios to illustrate: a. the epicenter of an earthquake from its focus, b. the intensity of an earthquake from its magnitude, and	

	c. how underwater earthquakes may or may not generate tsunamis;	
D. LEARNING OBJECTIVES	Learning Objectives: 1. Describe the effects of earthquake; 2. Identify the relationship between earthquake magnitude and its effects on communities; and 3. Recognize the use of PHIVOLCS Fault Finder or other reliable information source to assess the risk of earthquakes in their community. Learning Objectives: 1. Create a model to represent the anatomy of an earthquake; 2. Relate the intensity of an earthquake, its magnitude, and the damage that they may cause. 3. Deduce that underwater earthquakes may or may not generate tsunamis.	

I. CONTENT

Anatomy of Earthquake

II. LEARNING RESOURCES

A. REFERENCES	• United States Geological Survey (USGS). (n.d.). Magnitude, intensity, and earthquake effects. In Earthquake Hazards Program. Retrieved from https://pubs.usgs.gov/gip/earthq3/magnitude.html • Gomez, J., & Gomez, J. (2018, December 29). Tsunami alert in Philippines lifted hours after undersea quake. TheQuint. https://www.thequint.com/news/world/tsunami-alert-in-philippines-lifted-hours-after-undersea-quake
B. OTHER LEARNING RESOURCES	

III. TEACHING AND LEARNING PROCEDURE

BEFORE/PRE-LESSON PROPER

ACTIVATING PRIOR KNOWLEDGE	Short Review The PHIVOLCS FaultFinder is a valuable tool for promoting disaster preparedness and safety. It allows individuals and communities to identify the location of active faults and assess their proximity to residential areas, schools, and other vital structures. By accessing this reliable information, people can make informed decisions on land use, building design, and emergency planning. The use of credible sources like PHIVOLCS helps raise awareness of earthquake risks and emphasizes the importance of proactive measures to minimize potential damage and protect lives.	
LESSON PURPOSE/INTENTION	Lesson Purpose: The purpose of this lesson is to help students understand the principles of earthquake modeling and how it simulates the movement and impact of seismic waves. Through hands-on activities and visual simulations, students will explore how different factors, such as fault types, magnitude, and soil composition, affect the intensity of earthquakes. This lesson aims to develop critical thinking skills in analyzing earthquake scenarios and foster awareness of the importance of disaster preparedness and mitigation strategies in reducing earthquake risks.	
LESSON LANGUAGE PRACTICE	Direction: Unscramble the letters to form the correct word based on the provided definition. Write your answers on the space provided. 1. FRULAVNEEITB – The degree to which a community is susceptible to damage from a hazard. 2. TPMAMAEHNR – Preparedness efforts to reduce the impact of disasters. 3. LSFOCA TIENDIFR – A digital tool developed by PHIVOLCS to locate active faults in the Philippines. 4. CSAESSS EIKRS – The process of evaluating the potential impact of a hazard. 5. MRIEOSIIANTFN EFHTCENIC – Trusted resources for gathering reliable information about hazards.	Answer key: 1. Vulnerability 2. Earthquake 3. Fault Finder 4. Assess Risks 5. Reliable Information Source

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DURING/LESSON PROPER

READING THE KEY
IDEA/STEM

Earthquake damage modeling

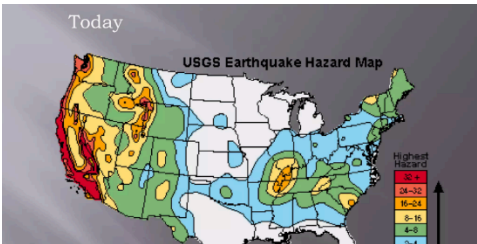
Hazards Insurance

First practiced by ancient Chinese and Babylonian traders, General Insurance, also known as Property and Casualty, has played a critical role in the evolution of modern society.

An immense field continuing to grow in size and complexity. As increased globalization, and new economies and volatilities emerge, so do new opportunities-especially for risk-focused professionals.

Lessons from earthquakes

- 2010 had the most devastating earthquakes in recent times. The largest quakes in Haiti, Chile and New Zealand claimed well over 200,000 lives, almost exclusively in Haiti, and roughly 50 billion USD in damage to the economy.
- Actual losses varied substantially across affected regions. In the case of Chile and New Zealand, the events showed that strict implementation of building codes does save lives by significantly reducing building damage. Cat modeling assumptions have been proved to be accurate in this regard.
- From an insurance perspective, one of the key lessons learned is that so-called secondary loss agents - such as liquefaction and tsunamis - are generally undervalued in loss modeling. Business interruption is another widely underestimated risk, especially for certain industries such as pulp manufacturers, breweries and refineries.

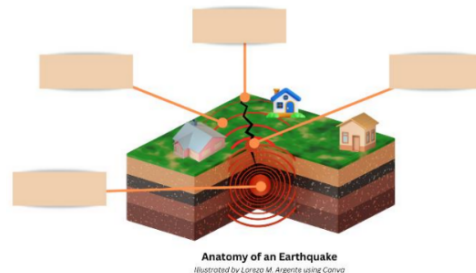


**DEVELOPING and
DEEPENING
UNDERSTANDING OF THE
KEY IDEA/STEM**

SUB-TOPIC 2: Earthquake Modeling

1. Explicitation

The learners will label the anatomy of the earthquake by choosing the answer from the pool of words below the picture.



Epicenter

Fault

Focus

Magnitude

Seismic wave

follows.

Scenarios (30

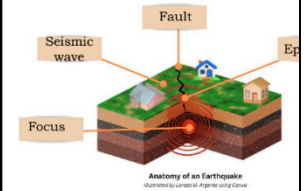
you should be able to understand the concepts of earthquake epicenter and focus, earthquake magnitude, and intensity.

III. Materials Needed: Modeling clay or playdough (different colors if possible), toothpicks, large shallow tray, sand or gravel, plastic syringe

IV. Instructions:

1. Use the modeling clay or playdough to create a big cross-section model of the Earth's surface.
2. Use a different color of clay to represent the focus of the earthquake within the Earth's crust. You can place this clay at varying depths to simulate earthquakes of different magnitudes.
3. Use the toothpick to create structures on the surface of your model representing buildings, roads, and other infrastructure.
4. Simulate various earthquake magnitudes by pressing down on the focal clay with increasing force, from the smallest force to the highest force, generating variable amounts of shaking and devastation on the surface.

The teacher can print the picture or draw the anatomy of an earthquake on the board.



- Instruct each group to use the modeling clay or playdough to create a cross-section model of the Earth's surface, representing the layers of the Earth.

- Have them use a different color of clay to represent the focus of the earthquake within the Earth's crust. They can place this clay at varying depths to simulate earthquakes of different magnitudes.

**Modeling
Earthquake
Magnitude and
Intensity**

- Explain to the students that earthquake magnitude is a measure of the energy released during an earthquake, while

5. Fill the large shallow container with sand or gravel to represent the ocean floor.
6. Add a layer of water to the container to simulate the ocean.
7. Use the plastic syringe to create underwater disturbance representing earthquakes.

Guide Questions:

1. What happens to the amount of damage in the infrastructure as you increase the force on the focus?
2. If the clay represents the ocean plate and water surrounds the plate, how do you think the water will react with each force that you apply?

Rubric or Score Guide

Advanced (5 points)	Proficient (4)	Nearly Proficient (3)	Emerging (2)	Needs Improvement (1)
The model represents the anatomy of an earthquake, and the answers to guide questions were well-organized and	The model represents the anatomy of an earthquake, and the answers were well-organized and completely	Some of the required parts in the anatomy of an earthquake is missing, and the answers were somewhat organized and	Some of the required parts in the anatomy of an earthquake is missing, but the answers were not organized and	Most of the required parts in the anatomy of an earthquake is missing, and the answers were not organized and explained

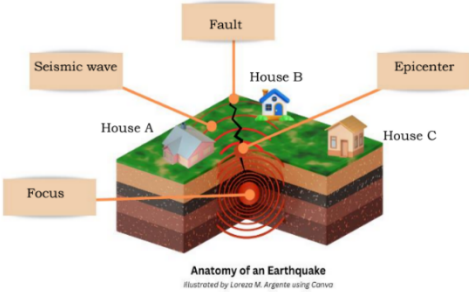
intensity refers to the effects of the earthquake at a particular location.

- If the syringe is not available, you may use a dropper as an alternative.

- Discuss how the models demonstrated the concepts of earthquake epicenter, focus, magnitude, intensity

- The amount of damage in the infrastructure increases as you increase the force on the focus.

- Waves in the water will be generated leading to the formation of tsunami.

	completely explained in detail explained, but not in detail explained but not in detail not explained in detail in detail	
	3. Lesson Activity Let the learners analyze the illustration and answer the questions that follow.  Process Questions: - Which among the houses will experience the greatest damage? Explain your answer. - What are the things that you will consider in finding the safest location for you dream house?	- Modeling the Epicenter and Focus - Explain to the students that the focus of an earthquake is the point within the Earth where the seismic energy is released, while the epicenter is the point on the Earth's surface directly above the focus.

AFTER AFTER/POST-LESSON

MAKING GENERALIZATIONS AND ABSTRACTIONS	Learners' Takeaways Earthquake Takeaway Gallery Using colored papers, reflect on the knowledge you have acquired throughout the lesson or unit, including concepts, facts, and real-world implications of earthquakes. You can also use drawings, diagrams, symbols, or written statements to convey your understanding of earthquakes. Once you have completed your creation, share your takeaways by placing them on the "Earthquake Takeaway Gallery." Reflection on Learning How Well Did You Know? Place a check in the column that represents your answer: I know the... I know it I know it but still I did not understand it	The teacher may prepare the strips of paper ahead of time or ask them to bring one before the session. A manila paper or a designed cartolina may be used as the "Earthquake Takeaway Gallery."
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		well	have questio ns			
	1. anatomy of an earthquak e					
	2. use of FaultFinde r to identify where the nearest fault system is located from my community .					
	3. assessme nt of the risk of earthquak es to my local community					
	4. relationshi p between magnitude and effect of earthquak e in the infrastruct ure.					
	5. importanc e of knowing the cause and effect of earthquak es					

EVALUATING LEARNING	Direction: Read each question carefully and choose the best answer. Encircle the letter of your choice. 1. What type of information does PHIVOLCS primarily provide? a. Weather forecasts b. Traffic updates c. Seismic and volcanic activity data d. Political news 2. How does PHIVOLCS FaultFinder help individuals and local governments? a. By creating awareness and guiding land use planning b. By promoting land disputes c. By preventing earthquakes d. By predicting tsunamis 3. What does it mean if your community is near an active fault? a. You are completely safe from earthquakes b. You have a higher risk of experiencing earthquakes c. There is no need for earthquake preparedness d. PHIVOLCS will prevent earthquakes in your area 4. Which action shows responsible use of earthquake risk information? a. Ignoring fault proximity information b. Sharing earthquake myths on social media c. Creating an earthquake preparedness plan d. Refusing to participate in earthquake drills 5. Which of the following is an example of a reliable information source for assessing earthquake risks? a. Social media rumors b. PHIVOLCS website c. Random blog posts d. Fictional books about disasters	Answer key: 1. c 2. a 3. b 4. c 5. b
ADDITIONAL ACTIVITIES FOR APPLICATION OR REMEDIATION (IF APPLICABLE)		
REMARKS		
REFLECTION		

Prepared by:

Subject Teacher

Reviewed by:

Master Teacher/Head Teacher