8

DepED
DEPARTMENT OF EDUCATION

Lesson Exemplar for Science

Quarter 3
Lesson
2

Lesson Exemplar for Science
Quarter 3: Lesson 2 of 8 (Week 2)
SY 2025-2026

Development Team

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SCIENCE (EARTH AND SPACE) /QUARTER 3 / GRADE 8

I. CURRICULUM CONTENT, STANDARDS, AND LESSON COMPETENCIES	
A. Content Standards	The learners learn that… 1. volcanic terrain is built by the slow accumulation of erupted lava; and 2. the earth's surface is made of separate and movable plates.
B. Performance Standards	By the end of the Quarter, learners demonstrate an appreciation of the large-scale features of the 'blue planet' Earth and relate those features to the geological characteristics of the upper crustal layers of the Earth. They identify and describe the nature and impact of volcanic activity in building new crust and identify that these crust-forming processes account for patterns and changes in the distribution of volcanoes, earthquakes, and mountain chains that have occurred over time.
C. Learning Competencies and Objectives	***Learning Competency*** *The learners…* 1. Describe the different types of volcanoes found around the world according to their: a. activity; b. type of eruption c. location in the crust; **Lesson Objectives** 1. Differentiate volcanoes from mountains; 2. Describe the relationships between the role of plate interactions in the formation of volcanoes; 3. Relate the types of volcanoes to the process of volcanic formation; and 4. Classify different types of volcanoes based on their major characteristics.
D. Content	Types of Volcanoes
E. Integration	Unity and/in Diversity

II. LEARNING RESOURCES

Libretexts. (2024, April 24). *4.3: Types of volcanoes*. Geosciences LibreTexts.
https://geo.libretexts.org/Bookshelves/Geology/Physical_Geology_(Earle)/04%3A_Volcanism/4.03%3A_Types_of_Volcanoes
Mayon Volcano. (n.d.).
https://worldlandforms.com/landforms/mayon-volcano/
Scientific American. (2018, May 31). *How did Hawaii form?* [Video]. YouTube.
https://www.youtube.com/watch?v=LdlEufZop-Y

III. TEACHING AND LEARNING PROCEDURE

A. Activating Prior Knowledge

DAY 1

1. Short Review:

Activity 1.

Check the Crustal Landforms

Procedure:

1. Present the table below.
2. Direct the class to put a check where each landform (column) can be found with respect to the type of crust (row).
3. Call students to put the check on the table.
4. After completing the table, direct the discussion by asking the guide questions that follow,

Crust	Landforms			
	Trench	**Mid-Oceanic Ridge**	**Volcanoes**	**Mountains**
Oceanic Crust				
Continental Crust				

Guide Question:

- How would the landforms relate with the type of crust they are commonly found?

NOTES TO TEACHERS

This activity is a recall of the formative assessment from Week 1. The activity can be further improved by using pictures of the landforms instead of checking the table depending on the availability of the resources.

	Discussion Points: Basaltic rocks make up most of the thinner and denser oceanic crust, which weighs between 2.9 and 3.0 g/cm³. Underneath features such as trenches, mid-ocean ridges, and undersea volcanoes are indicative of the ocean basins beneath them. The oceanic crust is constantly being created and destroyed by seafloor spreading and subduction zones. The granitic rocks that make up the continental crust are mainly thicker and less dense (around 2.7 g/cm³). The continents and other elevated landmasses are formed by this buoyant crust such as volcanoes and mountains.	The discussion points can be augmented by presenting relevant pictures of the landforms used in the previous activity. After the discussion on the continental crust, direct the discussion on determining the difference between volcanoes and mountains as part of the lesson purpose.
B. Establishing Lesson Purpose	**1. Lesson Purpose** Let the learners read the lesson objectives aloud. • Differentiate volcanoes from mountains; • Describe the relationships between the role of plate interactions in the formation of volcanoes; • Relate the types of volcanoes to the process of volcanic formation; and • Classify different types of volcanoes based on their major characteristics. On a ¼-sheet of yellow paper, ask the students to write their initial thoughts on the objectives. This can be based on what they already know and want to know relevant to their objectives. **2. Unlocking Content Area Vocabulary** **Activity 2.** • Share the Pair! Match the words in column A on the descriptions in column B based on the context of the lesson.	These will be revisited by the end of the lesson for the learning check. Call the students to match these columns one by one and ask them to share their justification for their choice.

	Column A — **Column B** 1. Activity — A. process by which a volcano expels molten rock 2. Eruption — B. segments in the lithosphere with irregular sizes and shapes 3. Magma — C. refers to a volcano's current state 4. Plates — D. molten rock that lies beneath the Earth's surface	**ANSWER KEY:** 1. C 2. A 3. D 4. B Emphasize that these terms will be encountered most of the time in the discussion.
C. Developing and Deepening Understanding	**1. Explicitation** **Activity 3.** • *Volcanoes vs. Mountains*. Display the question, "What is the difference between a mountain and a volcano?" • Ask two to three students to answer the question yet the confirmation of their answer shall be answered in the latter part of the session. **Discussion Point:** Volcanoes and mountains are both prominent geological features. However, they have significant differences in terms of formation, composition, activity, and shape. **2. Worked Example** **Activity 4.** • *Volcano-Mountain Album*. In a box, place the printed pictures of the following mountains and volcanoes: o Mount Apo o Mount Pulag o Mount Kitanglad o Mayon Volcano o Taal Volcano o Mount Pinatubo • Shuffle these pictures before asking someone to pick a picture and classify it as a mountain or a volcano by posting it on the board. • Guide Questions: • How could you tell if that image was a volcano or a mountain? • Which photos were difficult to classify? How come?	As an opening question, ask the question relevant to the review activity in the previous question. Answers to this question may vary from the activity or location. Keep their answers and return them after they Worked Example. Pictures of the Mountains and Volcanoes may vary depending on the context of the locality. **ANSWER KEY:** Mountains: o Mount Apo o Mount Pulag o Mount Kitanglad Volcanoes

- What examples of mountains and volcanoes exist in the actual world?

- Mayon Volcano
- Taal Volcano
- Mount Pinatubo

Discussion Points

Distinct Differences	***Volcano***	***Mountain***
Formation	Volcanoes are formed by the accumulation of volcanic material ejected during eruptions	Mountains are typically formed by tectonic forces, such as the collision or convergence of tectonic plates, or by erosion and uplift over time
Composition	Volcanoes are composed of volcanic rocks, lava flows, and ash deposits	Mountains may consist of a variety of rock types, including sedimentary, igneous, and metamorphic rocks.
Activity	Volcanoes are often associated with ongoing volcanic activity, including eruptions, earthquakes, and the release of gasses	Mountains may be relatively dormant and inactive
Shape	Volcanoes often have distinctive shapes, such as conical or dome-like structures, resulting from the accumulation of volcanic material around the vent.	Mountains can have a variety of shapes and forms, depending on their geological history and the processes that shaped them

DAY 2

3. Lesson Activity

Activity 5.

The Case of Hawaii. While volcanoes and mountains have distinctions, volcanic activity can relate to the formation of mountains. And because volcanoes are more complex due to the varying nature of eruptions and magma composition, this session will focus on these geologic features.

See Learning Activity *Activity #1: The Case of Hawaii*

	For this activity, let the students watch the "How Did Hawaii Form?" video by Kelsey Kennedy from the Scientific American. Before watching the activity, let the students take note of the following questions: • How does the movement of the Pacific Plate over the hotspot result in the formation of the Hawaiian Island chain? • How do the eruptions of these volcanoes contribute to the growth of the islands? • What are the steps in forming volcanoes based on the video? • How do you think this volcanic activity on the island can form the mountains? After watching the video, ask volunteers to answer the questions before proceeding with the discussion points. **Discussion Points** A variety of geological processes, such as plate tectonics, magma production, and volcanic activity, combine to generate volcanoes. Consider the following processes involved in the creation of a volcanic terrain in Hawaii: 1. **Magma Generation**: Heat and pressure combine to melt rock deep under the Earth's mantle, creating magma. 2. **Magma Ascent/Rise**: Magma may be built up in subterranean spaces known as magma chambers as it climbs toward the surface. The Earth's crust has cracks and faults that cause these chambers to rise. 3. **Eruption**: An eruption happens when the pressure inside the magma chamber increases to a point where it is greater than the strength of the surrounding rock. There is a wide range of eruptions, from mild lava flows to explosions that emit gas, ash, and volcanic bombs. 4. **Volcanic Material Accumulation**: During eruptions, ash, pyroclastic debris, and lava flows shoot out of the vent and gather around the volcano's summit and slopes. The volcano's shape and form are built up over time by multiple eruptions. 5. **Ongoing Activity**: Volcanoes have the potential to erupt periodically, followed by periods of inactivity. Certain species might endure millennia, but others go extinct. There is more than only the exhaustion of magma sources that can lead to extinction. Volcanoes may be moved by plate movement away from the source of magma, which reduces the likelihood of eruptions.	Cite answers from the students that coincide with the discussion points. At this point, do not discuss thoroughly the plate boundaries as these are for the Grade 9 discussion. Emphasize that volcanic eruptions can contribute to the formation of mountains, but it's not the only way mountains are created. Direct the discussion to the introduction of the activity.

DAY 3

Elicit from the previous activity the features of volcanoes they observed such as the shapes of volcanoes. Point out the idea that volcanoes, like in Hawaii, can be classified according to their shapes.

Activity 6.

- *Sorting-Me-Out.*
- Obective: To describe the three main types of volcanoes (shield, stratovolcano, and cinder cone) based on their shapes, characteristics, and associated geological processes.
- Materials: Printed/Drawn Copies of the following materials

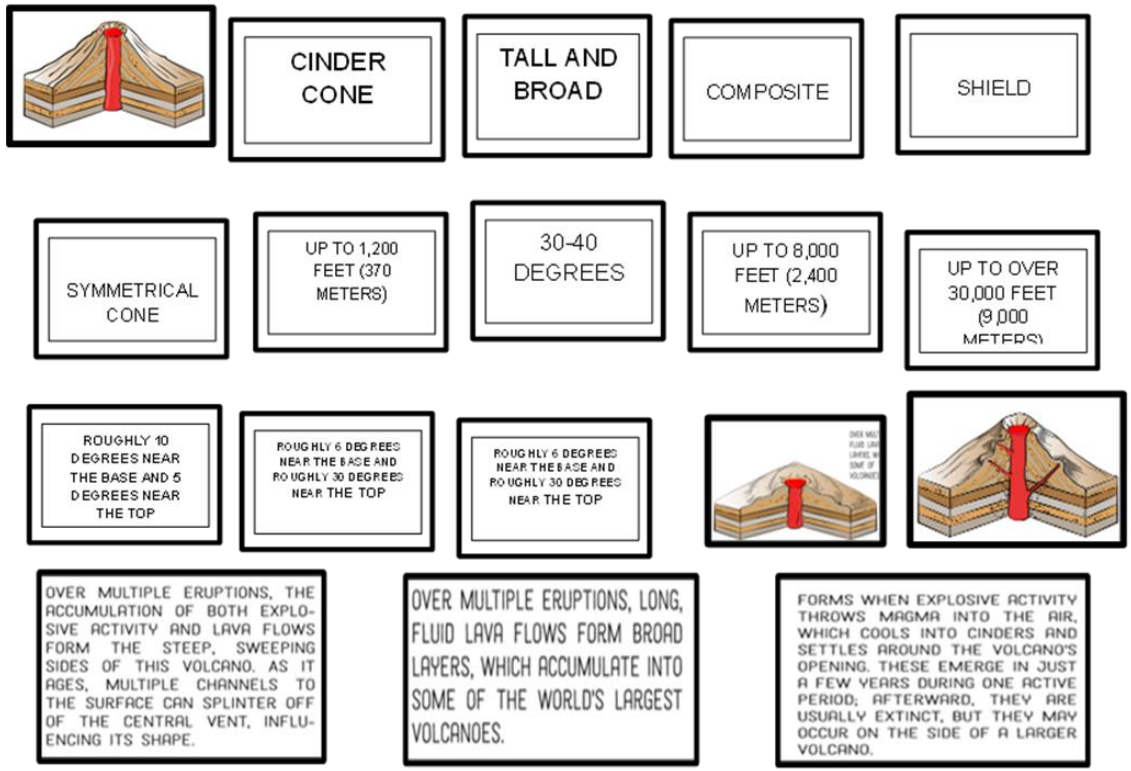

Image Source: geo.libretexts.org

1. On one side of the board, arrange these cards randomly while on the other side, prepare a blank table like this:

Type of Volcano	Shapes	Height	Slope	Formation

2. Ask volunteers to get a card and place them one by one until the table is complete.

Guide Questions:

1. Why do you think volcanoes come in different types?
2. How do you relate the type of volcano based on its volcanic formation?

Discussion Points:

1. **Cinder Cone** – symmetrical in shape
   - Steep-sided with a conical shape, with slopes 30-40 degrees
   - Cinder cones only grow to about 1,000-1,200 feet tall.
   - Cinder cones are created from a single opening.
   - The opening of a cinder cone is a cone-shaped structure
   - formed by the eruption of pyroclastic material, including cinders, ash, and volcanic bombs, which accumulate around the vent to create a cone-shaped hill.
   - Examples:
     - ***Mount Iriga*** in Camarines Sur (height: approximately 1,196 meters, slope: 25-30 degrees).
     - ***Paricutin in Mexico*** (height: approximately 424 meters, slope: 35-40 degrees)
2. **Shield** – tall and broad up to over 30,000 ft (9000m)
   - Roughly 10 degrees near the base and 5 degrees near the top
   - formed by the eruption of low-viscosity basaltic lava, which flows easily and spreads out over large distances, gradually building a broad, shield-like shape.
   - Example: ***Mauna Loa in Hawaii*** (height: approximately 4,170 meters, slope: less than 5 degrees)
3. **Composite a.k.a. stratovolcano**

For the discussion points, images of the sample volcanoes can further help in visualizing the difference between the types of volcanoes.

- tall, steep, and symmetrical
- up to 8,000ft (2,400m)
- roughly 6 degrees near the base and roughly 30 degrees near the top
- Formed by alternating layers of lava, ash, and volcanic rocks from both explosive and effusive eruptions, resulting in the buildup of layers over time.
- Examples:
  - **Mount Mayon in Albay** (height: approximately 2,463 meters, slope: 10-15 degrees).
  - **Mount Fuji in Japan** (height: approximately 3,776 meters, slope: 30-35 degrees)

Type of volcano	Tectonic Setting	Size and Shape	Magma and eruption characteristics
Shield volcano	Most are at the mantle plumes; some are on spreading ridges	Large (up to several 1,000 m high and 200 km across), not steep (typically 2- 10 degrees)	Magma is almost always mafic, and eruptions are typically effusive
Cinder Cone	Some form on the flanks of larger volcanoes	Small (10s to 100s of m) and steep (>20 degrees)	Most are mafic and form from the gas-rich early stages of a shield - or rift-associated eruption
Composite Volcano	Almost all are in the subduction zones	Medium size (1000s of m) and moderate steepness (10 - 30 degrees)	Magma composition varies from felsic to mafic, and from explosive to elusive.

DAY 4
Activity 7.

- ***The Volcanoes Around the Globe***

Prior to the end of the previous activity, ask the students to individually bring a printed picture of a volcano around the globe that captures their attention. Make sure you do not have a repetition of choice within the group and from the samples given in class. Ask them to prepare a short description of its characteristics.

Source: geo.libretexts.org

Assignment:
As a group, divide the class into five groups and ask them to bring the cartolina/Manila paper, marker, ruler, and glue/paste.

- Objective: Classify the volcanoes into shield, cinder, and composite volcanoes.
- Materials: cartolina/Manila paper, marker, ruler, glue/paste, and a picture of their chosen volcano

1. Ask each group to draw a table on the cartolina or Manila paper and divide it into three columns – Volcano, Type of Volcano, and Characteristics.
2. Using the pictures of their chosen volcano, complete the table for each group and prepare to briefly share it in class.
3. In their presentation, they present the rubric for grading:
   Accuracy – 10 points
   Clarity of Presentation – 5 points
   Total: 15 points
4. Here is a sample for Mayon Volcano as a reference:

Volcanoes	*Type of volcano*	*Characteristics*
 Image Source: worldlandforms.com	*Stratovolcano/ composite*	a. A variety of magma erupts, mostly basalt, andesite, dacite, and rhyolite which produces a wide range of eruption styles. This volcano forms tens to hundreds of thousands of years from accumulating lava flows, lava domes, and explosive deposits. b. Have multiple eruption centers or vents. c. Hazards include lava flows and pyroclastic flows. d. Dormant periods may last tens of thousands of years.

Ensure that the presentation is anchored to the discussion on the types of volcanoes and their characteristics.

In processing their presentation, make sure to emphasize their reasons as well for choosing such volcano for a more interactive discussion.

D. Making Generalizations

Learners' Takeaways

Bring back to the discussion the submissions during the presentation of the

Take time to return to

	lesson purpose. Ask the students how their entries change and/or what questions do they still have in mind after the discussion. **Reflections** To extend what they know, ask the students the following question, "In what ways do you think this knowledge about volcanoes will be useful in real-life situations or future studies?"	the discussion points that students might find difficult to understand.

IV. EVALUATING LEARNING: FORMATIVE ASSESSMENT AND TEACHER'S REFLECTION		**NOTES TO TEACHERS**
A. Evaluating Learning	**1. Formative Assessment** Instructions: On a ¼ sheet of pad paper, answer the following items. Choose the letter of the **best** answer. 1. How are composite volcanoes different from shield volcanoes? a. Shield volcanoes have steep sides b. Composite volcanoes are much smaller c. Shield volcanoes have violent eruptions d. Composite volcanoes are formed by layers of volcanic ash and lava 2. Which of the following is NOT a feature of a stratovolcano? a. Layers of ash and lava b. Tall, conical shape c. Gentle sloping sides d. Explosive eruptions 3. How does a cinder cone volcano typically form? a. Through violent eruptions b. By layers of cooled lava flow c. As layers of volcanic ash builds up d. Through the accumulation of ejected cinders 4. Which type of volcano is known for its quiet eruptions with flowing lava?	**ANSWER KEY:** *1. D* *2. C* *3. D* *4. A*

<table>
<tr><td></td><td colspan="3">a. Shield volcano
b. Stratovolcano
c. Cinder cone volcano
d. Caldera volcano

2. Homework (Optional)</td><td></td></tr>
<tr><td rowspan="5">B. Teacher's Remarks</td><td>Note observations on any of the following areas:</td><td>Effective Practices</td><td>Problems Encountered</td><td rowspan="5">This lesson design component prompts the teacher to record relevant observations and/or critical teaching events that he/she can reflect on to assess the achievement of objectives.

The documenting of experiences is guided by possible areas for observation including teaching strategies employed, instructional materials used, learners' engagement in the tasks, and other notable instructional areas.

Notes here can also be on tasks that will be continued the next day or additional activities needed.</td></tr>
<tr><td>strategies explored</td><td></td><td></td></tr>
<tr><td>materials used</td><td></td><td></td></tr>
<tr><td>learner engagement/ interaction</td><td></td><td></td></tr>
<tr><td>Others</td><td></td><td></td></tr>
</table>

C. Teacher's Reflection	*Reflection guide or prompt can be on:* ▪ *<u>principles behind the teaching</u>* *What principles and beliefs informed my lesson?* *Why did I teach the lesson the way I did?* ▪ *<u>students</u>* *What roles did my students play in my lesson?* *What did my students learn? How did they learn?* ▪ *<u>ways forward</u>* *What could I have done differently?* *What can I explore in the next lesson?*			This lesson design component guides the teacher in reflecting on and for practice. Entries on this component will serve as inputs for the LAC sessions, which can center on sharing the best practices discussing problems encountered and actions to be taken; and identifying anticipated challenges and intended solutions. Guide questions or prompts may be provided here.