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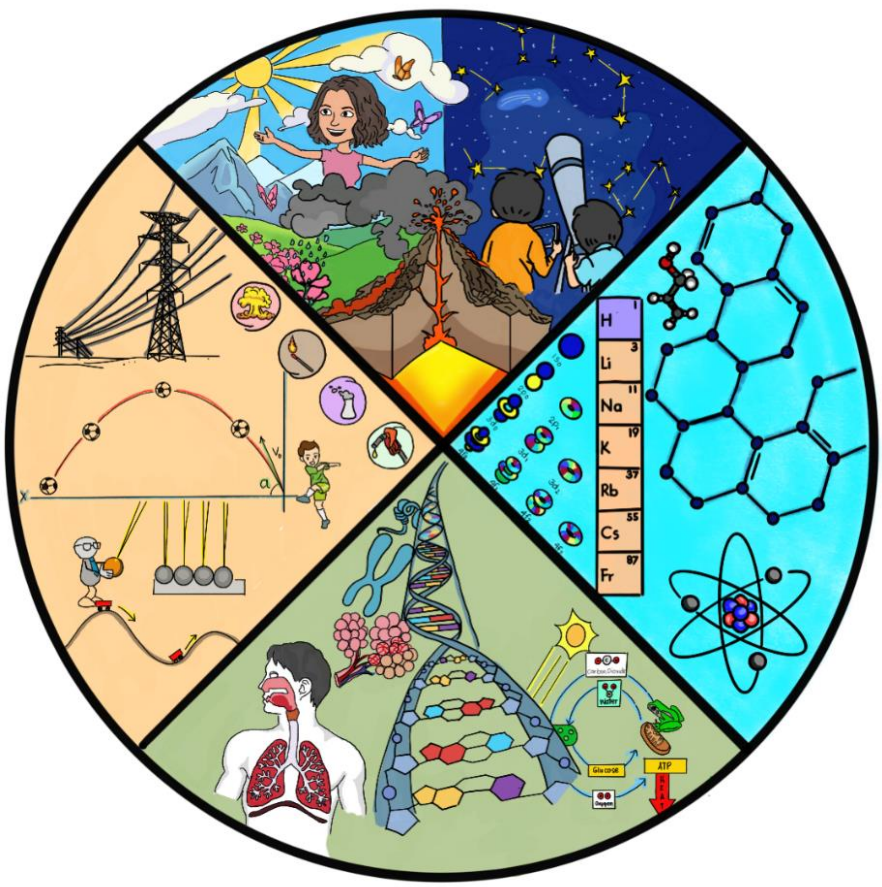
Department of Education
National Capital Region
SCHOOLS DIVISION OFFICE
MARIKINA CITY

Science

Quarter 3 - Module 1

Types of Volcano



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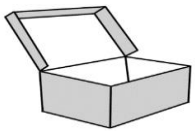


What I Need to Know

The purpose of this module is to help you understand better volcanic activities and its effect to the environment and to our lives. Volcanoes discharge hot and dangerous gases, ashes, lava, and rocks that are violently destructive to properties and lives. It is important for you to understand the characteristics of volcano and learn how to protect yourselves from possible damages and risks it might bring to your lives.

This module contains two lessons namely:

- Lesson 1 – Parts and types of volcanoes based on structure and activity.
- Lesson 2 – Active and inactive volcanoes

After going through this module, you are expected to **describe the different types of volcanoes and volcanic eruption**. **S9ES-III A-25 and S9ES -IIIb27.3.5**

Specifically, you should be able to:

- describe the different types of volcano;
- describe volcano and its parts and the types of volcano based on structure and activity;
- differentiate between active and inactive volcanoes; and
- give examples of active and inactive volcanoes in the Philippines.

What I Know

Read and understand each question and encircle the letter of the correct answer.

1. Mayon volcano, one of the famous volcanoes in the world, has erupted recently, what type of volcano is it?
   A. Active C. Extinct
   B. Dormant D. None of the above

2. The scientists believed that the steaming part of the earth is/are _____.
   A. Falls B. Mountains C. River D. Volcano

3. What type of volcano is formed almost entirely from great amounts of liquid lava?
   A. Cinder cone B. Lava dome C. Shield D. Stratovolcano

4. Volcano emits magma in different amounts. Which of the following characteristics of a volcano depends on its magma emission?
   A. Age B. Location C. Shape D. Size

5. The Philippines has several active and inactive volcanoes, the following are correctly matched EXCEPT?
   A. Mount Abunag- Active
   B. Mount Giron- Inactive
   C. Mount Kanlaon- Active
   D. Mount Smith-Inactive

6. What type of volcano has gentle eruption with oozing lava flow?
   A. Cinder
   B. Composite
   C. Shield
   D. All of the above

7. What type of volcano has violent eruptions with alternating layers of lava flow and volcanic particles?
   A. Cinder
   B. Composite
   C. Shield
   D. All of the above

8. A subduction zone can create volcanoes. What type of plate boundary do subduction zone occur?
   A. Convergent boundary
   B. Divergent boundary
   C. Subduction boundary
   D. Transform boundary

9. The following are benefits from volcanoes EXCEPT:
   A. Increased tourism
   B. Fertile soil
   C. Geothermal plant
   D. Land destroyed

10. A volcano that has a possibility of erupting again is called _____.
   A. Active
   B. Dormant
   C. Extinct
   D. None of the above

Lesson 1 Parts and Types of Volcanoes

What's In

Describe the Mayon Volcano based on its location, activity, and structure.

Figure 1. Mayon Volcano
http://bit.ly/3s5mlxJ

_____
_____
_____

What's New

On January 12, 2020, Taal Volcano has erupted. The Philippine Institute of Volcanology and Seismology (PHIVOLCS) raised the alert level from 1-4 after the increasing volcanic activities like unrest earthquake or volcanic tremor, frequent and strong ash explosions, and increasing of sulfur dioxide emission. Thousands of people, houses and livelihood were devastated because of the great volcanic ashfall.

Figure 2. Taal Volcano
http://bit.ly/3khQDKP

Guide Questions:

1. What external part of the volcano can be seen in the Taal volcano?
2. Where do molten rocks, and gases erupt?
3. How are volcanic vents form?

What Is It

A volcano is a landform produced by the continuous movement of plate boundaries. It is also a mountain that has an opening on the top and it is a rupture in the Earth's surface or crust that allows the hot, molten rock, ash, and gases to escape deep below the surface. Scientists believe that the volcano is the steaming area of the Earth. The volcano has different external and internal parts as shown in the illustration below:

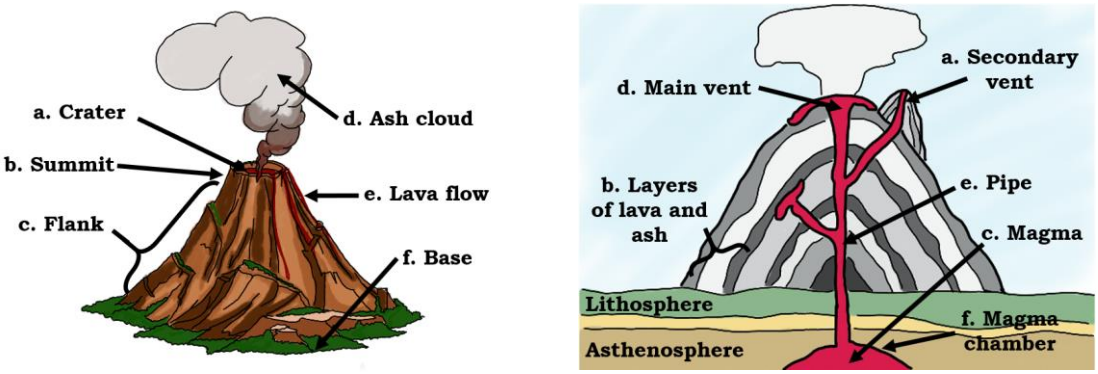


Figure 3. External (A) and Internal (B) Parts of a Volcano

External Parts

1. **Base**- foot of the volcano
2. **Flank**- side of the volcano
3. **Crater**- opening of the volcano
4. **Summit**- highest part of the volcano
5. **Lava flow**- stream of molten rock that pour from erupting vent
6. **Ash cloud**- small fragment of rock formed by volcanic explosion

Internal Parts

1. **Magma-** molten rocks
2. **Magma Chamber-** deposit of magma
3. **Pipe** – passage of magma from the magma chamber to the vent
4. **Vent-** opening in earth's surface through which volcanic materials escape

Based on the illustrations, describe the external and internal part of volcano. Copy the table and write your answer on a separate sheet of paper.

Parts of Volcano	Description
A. External	
a. Crater	
b. Summit	
c. Flank	
d. ash cloud	
e. lava flow	
f. base	

B. Internal	
a. vent	
b. magma	
c. pipe	
d. magma chamber	

What's More

The volcano has different types based on the structure and activity. The different volcano formed depends on the viscosity of the magma, the amount of gas in the magma, and the way the magma reached the surface.

Types of Volcano	Description
A. Stratovolcano or Composite Volcano  **Mount Kanlaon, Philippines** http://bit.ly/3aH9njL	• steep-sided slope • Symmetrical cones of large dimension • built of alternating volcanic ash and lava flow • The crater is also the summit. • have multiple vents like Taal volcano has 47 vents • 8,000 feet tall • Pressure build in the magma chamber. • with thick or highly viscous lava • Violent eruptions • grandest mountain
B. Cinder Cone  **Smith Volcano, Philippines** http://bit.ly/37CfkMR	• has single vent • has an oval cone and bowl-shaped crater • 300- 1,200 feet tall • have a crater at the summit • violent eruption • Simplest volcano

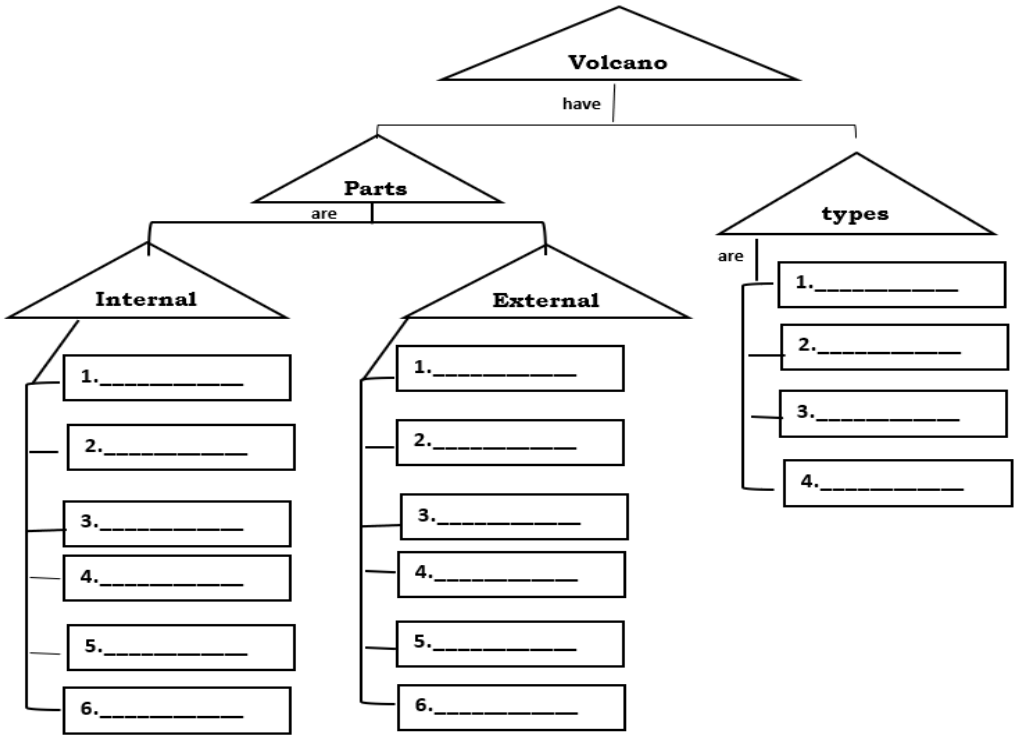
C. Shield Volcano  **Sierra Grande, New Mexico** https://bit.ly/2NQM91q	• broadest volcano (3-4 miles in diameter) and a huge volcano • 1500-2000 feet tall • has gentle slope • has a thin lava flow • have multiple vents • has flatter summit • non-violent eruption • quiet eruption
D. Lava Dome Volcano  **Musuan Peak, Philippines** http://bit.ly/3dkMe8D	• Has steeper side than shield volcano • Lava cannot flow very far because of too viscous to flow • lava domes often form within the craters of stratovolcanoes

What I Have Learned

A. Put a check on the specific volcano being described.

Types of Volcano	Cinder	Lava Dome	Stratovolcano/ composite	Shield Volcano
has single vent				
tallest volcano				
gentle slope				
broadest volcano				
quiet eruption				
Lava is too viscous to flow				

B. Complete the concept map. Copy and answer on a separate sheet of



What I Can Do

Write 5 volcanoes found in the Philippines then describe each volcano and classify what types of volcano it is.

1._____
2. _____
3. _____
4. _____
5. _____

Assessment

Read and understand each question and encircle the letter of the correct answer.

1. Which material flows from the crater to the crust?
   A. Air B. Lava C. Magma D. Sulfur

2. Which type of volcano has a steep slope and mostly found in the pacific ring of fire?
   A. Cinder cone B. Lava dome C. Shield D. Stratovolcano

3. It measured the steepness of the slope of the volcano is called_____.
   A. Crater B. Flank C. Lava D. Magma

4. Which material is a molten rock found inside the volcano and most of this material found in the magma chamber?
   A. Chamber B. Lava C. Magma D. Summit

5. Which is the passageway of magma from the magma chamber to the crater?
   A. Crater B. Flank C. Summit D. Vent

Additional Activities

Locate the given volcanoes on the Philippine Map then classify what kind of volcano it is.

Volcano	Location		Active/ Inactive
	Region	Province	
1. Mt. Hibok- Hibok			
2. Mt. Smith			
3. Mt. Bulusan			
4. Mt. Banahaw			
5. Balo Dome			

Lesson 2 Active and inactive volcanoes

What's In

Cite at least 3 differences between Mayon Volcano and Mount Arayat based on the pictures below.

Figure 1. Mayon Volcano
http://bit.ly/3bbTwZE

Figure 2: Mount Arayat
http://bit.ly/3qFt2pC

1. _____

2. _____

3. _____

What's New

The Philippines is found in the convergent boundary of the Eurasian plate, and the Philippine plate. It is surrounded by the colliding of plates and that result to the formation of volcanoes. There are about 300 volcanoes found in the Philippines, 24 are active while the rest are inactive volcanoes.

List 5 active volcanoes and 5 inactive volcanoes that are found in the Philippines.

Active Volcano	Place or Province	Inactive Volcano	Place or Province
1.		1.	
2.		2.	
3.		3.	
4.		4.	
5.		5.	

What Is It

According to the Philippines Institute of Volcanology and Seismology (PHIVOLCS), volcanoes are classified as Active and inactive. It is considered active when it erupted during the historical times or within the past 600 years while inactive volcano has no recorded eruption.

Activity: Active and Inactive Volcanoes in the Philippines

Based on the description below, identify the following volcanoes if it is active or inactive. Write your answer on the table.

Volcano	Place	Number of eruptions	History of eruption/ Volcanic Activity	Active/ Inactive
1. Mount Bagsak	Sulu	0	No recorded history of eruption	
2. Ambalatungan group	Kalinga	0	steam with sulfur dioxide, carbon dioxide, hydrogen chloride and hydrogen sulfide and thermal springs released in 1952 has not considered an explosion.	
3. Mount Biliran	Biliran	1 (1939)	Phreatic eruption, smoke with thermal springs	
4. Mount Bulusan	Sorsogon	17 (1860- 2011)	Permanently monitored	
5. Mount Didicas	Cagayan	6 1773, 1856,1900,1952,1969 and 1978	Submarine volcano till 1952	

What's More

The Pacific ring of fire is the area where the most active or dangerous volcanoes are found. The Philippines is located in this area and has 24 active volcanoes.

Activity: Location of Active and Inactive Volcanoes in the Philippines.

You will need: Blue and red colored paper, Philippine map, 1 brown clay

What to do:

1. Cut the colored paper into triangular shape.
   Red for active volcanoes and **Blue** for inactive volcanoes
2. Paste the colored triangular strips on the map using the brown clay as its holder.
3. Use the table below as your guide.

Volcano	Location	Number/year of eruption	Description
1. Mount Iraya	Batanes	1/ 1954	Seismic swarm in 1998
2. Mount Iriga	Camarines Sur	2/ 1628, 1642	
3. Mount Agutaya	Palawan	0	
4. Mount Kalaon	Negros Occidental	26	Permanently Monitored
5. Leonard Kniaseff	Davao de Oro	1800or 120 AD	Strong thermal features in last eruption 120 AD Volcanic earthquakes
6. Mount Abunug	Southern Leyte	0	
7. Mount Matumtum	South Cotabato	1/ 1911	Released steam on March 7, 1911. Thermal springs
8. Balo Dome	South Cotabato	0	
9. Mount Parker	South Cotabato	1/1641	Forming of Caldera on last eruptions
10. Mount Giron	Biliran	0	

Guide Questions:

1. Where are the most active volcanoes found?

_____

2. Are those active volcanoes found in the same place? Why?

_____

3. From the table above, which volcanoes had the most number, least number, and no record of eruptions? _____

4. From the table above, which are the active and inactive volcanoes? Why?

_____

5. How do you classify volcanoes?

_____

6. Differentiate active and inactive volcano.

_____

What I Have Learned

Complete the table below.

Classification	Description	Example	Region and Province
Active		Taal Volcano	
	No recorded history of eruption		

What I Can Do

Write 3 sentences about the advantages and disadvantages of volcano.

_____

_____

_____

_____

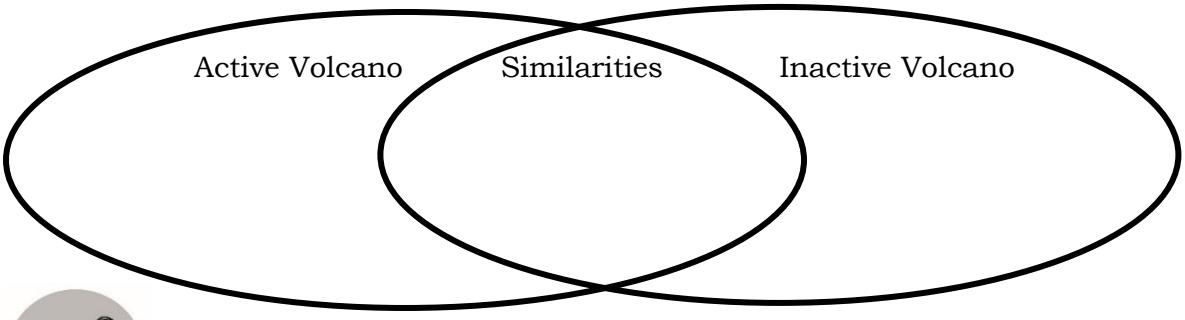
Assessment

Read the statement carefully. Write T If the statement is true and F if the statement is false.

_____ 1. Mount Hibok- Hibok and Mount Bulusan are inactive volcano.
_____ 2. Active volcano releasing steam, ash clouds are signs of possible eruption.
_____ 3. All active volcanoes are located in Luzon.
_____ 4. The Philippines is found in convergent boundary of Eurasian and Philippine plate.
_____ 5. PHIVOLCS monitors Inactive volcano only.

Additional Activities

Using the Venn Diagram, show the similarities and differences between active and inactive volcano.



Posttest

Read and understand each question and encircle the letter of the correct answer.

1. What type of volcano that has lava flow that is too slow in a great distance and its surface cools and hardens that makes lava pile?
   A. Cinder cone
   B. Lava dome
   C. Shield volcano
   D. Stratovolcano

2. A 1000 feet volcano and formed from lava ejected from single vent at the top is called_____.
   A. Cinder cone B. Composite C. Lava dome D. Shield

3. Which type of a volcano is the most dangerous when it erupts?
   A. Cinder cone volcano
   B. Lava Dome volcano
   C. Shield volcano
   D. Stratovolcano

4. Most shield volcanoes found on the ocean floor form _____.
   A. Canyons B. Dikes C. Islands D. Tectonic plates

5. Philippines belongs to the Ring of fire. “Ring of Fire” means _____.
   A. An active erupting volcano.
   B. The land once known as Pangaea.
   C. The volcanoes surrounding the Pacific Ocean.
   D. The spreading that takes place on the ocean floor.

6. It is a landform produced by continuous movement of convergent plate boundaries with opening on the top.
   A. Plain B. Plateau C. Valley D. Volcano

7. How are volcanoes formed?
   A. Spin of earth
   B. L-waves traveling through earth
   C. Magma is pushed up through earth’s crust
   D. Shock waves from the movement in earth’s crust

8. Which volcano has a very broad shape with a gentle slope?
   A. Cinder cone B. Composite C. Lava dome D. Shield

9. Where is the world’s most active volcanoes located?
   A. At the divergent boundaries of Great rift valley of East Africa
   B. At convergent boundaries around the Pacific ring of fire
   C. Where tectonic slide past one another in San Andreas fault
   D. Where two continental plates collide in Himalayas

10. Which is NOT a characteristic of an inactive volcano?
   A. It has not erupted for at least ten years
   B. It has noticeable steaming or fumarolic activity
   C. It has supply of magma that stays in the same place within the earth
   D. It is still considered active but do not show noticeable volcanic activities.

Answer Key

Additional Activity

Volcano	Region	Location	Active / Inactive
Mt. Hibok-Hibok	X	Camiguin	Active
Mt. Smith	II	Batanes	Active
Mt. Bulusan	V	Sorsogon	Active
Mt. Banahaw	IVA	Laguna- Quezon	Active
Balo Dome	XII	Sarangani	Inactive

Lesson 2
What's In
The Answer may vary.

Lesson 2
What's New
The Answer may vary.
What Is It
1. Mount Bagsak- Inactive
2. Ambalatungan group- Inactive
3. mount Biliran- Active
4. Mount Bulusan- Active
5. Mount Didicas – Active
What's More
Guide Questions
1. Active volcanoes found in the Eastern Part of the Philippines face the Pacific Ocean.
2. No, it is located in different regions of the Philippines
3. **Most number of eruptions**
Mount Kanlaon 26 eruptions
Least number of eruption
Mount Matumtum- 1 eruption
Iraya – 1 eruption
Leonard Kniaseff- 1
No historical eruption
Mount Giron – 0 eruption Mount Agutay- 0 eruption
4. **Active Volcanoes**
Mount Kalaon Mount Iriga
Mount Iraya Leonard Kniaseff
Mount Matumtum Mount Parker
Inactive Volcanoes
Mount Agutuya Mount Abunag
Mount Giron Balo Dome
5. Active volcano and Inactive Volcano
6. Active Volcano has 1 or more historical eruption while Inactive there is no historical eruption.
Module 1 Lesson 2
What I Have Learned

Classification	Description	Example	Region and Province
Active	Has recorded history of eruption	Taal Volcano	IVA
Inactive	No recorded history of eruption	Answer may vary	Answer may vary

What I Can Do
The answer may vary.
Assessment
1. F 2. T 3. F 4. T 5. F
Additional Activity
Active Volcano - has recorded historical eruption
Inactive Volcano - none recorded historical eruption
Similarities - It creates livelihood and tourist attraction.

Module 1
Lesson 1
What's In
The answer may vary
What's New
1. Crater
2. Yes,
3. Taal is caldera volcano due to number of craters
What Is It
A. external part of volcano
a. Crater- opening of the volcano
b. Summit - peak/ highest part of the volcano
c. Flank – steepness of the volcano
d. Ash Clouds – small fragment of rock formed by volcanic explosion
e. Lava flow- magma flow on the surface of the Earth
f. Base- foot of the volcano
B. Internal part of volcano
a. Vent -_opening in earth's surface through which volcanic materials escape and where the magma leaves the volcano's pipe
c. magma- molten rock
e. pipe- narrow, almost vertical crack in the crust through the magma rises to the surface
f. magma chamber large underground pocket where the magma deposit
What's More

Types of Volcano	Cinder	Lava Dome	Stratovolcano/ composite	Shield Volcano
has single vent	/			
tallest volcano			/	
gentle slope				/
broadest volcano				/
quiet eruption				/
Lava is too viscous to flow				/

What I Have Learned
External Parts of Volcano
a. Summit d. Ash clouds
b. Crater Se. lava flow
c. Flank f. base
Internal Parts of Volcano
a. magma chamber d. Vent
b. magma e. secondary vent
c. pipe f. layers of ash and lava
Types of volcano
1. Stratovolcano/ Composite
2. Cinder Cone volcano
3. Shield Volcano
4. Lava Dome Volcano
What I Can Do
The answer may vary.
Assessment
1. B 3. C 5. D
2. C 4. D

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