

## Earth Science Chapter 10 - Volcanoes - Quiz Questions (#1- #6)

| Front - Question  |                            | Back - Answer  |
|---|----------------------------|--|
| <p><b>Q1-1:</b> What is the difference between magma and lava?</p>  | <p>f<br/>o<br/>l<br/>d</p> | <p><b>A1-1:</b> Magma is underground melted rock. Lava is magma that has reached Earth's surface and cooled.</p>           |
| <p><b>Q1-2:</b> Imagine a volcano with only one vent. What change might cause a second vent to appear on the side of the volcano?</p>   | <p>f<br/>o<br/>l<br/>d</p> | <p><b>A1-2:</b> A second vent could appear on the side of the volcano if a still or dike broke through to the surface.</p> |
| <p><b>Q1-3:</b> About 7,000 years ago, Mount Mazama erupted and the summit (top) of the volcano collapsed forming a depression that was filled with rain and melted snow. The depression is now called Crater Lake. Mount Mazama is an extinct volcano. What is the best term to describe the depression that holds Crater Lake?</p>                  | <p>f<br/>o<br/>l<br/>d</p> | <p><b>A1-3:</b> The depression is called a caldera.</p>  |
| <p><b>Q1-4:</b> Which kind of volcano is being described below? Use one of these terms: active, dormant, or extinct. a. No longer erupting; b. Could be described as "sleeping"; c. May erupt in the future but is not erupting at present or recently; d. Erupting on a regular basis; e. The volcano is eroding and a volcanic rock is exposed.</p> | <p>f<br/>o<br/>l<br/>d</p> | <p><b>A1-4:</b> A. extinct, B. dormant, C. dormant, D. active, E. extinct</p>  |

**Q1-5:** What is the difference between a dormant volcano and an active volcano?

f  
o  
l  
d

**A1-5:** A dormant volcano is not currently active, but may become active in the future. An active volcano is erupting or has erupted recently and is expected to erupt again in the near future.

**Q1-6:** Based on your reading in this section, answer these questions: a. Under what conditions of temperature and pressure does a solid rock begin to melt? b. Under what conditions of temperature and water content does a solid rock begin to melt?

f  
o  
l  
d

**A1-6:** A rock begins to melt at low temperature and high water content –or- a rock begins to melt at high temperature and low water content.

**Q2-1:** What did early map makers notice about the locations of volcanoes?

f  
o  
l  
d

**A2-1:** Volcanoes were located along coastlines.

**Q2-2:** What causes the region called the Ring of Fire?

f  
o  
l  
d

**A2-2:** The Ring of Fire is caused by subduction of the Pacific Plate under other plates.

**Q2-3:** If you could melt a piece of quartz in some lava, would the lava get more sticky or less sticky? Explain your answer.

f  
o  
l  
d

**A2-3:** Adding this mineral to lava makes it stickier.

Q2-4: Where is runny lava found: (a) On a continental plate, or (b) on an oceanic plate? Why?

f  
o  
l  
d

A2-4: This type of lava is found at mid-ocean ridges or hot spots because it is low in silica content.

Q2-5: Where is thick and sticky lava found: (a) On a continental plate, or (b) on an oceanic plate? Why?

f  
o  
l  
d

A2-5: This type of lava is found on continental plates.

Q2-6: When volcanic island chains are formed, what moves? Pick the correct answer: a. the mantle plume; b. the plate above the mantle plume; c. both the plate and the plume; d. nothing moves

f  
o  
l  
d

A2-6: The correct answer is (b).

Q2-7: Which of the Hawaiian Islands formed first and how long ago did it form?

f  
o  
l  
d

A2-7: The first Hawaiian Island was Kauai, which formed 3.8 to 5.6 million years ago.

Q2-8: What kind of geologic formation is Loihi? Is it a part of the Hawaiian chain? Explain your answer.

f  
o  
l  
d

A2-8: Loihi is an undersea volcano. It is part of the Hawaiian chain, a volcanic island chain that continues to move over a hot spot.

Q2-9: How have scientists figured out that the Pacific Plate is moving at about 9 centimeters per year?

f  
o  
l  
d

A2-9: They study the direction, age, and length of the volcanic chain.

Q2-10: If the Pacific Plate is moving at 9 cm per year, calculate: a. How long will it take for this plate to travel 4.5 meters?  
b. How far will the plate have travelled in meters after 3 years?

f  
o  
l  
d

A2-10: (a)  $4.5\text{m} \times 100 = 450$  centimeters;  $450\text{ cm} / 9\text{ cm/yr} = 50$  years (b)  $9\text{ cm} \times 3\text{ yrs} = 27\text{ cm}$  or .27 meters

Q2-11: What are the names of the items (A-C) on the graphic shown to the right? (color version found on page 214)?

f  
o  
l  
d

A2-11: a. magma; b. trench; c. mid-ocean ridge (divergent boundary)

Q2-12: Name a difference between an island chain and an island arc.

f  
o  
l  
d

A2-12: An island chain occurs on a lithospheric plate. An island arc is a string of volcanic islands that forms close to a plate boundary.

Q3-1: What two ingredients in magma affect the type of explosion and shape of a volcano?

f  
o  
l  
d

A3-1: Silica and dissolved gas in magma affect the type of explosion and shape of a volcano.

Q3-2: Under what conditions will magma be very thick and sticky?

f  
o  
l  
d

A3-2: High silica content = thick and sticky magma

Q3-3: Describe what a shield volcano's eruption is like. Then describe a composite volcano's eruption. a. shield volcano eruption; b. composite volcano eruption.

f  
o  
l  
d

A3-3: A shield volcano is not explosive and produces a flattened mound; a composite volcano has explosive eruptions and produces a cone-shaped volcano.

Q3-4: Compare and contrast these items: a. pumice; b. obsidian; c. ash.

f  
o  
l  
d

A3-4: a. dark rock with many holes. Low density & can float in water; b. volcanic glass low in dissolved gas; c. finer particles that can drift with the wind.

Q3-5: For each of the following statements, indicate which volcano is being described: a. a cone composed of layers; b. forms in calderas; c. forms from a buildup of lava on the ocean floor.

f  
o  
l  
d

A3-5: a. composite volcano; b. cinder cone; c. shield volcano

Q4-1: Describe two (2) characteristics of an igneous rock.

f  
o  
l  
d

A4-1: a. Formed as melted rock, cools, and crystallizes; b. crystals tightly locked together.

**Q4-2:** If lava on Earth's surface cools very quickly, will the crystals in the resulting igneous rock be small or large?

f  
o  
l  
d

**A4-2:** lava that cools quickly = small crystals

**Q4-3:** Which of the following pieces of information can you learn by looking at an igneous rock. Put checks by the correct answer. a. how old it is; b. how fast it cooled; c. how much it weighs; d. whether it formed above or under ground; e. how long it will take to metamorphose; f. what time of day it formed.

f  
o  
l  
d

**A4-3:** correct answers are b. (how fast it cooled) and d. (whether it formed above or under ground)

**Q4-4:** How is gabbro similar to granite?

f  
o  
l  
d

**A4-4:** Both have large crystals and are formed underground.

**Q4-5:** Fill in the table below to compare and contrast basalt and granite. A. size of crystals; B. Formed where?; C. Silica content; D. Where found; E. Density

f  
o  
l  
d

**A4-5:** basalt=fine crystals, formed on surface, low silica content, found on ocean plates, high density; granite=large crystals, formed underground, high silica content, found on continental plates, low density

**Q4-6:** Granite, rhyolite, and obsidian are shown on page 223. Determine which photograph represents each rock. A: \_\_\_\_  
B: \_\_\_\_ C: \_\_\_\_

f  
o  
l  
d

**A4-6:** A. obsidian; B. granite; C: rhyolite

Q4-7: You want to take a vacation to a place where you could find igneous rocks. To which places would you go? Justify your answer. a. Niagara Falls; b. Las Vegas; c. The Hawaiian Islands; d. Your own backyard

f  
o  
l  
d

A4-7: Hawaiian Islands...  
igneous rocks created from  
rising magma from hot spots

Q4-8: The Mid-Atlantic Ridge goes through the country of Iceland. Would you expect to find igneous rocks in Iceland? Explain your answer.

f  
o  
l  
d

A4-8: Yes, you would expect to find igneous rocks there. New material comes up from the mantle to cool and solidify into new rock.

Q5-1: volcano

f  
o  
l  
d

A5-1: Geologic feature that  
an eruption can produce

Q5-2: lava

f  
o  
l  
d

A5-2: Magma that has  
reached and cooled on Earth's  
surface

Q5-3: magma chamber

f  
o  
l  
d

A5-3: A place where  
magma cools underground

|                      |                  |   |
|----------------------|------------------|---|
| Q5-4: caldera        | f<br>o<br>l<br>d | A5-4: A bowl-shaped volcanic feature on Earth's surface                                       |
| Q5-5: lava lake      | f<br>o<br>l<br>d | A5-5: A volcanic feature that occurs when water fills a caldera and lava oozes into the water |
| Q5-6: resurgent dome | f<br>o<br>l<br>d | A5-6: A mound of magma that forms on the floor of a caldera                                   |
| Q5-7: active volcano | f<br>o<br>l<br>d | A5-7: Type of volcano that is erupting or has erupted recently                                |
| Q5-8: Ring of Fire   | f<br>o<br>l<br>d | A5-8: Region where about half of the active volcanoes on Earth occur                          |



|                         |                  |   |
|-------------------------|------------------|---|
| Q5-9: silica            | f<br>o<br>l<br>d | A5-9: Substance that makes magma thick and sticky   |
| Q5-10: hot spot         | f<br>o<br>l<br>d | A5-10: Mantle area over which a volcanic island can form  |
| Q5-11: cinder cone      | f<br>o<br>l<br>d | A5-11: Volcanic feature that can form on the sides of either a shield or composite volcano.   |
| Q5-12: pyroclastic flow | f<br>o<br>l<br>d | A5-12: A combination of hot gases and ash that can move like a liquid down the sides of a volcano during an eruption. Can cause a great deal of destruction |
| Q5-13: water cycle      | f<br>o<br>l<br>d | A5-13: A natural cycle energized by the Sun that deals with water   |

|  |                  |  |
|--|------------------|--|
| Q5-14: obsidian  | f<br>o<br>l<br>d | A5-14: Igneous rock –<br>formed by low gas & high<br>silica magma  |
| Q5-15: basalt  | f<br>o<br>l<br>d | A5-15: Igneous rock –<br>formed by high gas & low<br>silica magma  |
| Q5-16: What is the difference<br>between a conduit and a vent<br>on a volcano?                                 | f<br>o<br>l<br>d | A5-16: Magma leaves the<br>magma chamber, moves up the<br>conduit, and leaves the conduit<br>at the vent.  |
| Q5-17: Describe the three (3)<br>phases in the life of a volcano.  | f<br>o<br>l<br>d | A5-17: a. active – erupting or<br>recently erupted; b. dormant – not active<br>now, but may be in the future; c. extinct –<br>no longer able to erupt. |
| Q5-18: Is the material that<br>forms a volcanic neck<br>considered to be solidified<br>magma or lava? Explain. | f<br>o<br>l<br>d | A5-18: The material is the<br>solid remains of magma that<br>filled the conduit of a volcano   |

Q5-19: How are pressure and heat involved in melting rock in the mantle?

f  
o  
l  
d

A5-19: At low temperature and low pressure, melting can begin. At high temperature and high pressure, melting can also begin.

Q5-20: How does plate tectonics cause volcanic islands to form in a chain?

f  
o  
l  
d

A5-20: The plate is moving over the top of a stationary mantle plume. As the plate moves, it carries the volcanic island away from the hot spot and another volcano begins to form.

Q5-21: Describe how the granite domes of Yosemite National Park were formed.

f  
o  
l  
d

A5-21: They were formed as silica-rich magma that rose through the edge of the overlying North American plate at a subduction zone that no longer exists. When the subduction stopped the magma cooled. The surrounding land eroded away, exposing the granite domes.

Q5-22: Describe the magma of fire fountain eruptions in terms of silica and gas content.

f  
o  
l  
d

A5-22: When low silica magma has high levels of dissolved gas, the gas bubbles out as it reaches the volcano vent.

Q5-23: Explain how a shield volcano differs from a composite volcano.

f  
o  
l  
d

A5-23: A shield volcano has low silica magma and is in the shape of a flattened mound. A composite volcano has high silica magma and is a tall, cone-shaped volcano made up of layers of ash and lava.

Q5-24: What is the difference between a pyroclastic flow and a lahar?

f  
o  
l  
d

A5-24: When a column of exploding material collapses, it races down the side of a mountain as a pyroclastic flow. A lahar is a mud flow that accompanies a composite volcano eruption.

Q5-25: How do igneous rocks form?

f  
o  
l  
d

A5-25: From cooling of magma or lava

Q5-26: What about the appearance of an igneous rock gives you a clue about whether it cooled slowly or quickly?

f  
o  
l  
d

A5-26: slow cooling = large crystals; fast cooling = small crystals

Q5-27: Math Problem: The speed of a pyroclastic flow is 100 km/hr. How far would this flow travel in 10 minutes? (Show your work – not just the answer! Hint: Begin by converting 100 km/hr to ? km/min first.)

f  
o  
l  
d

A5-27: 100 km/hr divided by 60 = 1.67 km/min (x) 10 min. = 16.67 km distance

Q6-1: volcano

f  
o  
l  
d

A6-1: An erupting vent through which molten rock reaches Earth's surface or a mountain built from the products of an eruption.

|                     |                  |  |
|---------------------|------------------|--|
| Q6-2: magma         | f<br>o<br>l<br>d | A6-2: Underground melted rock  |
| Q6-3: magma chamber | f<br>o<br>l<br>d | A6-3: A location where magma collects inside Earth                           |
| Q6-4: conduit       | f<br>o<br>l<br>d | A6-4: Central internal vertical shaft that carries magma up inside a volcano |
| Q6-5: vent          | f<br>o<br>l<br>d | A6-5: An opening to the surface where magma leaves the volcano conduit       |
| Q6-6: dike          | f<br>o<br>l<br>d | A6-6: An upward-slanting sheet of magma within a volcano                     |

|                       |                  |   |
|-----------------------|------------------|---|
| Q6-7: sill            | f<br>o<br>l<br>d | A6-7: The sideways movement of magma underground inside a volcano |
| Q6-8: lava            | f<br>o<br>l<br>d | A6-8: Magma that has reached and cooled on Earth's surface        |
| Q6-9: caldera         | f<br>o<br>l<br>d | A6-9: A bowl-shaped vent of a volcano after it has erupted        |
| Q6-10: resurgent dome | f<br>o<br>l<br>d | A6-10: A mound in the vent of an erupted volcano                  |
| Q6-11: lava lake      | f<br>o<br>l<br>d | A6-11: A lake that contains lava that has formed in a caldera     |

|                        |                  |   |
|------------------------|------------------|---|
| Q6-12: active volcano  | f<br>o<br>l<br>d | A6-12: A volcano that is erupting or has erupted recently   |
| Q6-13: dormant volcano | f<br>o<br>l<br>d | A6-13: A volcano that is not erupting now, but that may erupt in the future   |
| Q6-14: extinct volcano | f<br>o<br>l<br>d | A6-14: A volcano that no longer erupts and is in the process of eroding   |
| Q6-15: volcano neck    | f<br>o<br>l<br>d | A6-15: Solid remains of magma that filled the conduit of an extinct volcano. The neck is exposed as the volcano erodes. |
| Q6-16: Ring of Fire    | f<br>o<br>l<br>d | A6-16: A region of Earth's plate boundaries where oceanic crust is subducting under other plates                        |

|                        |                  |   |
|------------------------|------------------|---|
| Q6-17: basalt          | f<br>o<br>l<br>d | A6-17: A dense, oceanic, dark-colored rock that is NOT silica rich                        |
| Q6-18: silica          | f<br>o<br>l<br>d | A6-18: Like the mineral quartz, it makes magma thick and sticky                           |
| Q6-19: pillow lava     | f<br>o<br>l<br>d | A6-19: Runny basaltic lava that oozes out at a mid-ocean ridge and cools quickly in water |
| Q6-20: volcanic island | f<br>o<br>l<br>d | A6-20: A volcano that forms away from a plate boundary on an oceanic plate                |
| Q6-21: hot spot        | f<br>o<br>l<br>d | A6-21: The top of an established mantle plume   |



|                              |                  |   |
|------------------------------|------------------|---|
| Q6-22: volcanic island chain | f<br>o<br>l<br>d | A6-22: A series of volcanoes formed by a hot spot as a lithospheric plate moves over the hot spot |
| Q6-23: mantle plumes         | f<br>o<br>l<br>d | A6-23: Narrow channels of magma that rise up through the mantle                                   |
| Q6-24: Loihi                 | f<br>o<br>l<br>d | A6-24: A new volcanic island forming underwater next to Kilauea in Hawaii                         |
| Q6-25: island arc            | f<br>o<br>l<br>d | A6-25: A string of volcanic islands that forms close to a plate boundary                          |
| Q6-26: subduction zone       | f<br>o<br>l<br>d | A6-26: An area where denser basaltic oceanic plates dive under less dense continental plates      |

|                          |                  |   |
|--------------------------|------------------|---|
| Q6-27: shield volcano    | f<br>o<br>l<br>d | A6-27: Low silica magma producing a wide, flat volcano  |
| Q6-28: cinder cone       | f<br>o<br>l<br>d | A6-28: A pile of rock bits that forms on the sides or in the caldera of a volcano   |
| Q6-29: fire fountain     | f<br>o<br>l<br>d | A6-29: A high gas magma eruption  |
| Q6-30: composite volcano | f<br>o<br>l<br>d | A6-30: A tall, explosive, cone-shaped volcano formed by layers of silica-rich lava and ash                                |
| Q6-31: pyroclastic flow  | f<br>o<br>l<br>d | A6-31: A destructive cloud of volcanic material that moves quickly down the side of a volcano after an explosive eruption |

|                       |                  |   |
|-----------------------|------------------|---|
| Q6-32: lava bombs     | f<br>o<br>l<br>d | A6-32: Blobs of glowing lava thrown from an explosive eruption                                      |
| Q6-33: lahar          | f<br>o<br>l<br>d | A6-33: A mudflow that results from a volcanic eruption  |
| Q6-34: water cycle    | f<br>o<br>l<br>d | A6-34: A set of processes energized by the Sun that keeps water moving from place to place on Earth |
| Q6-35: geologic cycle | f<br>o<br>l<br>d | A6-35: A set of processes that keeps rocky material moving from place to place on Earth             |
| Q6-36: geysers        | f<br>o<br>l<br>d | A6-36: An explosive eruption of water from volcanic-heated underground chambers                     |

|                      |                  |  |
|----------------------|------------------|--|
| Q6-37: hot springs   | f<br>o<br>l<br>d | A6-37: Volcanic-heated water that rises to the surface in pools  |
| Q6-38: igneous rocks | f<br>o<br>l<br>d | A6-38: Rocks that are formed from magma or lava  |
| Q6-39: granite       | f<br>o<br>l<br>d | A6-39: Light-colored igneous rock with large, visible quartz and feldspar crystals made from silica-rich magma |
| Q6-40: gabbro        | f<br>o<br>l<br>d | A6-40: A type of rock made from silica-poor magma (has large crystals)   |
| Q6-41: obsidian      | f<br>o<br>l<br>d | A6-41: Volcanic glass – cools quickly & has no crystals  |

Q6-42: welded tuff

f  
o  
l  
d

A6-42: Orange-tan in color; left over from a pyroclastic flow

Q6-43: weathering

f  
o  
l  
d

A6-43: The process of breaking down rocks