**Chapter 1.1: Where Volcanoes Are Located**

Name:

Date:

**Lesson 1.1: True or False**

Write true if the statement is true or false if the statement is false.

\_\_\_\_\_ 1. When magma flows onto Earth’s surface, it always forms volcanic mountains.

\_\_\_\_\_ 2. Almost all volcanoes occur over hotspots within tectonic plates.

\_\_\_\_\_ 3. Volcanoes erupt at mid-ocean ridges.

\_\_\_\_\_ 4. Wherever mantle rock melts, volcanoes may result.

\_\_\_\_\_ 5. Any water on a subducting plate raises the melting point of mantle material.

\_\_\_\_\_ 6. The Cascade Mountains in Washington State occur along a transform plate boundary.

\_\_\_\_\_ 7. Volcanoes are likely along the San Andreas fault in California because it is a convergent plate boundary.

\_\_\_\_\_ 8. Volcanoes in an island arc are all about the same age.

\_\_\_\_\_ 9. The most geologically active region in the world is the Pacific Ring of Fire.

\_\_\_\_\_ 10. Volcanoes occur in the East African Rift Valley because the valley is over a hotspot.

**Lesson 1.1: Critical Reading**

Read this passage based on the text and answer the questions that follow.

**Volcanic Hotspots**

Most volcanoes are found at convergent or divergent plate boundaries, but there are some intraplate volcanoes. The Hawaiian Islands are examples. The islands are the exposed peaks of a great chain of volcanoes that lie in the middle of the Pacific plate. The youngest of the Hawaiian Islands sits directly above a column of hot rock called a mantle plume. As the plume rises through the mantle, pressure is released and mantle melts to create a hotspot. All of the Hawaiian Islands are hotspot volcanoes.

Earth is home to about 50 known hotspots. Most of them are in the oceans because magma can more easily penetrate oceanic than continental lithosphere. The hotspots that are known beneath continents are extremely large. For example, a huge hotspot is located beneath the Yellowstone volcano on the North American continent.

As a plate drifts over a mantle plume, a hotspot volcano slowly moves away from the hotspot. Then a new hotspot volcano forms. This keeps repeating as the plate continues to drift, forming a chain of hotspot volcanoes. The youngest volcano in the chain is always at the start of the chain, directly over the mantle plume. Each volcano after that is older than the one before it, with the oldest volcano at the opposite end of the chain.

**Questions about the Passage**

1. What is a hotspot volcano? Give examples.
2. How does a hotspot volcano form?
3. How many hotspots are there, and where are they found?
4. Describe and explain the relative ages of volcanoes in a chain of hotspot volcanoes.

**Lesson 1.1: Multiple Choice**

Circle the letter of the correct choice.

1. Mantle rocks may melt if

1. its temperature rises.
2. pressure on it decreases.
3. water is added to it.
4. any of the above

2. Volcanoes are common along

1. convergent plate boundaries.
2. divergent plat boundaries.
3. transform plate boundaries.
4. two of the above

3. About 75 percent of the world’s volcanoes are found

1. around the Atlantic Ocean basin.
2. along the mid-Atlantic ridge.
3. around the Pacific Ocean basin.
4. throughout the American Northwest.

4. Melting occurs at divergent plate boundaries because hot mantle rock rises and this

1. increases the temperature of the mantle.
2. decreases the temperature of the mantle.
3. allows runoff to seep into the mantle.
4. releases pressure on the mantle.

5. Which of the following landforms result from volcanic activity?

1. continental arcs
2. hotspot islands
3. island arcs
4. all of the above

6. Volcanoes are common along oceanic trenches because this is where

1. most hotspots are found.
2. subduction occurs.
3. new seafloor forms.
4. none of the above

7. About how many known hotspots are there on Earth?

1. 5
2. 50
3. 500
4. 5000

**Lesson 1.1: Matching**

Match each definition with the correct term.

|  |  |
| --- | --- |
| **Definitions**  \_\_\_\_\_ 1. column of hot rock in the mantle  \_\_\_\_\_ 2. line of volcanic activity that surrounds the Pacific Ocean basin  \_\_\_\_\_ 3. crack in the ground at a divergent plate boundary where magma erupts  \_\_\_\_\_ 4. place above a mantle plume where melted rock can form a volcano  \_\_\_\_\_ 5. eruption of magma from the mantle onto the surface  \_\_\_\_\_ 6. example of islands that formed over a hotspot  \_\_\_\_\_ 7. example of islands that formed over a convergent plate boundary | **Terms**  a. volcano  b. fissure  c. mantle plume  d. hotspot  e. Ring of Fire  f. Aleutian Islands  g. Hawaiian Islands |

**Lesson 1.1: Fill in the Blank**

Fill in the blank with the appropriate term.

* 1. The first step in the formation of a volcano is rock melting in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
  2. Subduction of a plate into the mantle occurs at \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ plate boundaries.
  3. Subduction at the Middle American Trench creates volcanoes in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ America.
  4. Icelandic volcanoes occur over a(n) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ along the mid-Atlantic ridge.
  5. All intraplate volcanic activity occurs over \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  6. In a chain of hotspot volcanoes, the volcano that sits directly above the mantle plume is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
  7. Hotspots can penetrate oceanic lithosphere\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ easily than continental lithosphere.

**Lesson1.1: Critical Writing**

Thoroughly respond to the prompt below. Use appropriate academic vocabulary and clear and complete sentences.

***Prompt:*** Volcanoes erupt when mantle rock melts. Explain why this occurs at convergent and

divergent plate boundaries.