**Chapter 1.4: Theory of Plate Tectonics**

**Lesson 1.4: True or False**

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

\_\_\_\_\_ 1. Earthquake epicenters outline the edges of tectonic plates.

\_\_\_\_\_ 2. Convection cells in the mantle rise at deep-sea trenches.

\_\_\_\_\_ 3. Mid-ocean ridges occur at convergent plate boundaries.

\_\_\_\_\_ 4. Earthquakes occur only at transform plate boundaries.

\_\_\_\_\_ 5. Volcanoes are unlikely where two continental plates converge.

\_\_\_\_\_ 6. The Atlantic Ocean currently is shrinking because of plate tectonics.

\_\_\_\_\_ 7. Supercontinents form and break up in a cycle.

\_\_\_\_\_ 8. Hotspot volcanoes form in a line as crust moves over a mantle plume.

\_\_\_\_\_ 9. Hotspot magma rarely penetrates oceanic crust.

\_\_\_\_\_ 10. The Appalachian Mountains formed at a convergent plate boundary as Pangaea came together.

**Lesson 1.4: Critical Reading**

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

**Earth’s Tectonic Plates**

The lithosphere is divided into a dozen major and several minor plates. The edges of the plates can be identified from the distribution of earthquake epicenters. That’s because most earthquakes occur at plate boundaries. A single plate may consist only of oceanic lithosphere or only of continental lithosphere, but nearly all plates are made of a combination of both types of lithosphere.

Plates are constantly moving over Earth’s surface. Movement of the plates is termed plate tectonics. Plates move at a rate of a few centimeters a year. The reason they move is seafloor spreading, which occurs because of convection currents in the mantle. Hot material rises at a mid-ocean ridge; gradually moves horizontally away from the axis of the ridge, dragging seafloor with it; and eventually sinks back deep into the mantle at deep-sea trenches.

Plate boundaries are the edges where two plates meet. Most geologic activities—including earthquakes, volcanoes, and mountain building—take place at plate boundaries. Because plates are always moving, they move relative to one another at plate boundaries. Plates can move relative to one another in three different ways:

* They can diverge, or move away from each other. This occurs at a divergent plate boundary.
* They can converge, or move toward each other. This occurs at a convergent plate boundary.
* They can transform, or slide past each other. This occurs at a transform plate boundary.

The type of plate boundary and the type of crust (oceanic or continental) found on each side of the boundary determine the type of geologic activity that will occur there.

**Questions about the Passage**

1. Describe Earth’s plates.

2. Explain what causes plates to move.

3. Define the term ***plate boundary***, and identify types of plate boundaries.

**Lesson 1.4: Multiple Choice**

Circle the letter(s) of the correct choice(s). Some questions may have more than one answer.

1. Nearly all tectonic plates consist of

1. only oceanic crust.
2. only continental crust.
3. both oceanic and continental crust.
4. neither oceanic nor continental crust.

2. Each year, tectonic plates move a few

1. millimeters.
2. centimeters.
3. kilometers.
4. none of the above

3. Seafloor spreading occurs because of

1. convection cells in the mantle.
2. earthquakes in the oceanic crust.
3. movement toward a ridge axis.
4. subduction at a mid-ocean ridge.

4. Most geologic activity takes place

1. within plates.
2. at plate boundaries.
3. where continents subduct.

5. Which feature could form at a divergent plate boundary?

1. rift valley
2. transform fault
3. continental arc
4. subduction zone

6. At a convergent plate boundary between oceanic and continental crust, the oceanic crust always plunges

beneath the continental crust because oceanic crust is

1. lighter.
2. denser.
3. colder.
4. less viscous.

7. Some of the largest mountains in the world, including the Himalayas, occur where

1. two oceanic plates diverge.
2. two continental plates converge.
3. an oceanic and a continental plate diverge.
4. an oceanic and a continental plate converge.

**Lesson 1.4: Matching**

Match each definition with the correct term.

|  |  |
| --- | --- |
| **Definitions**  \_\_\_\_\_ 1. edge where two plates move toward each other  \_\_\_\_\_ 2. large body of intrusive igneous rock at the edge of a subducting plate  \_\_\_\_\_ 3. edge where two plates move away from each other  \_\_\_\_\_ 4. result of divergent plate boundaries that occur within a continent  \_\_\_\_\_ 5. point on the Earth’s surface directly above the place where an  earthquake occurs  \_\_\_\_\_ 6. line of coastal volcanic islands at the edge of a subducting plate  \_\_\_\_\_ 7. edge where two plates slip past each other | **Terms**  a. batholith  b. continental arc  c. continental rifting  d. epicenter  e. convergent plate boundary  f. transform plate boundary  g. divergent plate boundary |

**Lesson 1.4: Fill in the Blank**

Fill in the blank with the appropriate term.

1. A large chunk of lithosphere that can move over Earth’s surface is called a(n) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

2. The edge where two tectonic plates meet is called a(n) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ occurs when an oceanic plate plunges beneath a continental plate at a convergent

plate boundary.

4. A region where the phenomenon described in question 3 occurs often is called a(n) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

5. The movement of plates over Earth’s surface is called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

6. A line of volcanoes that forms where two oceanic plates converge is called a(n) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

7. Geologic activity that takes place within a plate rather than at plate boundaries is known as

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ - activity.

**Lesson 1.4: Critical Writing**

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

***Prompt***: Compare and contrast geologic activity at a convergent plate boundary between oceanic and

continental plates with that between two continental plates.