

**Chapter 02 - Plate Tectonics and Physical Hazards**

1. Earth's crust is thinner than its mantle.

- a. True
- b. False

**ANSWER:** True

**REFERENCES:** Earth Structure

**KEYWORDS:** Bloom's: Remember

2. The concept of isostasy states that high-density rock will stand higher than low-density rock, which explains the formation of subduction zones.

- a. True
- b. False

**ANSWER:** False

**REFERENCES:** Earth Structure

**KEYWORDS:** Bloom's: Remember

3. The plates involved in plate tectonics are part of Earth's lithosphere.

- a. True
- b. False

**ANSWER:** True

**REFERENCES:** Plate Movement

**KEYWORDS:** Bloom's: Remember

4. A divergent boundary is responsible for rift zones.

- a. True
- b. False

**ANSWER:** True

**REFERENCES:** Hazards and Plate Boundaries

**KEYWORDS:** Bloom's: Remember

5. Convergent boundaries produce a relatively low number of earthquakes compared to other boundaries.

- a. True
- b. False

**ANSWER:** False

**REFERENCES:** Hazards and Plate Boundaries

**KEYWORDS:** Bloom's: Remember

6. The tallest mountain ranges are created at transform boundaries.

- a. True
- b. False

**ANSWER:** False

**REFERENCES:** Hazards and Plate Boundaries

**KEYWORDS:** Bloom's: Remember

7. Transform boundaries are responsible for the formation of island chains such as the Hawaiian Islands.

- a. True
- b. False

## **Chapter 02 - Plate Tectonics and Physical Hazards**

**ANSWER:** False

**REFERENCES:** Hazards and Plate Boundaries

**KEYWORDS:** Bloom's: Remember

8. Volcanoes are only formed at plate boundaries, and cannot exist in the middle of large plates.

a. True

b. False

**ANSWER:** False

**REFERENCES:** Hazards and Plate Boundaries

**KEYWORDS:** Bloom's: Remember

9. The theory of continental drift was developed using the theory of plate tectonics.

a. True

b. False

**ANSWER:** False

**REFERENCES:** Development of a Theory

**KEYWORDS:** Bloom's: Remember

10. Earth's magnetic field played a crucial role in understanding subduction zones

a. True

b. False

**ANSWER:** False

**REFERENCES:** Development of a Theory

**KEYWORDS:** Bloom's: Remember

11. Which statement about the Earth's is true?

a. The lithosphere is less dense than the asthenosphere, and located above it.

b. The lithosphere is denser than the asthenosphere, and located above it.

c. The lithosphere is less dense than the asthenosphere, and located below it.

d. The lithosphere is denser than the asthenosphere, and located below it.

e. The lithosphere and asthenosphere are equally dense.

**ANSWER:** a

**REFERENCES:** Earth Structure

**KEYWORDS:** Bloom's: Understand

12. Compared to the lithosphere, the asthenosphere is \_\_\_\_.

a. cooler and more rigid

b. cooler and more plastic

c. hotter and more rigid

d. the same temperature and rigidity

e. hotter and more plastic

**ANSWER:** e

**REFERENCES:** Earth Structure

**KEYWORDS:** Bloom's: Understand

## **Chapter 02 - Plate Tectonics and Physical Hazards**

13. The concept of isostasy explains why \_\_\_\_.
- a. magnetic differences exist in stripes along the seafloor
  - b. magma plumes are created
  - c. continental crust stands higher than oceanic crust
  - d. convection moves magma under the lithosphere
  - e. lithospheric plates move in response to convection

**ANSWER:** c

**REFERENCES:** Earth Structure

**KEYWORDS:** Bloom's: Understand

14. Oceanic crust is denser than continental crust because \_\_\_\_.
- a. continental crust stands at a higher altitude
  - b. oceanic crust is rich in silica
  - c. oceanic crust is compressed at convergent boundaries
  - d. water pressure from the oceans makes oceanic crust thinner
  - e. oceanic crust is rich in iron- and magnesium-containing minerals

**ANSWER:** e

**REFERENCES:** Earth Structure

**KEYWORDS:** Bloom's: Understand

15. When oceanic plates meet continental plates at a convergent boundary, a \_\_\_\_.
- a. subduction zone will form because the oceanic plate is more dense than the continental plate
  - b. subduction zone will form because the oceanic plate is less dense than the continental plate
  - c. rift zone will form because the oceanic plate is more dense than the continental plate
  - d. rift zone will form because the oceanic plate is less dense than the continental plate
  - e. subduction zone will form on the oceanic plate, and a rift zone will form on the continental plate

**ANSWER:** a

**REFERENCES:** Plate Movement

**KEYWORDS:** Bloom's: Understand

16. Earth's crust is divided into \_\_\_\_.
- a. dozens of large plates and a much smaller number of small plates
  - b. about a dozen large plates and about an equal number of small plates
  - c. a small number of large plates and dozens of small plates
  - d. five large oceanic plates and an equal number of small plates
  - e. dozens of small plates

**ANSWER:** b

**REFERENCES:** Plate Movement

**KEYWORDS:** Bloom's: Understand

17. Areas of Earth's sea floor can create new crust because \_\_\_\_.
- a. continental collisions raise mountains continuously higher
  - b. earthquakes consume new sea floor at transform zones
  - c. hot spots cause crustal material to sink into the mantle
  - d. continental plates rise higher through isostasy

## **Chapter 02 - Plate Tectonics and Physical Hazards**

- e. crust is consumed in subduction zones

**ANSWER:** a

**REFERENCES:** Plate Movement

**KEYWORDS:** Bloom's: Understand

18. Earthquakes are common along which types of plate boundaries?

- a. only convergent
- b. only divergent
- c. only convergent and divergent
- d. convergent, divergent, and transform
- e. only convergent and transform

**ANSWER:** d

**REFERENCES:** Hazards and Plate Boundaries

**KEYWORDS:** Bloom's: Understand

19. Basalt lava flows primarily erupt in \_\_\_\_.

- a. rift zones
- b. continental collision zones
- c. subduction zones
- d. volcanic hotspots
- e. convergence zones

**ANSWER:** a

**REFERENCES:** Hazards and Plate Boundaries

**KEYWORDS:** Bloom's: Understand

20. Which process creates island chains with active volcanoes at one end?

- a. Asthenospheric convection moves a magma plume under a stationary plate.
- b. Magma plumes form on the Earth's outer core and rotate under a stationary plate.
- c. Divergent boundaries move plates away from a stationary magma plume.
- d. Convergent boundaries move the location of melting crust under a stationary plate.
- e. Crustal plates move over a stationary magma plume.

**ANSWER:** e

**REFERENCES:** Hazards and Plate Boundaries

**KEYWORDS:** Bloom's: Understand

21. The San Andreas Fault marks a \_\_\_\_.

- a. convergent boundary
- b. divergent boundary
- c. subduction zone
- d. continental collision zone
- e. transform boundary

**ANSWER:** e

**REFERENCES:** Hazards and Plate Boundaries

**KEYWORDS:** Bloom's: Understand

## **Chapter 02 - Plate Tectonics and Physical Hazards**

22. Volcanoes and earthquakes along the Mid-Atlantic Ridge are \_\_\_\_.
- a. rare, but create catastrophic damage to island chains
  - b. rare, and do not threaten populations
  - c. common, and cause moderate coastal damage from storm surge
  - d. rare, but cause catastrophic coastal damage from tsunamis
  - e. common, and do not threaten populations

**ANSWER:** a

**REFERENCES:** Hazards and Plate Boundaries

**KEYWORDS:** Bloom's: Understand

23. Spreading centers on continental plates \_\_\_\_.
- a. spread much faster than spreading centers on oceanic plates and create rift zones
  - b. spread much slower than spreading centers on oceanic plates and create rift zones
  - c. are identical to spreading centers on oceanic plates
  - d. spread much faster than spreading centers on oceanic plates but do not create rift zones
  - e. spread much slower than spreading centers on oceanic plates but do not create rift zones

**ANSWER:** b

**REFERENCES:** Hazards and Plate Boundaries

**KEYWORDS:** Bloom's: Understand

24. When an oceanic plate sinks in a subduction zone, a volcanic arc arises \_\_\_\_.
- a. on the oceanic side of the zone
  - b. at the zone
  - c. on the opposite side of the subducting plate
  - d. on the opposite side of the inland plate
  - e. inland from the zone

**ANSWER:** a

**REFERENCES:** Hazards and Plate Boundaries

**KEYWORDS:** Bloom's: Understand

25. Subduction zones \_\_\_\_.
- a. dissipate heat from Earth's interior
  - b. occur when plates collide instead of sink
  - c. produce high mountain ranges
  - d. generate Earth's largest earthquakes
  - e. are rarely associated with volcanoes

**ANSWER:** d

**REFERENCES:** Hazards and Plate Boundaries

**KEYWORDS:** Bloom's: Understand

26. Transform boundaries occur where \_\_\_\_.
- a. rising basalt is transformed to rhyolite
  - b. volcanic arcs are created by convergent zones
  - c. there are no plate borders
  - d. plates move without pulling apart or colliding

## **Chapter 02 - Plate Tectonics and Physical Hazards**

- e. a convergent boundary becomes a divergent boundary

**ANSWER:** d

**REFERENCES:** Hazards and Plate Boundaries

**KEYWORDS:** Bloom's: Understand

27. Magma plumes \_\_\_\_.

- a. only create volcanoes on oceanic plates
- b. create volcanoes on both oceanic and continental plates
- c. only create volcanoes on continental plates
- d. create only volcanoes on oceanic plates, and only earthquakes on continental plates
- e. create only earthquakes on oceanic plates, and only volcanoes on continental plates

**ANSWER:** b

**REFERENCES:** Hazards and Plate Boundaries

**KEYWORDS:** Bloom's: Understand

28. Plate motion is responsible for \_\_\_\_.

- a. only convergent boundaries
- b. only divergent boundaries
- c. convergent, divergent, and transform boundaries
- d. only convergent and divergent boundaries
- e. only divergent and transform boundaries

**ANSWER:** c

**REFERENCES:** Hazards and Plate Boundaries

**KEYWORDS:** Bloom's: Understand

29. Basalt is material that \_\_\_\_.

- a. forms most of the material of continental plates
- b. is created when rhyolite is subjected to high temperatures
- c. is created when serpentine reacts with seawater
- d. comes from the mantle relatively unchanged
- e. is created only at places where an oceanic plate subducts into the mantle

**ANSWER:** d

**REFERENCES:** Hazards and Plate Boundaries

**KEYWORDS:** Bloom's: Understand

30. Oceanic plates are \_\_\_\_.

- a. poor in basalt, but rich in silicates
- b. an even mix of basalts and silicates
- c. rich in basalt and silicates
- d. rich in basalt, but poor in silicates
- e. poor in basalts and silicates

**ANSWER:** d

**REFERENCES:** Earth Structure

**KEYWORDS:** Bloom's: Understand

## **Chapter 02 - Plate Tectonics and Physical Hazards**

31. The alternating stripes of magnetic field patterns are used to explain \_\_\_\_.
- a. seafloor spreading
  - b. island chains
  - c. transform faults
  - d. stratovolcanoes
  - e. oceanic trenches

**ANSWER:** a

**REFERENCES:** Development of a Theory

**KEYWORDS:** Bloom's: Understand

32. Wegener used \_\_\_\_.
- a. only geographic information from maps in forming the theory of continental drift
  - b. only geological information from rock composition in forming the theory of continental drift
  - c. geographic and geological information to form the theory of continental drift
  - d. geographic and geological information to form the theory of plate tectonics
  - e. geographic and geological information to disprove the theory of plate tectonics

**ANSWER:** c

**REFERENCES:** Development of a Theory

**KEYWORDS:** Bloom's: Understand

33. Earth's magnetic field \_\_\_\_.
- a. changes polarity due to motions in Earth's mantle, while plate motion remains relatively stable
  - b. changes polarity due to motions in Earth's core, while plate motion remains relatively stable
  - c. changes polarity due to motions in Earth's crust, while plate motion remains relatively stable
  - d. remains stable, while plate motion oscillates back and forth
  - e. remains stable, while magma motion oscillates back and forth

**ANSWER:** b

**REFERENCES:** Development of a Theory

**KEYWORDS:** Bloom's: Understand

34. The theory of plate tectonics is a \_\_\_\_.
- a. theory that improved on the theory of continental drift
  - b. hypothesis that may improve on the theory of continental drift
  - c. theory that disproved the theory of continental drift
  - d. hypothesis that may disprove the theory of continental drift
  - e. natural law that arose from the theory of continental drift

**ANSWER:** a

**REFERENCES:** Development of a Theory

**KEYWORDS:** Bloom's: Understand

35. Wegener's hypothesis that continents move apart \_\_\_\_.
- a. was too flawed to result in an accepted theory
  - b. is disproved by modern data, but explains the reasons for continental drift properly
  - c. is disproved by modern data, and does not explain the reasons for continental drift properly
  - d. is confirmed by modern data, and explains the reasons for continental drift properly

## **Chapter 02 - Plate Tectonics and Physical Hazards**

e. is confirmed by modern data, but does not explain the reasons for continental drift properly

**ANSWER:** a

**REFERENCES:** Development of a Theory

**KEYWORDS:** Bloom's: Understand

36. The asthenosphere is part of the layer of Earth's interior called the \_\_\_\_\_.

**ANSWER:** mantle

**REFERENCES:** Earth Structure

**KEYWORDS:** Bloom's: Remember

37. The \_\_\_\_\_ includes the crust and portions of the upper mantle.

**ANSWER:** lithosphere

**REFERENCES:** Earth Structure

**KEYWORDS:** Bloom's: Remember

38. When an oceanic plate collides with continental crust, a(n) \_\_\_\_\_ zone is the most likely result.

**ANSWER:** subduction

**REFERENCES:** Plate Movement

**KEYWORDS:** Bloom's: Remember

39. The movement of Earth's plates is described by "the theory of \_\_\_\_\_".

**ANSWER:** plate tectonics

**REFERENCES:** Plate Movement

**KEYWORDS:** Bloom's: Remember

40. A(n) \_\_\_\_\_ boundary is formed where two plates slide past each other.

**ANSWER:** transform

**REFERENCES:** Plate Movement

**KEYWORDS:** Bloom's: Remember

41. A series of ridges along a divergent boundary marks a(n) \_\_\_\_\_ zone.

**ANSWER:** rift

**REFERENCES:** Hazards and Plate Boundaries

**KEYWORDS:** Bloom's: Remember

42. \_\_\_\_\_ volcanoes are found far from plate boundaries.

**ANSWER:** Hotspot

**REFERENCES:** Hazards and Plate Boundaries

**KEYWORDS:** Bloom's: Remember

43. The Himalayan mountains are located at a(n) \_\_\_\_\_ boundary between Indian and Asian plates.

**ANSWER:** convergent

**REFERENCES:** Hazards and Plate Boundaries

**KEYWORDS:** Bloom's: Remember

44. Wegener proposed that the major continents were once part of a supercontinent named \_\_\_\_\_.



## **Chapter 02 - Plate Tectonics and Physical Hazards**

**ANSWER:** Pangaea

**REFERENCES:** Development of a Theory

**KEYWORDS:** Bloom's: Remember

45. Currents in Earth's core create a(n) \_\_\_\_\_ field.

**ANSWER:** magnetic

**REFERENCES:** Development of a Theory

**KEYWORDS:** Bloom's: Remember

46. Describe the three types of plate boundaries and the motions that lead to them.

**ANSWER:** Convergent boundaries are created when two plates collide, with both plates moving toward each other. Divergent boundaries are created when two plates separate, with both plates moving away from each other. Transform boundaries are created when two plates slide past each other, neither separating or colliding.

**REFERENCES:** Plate Movement

**KEYWORDS:** Bloom's: Apply

47. The major islands of the state of Hawaii are formed from a line of separate volcanoes emerging from the ocean floor of the Pacific Plate. The line extends from Kauai in the northwest, to Hawai'i in the southeast over a range of hundreds of miles. Kauai was formed from volcanoes that formed about 5 million years ago; on Hawai'i the volcanoes are currently active.

Explain the process that formed the Hawaiian Islands and what information a geophysicist could determine about the motion of Earth's parts from observing them.

**ANSWER:** In the deep layers of the mantle, a hot lump of basalt will rise and begin to melt. As it nears the surface, it will create a "magma plume," a bubble of hot molten rock. This plume will eventually fuel a volcano under the ocean, which grows above the surface to form an island. The crustal plate moves as new volcanoes are created, causing the volcanoes to be spaced out in a line of separate islands. By observing the Hawaiian Islands, a geophysicist could conclude that the Pacific Plate is moving in the direction from Hawai'i towards Kauai, and that it must have moved at a certain speed to move Kauai away from the hot spot in the last five million years.

**REFERENCES:** Hazards and Plate Boundaries

**KEYWORDS:** Bloom's: Analyze

48. The theories of continental drift and plate tectonics rely on many pieces of physical evidence. Identify and explain three observations that led to the acceptance of the theory of plate tectonics.

**ANSWER:** Possible answers taken from the text include that:

- the coastlines of South America and Africa have similar shapes, implying that these landmasses were once joined, then moved apart
- ancient rocks, fossils, and the shape of mountain ranges are similar at places where the current continents were once connected in a supercontinent
- evidence of ancient glacial processes implies that the same glaciers moved through areas on several different continents, implying that they were once joined
- fossils of species from warm climates have been found in the Arctic and Antarctic, implying that the fossils were created when the land was in a warm climate zone, but that the land has since moved to a cold climate zone
- the Mid-Atlantic Ridge is a center for numerous earthquakes and implies that the ridge could result from the spreading of the seafloor away from a central area
- magnetic effects detectable in rocks around the Mid-Atlantic Ridge prove that the ridge is created by

**Chapter 02 - Plate Tectonics and Physical Hazards**

slowly emerging basalt which moves away from a divergent zone

*REFERENCES:* Development of a Theory

*KEYWORDS:* Bloom's: Apply

49. Discuss the source and interaction of basalt and rhyolite.

*ANSWER:* Basalt consists of rock that comes from the magma in Earth's mantle. Rising basalt is hot enough to melt the silica-rich material of continental plates. Rhyolite is the result of hot basalt melting continental plate material.

*REFERENCES:* Hazards and Plate Boundaries

*KEYWORDS:* Bloom's: Apply

50. Why is an understanding of Earth's magnetic field important in the acceptance of the theory of plate tectonics?

*ANSWER:* It is known that Earth's magnetic field changes its polarity, or direction, with a long recurrence interval due to changes in currents in its core. New rock formed at divergent boundaries like the Mid-Atlantic Ridge "records" the polarity of Earth's magnetic field. Observations of the recorded magnetic field in ridges around the Mid-Atlantic Ridge show that the stripes of alternating polarity surround the ridge. The conclusion is that the stripes represent rock created during different epochs of the magnetic field, demonstrating that the ridge is an area where new rock is created.

*REFERENCES:* Development of a Theory

*KEYWORDS:* Bloom's: Apply