

Directed Reading

Section: The Theory of Plate Tectonics

1. The theory that explains why and how continents move is called _____

2. By what time period was there evidence supporting continental drift, which led to the development of plate tectonics?

HOW CONTINENTS MOVE

In the space provided, write the letter of the definition that best matches the term or phrase.

- | | |
|----------------------------|---|
| _____ 3. oceanic crust | a. the solid outer layer of Earth, which consists of the crust and the rigid upper part of the mantle |
| _____ 4. continental crust | b. dense crust made of rock that is rich in iron and magnesium |
| _____ 5. tectonic plates | c. blocks of Earth's shell that ride on a deformable layer of the mantle |
| _____ 6. lithosphere | d. solid, plastic layer of the mantle beneath the lithosphere |
| _____ 7. asthenosphere | e. low-density crust made of silica-rich rock |

8. What is "plastic" rock, and how does it move?

9. Describe how continents and oceans are carried on tectonic plates.

TECTONIC PLATES

10. How many major tectonic plates have scientists identified?

Directed Reading *continued*

11. Why are the boundaries of the tectonic plates not always easy to identify?

12. How do scientists identify plate boundaries?

13. A sudden movement along the boundary of a tectonic plate is a(n)

14. Frequent earthquakes in a given zone are evidence that

15. How do volcanoes help to identify the locations of plates boundaries?

16. A zone of active volcanoes that encircles the Pacific Ocean is known as the

17. In addition to volcanoes, what also frequently occurs in the Pacific Ring of Fire?

18. What do the characteristics of the Pacific Ring of Fire indicate?

TYPES OF PLATE BOUNDARIES

In the space provided, write the letter of the definition that best matches the term or phrase.

- | | |
|---------------------------|---|
| _____ 19. divergent | a. boundary between tectonic plates that are sliding past each other horizontally |
| _____ 20. convergent | b. region where one plate moves under another |
| _____ 21. transform | c. boundary between tectonic plates that are moving away from each other |
| _____ 22. mid-ocean ridge | d. undersea mountain range |
| _____ 23. subduction zone | e. short segments of a mid-ocean ridge that are connected by transform boundaries |
| _____ 24. fracture zone | f. the boundary between colliding tectonic plates |

Directed Reading *continued*

25. Name three areas where plate boundaries may be located.

26. What happens to magma at divergent boundaries?

27. Describe the rock that forms when magma cools to form new oceanic lithosphere.

28. A narrow valley that forms where the plates separate at a divergent boundary is called a _____.

29. Where are most divergent boundaries located?

30. Describe an example of a rift valley.

31. When oceanic lithosphere collides with continental lithosphere, the oceanic lithosphere is less dense than the continental lithosphere, so it sinks, or _____.

32. What deep-ocean feature forms at subduction zones?

33. As the oceanic plate subducts, it heats up and releases fluids into the mantle, causing magma to form and rise to the surface, forming _____.

Directed Reading *continued*

34. What happens when two plates made of continental lithosphere collide?

35. What is an example of a large mountain range formed when two plates made of continental lithosphere collided?

36. What happens when two plates made of oceanic lithosphere collide?

37. What is produced from magma formed from melted mantle rock?

38. An example of a feature that formed when two plates made of oceanic lithosphere collided is _____.

39. What causes earthquakes at transform boundaries?

40. How are transform boundaries different from other types of boundaries?

41. An example of a transform boundary is the _____.

42. The San Andreas Fault is located between which two plates?

43. Transform boundaries that connect short segments of a mid-ocean ridge are called _____.

44. What is an example of a convergent boundary?

45. What is an example of a divergent boundary in the mid-Atlantic?

Directed Reading *continued*

CAUSES OF PLATE MOTION

_____ 46. The movement of heated material due to differences in density is called
a. convection.
b. a convection cell.
c. radioactivity.
d. plate motion.

_____ 47. The cycle in which the cooler, denser water sinks and the warmer water rises to the surface to create a cycle is called
a. radioactivity.
b. plate tectonics.
c. a convection cell.
d. boiling water.

_____ 48. Earth's mantle is heated by energy generated by
a. tectonic plates.
b. Earth's core and radioactivity.
c. boiling water.
d. cool, dense mantle material.

_____ 49. What causes tectonic plate movement?
a. Hot material in the mantle sinks.
b. Lack of a convection cell causes plates to rise.
c. As the mantle material moves, the overlying tectonic plates move along with it.
d. Divergent boundaries come together.

_____ 50. What happens to newer, warmer rock at a mid-ocean ridge as it cools?
a. It is elevated above nearby rock.
b. It slopes downward away from the ridge.
c. It slides down the slope between the lithosphere and the asthenosphere.
d. It exerts force on the plate.

51. The force on the rest of the plate from the asthenosphere below cooling, sliding rock is called _____

52. What happens as a result of ridge push?

Directed Reading *continued*

53. Is ridge push the main driving force of plate motion? Along with ridge push, what did scientists study for clues about forces that drive plate motion?

54. What happens to magma in places where plates pull away from each other at mid-ocean ridges?

55. The force exerted by a sinking plate caused by the subduction of lithosphere into the asthenosphere is called _____.

56. Compared to the speed of plates that are not subducting, plates that are subducting move _____.

57. What three mechanisms of Earth's convecting system work together to cause plate motions?
