Answers

Plate Tectonics

Chapter Test A

1. D
2. B
3. C
4. D
5. B
6. C
7. C
8. B
9. A
10. D

11. continental drift
12. sea-floor spreading
13. deep-ocean trench
14. plates
15. rift valley
16. F, shrink
17. T
18. F, continental drift
19. T
20. F, transform

21. Plates A and B are made of oceanic crust and lithosphere. Plate C is made of continental crust and lithosphere.

22. At X, the mid-ocean ridge occurs along a boundary between two oceanic plates. The plates are moving apart, causing molten material to repeatedly rise from the mantle, erupt, and harden as solid rock along the center of the ridge.

23. At Y, a deep-ocean trench is forming. Two plates of different densities are colliding. The oceanic crust is denser and plunges beneath the continental crust, forming a trench.

24. The edge of plate B is plunging beneath plate C and melting in the mantle in the process of subduction.

25. Magnetic stripes in the oceanic crust show the direction of Earth’s magnetic field when the oceanic crust formed. Oceanic crust contains iron. As new crust cools and hardens, the iron atoms line up according to the direction of Earth’s magnetic field at that time. But Earth’s magnetic field occasionally reverses itself. Scientists found that the pattern of magnetic reversals on the sea-floor was the same on both sides of the mid-ocean ridge. This supported the idea of sea-floor spreading.

26. When two oceanic plates collide, one bends and slides under the other, forming a trench. When two continental plates collide, they squeeze the crust upward into mountain ranges. When an oceanic and a continental plate collide, the oceanic plate slides beneath the continental plate. The oceanic plate begins to melt as it sinks back into the mantle. This melting forms magma, which then may erupt through the continental plate as volcanoes.

27. Map A shows the breakup of the supercontinent Pangaea. Maps B and C show the gradual motion of the continents to their present day locations, in Map D.

28. Sample answer: Africa and South America; Europe and North America; Australia and Antarctica

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Chapter Tests

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29. The plate carrying present-day India moved over time and collided with the large plate carrying Europe and Asia. When these two continental plates collided, continental crust was pushed up, creating the Himalayan mountain range.

30. According to the theory of plate tectonics, the lithosphere is made up of a number of plates that contain oceanic and continental crust. These plates are in constant slow motion, driven by convection currents in the mantle. As they move, the plates collide, pull apart, or grind past each other, creating landforms on Earth’s surface.

31. Rock from a mountain range in Africa matches up with similar rock in South America, suggesting that the two were once joined. A type of fossil plant has been found on both continents. The seedlike structures of this plant could not have traveled the great distances now separating the continents. Therefore, it seems likely that the two landmasses once were joined.