Chapter Review

1. Sample answer: A seismic wave is released when elastically deformed rock along a fault slips. A P wave is the fastest seismic wave and can move through all parts of the Earth. An S wave moves rock from side to side as the wave travels through the Earth.
2. Sample answer: A seismograph is an instrument that is used to record seismic waves. A seismogram is the tracing of earthquake motion created by a seismograph.
3. Sample answer: A focus is the point along a fault where an earthquake starts. An epicenter is the point on Earth's surface above the focus.
4. Sample answer: The gap hypothesis states that strong earthquakes are likely to occur along sections of active faults that have had relatively few earthquakes. Seismic gaps are areas along active faults where relatively few earthquakes have occurred.
5. B
6. B
7. D
8. B
9. B
10. D
11. No, a minimum of three seismograph stations are needed to find an earthquake's epicenter using the S-P time method.
12. The Richter magnitude scale measures the ground motion from an earthquake and adjusts for distance to find earthquake strength. The Modified Mercalli Intensity Scale measures the degree to which an earthquake is felt by people and the amount of damage caused by an earthquake.
13. With each step down in earthquake strength or magnitude, the number of earthquakes per year is greater.
14. P waves move rock back and forth, squeezing and stretching the rock. S waves stretch rock sideways as well as back and forth. Surface waves move rock up, down, and around or, in a back-and-forth motion.
15. Answers may vary. Sample answer: You should protect yourself and your property against earthquakes by storing items you may need after a strong, damaging earthquake. You should put heavy items closer to the floor so that they do not fall during earthquakes. You should find safe places within each room of your home or outdoors in the event there is an earthquake.
16. An answer to this exercise can be found at the end of the Teacher Edition.
17. Answers may vary. Sample answer: Based on the average number of earthquakes of different magnitudes that happen annually, a light earthquake would be more likely to happen along a major fault where there have not been many major earthquakes.
18. Because most earthquakes occur at tectonic plate boundaries, the earthquake-hazard level in Japan would be high.
19. Answers may vary. Sample answer: You might want to leave your car if it was stranded on or beneath a highway overpass.
20. A gelatin model is limited because it does not have the same properties as rock, such as density and hardness.
21. 4
22. 100 mm – 10 mm = 90 mm
23. Students should recognize that seismogram heights increase at a greater rate with each increase in earthquake magnitude. The relationship is logarithmic, not linear.

Reinforcement

COMPLETE A SEISMIC STORY

seismologist
fault
seismology
fault
deformation
plastic deformation
elastic deformation
seismograph
elastic rebound
seismogram
seismologist
epicenter
epicenter
focus
focus

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