

CHAPTER REVIEW ANSWERS

Checking Concepts

1. Pangaea means “all world.”
2. Sample answers:

(a)

Asthenosphere	Both	Lithosphere
<ul style="list-style-type: none"> – Partly-molten layer of upper mantle – Flows – Found below lithosphere 	<ul style="list-style-type: none"> – Involved in plate tectonics 	<ul style="list-style-type: none"> – Solid, rocky layer of crust and upper mantle – Rigid – Found above asthenosphere

(b)

Shield Volcano	Both	Rift Eruption
<ul style="list-style-type: none"> – Produces a large cone with gentle slopes 	<ul style="list-style-type: none"> – Not explosive – Produces lava 	<ul style="list-style-type: none"> – Lava erupts from long, narrow cracks

(c)

P wave	Both	S wave
<ul style="list-style-type: none"> – Compressional wave – Fastest wave – Travels through anything 	<ul style="list-style-type: none"> – Travel through ground – Caused by earthquake – Cause damage – Make ground shake 	<ul style="list-style-type: none"> – Shear wave – Slower than P – Cannot travel through liquid

(d)

Seismometers	Both	Seismogram
<ul style="list-style-type: none"> – Instrument to measure earthquakes – Measures ground shaking – Produces seismogram 	<ul style="list-style-type: none"> – Record ground shaking in an earthquake 	<ul style="list-style-type: none"> – Paper record of an earthquake – Displays ground shaking of P-, S- and L-waves

(e)

Focus	Both	Epicentre
<ul style="list-style-type: none"> – Point in Earth where earthquake actually begins 	<ul style="list-style-type: none"> – Focus and epicentre can be same location on Earth's surface. – Both give the specific location of an earthquake. – Both are used to describe an earthquake. 	<ul style="list-style-type: none"> – Point on Earth's surface directly above the focus – Used for geographical location of an earthquake

3. (a) Matching continental margins suggest the continents were once part of a single large continental mass.
- (b) Similar animal fossils suggest the continents were once together, because it is unlikely the same organism that produced the fossil would develop identically on continents several thousands of kilometres apart.
- (c) Rocks of the same age and matching mountain ranges suggest the forces that produced them were acting on a single large continental mass that has since broken apart.
- (d) **Note:** You may wish to have students delete this question.
4. **Note:** As an alternative question, ask “Why do *earthquakes* occur at tectonic plate boundaries?” Earthquakes occur at plate boundaries because

large slabs of rock are trying to slide past each other or into each other. The rock resists this motion, and stress (pressure) builds up. When that pressure is released, an earthquake occurs.

5. Rocks increase in age as distance increases from a spreading ridge.
6. Subduction zones experience the deepest earthquakes, because one plate is diving deep beneath another.
7. Magma rises and breaks through the lithosphere at spreading ridges. The magma solidifies into rock. New magma rising through the ridge pushes the new rock material away.

8. Shield volcanoes occur over hot spots.
9. The magma that forms composite volcanoes traps gas, which increases the pressure. When the pressure becomes too great, the volcano erupts violently.
10. Sample answer: Similarities: Both are caused by earthquakes; both cause the ground to vibrate/shake; both start at the same focus; both cause damage to buildings/structures; and both can travel through solids.
Differences: P-waves squeeze and stretch the ground in the direction they travel, and are faster than S-waves; S-waves squeeze and stretch the ground at 90 degrees to the direction they travel; S-waves are slower than P-waves; and S-waves cannot travel through liquids.
11. Earthquakes are caused by the build-up of stress between tectonic plates, caused by friction.

Understanding Key Ideas

12. Continental drift
13. (a) Transform plate boundary
(b) Convergent plate boundary
(c) Divergent plate boundary
14. There is no source of magma at these types of plate boundaries.
15. Rocks of the same age and matching mountain ranges suggest the forces that produced them were acting on a single large continental mass that has since broken apart.
16. If mantle convection stopped, there would be no plate movement and therefore no earthquakes or volcanoes.
17. Material from volcanoes (lava from magma) originated deep in Earth.
18. Volcanoes occur at subduction plate boundaries and diverging plate boundaries, where magma from the mantle rises and breaks through the lithosphere.

19. A rift eruption may produce a great deal of lava, which could cause damage to buildings, bridges, rivers, and agriculture. Ash released from the eruption may affect climate.
20. Earthquakes are difficult, if not impossible, to predict.
21. A. Trench
B. Volcanic island arc
C. Upper mantle
D. Oceanic crust
E. Mantle
22. She can conclude that the rock in the middle layer formed at a time when Earth's polarity was reversed.
23. (a) Convergent
(b) Toward each other
(c) 0 m to -35 m
(d) **Note:** As an alternative question, ask "Would you expect to find volcanoes in this area? Explain." Answer: Yes, the depth of foci indicates that one plate is subducting beneath another plate. The results would be volcanoes in the area of the subduction zone.

