



ANSWER KEY

Exercise: 1

Instructions: The crust of the earth is constantly moving. This movement can create stress that can change the shape of a body of rock. Sometimes stress builds up between two bodies of rock and they can slide past, over, or under one another fairly quickly. This sudden release of stress can cause earthquakes. Earthquakes are most common near major faults. Use your knowledge to answer the following questions completely and accurately.

1. What is the difference between compressive stress, tensional stress, and shear?

Compressive stress is a force that pushes against rock to shorten the rock body, tensional stress pulls on rock to elongate the rock body, shear refers to stresses that are parallel but in opposite directions.

2. What is the difference between strike and dip?

Strike and dip refer to the extent and direction of tilting of fractures and layering of rock. Strike is the compass direction of a line formed by the intersection of an inclined plane with an imaginary horizontal plane. The dip would be the direction a ball would follow down a tilted surface.

3. Where, in relation to the crust, do most fractures occur compared to most plastic deformations?

Fractures occur near the surface where the rock is cold, plastic deformations occur deep where the rock is still hot.

4. What is the difference between a joint and a fault? Along which one might you expect more earthquakes to occur?

Joints and faults are types of fractures. A joint is a fracture along which no movement has taken place, usually caused by tensional forces. A fault is a fracture or break in the rock along which movement has taken place. One might expect more earthquakes to occur near faults.

5. How would one distinguish between a normal fault, reverse fault, and a strike-slip fault?

A normal fault is a fault where the hanging wall has moved down relative to the footwall. In a reverse fault, the hanging wall moves up relative to the footwall. A strike-slip fault is one along which the movement has been parallel to the fault plane.

6. What is a seismic wave?

A seismic wave is the energy wave sent out by an earthquake. The movement of the seismic wave causes the ground to shake.

7. A Richter scale was used to measure an earthquake and a magnitude of 5.6 was obtained. What would be the magnitude of an earthquake 1000 times stronger?

The magnitude of an earthquake 1000 times stronger than an earthquake with a magnitude of 5.6 would have a magnitude of 8.6 on the Richter scale.

8. What is the difference between magnitude and intensity?

Magnitude refers to the amount of energy releases by an earthquake; intensity refers to how much damage was done.

9. Why can an earthquake with an epicenter in the ocean still cause considerable damage on land?

Earthquakes that occur with an epicenter in the ocean can cause seismic seawaves that can cause considerable damage on land.

10. What causes most of the earthquakes in Idaho today?

Earthquakes in Idaho are the result of Basin and Range extension and volcanism associated with the Yellowstone Hot Spot. There is also a zone of seismic activity that surrounds the fringes of the Yellowstone Hot Spot track.

11. What is a fault scarp?

The rupture or tear in the earth's surface that result from an earthquake is a fault scarp.

12. How can volcanoes cause earthquakes?

Volcanoes can cause earthquakes by making bodies of rock accommodate the movement of magma.

13. How do calderas form and how would you be able to recognize one if you saw one?

Calderas can be formed from a volcano falling back into its empty magma chamber. They can be recognized by a circular depression over a volcanic center.

14. What is the difference between the focus and epicenter of an earthquake?

The focus is the point within the earth where seismic waves originate; it is centered on the part of the fault that has the greatest movement. The epicenter is on the earth's surface directly above the focus.

15. Generally speaking, where do most earthquakes occur?

Earthquakes generally occur near faults where there is a lot of stress.