

8th Grade Science Blizzard Bag Day 2
Earth Science

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1. Seismic waves can be measured and recorded by devices called _____. These devices record the seismic wave vibrations as jagged lines on paper. The stronger the vibrations, the more jagged the lines. These recordings are called _____.

- A. GPS receivers; GPS transmitters
 - B. seismographs; seismograms
 - C. GPS transmitters; GPS receivers
 - D. seismograms; seismographs
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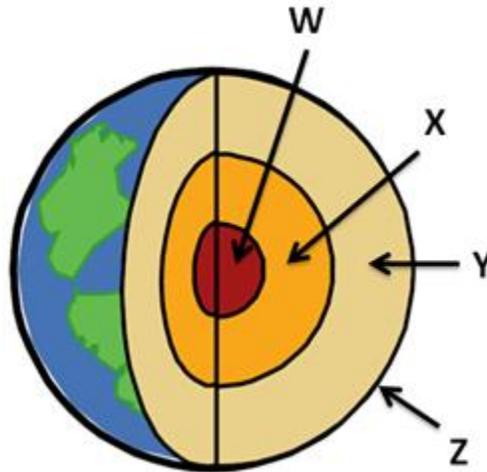
2. Which of the following is the densest layer of the solid Earth?

- A. core
 - B. atmosphere
 - C. crust
 - D. mantle
-

3. The Earth's mantle lies between the Earth's _____ and _____.

- A. crust, oceans
 - B. oceans, core
 - C. continents, core
 - D. crust, core
-

4. Which arrow on the picture below is pointed at the Earth's crust?



- A. Z
 - B. Y
 - C. X
 - D. W
-

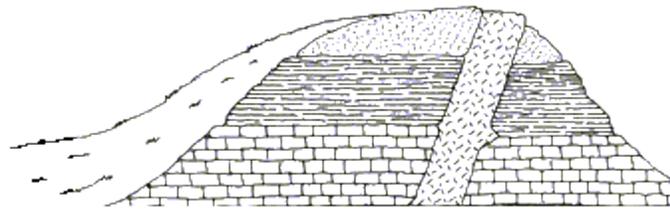
5. Seismic waves move more slowly through a _____ than a _____.

- A. liquid; gas
- B. solid; liquid
- C. solid; gas
- D. liquid; solid

6. Which of the following can help scientists estimate geologic time?

- A. radiometric dating
 - B. comparing fossils
 - C. observing rock sequences
 - D. all of these
-

Diagram of a Hillside



Key:

 sandstone	 limestone
 shale	 igneous

7. The diagram above shows a cross section of a hillside. Four rock units are shown in the cross section. Which of these units is the **youngest**?

- A. *igneous unit*
- B. *sandstone unit*
- C. *shale unit*
- D. *limestone unit*

8. In the late 1800s, Lord Kelvin established the age of the Earth to be less than 100 million years based on rates of heat flow from the Earth's interior. Kelvin's idea was that all of the heat flowing from the Earth's interior is left over from a beginning molten state of the Earth and has rapidly escaped. Based on measured rates of heat escape, it was believed that the Earth started out very hot, cooled and solidified quickly, and would soon be a very cold planet.

Shortly after Kelvin developed his idea, radioactivity was discovered. The work of various scientists, including Marie and Pierre Curie, involving radioactivity led to the understanding that new heat is continuously produced in the Earth's interior by radioactive elements. Scientists began to understand that the rate of heat flow from Earth's interior has been relatively constant for a very long time, and that Kelvin's estimate for the age of the Earth was far too low.

Further work focused on specific radioactive elements led to new estimates for the age of the Earth. Based on these studies, the Earth is estimated to be nearly _____ years old.

- A. *4.6 billion*
 - B. *150 million*
 - C. *150 quadrillion*
 - D. *4.6 trillion*
-

9. When fossils or minerals form, certain unstable elements are sometimes locked into them. The proportion of these unstable elements gradually decreases over time as they decay into other materials in a predictable way. Scientists use the rate at which such unstable elements decay to determine when the fossils or minerals formed.

The technique described above is known as as

- A. *fossil fusion.*
 - B. *radioactive dating.*
 - C. *the law of superposition.*
 - D. *the law of estimation.*
-

10. The Earth, the Sun, and the rest of the solar system are almost unimaginably old when viewed on a human time scale. While modern humans first evolved approximately 200,000 years ago, the age of the Earth, the Sun, and the rest of the solar system is approximately _____ years.

- A. *4.6 million*
- B. *4.6 billion*
- C. *100,000*
- D. *200,000*

11. Which of the following is true about Earth's continents?

- A.** *The positions of the continents did not change in the past and are not changing today.*
 - B.** *The positions of the continents have continually changed over time and continue to change today.*
 - C.** *The positions of the continents did not change during Earth's past, but they are changing today.*
 - D.** *The positions of the continents continually changed over time in the past, but they are no longer changing today.*
-

12. The early hypothesis of _____ was based on observations that suggested continents were once joined together. Later, the theory of _____ explained why large pieces of Earth's surface move around and how many of Earth's features form.

- A. continental drift; plate tectonics
 - B. plate tectonics; continental drift
 - C. gravitational force; continental drift
 - D. plate tectonics; gravitational force
-

13. In the Earth's mantle, heat is transferred in large convection currents. Within these currents,

- A. hotter and cooler rock sink but do not rise.
 - B. cooler and hotter rock rise but do not sink.
 - C. cooler rock rises and hotter rock sinks.
 - D. hotter rock rises and cooler rock sinks.
-

14.

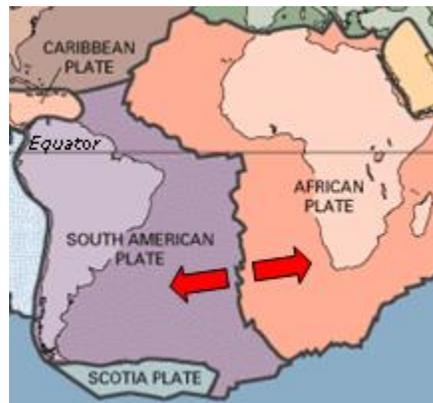


Image modified from <http://pubs.usgs.gov/gip/dynamic/slabs.html>

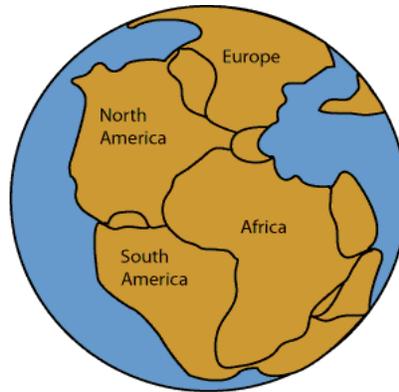
The map above shows the boundary between the South American plate and the African plate. The red arrow on each plate shows which direction the plate is moving relative to the other plate.

Which kind of tectonic plate boundary is this?

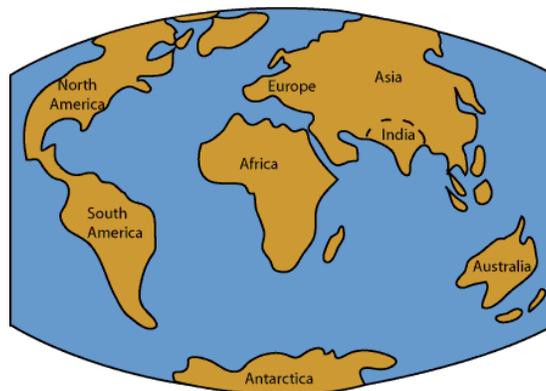
- A. divergent boundary
 - B. transform boundary
 - C. subduction zone
 - D. convergent boundary
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15.

Earth 250 million years ago



Earth Today



The images above show how the Earth's continents looked 250 million years ago and how they look today. The change in the continents' positions is explained by the modern theory of plate tectonics.

The theory of plate tectonics developed in part from an earlier hypothesis about how continents move. What is the name of this earlier hypothesis?

- A. evolution
- B. natural selection
- C. continental drift