

Post Assessment

Concept(s) Addressed

The Earth has different layers with different densities, composition and temperatures. Direct and indirect evidence are used to explain the layers. Convection currents in the mantle move the crust. Continents have moved and are still moving. Seismic activity at plate boundaries can be plotted through locations of earthquakes. Evidence of movement of the plates can be measured. Local landforms including mountains can be explained by plate boundaries types of convergent, divergent, or transform. Density of plate material (basalt or granite) at the boundary determines which plate will subduct.

Time

50 minutes

Materials

Individual
Prompt

Advance

preparation

1. Duplicate prompt for each student

Procedure:

1. Tell students they will have an opportunity to share what they understand about plate tectonics.
2. Distribute the prompt to each student and ask him/her to do his/her best work.

Post Test

Multiple Choice:

Directions: Please circle the best answer.

1. Old oceanic crust is more dense than new oceanic crust because it is
 - a. hot, new rock
 - b. moving toward a deep-ocean trench
 - c. cooled over time
 - d. closer to the mid-ocean ridge

2. The geological theory that states that pieces of Earth's lithosphere are in constant, slow motion is the theory of
 - a. subduction
 - b. plate tectonics
 - c. deep-ocean trenches
 - d. sea-floor spreading

3. When the heat source is applied to a fluid, convection currents in the fluid will
 - a. speed up.
 - b. change direction.
 - c. eventually stop.
 - d. continue at the same rate forever.

4. Using data from seismic waves, geologists have learned that Earth's interior is made up of several
 - a. continents.
 - b. layers.
 - c. ridges.
 - d. trenches.

5. Most geologists rejected Alfred Wegener's idea of continental drift because
 - a. they were afraid of a new idea.
 - b. Wegener was interested in what Earth was like millions of years ago.
 - c. Wegener used several different types of evidence to support his hypothesis.
 - d. Wegener could not identify a force that could move the continents.

6. Scientists think that convection currents flow in Earth's
 - a. continents.
 - b. mantle.
 - c. lithosphere.
 - d. inner core

7. A place where two plates slip past each other, moving in opposite directions, is known as a
 - a. sliding/transform boundary
 - b. spreading/divergent boundary
 - c. colliding/convergent boundary
 - d. rift valley

8. Holes drilled several kilometers into Earth's crust provide direct evidence about Earth's interior in the form of
 - a. seismic waves.
 - b. rock samples.
 - c. liquid iron.
 - d. volcanic eruption.

9. Which type of evidence was used by Alfred Wegener to support his continental drift hypothesis?
 - a. Evidence from landforms
 - b. Evidence from other scientists
 - c. Evidence from human remains
 - d. Evidence from water

10. Earth's mantle is
 - a. a layer of molten metal.
 - b. a layer of hot rock.
 - c. a dense ball of solid metal.
 - d. a layer of rock that forms Earth's outer skin.

11. Mid-ocean Ridges are
 - a. found in all of Earth's oceans.
 - b. found only in the Pacific Ocean.
 - c. located mostly along coastlines.
 - d. long deep-ocean trenches.

12. Most geologists think that the movement of Earth's plates is caused by
 - a. conduction.
 - b. earthquakes.
 - c. convection currents in the mantle.
 - d. Earth's magnetic field.

13. A collision between two pieces of continental crust at a colliding/convergent boundary produces a
 - a. mid-ocean ridge.
 - b. deep-ocean trench.
 - c. rift valley.
 - d. mountain range.

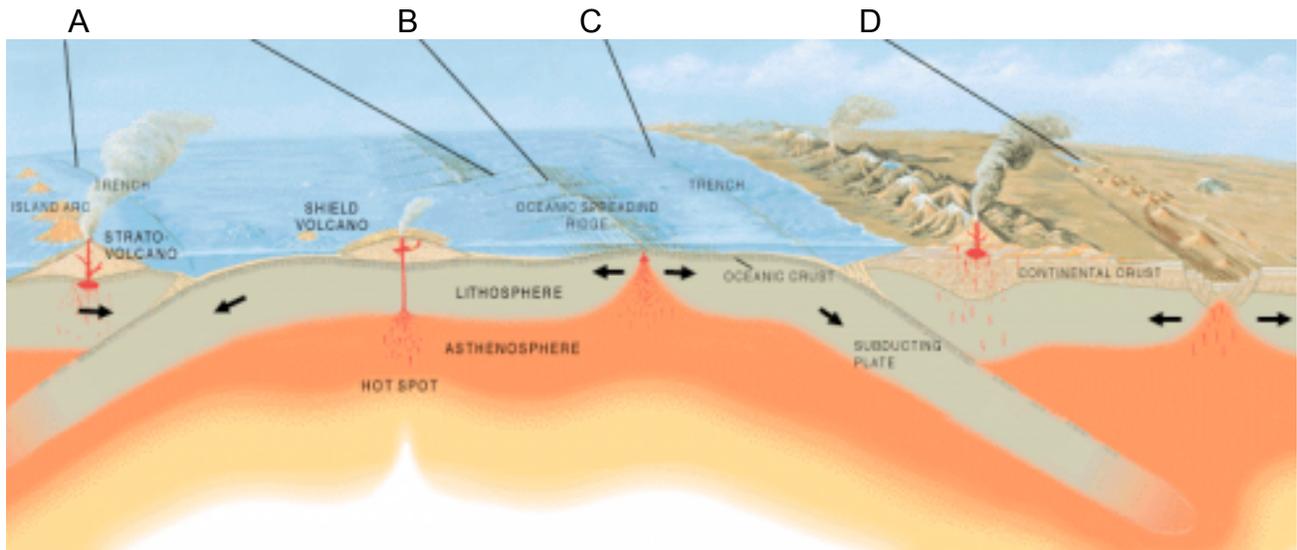
14. In sea-floor spreading, molten material rises from the mantle and erupts
 - a. along the edges of all the continents.
 - b. along mid-ocean ridges.
 - c. in deep-ocean trenches.
 - d. at the north and south poles.

15. Where would the least dense layer of the Earth be found?
 - a. Crust
 - b. Inner core
 - c. Mantle
 - d. Outer core

16. Which rock is most dense?
 - a. Granite
 - b. Limestone
 - c. Basalt
 - d. Shale

Expanded Multiple Choice:

Directions: Please use the diagram below to answer questions 17-18.



17. The place where two plates comes together represented by letter A in the diagram is known as
 - a. sliding/ transform boundary.
 - b. spreading/divergent boundary.
 - c. colliding/convergent boundary.
 - d. rift valley boundary.

18. A mid-ocean ridge forms at a
- a. colliding/convergent boundary.
 - b. spreading/divergent boundary.
 - c. sliding/ transform boundary.
 - d. Deep-ocean trench.

Justified Multiple Choice

Directions: Please circle the best answer and explain why it is the best answer using science terms for questions 19-22.

19. Geologists obtain indirect evidence about Earth's interior by
- a. measuring pressure differences at Earth's surface.
 - b. estimating temperature inside Earth.
 - c. directly looking under the many layers.
 - d. recording and studying seismic waves.

Science "reason:"

20. What is the correct order (starting from the surface) of Earth's layers?
- a. crust, outer core, inner core, mantle
 - b. mantle, outer core, inner core, crust
 - c. crust, mantle, outer core, inner core
 - d. outer core, inner core, crust, mantle

Science "reason:"

21. The process by which the ocean floor sinks beneath a deep-ocean trench and back into the mantle is known as
- a. convection.
 - b. continental drift
 - c. subduction
 - d. conduction

Science "reason:"

22. How did scientists discover that rocks farther away from the mid-ocean ridge were older than those near it?
- By observing eruptions of molten material on the sea floor
 - By mapping rocks on the sea floor using sonar
 - By determining the age of rock samples obtained by drilling on the sea floor
 - By measuring how fast sea-floor spreading occurs

Science “reason:”

Open Response

Directions: Please answer the following questions in the space provided. All answers should be in complete sentences. You may use diagrams to help explain your answers.

23. Describe what occurs when two oceanic plates collide, when two continental plates collide, and when an oceanic and a continental plate collide. Be sure to include basalt and granite in each answer.

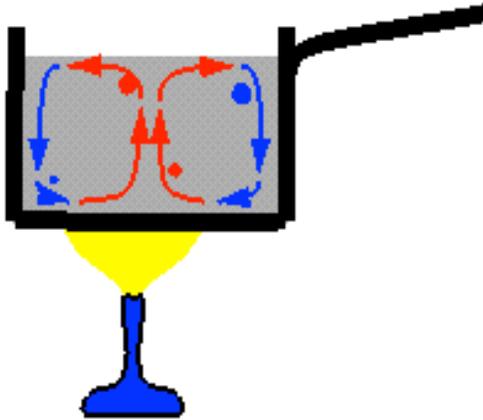
Oceanic-Oceanic:

Continental-Continental:

Oceanic-Continental:

24. Describe how the shapes of present-day continents support the theory of continental drift.

For questions 25-26 use the diagram below to answer the questions.



25. Explain the movement in this fluid.

26. How would this movement affect the crust?

Grade Six: Plate Tectonics
Post Test

Multiple Choice:

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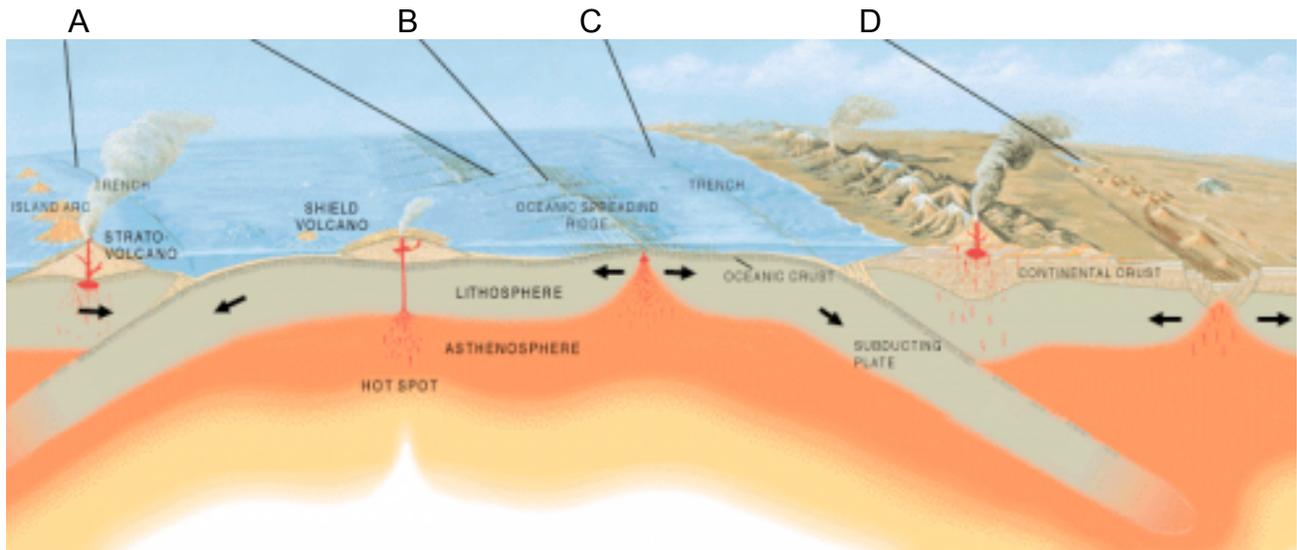
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Science "reason:"

Sample:

Seismic waves react differently when travelling through materials of different densities. We cannot use direct evidence to observe Earth's layers.

20. What is the correct order (starting from the surface) of Earth's layers?
- crust, outer core, inner core, mantle
 - mantle, outer core, inner core, crust
 - crust, mantle, outer core, inner core
 - outer core, inner core, crust, mantle

Science "reason:"

Sample:

Material layers from least dense to most dense. The inner core is the most dense and the crust the least dense.

21. The process by which the ocean floor sinks beneath a deep-ocean trench and back into the mantle is known as
- convection.
 - continental drift
 - subduction
 - conduction

Science "reason:"

Sample:

Ocean floor that moves beneath a deep-ocean trench is more dense material and cycles back to the mantle.

22. How did scientists discover that rocks farther away from the mid-ocean ridge were older than those near it?
- By observing eruptions of molten material on the sea floor
 - By mapping rocks on the sea floor using sonar
 - By determining the age of rock samples obtained by drilling on the sea floor
 - By measuring how fast sea-floor spreading occurs

Science “reason:”

Sample: Scientist studying the ocean floor drilled rock samples and were able to date the rocks. This meant rocks that moved farther away from the ocean ridge were older than those close to the ridge. Newer rocks were closer to the ridge.

Open Response

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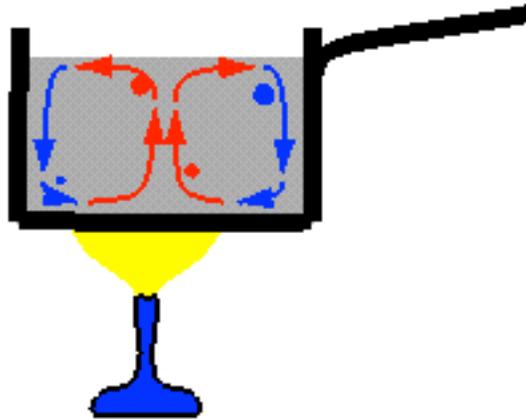
Oceanic-Oceanic: *Colliding plates under the ocean. One plate is subducted under the other plate. The plate with more dense basalt or older denser material would move under the less dense material (granite). Diagram accurate.*

Continental-Continental: *Mountains are formed at the convergence of the plates. Mountains formed at continental convergent boundaries have pushed up less dense granite material. Diagram accurate.*

Oceanic-Continental: *The denser basalt from the oceanic plate subducts under the less dense granite continental plate. Diagram accurate.*

24. Describe how the shapes of present-day continents support the theory of continental drift.
The continents fit together like a puzzle aligning not only the shapes but landforms, fossils, and glacier material on each continent.

For questions 25-26 use the diagram below to answer the questions.



25. Explain the movement in this fluid.

The liquid in the container is heated from the bottom. The blue arrows represent denser cooler liquid not heated and moving to the bottom. The red arrows represent warmer less dense heated liquid moving above the denser layer. This convection cycle continues until all liquid is at the same temperature.

26. How would this movement affect the crust?

Convection currents in the mantle under the Earth's crust move in the same manner as the liquid in the pot. This movement causes the crust to move and crack along boundaries of the different plates.