

Name: [Answer Key](#)
Earth Science

Date:
Period:

Earth Science Regents Review Workbook

Part 7: Dynamic Crust

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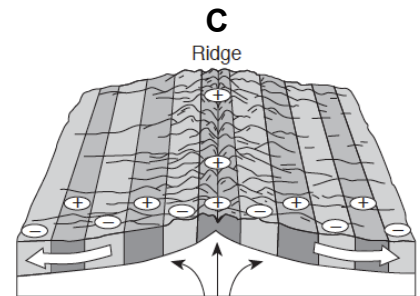
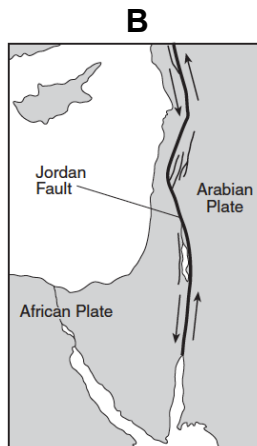
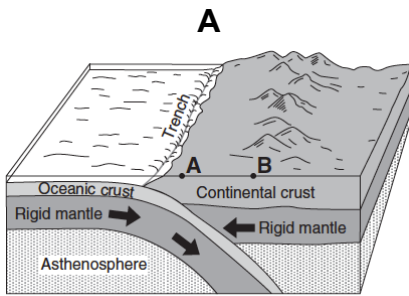
Earthquake Practice

Directions: Use ESRT page 11 to answer the questions below.

1. A seismic station located at point A is 5,400 kilometers away from the epicenter of the earthquake. If the arrival time for the P-wave at point A was 2:00 pm, the arrival time for the S-wave at point A was approximately
a. 1:53 p.m. **b. 2:07p.m.** c. 2:09 pm d. 2:16 p.m.
2. A seismograph station recorded the arrival of the first P-wave at 7:32 p.m. from an earthquake that occurred 4,000 kilometers away. What time was it at the station when the earthquake occurred?
a. 7:20 p.m. **b. 7:25 p.m.** c. 7:32 p.m. d. 7:39 p.m.
3. A seismic station 4,000 kilometers from the epicenter of an earthquake records the arrival time of the first P-wave at 10:00:00. At what time did the first S-wave arrive at this station?
a. 9:55:00 **b. 10:05:40** c. 10:07:05 d. 10:12:40
4. The first S-wave arrived at a seismograph station 11 minutes after an earthquake occurred. How long after the arrival of the first P-wave did this first S-wave arrive?
a. 3 min 15 s **b. 4 min 55 s** c. 6 min 05 s d. 9 min 00 s
5. A seismic station is recording the seismic waves produced by an earthquake that occurred 4,200 kilometers away. Approximately how long after the arrival of the first P-wave will the first S-wave arrive?
a. 1 min 05 sec **b. 5 min 50 sec** c. 7 min 20 sec d. 13 min 10 sec
6. An earthquake's first P-wave arrives at a seismic station at 12:00:00. This P-wave has traveled 6,000 kilometers from the epicenter. At what time will the first S-wave from the same earthquake arrive at the seismic station?
a. 11:52:20 **b. 12:07:40** c. 12:09:20 d. 12:17:00
7. The distance from Albany, New York, to the epicenter of this earthquake is 5,600 kilometer. Approximately how much longer did it take for the S-wave to arrive at Albany than the P-wave?
a. 4 min 20 s **b. 7 min 10 s** c. 9 min 0 s d. 16 min 10 s

Part 7: Dynamic Crust

Plate Tectonics

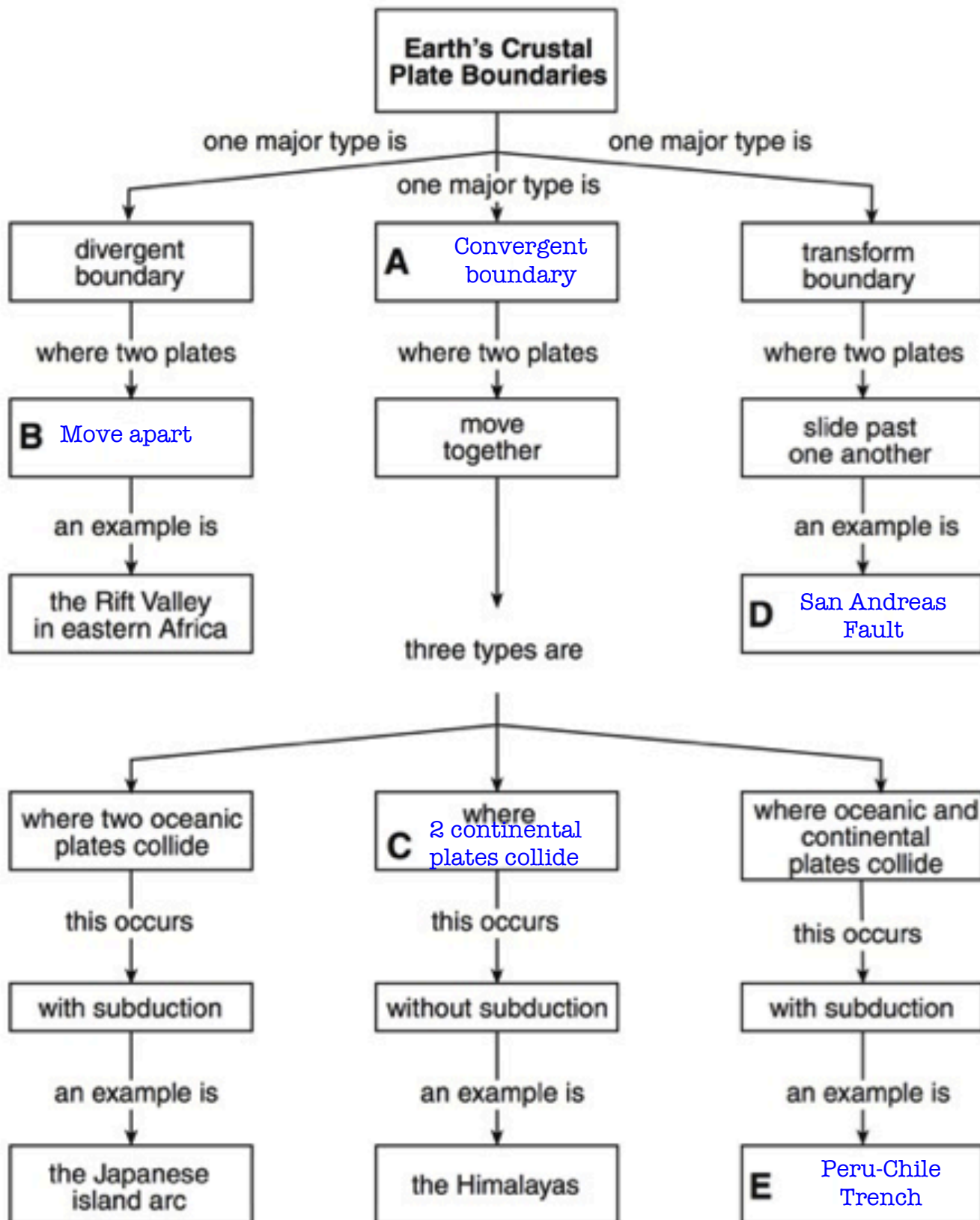


1. Name the type of plate boundary represented by diagram A. Convergent
2. Name one example of this type of plate boundary using ESRT page 5. Peru-Chile Trench
3. Name a geologic feature that is caused by this type of plate boundary. Trenches, volcanic mountains, deep earthquakes
4. Name the type of plate boundary represented by diagram B. Transform/fault
5. Name one example of this type of plate boundary using ESRT page 5. San Andreas Fault
6. Name a geologic feature that is caused by this type of plate boundary. Shallow earthquakes
7. Name the type of plate boundary represented by diagram C. Divergent
8. Name one example of this type of plate boundary using ESRT page 5. Mid-Atlantic Ridge
9. Name a geologic feature that is caused by this type of plate boundary. Volcanoes, new ocean crust
10. Which layer of Earth's interior has the convection currents that cause crustal plates to move? Asthenosphere (plastic mantle)
11. Describe the meaning of the + and - signs in diagram C. Changes in magnetic polarity on opposite sides of a mid-ocean ridge indicates the seafloor is spreading

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Plate Tectonics

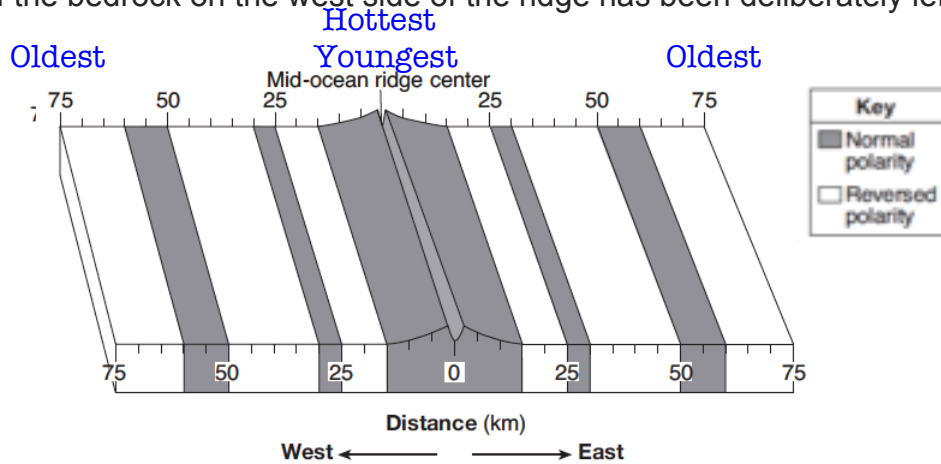
Directions: Complete the table below to describe Earth's Crustal Plate Boundaries.



Part 7: Dynamic Crust

Divergent Plate Boundaries

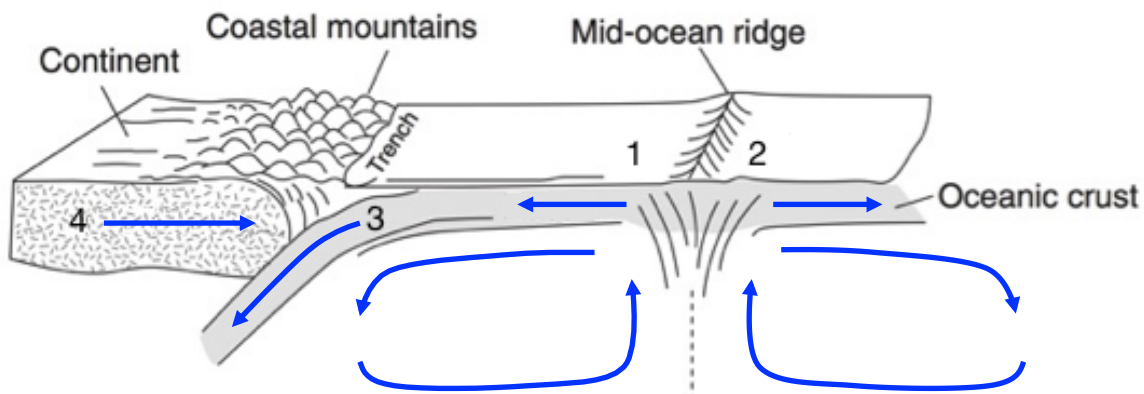
The diagram below represents the pattern of normal and reversed magnetic polarity and the relative age of the igneous bedrock composing the ocean floor on the east side of the Mid-Atlantic Ridge. The magnetic polarity of the bedrock on the west side of the ridge has been deliberately left blank.



- Draw the polarity pattern on the west side of the Mid-Atlantic Ridge.
- Draw arrows on the profile on both sides of the mid-ocean ridge that indicate the direction of sea floor spreading that is occurring.
- Label the location(s) of the youngest bedrock.
- Label the location(s) of the oldest bedrock.
- Label the location of the hottest crustal temperatures.

Convergent Plate Boundaries

The diagram below shows some features of Earth's crust and upper mantle.

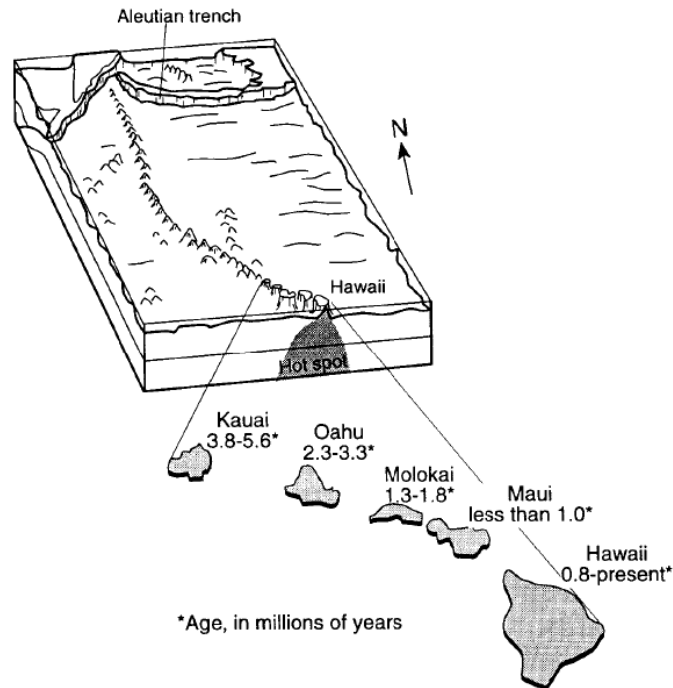


- On the diagram, draw the two convection cells with arrows to indicate the direction of heat flow under the oceanic crust.
- On the diagram, draw one arrow on **each numbered plate** to show the relative direction that plates are moving.
- What rock is the oceanic crust composed of? What is its density? Basalt, 3.0 g/cm³
- What rock is the continental crust composed of? What is its density? Granite, 2.7 g/cm³

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Hot Spots

The block diagram below shows the bedrock age and the present location of the Hawaiian Island chain. These volcanic islands may have formed as the Pacific Plate moved over a mantle hot spot.



1. What is a hot spot? Location away from a plate boundary in which volcanoes form
2. Which island of the Hawaiian chain is the oldest? Kauai
3. Which island of the Hawaiian chain is the youngest? Hawaii
4. Which tectonic plate is the Hawaiian Hot Spot located on? Pacific Plate
5. In which direction is the plate probably moving toward? Northwest
6. Make an inference on why the island of Hawaii is larger than any of the other islands.
It formed most recently so it did not weather and erode as much.
It had more volcanic eruptions than the other islands.
7. Another island is forming in the same area. Looking at the chain of existing islands, infer where this new island is forming?
Southeast of Hawaii
8. In the last 100 years, most of the world's earthquakes have been taken place in a region along the rim of the Pacific Ocean known as the Ring of Fire.