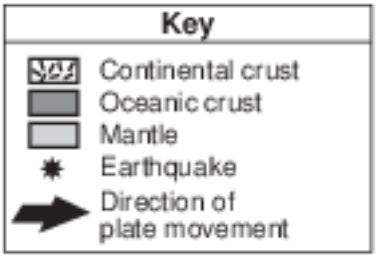
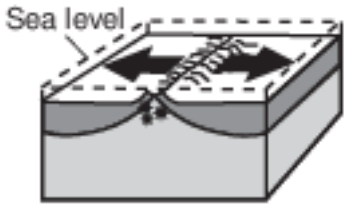
Tectonic Plates

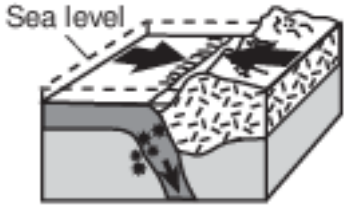
1 Which block diagram represents the plate motion that causes the earthquakes that occur along the San Andreas Fault in California?



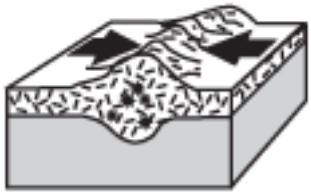
(1)



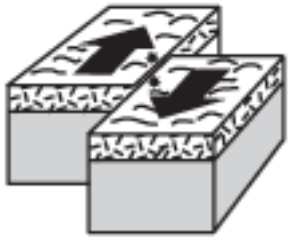
(2)



(3)



(4)



2 Which surface feature was produced by crustal movements at a transform plate boundary?

(1) East African Rift (3) Tasman Hot Spot

(2) Aleutian Trench (4) San Andreas Fault

3 Which two mantle hot spots are located at midocean ridges?

(1) Iceland and Yellowstone

(2) Galapagos and Tasman

(3) St. Helena and Hawaii

(4) Easter Island and Bouvet

4 Which tectonic feature is associated with a complex or uncertain plate boundary?

(1) Southwest Indian Ridge

(2) East African Rift

(3) Mariana Trench

(4) Galapagos Hot Spot

5 Which landmass is moving northward with Australia as part of the same tectonic plate?

(1) India (3) North America

(2) Antarctica (4) South America

6 Which mantle hot spot is correctly matched to its overlying tectonic plate?

(1) Tasman Hot Spot–Pacific Plate

(2) Canary Island Hot Spot–Eurasian Plate

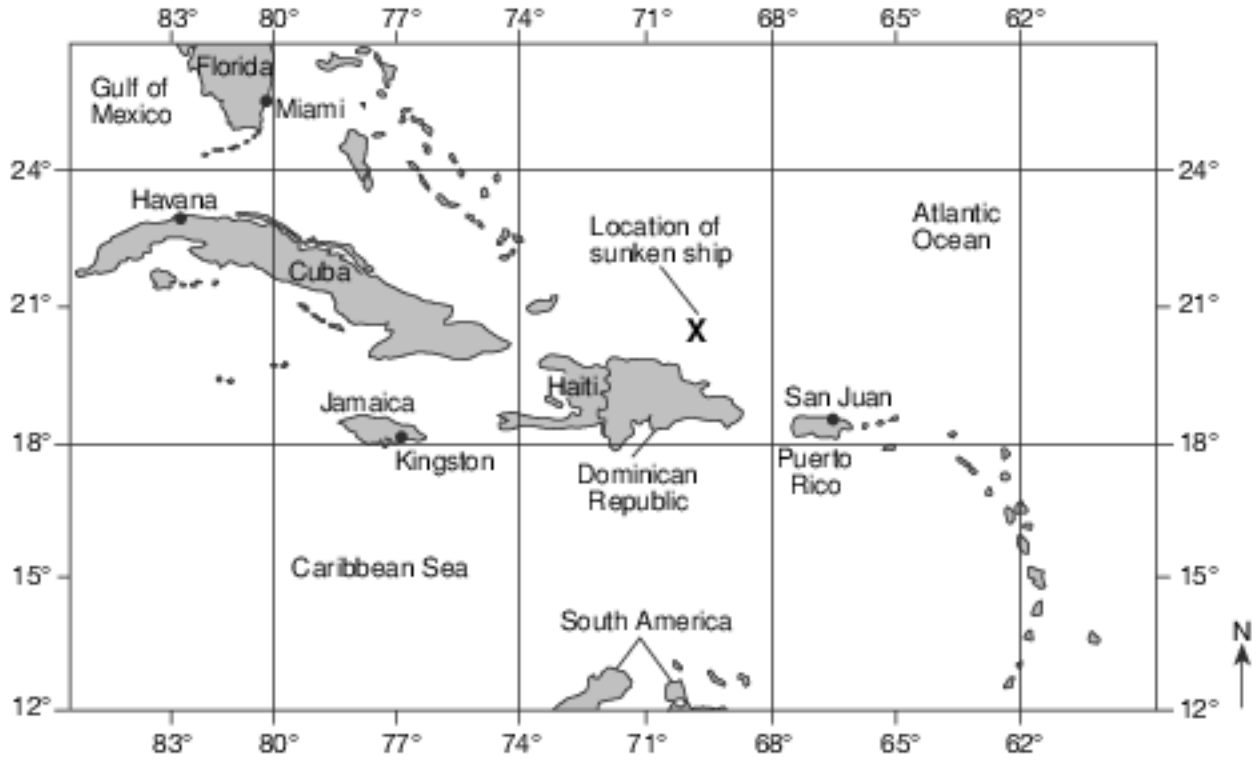
(3) St. Helena Hot Spot–South American Plate

(4) Yellowstone Hot Spot–North American Plate

Base your answers to questions 7 on the passage and map below. The map shows sections of the Atlantic Ocean, the Caribbean Sea, and the Gulf of Mexico.

Shipwreck

In 1641, the crew of the ship Concepcion used the Sun and stars for navigation. The crew thought that the ship was just north of Puerto Rico, but ocean currents had carried them off course. The ship hit a coral reef and sank off the coast of the Dominican Republic. The X on the map marks the location of the sunken ship.



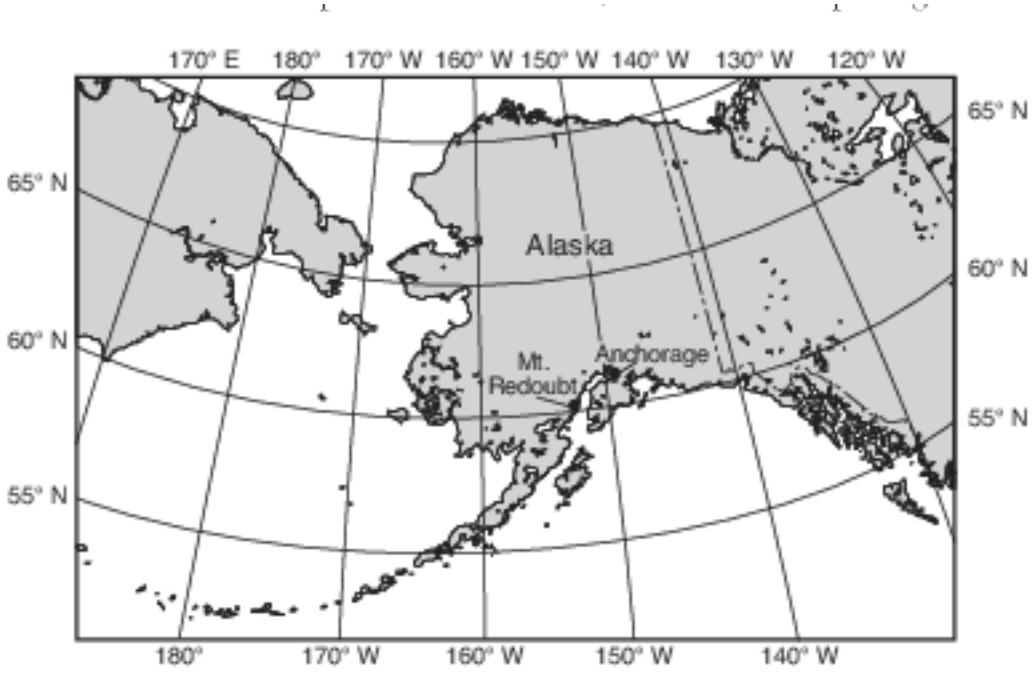
7 On which tectonic plate is Puerto Rico located?

(1) North American Plate
(2) South American Plate
(3) Caribbean Plate
(4) Cocos Plate

Base your answers to questions 8 on the passage and map below and on your knowledge of Earth science. The map shows the locations of the Mt. Redoubt volcano and Anchorage, Alaska.

Mt. Redoubt Volcano

In Anchorage, Alaska, scientists are monitoring sensors located on nearby Mt. Redoubt. The sensors measure seismic activity at the top of the volcano. No one lives near the volcano itself, so there is no danger to humans from lava flows, but ash can be dangerous when breathed in, and can damage airplanes and automobiles if the ash is drawn into their engines. When Mt. Redoubt erupted in 1989, a huge ash cloud reached an approximate height of 7.6 miles above sea level, and spread ash across Alaska for five months. The ash was composed largely of silica, which cooled rapidly as the ash rose into the atmosphere. In March 2009, Mt. Redoubt erupted again.



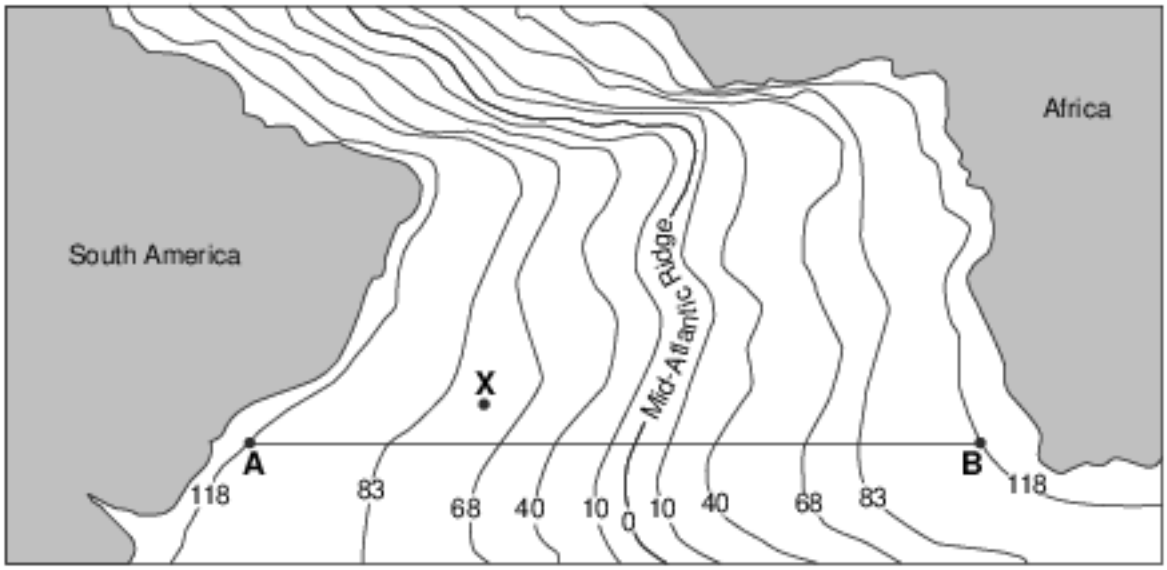
8 Mt. Redoubt's seismic activity is due to the interaction of which two tectonic plates?

(1) Pacific Plate and Eurasian Plate
(2) Eurasian Plate and North American Plate
(3) North American Plate and Pacific Plate
(4) Philippine Plate and Eurasian Plate

9 The formation of the Canary Islands was primarily caused by their location near a

(1) subduction zone
(2) mantle hot spot
(3) divergent boundary
(4) transform fault

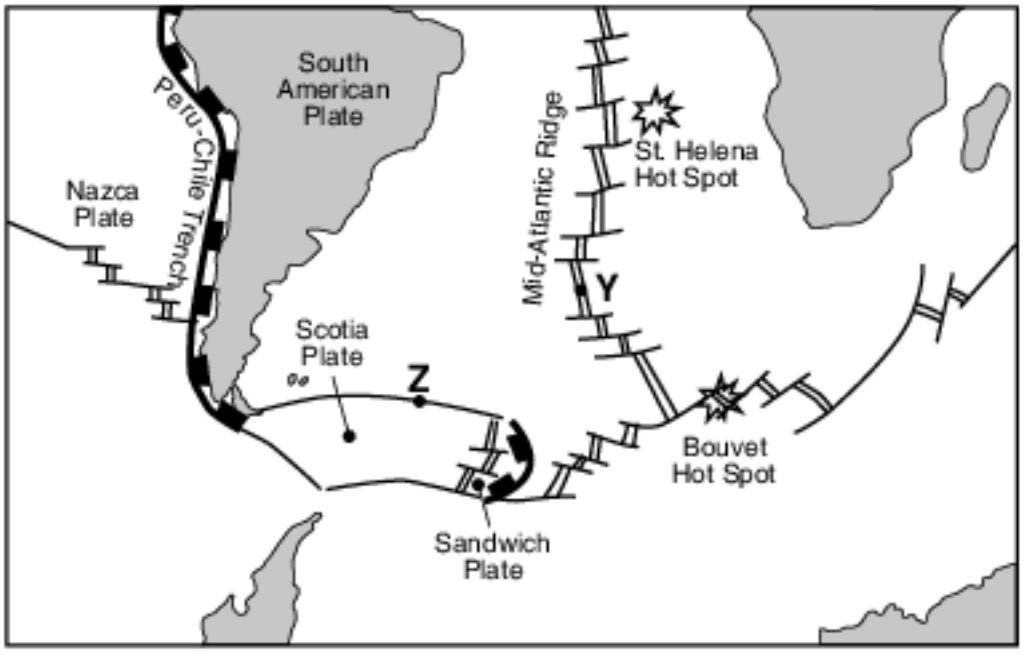
Base your answers to questions 10 on the generalized map below, which shows a portion of the Atlantic Ocean floor located between South America and Africa. Isolines show the approximate age, in million years, of the ocean-floor bedrock on each side of the Mid-Atlantic Ridge. Points A, B, and X represent locations on the ocean floor.



10 The Mid-Atlantic Ridge separates pairs of crustal plates, such as the South American Plate and the African Plate. Identify one other pair of crustal plates separated by the Mid-Atlantic Ridge. [1]

Plate and _____ Plate

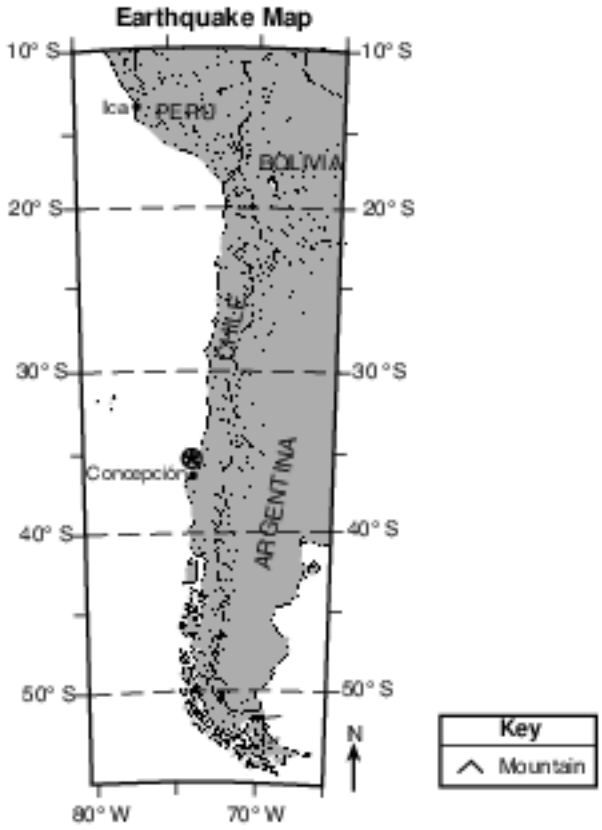
Base your answers to questions 11 on the map below and on your knowledge of Earth science. The map shows an enlargement of a portion of the Tectonic Plates map from the Physical Setting/Earth Science Reference Tables. Arrows showing plate motion have been omitted. Points Y and Z represent locations on plate boundaries.



11 Identify the type of tectonic plate boundary found at location Z. [1]

Base your answers to questions 12 on the passage and map below and on your knowledge of Earth science. The map shows the location of a major earthquake that occurred in 2010 off the west coast of Chile, in South America. The star (graphfile:esci12020-examw_g38.png) represents the location of the earthquake epicenter.

On February 27, 2010, a strong earthquake with a magnitude of 8.8 occurred off the west coast of South America near the city of Concepción in central Chile. There was tremendous damage to the region and loss of life, as buildings collapsed. Tremors were felt as far north as Ica, Peru, 2400 kilometers away. The earthquake triggered a tsunami that damaged several coastal towns. Tsunami warnings were issued to 53 countries, including the United States, where damage was reported. This earthquake is ranked as one of the highest in magnitude ever recorded by a seismograph. Chile has experienced some of the strongest earthquakes in the past, including a 1960 earthquake that had a magnitude of 9.5, the highest ever recorded.

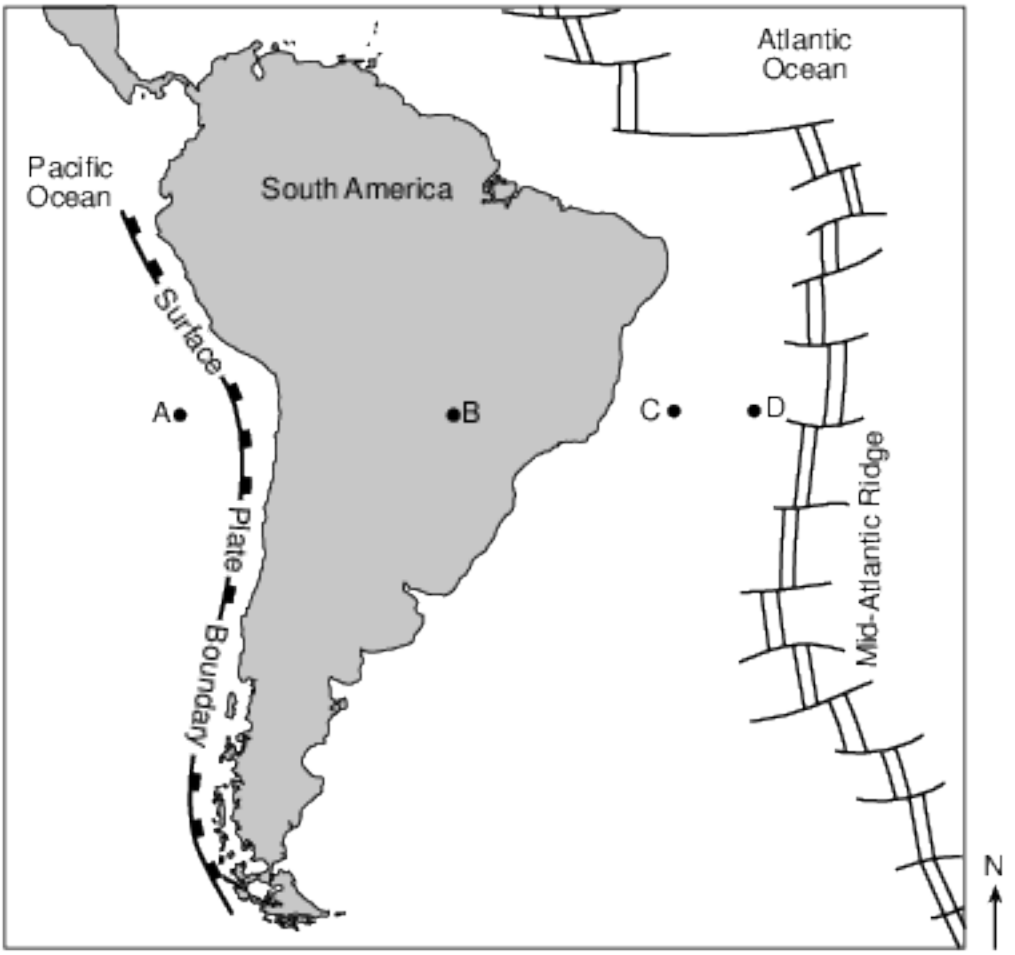


12 Identify the name of the oceanic tectonic plate located along the west coast of South America where this earthquake occurred. [1]
Plate

Base your answers to questions 13 on the world map below. Points A through H represent locations on Earth's surface.

13 Identify the tectonic feature responsible for the formation of the Hawaiian Islands. [1]

Base your answers to questions 14 on the map below and on your knowledge of Earth science. The map shows the surface location of a tectonic plate boundary along the western coast of South America. The Mid-Atlantic Ridge is also shown. Points A through D represent locations on Earth's surface.



14 Identify the names of the tectonic plates at locations A and B. [1]
Location A: Plate
Plate Location B:

Base your answers to questions 15 on the passage below and on your knowledge of Earth science. The passage describes unusual lava from a volcano in Africa.

Unusual Volcano

Nyiragongo, located at 2° S 29° E, is an active African volcano. It has the most fluid lava on Earth. The lava has a composition unlike any other lava in the world. The rare isotopes found in the lava are similar to those found in ancient asteroids. This fact leads scientists to infer that the lava may be as old as our solar system and that it comes from deep inside the mantle near Earth's outer core. Nyiragongo is one volcano in a ring of many volcanoes surrounding an area that is domed upward nearly a mile above sea level, causing scientists to infer that a new mantle hot spot is forming there.

15 Identify the type of tectonic plate boundary found in the vicinity of Nyiragongo. [1]

Answer Keys

1 4

2 4

3 4

4 2

5 1

6 4

7 3

8 3

9 2

10 Allow 1 credit. Acceptable responses include, but are not limited to:
- — North American Plate and Eurasian Plate
- — N. American Plate and African Plate

11 Allow 1 credit. Acceptable responses include, but are not limited to:
- — transform boundary
- — transform fault
- — strike-slip fault

12 Allow 1 credit for Nazca Plate.

13 Allow 1 credit. Acceptable responses include, but are not limited to:
- — Hawaii Hot Spot
- — mantle hot spot
- — volcano
- — a rising magma plume

14 Allow 1 credit if both responses are correct.
- Location A: Nazca Plate
- Location B: South American Plate

15 Allow 1 credit. Acceptable responses include, but are not limited to:
- — an uncertain or complex plate boundary
- — a divergent plate boundary
- — rift valley/East African Rift