Name _____ Class _____ Date _____

Chapter 9 Plate Tectonics

Section 9.1 Continental Drift

This section explains the hypothesis of continental drift and the evidence supporting it.

Reading Strategy

Summarizing Fill in the table as you read to summarize the evidence of continental drift. For more information on this Reading Strategy, see the **Reading and Study Skills** in the **Skills and Reference Handbook** at the end of your textbook.

Hypothesis	Evidence
Continental Drift	a. continental puzzle
	b.
	c.
	d.

The Continental Puzzle

1. Wegener called Earth's ancient supercontinent _____.

Evidence for Continental Drift

Match each example of continental drift with the type of evidence it is.

Example

_____ **2.** Similar mountain chains run through eastern North America and the British Isles.

_____ **3.** Land areas that show evidence of ancient glaciation are now located near the equator.

_____ **4.** The Atlantic coastlines of South America and Africa fit together.

_____ **5.** Remains of *Mesosaurus* are limited to eastern South America and southern Africa.

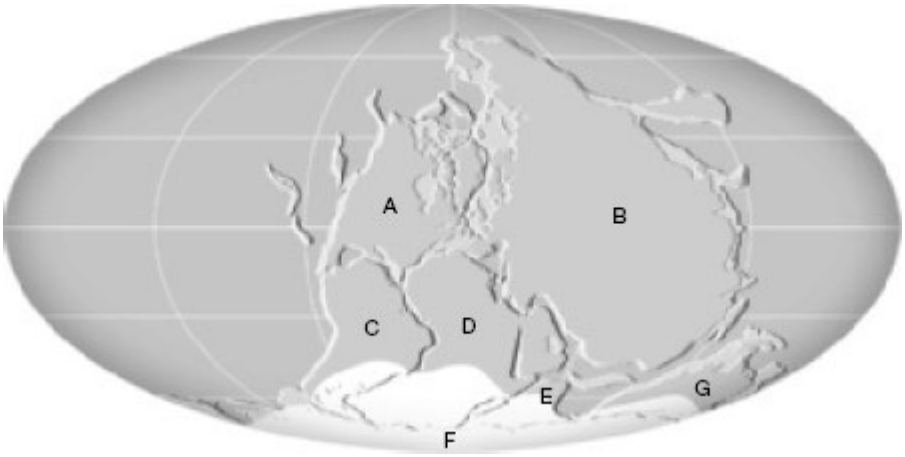
Evidence for Continental Drift

a. rock types and structures
b. matching fossils
c. continental puzzle
d. ancient climates

6. _____ evidence for continental drift includes several fossil organisms found on different landmasses.

7. Is the following sentence true or false? If the continents existed as Pangaea, the rocks found in a particular region on one continent should closely match in age and type those in adjacent positions on the adjoining continent. _____

8. The figure shows Earth's ancient supercontinent as it appeared about 300 million years ago, according to Alfred Wegener. Write the letter that represents each of the following present-day continents.



_____ Antarctica
_____ Europe and Asia
_____ South America
_____ India
_____ North America
_____ Africa
_____ Australia

Rejection of Wegener's Hypothesis

9. Circle the letter of an example of one objection that critics had about Wegener's continental drift hypothesis.

a. Wegener could not provide any evidence to support continental drift.
b. Wegener could not propose a mechanism capable of moving the continents.
c. Wegener's idea of the mechanism capable of moving the continents was physically impossible.
d. Wegener's fossil evidence was not accurate.

10. Is the following sentence true or false? Most scientists in Wegener's time supported his continental drift hypothesis.

_____

11. Is the following sentence true or false? Wegener proposed that during continental drift, larger continents broke through the oceanic crust. _____

12. By 1968, data collected about the ocean floor, earthquake activity, and the magnetic field led to a new theory called _____.

13. The new theory that replaced Wegener's hypothesis explained most geologic processes, including the formation of _____.

Name _____ Class _____ Date _____

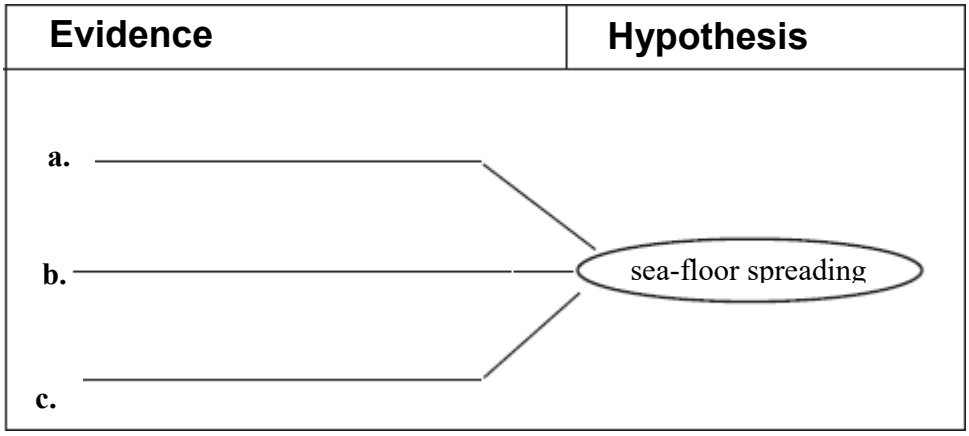
Chapter 9 Plate Tectonics

Section 9.2 Sea-Floor Spreading

This section discusses sea-floor spreading and subduction zones, and evidence for sea-floor spreading.

Reading Strategy

Identifying Supporting Evidence After you read, complete the graphic organizer to show the types of evidence that supported the hypothesis of sea-floor spreading.



Exploring the Ocean Floor

Match each definition with its term.

	Definition	Term
_____	**1.** system that uses sound waves to calculate the distance to an object	a. sonar
_____	**2.** deep faulted structure found along a divergent boundary	b. rift valley
_____	**3.** elevated seafloor along a divergent boundary	c. oceanic ridge

The Process of Sea-Floor Spreading

4. Circle the letter of the description of a subduction zone.

a. where an oceanic plate is forced beneath a second plate
b. where an oceanic plate grinds past a second plate
c. where a continental plate grinds past a second plate
d. where an oceanic plate moves away from a second plate

Evidence for Sea-Floor Spreading

5. _____ has occurred when rocks formed millions of years ago show the location of the magnetic poles at the time of their formation.

6. Is the following sentence true or false? When magnetic mineral grains in a rock form, they become magnetized in the direction parallel to Earth's existing magnetic field._____

7. Circle the letter of the statement representing some of the strongest evidence of sea-floor spreading.

a. Similar fossils are found in North America and Europe.

b. Earth's magnetic field periodically reverses polarity.

c. Strips of alternating polarity lie as mirror images across the ocean ridges.

d. Evidence of glaciation occurs on land in tropical and subtropical regions.

8. Circle the letter of the definition of reverse polarity.

a. the loss of magnetism by iron-rich mineral grains when heated

b. the gain of magnetism by iron-rich mineral grains when cooled

c. what rocks that show the same magnetism as the present magnetic field have

d. what rocks that show the opposite magnetism as the present magnetic field have

9. Is the following sentence true or false? Deep-focus earthquakes occur away from ocean trenches within the slab of lithosphere descending into the mantle._____

10. Where do shallow-focus earthquakes occur relative to (compared to) ocean trenches? _____

_____

11. Circle the letter of the location of the oldest oceanic crust, according to ocean drilling data.

a. near the edges of continents

b. at the ridge crest

c. between the continental margins and ridge crest

d. deep in the asthenosphere

12. Circle the letter of the location of the youngest oceanic crust, according to ocean drilling data.

a. at the continental margins

b. at the ridge crest

c. between the continental margins and ridge crest

d. deep in the asthenosphere

Name _____ Class _____ Date _____

Chapter 9 Plate Tectonics

Section 9.3 Theory of Plate Tectonics

This section discusses plate tectonics, including lithospheric plates and types of plate boundaries.

Reading Strategy

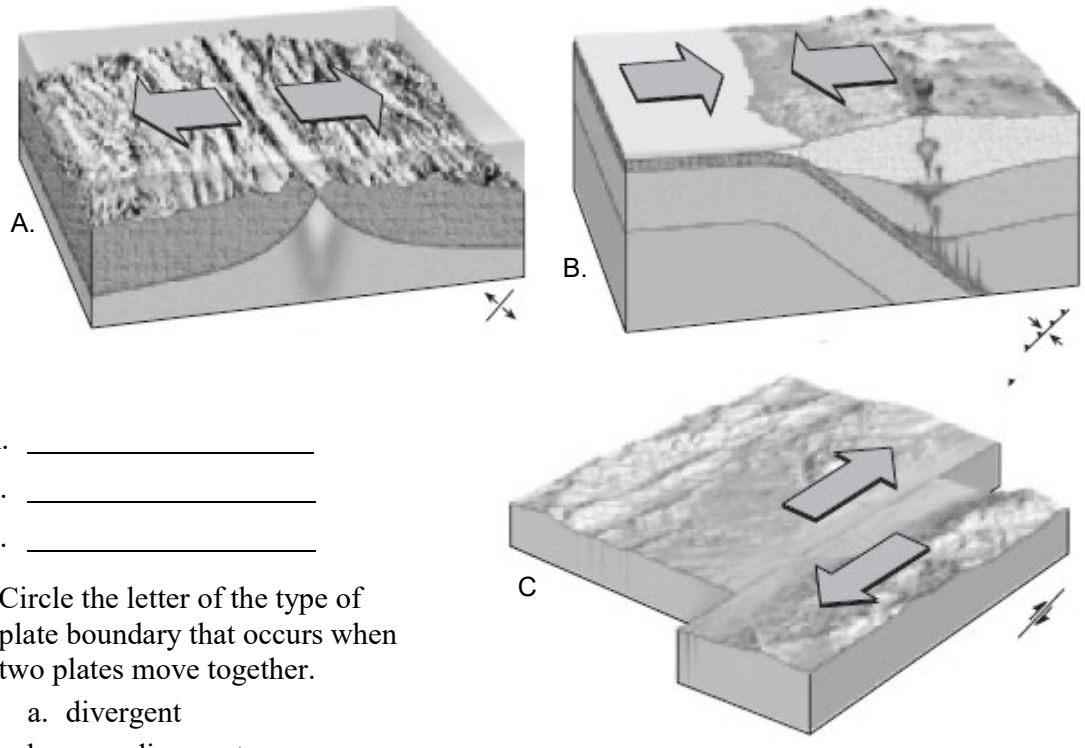
Comparing and Contrasting After you read, compare the three types of plate boundaries by completing the table. For more information on this Reading Strategy, see the **Reading and Study Skills** in the **Skills and Reference Handbook** at the end of your textbook.

Boundary Type	Relative Plate Motion
convergent	a.
divergent	b.
transform fault	c.

Earth's Moving Plates

1. Is the following sentence true or false? The lithospheric plates move at about 5 km per year. _____

2. Identify each type of plate boundary shown in the figure.



A. _____

B. _____

C. _____

3. Circle the letter of the type of plate boundary that occurs when two plates move together.

a. divergent
b. spreading center
c. convergent
d. transform fault

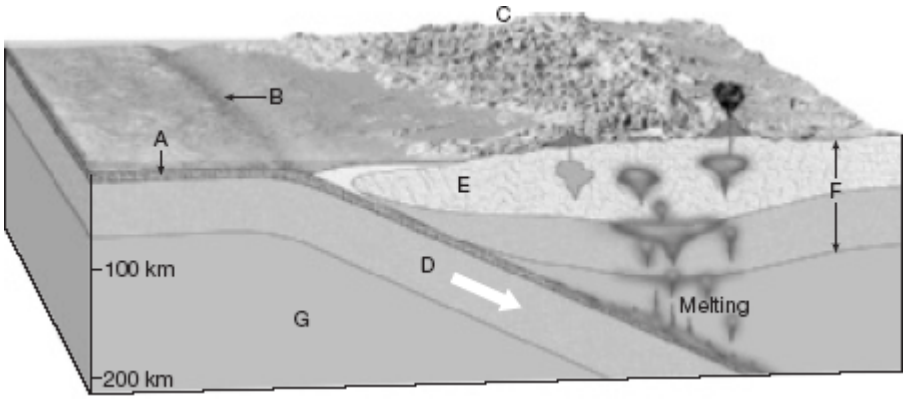
Divergent Boundaries

4. Is the following sentence true or false? Oceanic lithosphere is created at divergent boundaries. _____

5. Is the following sentence true or false? Divergent boundaries only occur on the ocean floor. _____

Convergent Boundaries

6. Select the appropriate letter in the figure that identifies each of the following features.



_____ Subducting oceanic lithosphere

_____ Oceanic crust

_____ Trench

_____ Continental volcanic arc

_____ Continental lithosphere

_____ Continental crust

_____ Asthenosphere

7. Newly formed land consisting of an arc-shaped island chain is called a(n) _____.

8. Is the following sentence true or false? Mountains form as a result of a collision between two continental plates.

_____

Transform Fault Boundaries

9. What happens at a transform fault boundary? _____

_____

_____

10. Circle the letter of the example of a transform fault boundary that is NOT located in an ocean basin.

a. the San Andreas Fault
b. the Aleutian Trench
c. the Himalayan mountains
d. the Nazca plate

Name _____ Class _____ Date _____

Section 9.4 Mechanisms of Plate Motions

This section explains what causes plate motion and the role played by unequal distribution of heat within Earth.

Reading Strategy

Identifying Main Ideas As you read, write the main ideas for each topic. For more information on this Reading Strategy, see the **Reading and Study Skills** in the **Skills and Reference Handbook** at the end of your textbook.

Topic	Main Idea
Slab-pull	a.
Ridge-push	b.
Mantle convection	c.

What Causes Plate Motions?

1. Circle the letter of the basic force that drives plate tectonics.
   a. Earth's magnetic field
   b. convection in the mantle
   c. tidal influence of the moon
   d. radiation from the sun

2. What happens to the material involved during convection?

_____

_____

3. A _____ is the continuous flow that occurs in a heated fluid becuse of differences of temperature and density.

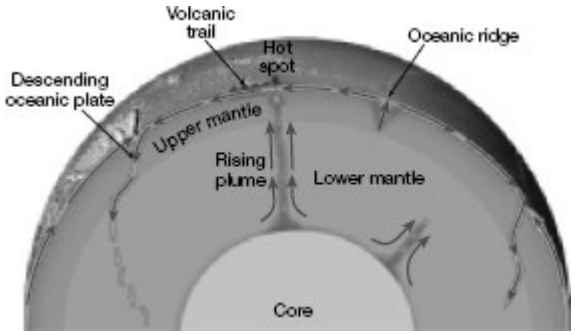
4. The mechanism called _____ causes oceanic lithosphere to slide down the sides of the oceanic ridge.

5. The mechanism that is the main downward component of mantle convection is _____.

6. Is the following sentence true or false? The upward flow of material in mantle convection consists of mantle plumes of rising hot rock. _____

7. The feature in the diagram where rock is coolest and most dense is the

a. lower mantle
b. descending oceanic plate
c. rising plume
d. oceanic ridge



8. Circle the letter of the statement that best describes the whole-mantle convection model.

a. Rock magnetism changes as rock layers melt under heat and pressure.
b. Hot oceanic lithosphere descends into the mantle, and cold mantle plumes move heat toward the surface.
c. Hot mantle plumes move heat toward the surface.
d. Convection in Earth's molten outer core transfers heat directly to the lithosphere.

9. What causes thermal convection in the mantle?

_____

_____

Name _____ Class _____ Date _____

Chapter 9 Plate Tectonics

WordWise

Complete the sentences by using one of the scrambled vocabulary terms below.

gentverdi dariensbou
nagapae
chtrne
ngameopalstmie
tnegrevcon seiradnoub
nouiusbdct eozns
entlanitcno itfrd
cinocae esrigd
letasp

Destructive plate margins called _____ are where one oceanic plate is forced down into the mantle beneath a second plate.

Where two plates move together,_____ occur.

Wegener proposed that in the past, the continents were joined to form a supercontinent he named _____.

_____ occur where two tectonic plates move away from each other.

An ocean _____ is a surface feature produced by a descending plate.

Wegener's _____ hypothesis proposed that the continents changed position on Earth's surface.

A record of _____ is preserved in the sequence of rock strips at oceanic ridges.

Earth's lithosphere is divided into _____ that move and change shape.

Elevated areas of the seafloor called _____ occur along well-developed divergent plate boundaries.