

Chapter 11

Text Pages 294–297

STUDY GUIDE

● Continental Drift

Use the words and phrases in the boxes to complete each part of the outline.

Climate clues
Fossil clues
Glaciers

Plants
Rock clues

Evidence for continental drift**I. Early evidence**

A. Puzzlelike fit of continents

B. _____

1. *Mesosaurus*2. *Glossopteris*

3. _____

C. _____

1. _____

2. Glacial deposits

D. _____

Magnetic evidence
Age evidence
Older rock farther from mid-ocean ridge

Reversal of magnetic alignment of rocks
Ocean rock younger than continental rock

II. Later evidence: seafloor spreading

A. _____

1. *Glomar Challenger* research

a. Newer rock near mid-ocean ridge

b. _____

c. _____

B. _____

1. Known reversal of Earth's magnetic field

2. _____

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REINFORCEMENT

● Continental Drift

Match the items in Column I with the terms or phrases in Column II. Write the letter of the correct term or phrase in the blank at the left.

Column I

- _____ 1. Reptile fossil found in South America and Africa
- _____ 2. Fern fossil found in Africa, Australia, India, South America, and Antarctica
- _____ 3. Clues that support continental drift
- _____ 4. Mountains similar to those in Greenland and Western Europe
- _____ 5. An underwater mountain range
- _____ 6. Scientist who suggested theory of continental drift
- _____ 7. Scientist who suggested theory of seafloor spreading
- _____ 8. Material that rises to surface at mid-ocean ridge
- _____ 9. Direction in which ocean floor moves
- _____ 10. Place where the seafloor is forced down into the mantle
- _____ 11. Research ship
- _____ 12. Age of oldest seafloor rocks
- _____ 13. Age of oldest continental rocks
- _____ 14. Location of youngest seafloor rocks
- _____ 15. Rock containing iron
- _____ 16. Poles that reverse themselves
- _____ 17. Magnetic alignment of rocks in mid-ocean ridge
- _____ 18. Process that forms new seafloor
- _____ 19. Movement of continents
- _____ 20. Evidence that Africa was once cold

Column II

- a. Alfred Wegener
- b. Appalachians
- c. away from the mid-ocean ridge
- d. basalt
- e. continental drift
- f. glacial deposits
- g. *Glomar Challenger*
- h. *Glossopteris*
- i. Harry Hess
- j. magnetic
- k. alternating
- l. *Mesosaurus*
- m. mid-ocean ridge
- n. molten material in the mantle
- o. nearest to ridge
- p. rock, fossil, and climate
- q. seafloor spreading
- r. almost 4 billion years
- s. trench
- t. 160 million years

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STUDY GUIDE

● Seafloor Spreading

Use words in the boxes to fill in the blanks.

inner core
iron and nickel

liquid
outer core

rock
solid

Scientists know Earth's interior is made mostly of layers of _____ .
Some layers, like the center part, called the _____ are hard and
_____. Other layers are not. The layer next to the center, called the
_____, is _____. Both parts of the core are made of
_____ .

continents
crust
hot

mantle
oceans

plasticlike
soil

The largest layer inside Earth is called the _____. It's neither completely
solid nor completely liquid, but _____. It's extremely
_____ .

Earth's outermost layer is the _____. This layer is about 5 km thick
under the _____ and up to 35 km thick under the
_____. On top of the outer layer is the weathered rock we call
_____ .

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REINFORCEMENT

● Seafloor Spreading

Find the mistakes in the statements below. Rewrite each statement correctly on the lines provided.

1. The youngest rock is found along the far edges of an ocean ridge. _____

2. The scientist Henry Hess invented echo-sounding devices for mapping the ocean floor. _____

3. As the seafloor spreads apart, hot saltwater rises and flows from the cracks. _____

4. As the seafloor moves away from the ridge and becomes hotter, it moves upward and forms still higher ridges. _____

5. The research ship *Glomar Challenger* was equipped with a magnetometer that records magnetic data. _____

6. Scientists found that the rocks were younger closer to the trenches. _____

7. Rocks on the seafloor are much older than the continental rocks. _____

8. The oldest rocks found on the seafloor were almost four billion years old. _____

9. All the rocks on the seafloor are aligned according to the same magnetic field orientation.

10. Evidence supporting continental drift shows that the ocean floor is always stable. _____

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REINFORCEMENT

● Theory of Plate Tectonics

Use the words in the box to fill in the blanks.

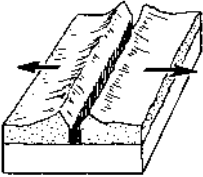
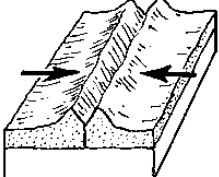
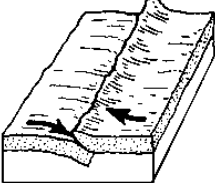
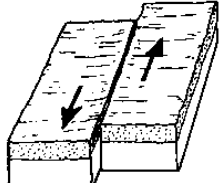
asthenosphere
convection current

lithosphere
plates

plate tectonics

- The theory of _____ states that Earth's crust and upper mantle are broken into sections.
- These sections, called _____, are composed of the crust and a part of the upper mantle.
- The crust and upper mantle are called the _____.
- Beneath this layer is the plasticlike _____.
- Many scientists think hot plasticlike rock is forced upward toward the surface, cools, and sinks. This process is called a _____ current.

Four diagrams are shown in the table below. Explain each diagram to complete the table.

Diagram	Type of boundary and motion at boundary	Diagram	Type of boundary and motion at boundary
6. 		8. 	
7. 		9. 	

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STUDY GUIDE

● Before Pangaea, Rodinia

Complete each statement from your textbook on the lines provided.

1. Edges of some continents look as if they would _____ .
2. People wondered if these continents had been _____ .
3. In 1915, Alfred Wegener proposed an idea called _____ .
4. This idea states that continents moved through the _____ .
5. Wegener thought that long ago the continents formed _____ .
6. He named it Pangaea, which means _____ .
7. Wegener's idea was rejected. The idea was so different that _____
_____ .
8. Today Wegener's ideas about continental drift are _____ .
9. Today some people still have trouble _____ .
10. One new idea that is still being debated explains _____ .
11. Walter and Luis Alvarez think that a large rocky object _____ .
12. This collision threw _____ .
13. The dust blocked the _____ .
14. This caused _____ .

Answer the questions on the lines provided.

15. Explain how Pangaea fits into Wegener's theory of continental drift. _____

16. State one reason why Wegener's ideas about continental drift were not believed.

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REINFORCEMENT

● Before Pangaea, Rodinia

Answer the following questions on the lines provided.

1. What was Rodinia? _____

2. Where did scientists find evidence about Rodinia? _____

3. How do scientists study evidence for the formation of Rodinia? _____

4. List two kinds of evidence for the relationship of East Antarctica and the North American Plate about 540 million years ago. _____

5. What does the computer model indicate happened to Rodinia 750 million years ago? _____

6. When did Pangaea form? _____
7. What does evidence from volcanic rocks and Paleozoic fossils indicate on the computer models? _____

8. What does the computer model indicate happened to the continental plates between 750 and 260 million years ago? _____

9. What do the simulations indicate happened to the North American Plate after it broke away from East Antarctica? _____

10. What evidence was used in the computer simulations to indicate what happened to the North American Plate? _____

Chapter 11

CHAPTER REVIEW

● Plate Tectonics

Part A. Vocabulary

Write the term that matches each description below in the spaces provided. Then unscramble the letters in the boxes to reveal the mystery phrase.

1. _____
2. _____ _____
3. _____
4. _____
5. _____
6. _____ _____
7. _____
8. _____
9. _____
10. _____
11. _____ _____
12. _____
13. _____
14. _____
15. _____

1. Plasticlike layer of Earth below the lithosphere
2. Mantle's cycle of heating, rising, cooling, and sinking
3. Theory stating that Earth's crust and upper mantle are broken into sections
4. Area where an oceanic plate descends into the upper mantle
5. Plate boundary that occurs when two plates slide past one another
6. Place where two plates collide
7. Rigid layer composed of Earth's crust and part of the upper mantle
8. Instrument that records magnetic fields that help confirm seafloor spreading
9. Name given to the landmass when all continents were connected
10. Idea that continents have moved horizontally through the seafloor to their current locations
11. Place where two plates move away from each other
12. Broken sections of the lithosphere
13. Largest layer of Earth, composed mostly of silicon, oxygen, magnesium, and iron
14. Earth's outermost layer
15. Landmass that existed 750 million years ago
16. Letters from boxes:

Mystery phrase:

Chapter Review (continued)**Part B. Concept Review****I. Labeling**

Diagram the upper layers of Earth's crust and mantle, including the lithosphere and the asthenosphere. Label the parts.

II. Writing

Answer each item in complete sentences.

1. Compare and contrast divergent, convergent, and transform fault plate boundaries. _____

2. Describe how convection currents might be the cause of plate tectonics. _____

3. Why are new ideas often rejected, and what is needed before new ideas should be accepted?
