Name _____ Date _____ Class _____

Drifting Continents

Key Concepts

- What was Alfred Wegener's hypothesis about the continents?
- What evidence supported Wegener's hypothesis?
- Why was Alfred Wegener's theory rejected by most scientists of his day?

In 1910, a young German scientist named Alfred Wegener became curious about why the coasts of several continents matched so well, like the pieces of a jigsaw puzzle. He formed a hypothesis that Earth's continents had moved! Wegener's hypothesis was that all the continents had once been joined together in a single landmass and have since drifted apart. He named this supercontinent Pangaea, meaning "all lands." According to Wegener, Pangaea existed about 300 million years ago. Over tens of millions of years, Pangaea began to break apart. The pieces of Pangaea slowly moved toward their present-day locations, becoming the continents of today. The idea that the continents slowly moved over Earth's surface became known as continental drift. In a book called *The Origin of Continents and Oceans,* Wegener presented his evidence. Wegener gathered evidence from different scientific fields to support his ideas about continental drift. He studied land features, fossils, and evidence of climate change.

Mountain ranges and other landforms provided evidence for continental drift. For example, Wegener noticed that when he pieced together maps of Africa and South America, a mountain range running from east to west in South Africa lines up with a range in Argentina. Also, European coal fields match up with coal fields in North America.

Fossils also provided evidence to support Wegener's theory. A fossil is any trace of an ancient organism preserved in rock. The fossils of the reptiles *Mesosaurus* and *Lystrosaurus* and a fernlike plant called *Glossopteris* have been found on widely separated landmasses. This convinced Wegener that the continents had once been united.

Wegener used evidence from climate change to further support his theory. For example, an island in the Arctic Ocean contains fossils of tropical plants. According to Wegener, the island once must have been located close to the equator. Wegener also pointed to scratches on rocks made by glaciers. These scratches show that places with mild climates today once had climates cold enough for glaciers to form. According to Wegener's theory, Earth's climate has not changed. Instead, the positions of the continents have changed.

Wegener also attempted to explain how the drift of continents took place. Unfortunately, Wegener could not provide a satisfactory explanation for the force that pushes or pulls the continents. Because he could not identify the cause of continental drift, most geologists rejected his theory. For nearly half a century, from the 1920s to the 1960s, most scientists paid little attention to the idea of continental drift. Then new evidence about Earth's structure led scientists to reconsider Wegener's bold theory.

Name _____ Date _____ Class_____

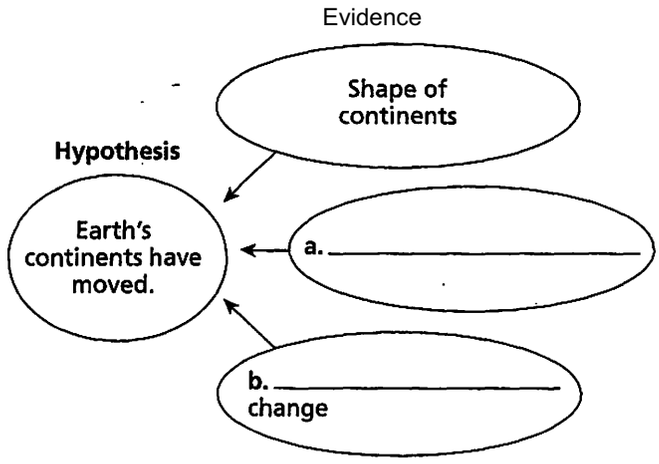
Plate Tectonic$ • *Guided Reading and Study*

Drifting Continents

This section describes a theory of how the continents came to be located where they are today. The sect on also gives evidence for the theory and explains why the theory was not accepted for many years.

Use Target Reading Skills

As you read about the evidence that supports the theory of continental drift, complete the graphic organizer.



Continental Drift

1. State Alfred Wegener's hypothesis is about how Earth's continents have moved.

_____

_____

2. Wegener named his supercontinent-------

3. What did Wegener think had happened to this supercontinent?

_____

_____

_____

4. Wegener's idea that the continents slowly moved over Earth's surface became known as----------

5. Circle the letter of each sentence that supports Wegener's hypothesis.
   a. Some continents match up like jigsaw puzzle pieces.
   b. Different rock structures are found on different continents.
   c. Fossils of tropical plants are found near the equator.
   d. Continental glaciers once covered South Africa.
6. Give an example of evidence from land features that supported Wegener's idea of continental drift. _____
7. Any trace of an ancient organism preserved in rock is called a(n) _____
8. How did Wegener explain similar fossils on different continents?
9. Is the following sentence true or false?
   Wegener believed that continental drift explained fossils of tropical plants found in places that today have a polar climate. _____

Wegener's Hypothesis Rejected

10. How did Wegener think that mountains formed? _____

11. How do the locations of mountains support Wegener's idea about how mountains form?

Drifting Continents

Understanding Main Ideas

Fill in the blanks in the table below.

Types of Evidence	Example of Evidence
Evidence from 1.	a. Mountain ranges in South America and 2. _____ lineup b. European coal fields match with similar coal fields in North America
Evidence from Fossils	a. Fossils of the plant 3. _____ Found in rocks on widely separated landmasses
Evidence from 4.	a. Fossils of tropical plants found near Arctic Ocean b. Scratches in rocks made by 5. _____ found in South Africa

Answerthe following questions on a separate sheet of paper.

6. State the hypothesis of continental drift.

7. Why did most scientists reject Wegener's theory for nearly a half century?

Building Vocabulary

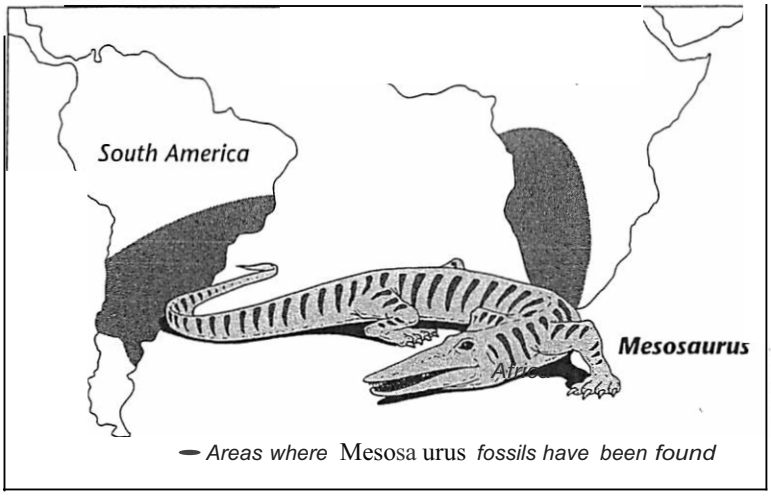
Fill in the blank to complete each statement.

8. All the continents were once joined together in a supercontinent called _____, meaning "all lands."

9. A(n) _____ is any trace of an ancient organism preserved in rock.

10. Wegener's theory that the continents slowly moved over Earth's surface became known as _____

The Curious Case of *Mesosaurus*



About 265 million years ago, a reptile called *Mesosaurus* lived in just a few places on Earth. This fairly small, lizard-like reptile measured 71 centimeters from its nose to the tip of its tail–or about two thirds of a meter. Its body was long and flexible, perfect for swimming swiftly through the water. *Mesosaurus* was a hunter of small fish and other aquatic animals. Its webbed feet and long tail worked like powerful paddles as it chased and captured its food. Like all other reptiles, *Mesosaurus* breathed air, so it had to return to the surface after hunting underwater. Freshwater ponds and lakes were its habitat.

In the 1800s, scientists began finding fossils of these ancient reptiles, which had long since become extinct. These fossils were found in only two regions, southern Africa and the southern part of South America. The shaded areas on the map show where fossils of *Mesosaurus* have been discovered. This distribution is a curious one-only two regions far from each other and separated by the Atlantic Ocean. What could explain this distribution?

Answer the following questions on a separate sheet of paper.

1. Describe the kind of environment in which *Mesosaurus* lived.
2. Is it likely that *Mesosaurus* swam back and forth across the Atlantic Ocean? Explain.
3. What could explain this distribution of *Mesosaurus* fossils?
4. Does the case of *Mesosaurus* support Wegener's theory of continental drift? Explain why or why not.
5. Does the case by itself prove the theory? Explain why or why not.