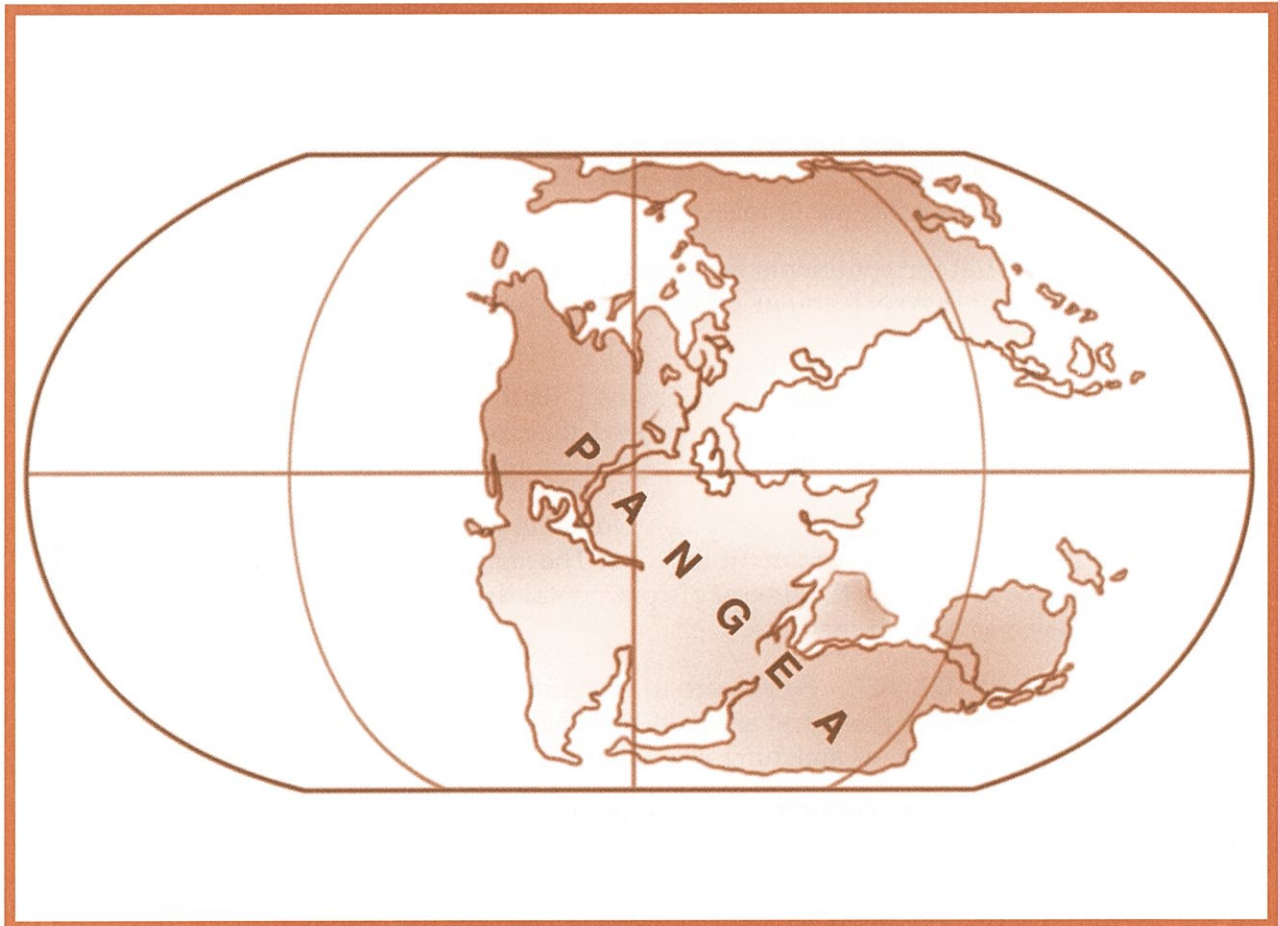


What is the theory of continental drift?



KEY TERM

continental drift: idea that states the continents were once a giant land mass, and broke into pieces that moved to the positions they are in today

LESSON 20 | What is the theory of continental drift?

You may find it hard to believe, but the seven continents are moving. A continent is a large land mass. In fact, most scientists think that at one time, there was only one giant continent. It was named Pangaea [pan-JEE-uh]. Pangaea is Greek for “all the land.” Then, about 200 million years ago, Pangaea began to break apart. The pieces began to move apart. They became today’s seven continents. How fast did the pieces move? VERY SLOWLY — no more than 2½ centimeters each year. Today the continents continue to move.

The idea that the continents were once part of a giant land mass is called **continental** [KAYNT-un-ent-ul] **drift**. It was first stated in 1912 by Alfred Wegener, a German scientist.

Wegener based his idea of continental drift upon his study of the coastlines of the continents. He noticed that in many places, coastlines seemed to fit together, like pieces of a giant jigsaw puzzle.

Look at Figure C on the next page. Notice how the coastlines of South America and Africa seem to fit together. The shape of coastlines is strong evidence to support the theory of continental drift. There is other strong evidence as well. It includes:

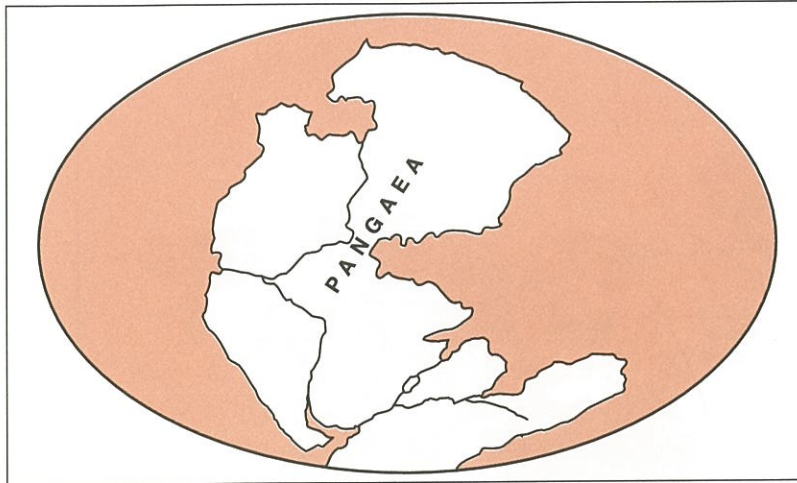
FOSSIL EVIDENCE Fossils are the remains of living things that lived long ago. Similar plant and animal fossils have been discovered in places that are far apart, in matching coastlines on different continents.

MOUNTAIN EVIDENCE Some mountain ranges on different continents seem to match. For example, a mountain range in eastern Canada seems to match one found in Norway and Sweden. The mountains would have separated when the continents started drifting apart.

ROCK EVIDENCE The age and kind of rocks and minerals along the edge of one continent match rocks and minerals along the edge of another continent.

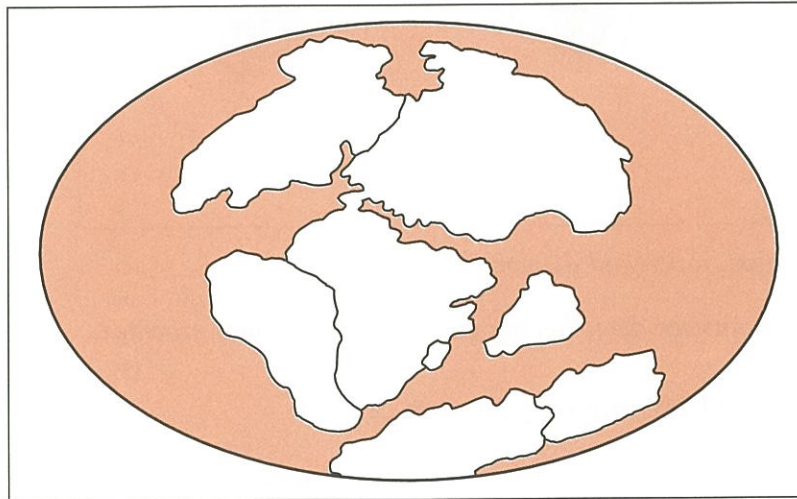
Most scientists support the theory of continental drift. Some, however, are not convinced. They point to evidence and questions that this theory cannot explain.

CONTINENTAL DRIFT



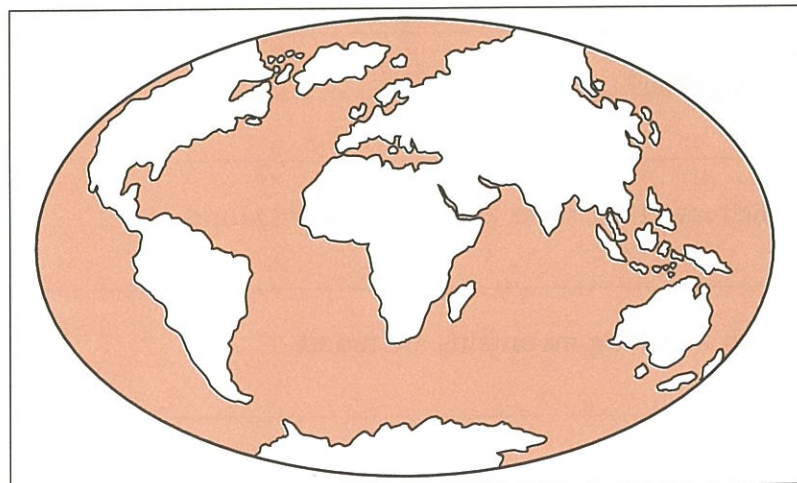
200 million years ago one giant land mass existed.

Figure A 200 million years ago



The land mass started separating. The pieces slowly drifted apart.

Figure B 135 million years ago



Today the pieces are the seven continents.

Figure C Today

EVIDENCE OF CONTINENTAL DRIFT

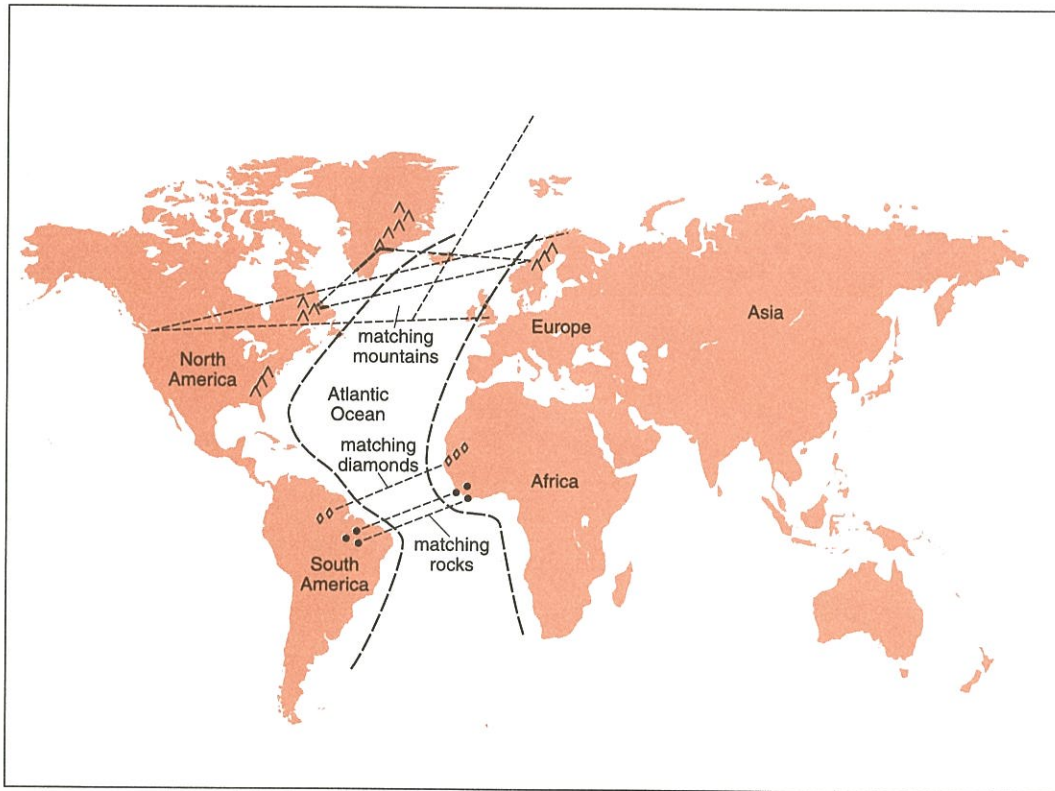


Figure D *Matching mountains, rocks, and diamonds (a mineral)*

Study Figures A, B, C, and D. Then answer the following questions on the lines provided.

1. What was the giant land mass of 200 million years ago called?

2. How do the shapes of different coastlines support continental drift?

3. Which continents seem to fit together? _____

4. Name two continents on which matching rocks and minerals are found.

5. Name two continents on which matching mountains are found.

FILL IN THE BLANK

Complete each statement using a term or terms from the list below. Write your answers in the spaces provided. Some words may be used more than once.

mountain ranges
one
fossils

Wegener
Pangaea
coastlines
continues

continental drift
200 million years
rocks and minerals
move apart

1. More than 200 million years ago, the earth had only _____ large land mass.
2. The earth's original land mass is called _____.
3. About 200 million years ago, the earth's single land mass broke up and started slowly to _____. That movement _____ even today.
4. The idea that the earth's land masses were once just one large land mass is called _____.
5. It took about _____ for the continents to look as they do today.
6. The idea of continental drift started from the study of the continent's _____.
7. The theory of continental drift was first proposed by the scientist _____.
8. Evidence from _____, _____, _____, and the shapes of _____ support the theory of continental drift.

MATCHING

Match each term in Column A with its description in Column B. Write the correct letter in the space provided.

	Column A	Column B
_____	1. fossils	a) move apart slowly
_____	2. drift	b) large land mass
_____	3. continent	c) "super continent"
_____	4. theory of continental drift	d) traces of past life
_____	5. Pangaea	e) supported by most scientists

FOSSIL EVIDENCE

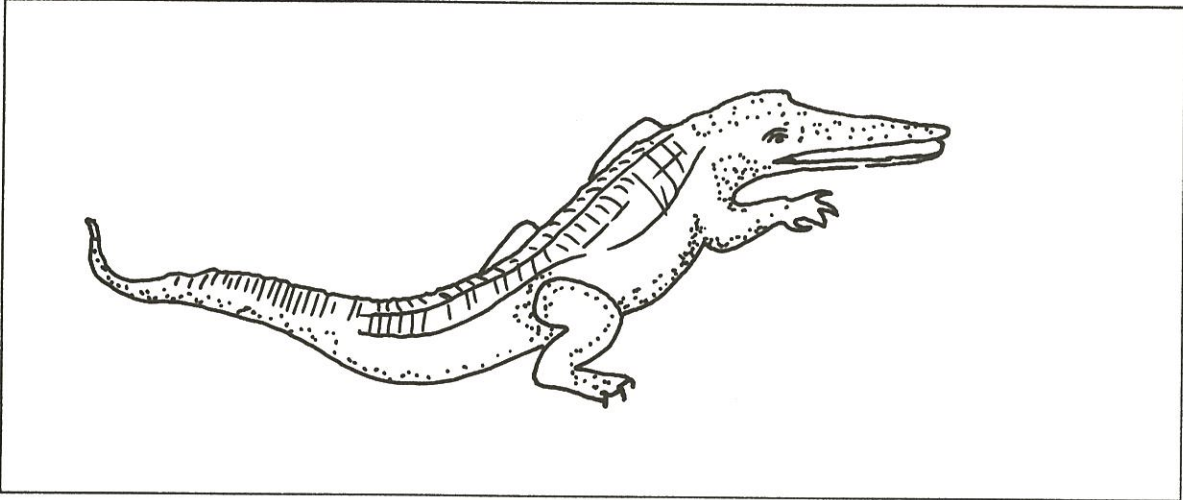


Figure E *Mesosaurus*

Alfred Wegener studied the fossils of Mesosaurus [meh-soh-SAWR-us]. Mesosaurus fossils were found in Africa and in South America. Mesosaurus was a fresh-water animal. Wegener wondered how it could swim across the salty Atlantic Ocean. He concluded that Mesosaurus must have lived on one land mass. When the land mass broke apart, some of the animals were trapped on each part.

TRY IT YOURSELF

- Trace the continents shown on the map in Figure C.
- Glue your tracing onto a sheet of construction paper.
- Carefully cut out the continents. You should have seven.
- Arrange the pieces to form Pangaea.
- Glue the model of Pangaea onto another piece of construction paper.

Place the drawings of the way the earth looked in the correct order based upon continental drift. Write the number of years ago in the space provided. Use these labels: **250 million years ago, 150 million years ago, 100 million years ago, 50 million years ago, present.**

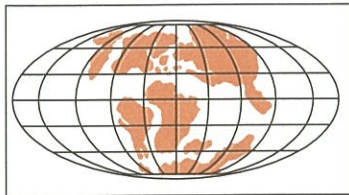


Figure F

1. _____

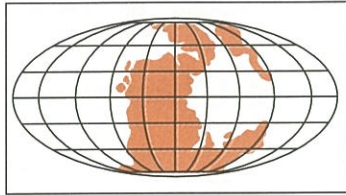


Figure G

2. _____

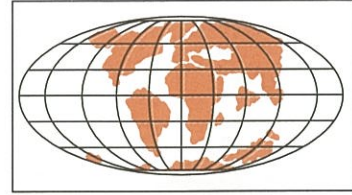


Figure H

3. _____

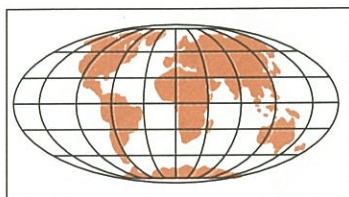


Figure I

4. _____

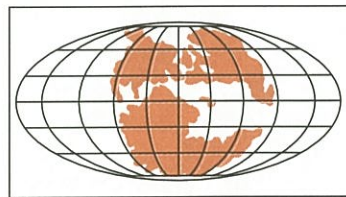


Figure J

5. _____

Place a check mark beside each statement that supports continental drift.

- _____ 1. Alfred Wegener named a giant land mass Pangaea.
- _____ 2. There are seven continents.
- _____ 3. Similar fossils are found in Africa and South America.
- _____ 4. Canada, the United States, and northern Europe have similar climates.
- _____ 5. Mountain ranges on different continents seem to match.
- _____ 6. Rocks along the edges of one continent match those along the edge of another continent.
- _____ 7. The continents are surrounded by water.
- _____ 8. The coastlines of South America and Africa seem to fit together like jigsaw puzzle pieces.

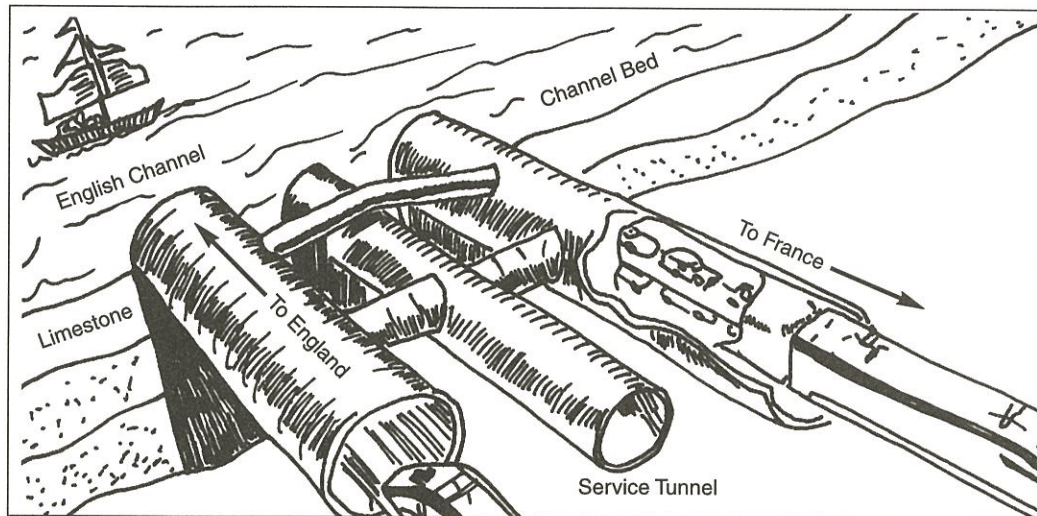
REACHING OUT

Scientists believe that the continents will always drift.

If that is true, what might happen in a few hundred million years? _____

SCIENCE **EXTRA**

The Chunnel



Geologists believe that Great Britain was once connected to the rest of Europe by a low lying plain. However, at the end of the last ice age, about seven thousand years ago, glaciers melted and flooded this plain. Since then, Great Britain has been reachable only by crossing the often stormy waters of the English Channel.

What nature had done, human technology has undone. On December 1, 1991, Graham Fagg of Dover, England and Philippe Cozette of Calais, France became the first two people to travel under the English Channel. Fagg was a member of a team of engineers that started digging a tunnel under the Channel from Great Britain. Cozette was part of a similar team of engineers that started digging under the Channel from France. The two tunnels were connected on December 1, 1991 as Fagg and Cozette used jackhammers to knock out the last foot of limestone that had separated the two tunnels.

When it was completed in 1993, the Channel Tunnel, also known as the "Chunnel," became the longest tun-

nel in the world, and the longest underwater passageway. The Chunnel actually consists of three tunnels. Two of the tunnels are for rail trains. One of the train tunnels is for travel from Great Britain to France. The other tunnel carries trains in the opposite direction. The third tunnel is a service tunnel. It runs between the other two tunnels and is connected to both train tunnels in several places. This allows service crews to reach trouble spots quickly.

The trains carry passengers and cargo, including automobiles. The crossing takes only thirty-five minutes compared to the ninety minutes it takes to cross the Channel by ferry boat.

The idea of digging a tunnel under the English Channel was not new. The idea was first considered in the 1700s and has been proposed countless times since then. However, it was not until the 1980s that there was the technology and desire to successfully carry out the project, and reunite a continent.