

# 13

## The Theory of Plate Tectonics

VIEW AND REFLECT

**I**N THE LAST activity, you used Alfred Wegener’s evidence to investigate the movement of Earth’s continents over geological time. Today, geologists know that continents are not all that moves—entire lithospheric plates move. The theory that the lithospheric plates are in constant motion is called **plate tectonics** (tek-TAWN-iks). But what new evidence led to the theory of plate tectonics?

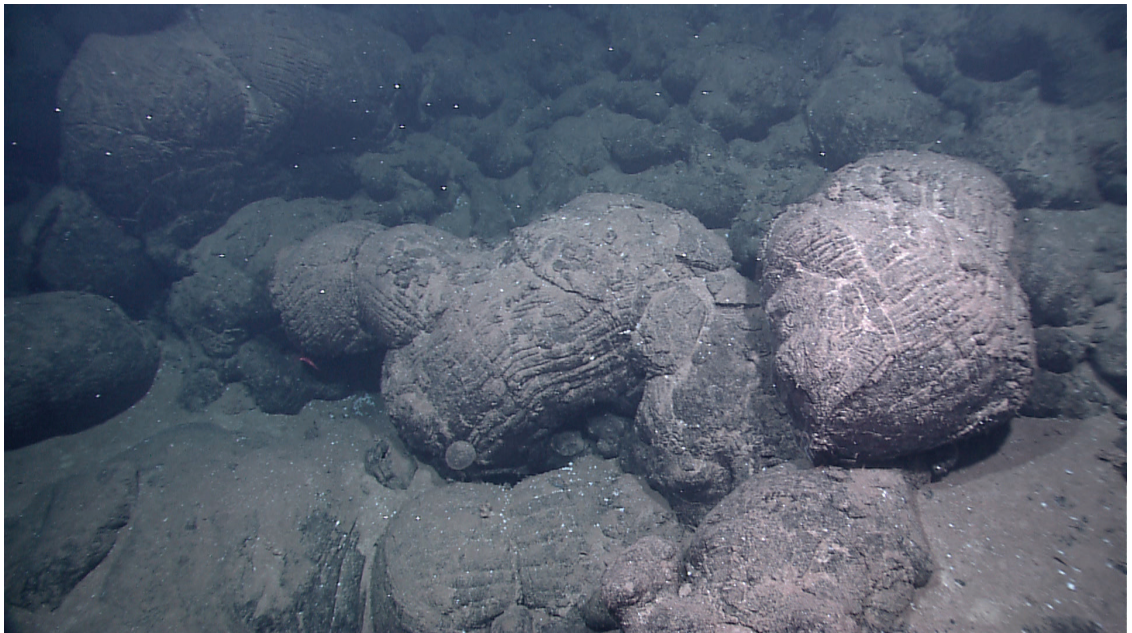
### GUIDING QUESTION

**How did Wegener’s idea of continental drift lead to the theory of plate tectonics?**

### MATERIALS

*For each student*

- 1 Student Sheet 13.1, “Plate Tectonics Video”



*At mid-ocean ridges, lava erupts from volcanoes, then cools and solidifies to form mounds of igneous rock called pillow lavas.*

## PROCEDURE

1. Watch the video segments on continental drift and plate tectonics.
2. Answer as many questions on Student Sheet 13.1, “Plate Tectonics Video,” as you can.
3. Watch the video segments again.
4. Complete Student Sheet 13.1.

## ANALYSIS

1. Why were scientists surprised to find coal in the Arctic?
2. The idea of continental drift eventually led to the modern theory of plate tectonics. To help you remember similarities and differences between these two ideas, create a larger version of the table shown below in your science notebook.
  - a. Compare continental drift and plate tectonics by recording unique features of each idea in the column with that label.  
*Hint:* Think about what you have learned about these ideas in the last two activities.
  - b. Record features that are common to both of these ideas in the column labeled “Both.”

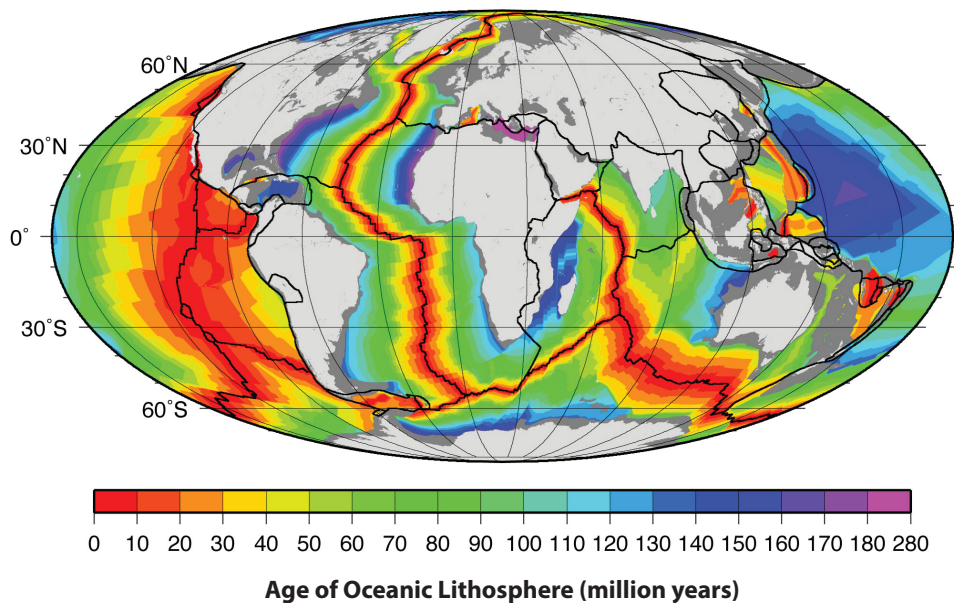
<i>Continental Drift</i>	<i>Both</i>	<i>Plate Tectonics</i>

3. Imagine that you are writing an article about what you are learning in science class for your school newspaper. In your own words, explain
  - the theory of plate tectonics.
  - how earthquakes, volcanoes, and mountain formation are related to plate tectonics.

- how changes to Earth's surface caused by plate motion can be gradual or sudden, and whether they affect small or large areas of Earth. Explain how scientists know these changes have happened both today and in the past.

Be as specific as you can, and include evidence.

4. Below you will find a map that shows the age of the oceanic lithosphere on the sea floor.



- a. Describe the patterns you see on the map. What happens to the age of the lithosphere as you move further from the mid-ocean ridge?
  - b. How do the patterns in the map relate to your observations from the video?
  - c. Look back at Student Sheet 12.1, "World Puzzle." How would you explain the evidence both in the map below and from Student Sheet 12.1?
5. What surprised or impressed you about Alfred Wegener and his approach to science?