## Lithospheric Plates

According to the theory of plate tectonics, the topmost solid part of the Earth, called the **lithosphere** (LIHTH-oh-sfeer), is made of a number of plates. The plates contain a thin layer of crust above a thick layer of relatively cool, rigid mantle rock. Plates usually contain both oceanic and continental crust.

There are seven major lithospheric plates, each of which is named after its surface features. The Pacific plate, which covers one-fifth of the Earth's surface, is the largest plate. The other major plates are the North American, South American, Eurasian, African, Indo-Australian, and Antarctic plates. Can you locate the seven major plates in Figure 3–8?

There are also many smaller plates. Some of these, such as the Caribbean and Arabian plates, are fairly large. Others are so small that they are not included in maps that show the entire Earth.

Plates move at different speeds and in different directions. Some small plates that lack landmasses move as much as several centimeters per year. Large plates that are weighted down with continents move only a few millimeters per year.

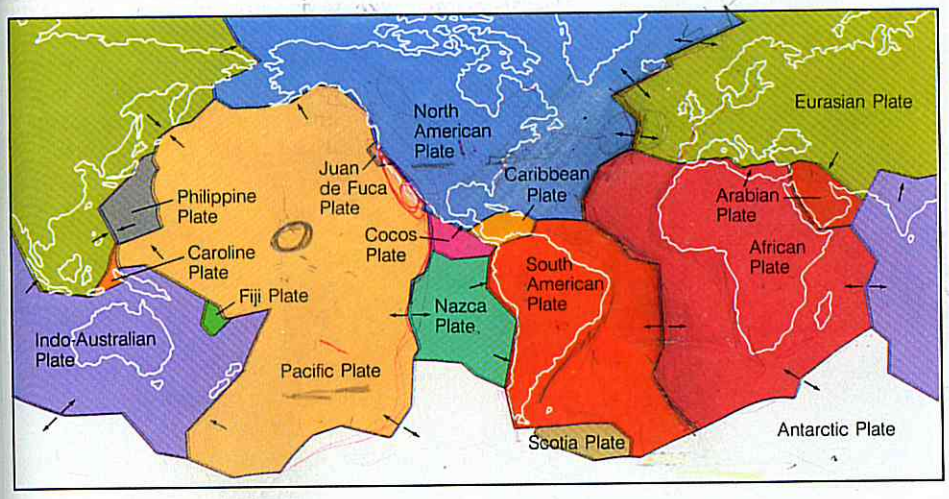
In a few cases, the edges of the continents are the boundaries of plates. However, most plate

### ACTIVITY CALCULATING

*Traveling Cities*

Los Angeles, on the Pacific plate, is slowly moving northwest. San Francisco, on the North American plate, is slowly moving southeast. These two cities are moving toward each other at a rate of about 5 centimeters per year. About 11 million years from now, the two cities will be next to each other. How many meters does each city have to travel before they meet? 4

**Figure 3–8** *This map shows the Earth's most important lithospheric plates. Which plate is most of the United States on? How do the boundaries of the plates relate to the earthquake zones shown in Figure 3–5 on page 61?* 1






## ANNOTATION KEY

### Answers

1 The United States is on the North American Plate. The boundaries of the plates match up with earthquake zones. (Interpreting diagrams)

### Integration

1 Language Arts

2 Life Science: Evolution. See *Evolution: Change Over Time,* Chapter 2.

3 Earth Science: Earth's Crust. See *Exploring Planet Earth,* Chapter 5.

4 Mathematics

## ACTIVITY CALCULATING

### TRAVELING CITIES

***Skills: Applying concepts, making calculations, calculator***

This computational activity will provide students with a mathematical way to comprehend the effects of moving plates. By computing the movement of two cities that are now far apart and by discovering how far they have to move to be next to each other in 11 million years, students will have a better understanding of the change that can occur on the Earth's surface.

Students must multiply 5 cm/year by 11 million years, convert the result to meters by dividing by 100, and divide by 2. The answer is 275,000 m.

**Integration:** Use this Activity to integrate mathematics into your lesson.

### REINFORCEMENT/RETEACHING

Review students' responses to the Section Review questions. Reteach any material that is still unclear, based on their responses.

### CLOSURE

▶ *Review and Reinforcement Guide*

Have students complete Section 3–2 in the *Review and Reinforcement Guide.*

## TEACHING STRATEGY 3–3

### FOCUS/MOTIVATION

Explain that not all scientists accepted the idea of continental drift when it was first proposed.

• **Why do you think some scientists were reluctant to accept this theory?** (Accept all logical answers.)

### CONTENT DEVELOPMENT

Discuss Figure 3–8 by asking questions such as the following.

• **Which plate is most of the United States on?** (The North American plate.)

• **Which plate contains the largest land surface?** (The Eurasian plate.)

#### Integration

Use the relationship of plate tectonics to knowledge of past life on Earth to integrate concepts of evolution into your lesson.

Use the discussion of the lithosphere to integrate the topic of the Earth's crust into your lesson.