

Chapter 13

Use with Section 1

ENRICHMENT**● Earth's Place in Space****A Day on Earth**

When you think of a day on Earth, you probably think of 24 hours. However, if you had lived millions of years ago, a day on Earth would have been much shorter. For example, 900 million years ago, the length of Earth's day was about 18 hours.

Earth's Slowing Rotation

You already know that Earth rotates about its axis. But Earth hasn't always rotated at the same speed. It used to rotate much faster. Scientists know that since about 1600, Earth has rotated about 0.002 s slower every 100 years. Scientists don't have accurate data on Earth's rotation before 1600, but they think that Earth's rotation has always been slowing down. The length of a day is the time it takes Earth to rotate once, so as Earth rotates more slowly, days last longer.

Earth and Its Moon

As the moon orbits Earth, its gravity pulls ocean water back and forth, causing tides. The water flowing across the ocean floor produces enough friction to slow down Earth's rotation.

Meanwhile, Earth's oceans, as they go through the tides, have enough mass to form their own gravitational pull on the moon. Some energy is transferred from Earth's tides to the moon. As a result, the moon speeds up in its orbit about Earth, causing it to move a little farther away. The distance from the moon to Earth increases by about 3 or 4 cm every year.

Applying Problem-Solving Skills

Answer the following questions, using complete sentences.

1. Scientists have calculated that the moon's rotation around Earth is increasing by about 0.015 s per century. At this rate, how long would it take the length of a month to increase by one full day?

2. Do you think Earth's slowing rotation affects the length of a year? Why or why not?
