

Ocean Zones ▪ *Section Summary***Exploring the Ocean****Guide for Reading**

- For what reason have people studied the ocean floor?
- What are the main sections of the ocean floor?
- What processes have shaped the ocean floor?

People have explored the ocean for thousands of years. Knowledge of the ocean has always been important to the people living along its coasts.

People have studied the ocean since ancient times because the ocean provides food and serves as a route for trade and travel. Modern scientists have studied the characteristics of the ocean's waters and the ocean floor.

Until recently the ocean floor was unexplored, and little was known about life in the oceans. A major advance in ocean-floor mapping was **sonar**, which stands for **sound navigation and ranging**. Sonar is a system that uses sound waves to calculate the distance to an object.

If you could travel along the ocean floor, you would see the continental shelf, the continental slope, the abyssal plain, and the mid-ocean ridge. The **continental shelf** is a gently sloping, shallow area of the ocean floor that extends outward from the edge of a continent. At a depth of about 130 meters, the slope of the ocean floor gets steeper. The steep edge of the continental shelf is called the **continental slope**. A broad area covered with thick layers of mud and silt is called the **abyssal plain**. The **mid-ocean ridge** is a continuous range of mountains that winds around Earth, much as the line of stitches winds around a baseball.

The mid-ocean ridge actually consists of two parallel chains of mountains separated by a central valley, with occasional trenches. A **trench** is a steep-sided canyon in the ocean floor. Some trenches are so deep you cannot see the bottom.

The pieces of Earth's crust, along with parts of the upper mantle, are called **plates**. Such plates move slowly on the underlying portion of the mantle. **Plate movements have shaped many of the most dramatic features of Earth, both on land and under the ocean.**

The mid-ocean ridge is located long the boundaries of plates that are moving apart, or diverging. Along the ridge, magma squeezes up through the cracks between the diverging plates. As the magma hardens along the ridge, it adds a new strip of rock to the ocean floor. Over millions of years, this process, called **seafloor spreading**, has produced the ocean floor.