Name: **Answer Key** #: _____

Date: _____

Section: _____ HR: _____

Skills Lab: Modeling Sea-Floor Spreading

Analyze & Conclude

1. What feature of the ocean floor does the center slit stand for?

The center slit stands for the central valley of the mid-ocean ridge.

What prominent feature of the ocean floor is missing from the model at this point?

The prominent feature that is missing at this point is the mountainous ridge.

2. What do the side slits stand for?

The side slits stand for the deep-ocean trenches.

What does the space under the paper stand for?

The space under the paper stands for the part of the mantle called the asthenosphere.

3. How does the ocean floor as shown by the part of a strip close to the center slit differ from the ocean floor as shown by the part near a side slit?

The ocean floor as shown by the strip near the center slit is younger, hotter and less dense than the ocean floor farther away. As the floor moves away from the ridge, it cools and becomes denser.

How does this difference affect the depth of the ocean?

Since the ocean floor gets cooler and more dense as the material moves toward the side slits, the depth of the ocean floor increases.

4. What do the stripes on the strips stand for?

The stripes on the strips stand for magnetic stripes or the pattern of rock as it spreads out from the mid-ocean ridge.

Why is it important that your model have an identical pattern of stripes on both sides of the center slit?

It is important to have identical patterns of stripes on both sides of the center slit because this represents that the ocean floor is expanding at the same rate on both sides of the mid-ocean ridge. Rock found at the same distance on either side of the mid-ocean ridge would be the same age.

5. Explain how differences in density and temperature provide some of the force needed to cause sea-floor spreading and subduction.

Temperature differences in the mantle cause convection currents. These currents cause molten rock to erupt through the valley that runs along the center of the mid-ocean ridge. As more material erupts, the sea floor spreads, cools, and becomes denser. The denser material sinks back into the mantle when it reaches a trench.

6. **Think About It** Use your own words to describe the process of ocean-floor spreading.

At the mid-ocean ridge, molten material rises from the mantle and erupts. The molten material then spreads out, pushing older rock to both sides of the ridge. Over tens of millions of years, the process continues until the oldest ocean floor collides with the continental crust. The more dense oceanic crust subducts (sinks) back into the mantle at a deep-ocean trench.

What parts of the process were not shown by your model?

The parts of the process that were not shown in this model include changes in density and the melting of the crust as it sinks back into the mantle.