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Warm-Up | Characteristics of the Seafloor

Lesson Question

Lesson Goals

Describe the process of seafloor spreading.

Describe _____ that supports seafloor spreading.

Explain what occurs at _____ trenches.

Words to Know

Write the letter of the definition next to the matching word as you work through the lesson. You may use the glossary to help you.

_____ mid-ocean ridge	A. a long area where one tectonic plate sinks beneath another
_____ subduction zone	B. the process by which ocean crust spreads apart along each side of a mid-ocean ridge
_____ deep-ocean trench	C. an area in the ocean that has an upwelling of molten material associated with seafloor spreading
_____ seafloor spreading	D. a deep canyon formed in the ocean at a subduction zone

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Continental Drift

In the early 1900s, _____ Wegener wrote a book about the origins of the continents.

- Claimed that continents were one huge landmass called _____
- Proposed that continents broke up due to continental _____

Plate Tectonics

Plate tectonics explains the formation, movement, and _____ of Earth's plates.

- Earth's lithosphere is made of sections called _____.
- Plates move constantly but slowly.
- Plates interact with one another at _____.
- Plate interaction creates _____ and causes geologic events.

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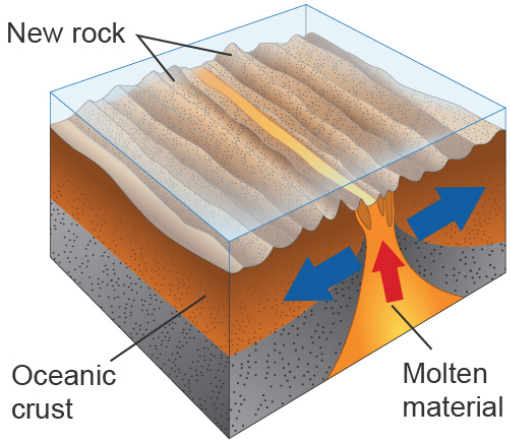
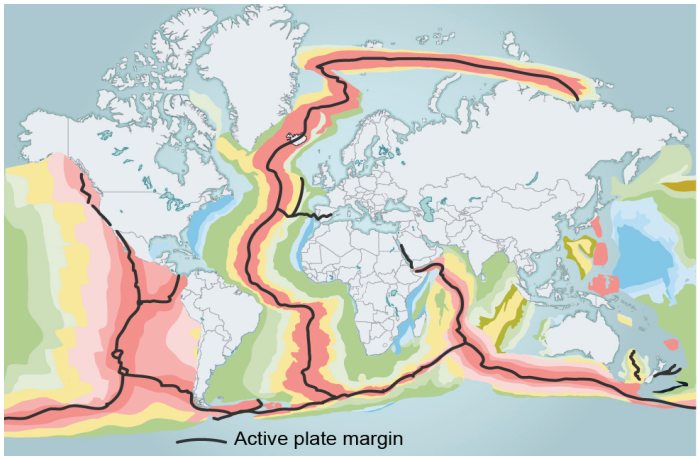
Seafloor Spreading

American geologist Harry Hess proposed the idea of **seafloor spreading**, which states that:

- the seafloor spreads along _____.
  - This process creates new ocean floor.
  - It also moves _____.



Age of the Seafloor



- The land masses are white and gray in the map.
- The areas with color are actually the floor of Earth's _____.
- The black jagged lines represent the _____ ridges.
- The colors represent the age of Earth's crust, with _____ being the youngest and _____ being the oldest.

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Steps of Seafloor Spreading

1. Crack forms in [ ] crust.
2. [ ] rock rises up through crust.
3. New material pushes [ ] rock away from ridge.
4. Molten rock [ ] at center of ridge.

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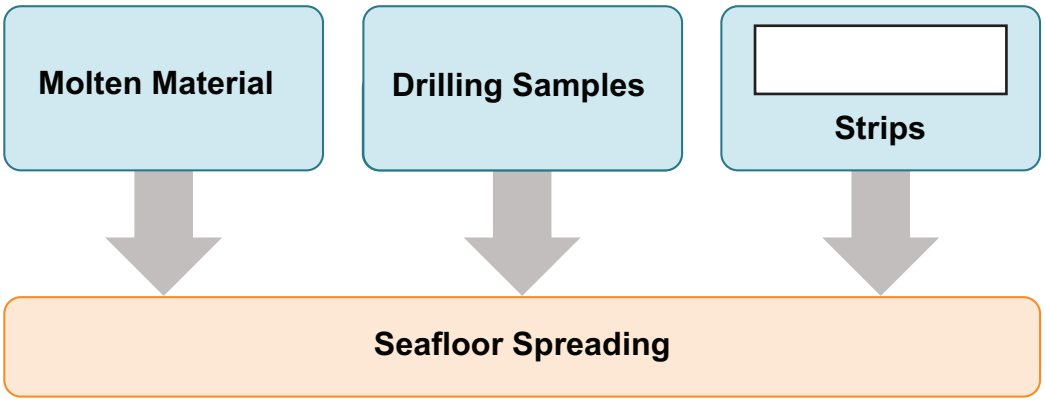
Evidence for Seafloor Spreading



Molten Material

Scientists discovered that molten material comes from the mid-ocean [ ].

- [ ] rocks form.
- Molten material makes new [ ].

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Drilling Samples

In 1968, the *Glomar Challenger* collected drilling samples from the _____ floor.

- Rocks closer to the center of mid-ocean ridges are always _____ than those that are farther away.

This evidence supported Hess's idea of seafloor spreading.

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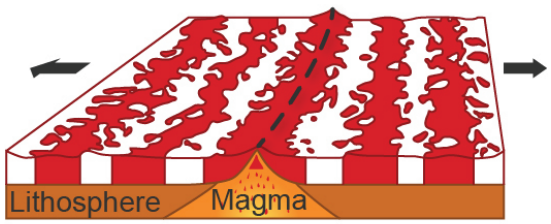
Magnetic Stripes in Ocean Rock

Rocks that make up the _____ occur in a pattern of magnetized stripes.

- Stripes that have iron oriented _____ alternate with stripes that have iron oriented _____.
- This pattern is found on _____ sides of the ridge.



Normal magnetic polarity

Reversed magnetic polarity

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Deep-Ocean Trenches

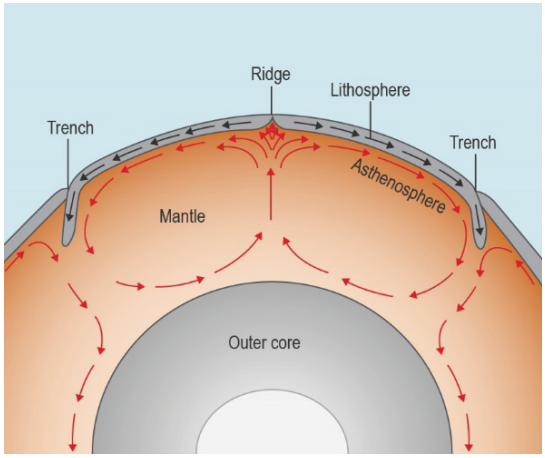
Although the [ ] is spreading, it does not continue to get wider and wider.

- **Deep-ocean trenches** occur at [ ] **zones**.
- [ ] plate slides under lighter plate.
- Crust material becomes [ ] rock.

Subduction and Seafloor Spreading in Action

Seafloor spreading and subduction work together.

- [ ] rises.
- The [ ] forms and moves away.
- The crust sinks under [ ] plate.
- The [ ] floor changes.



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Summary | Characteristics of the Seafloor

Lesson Question

What is the process of seafloor spreading?

Answer

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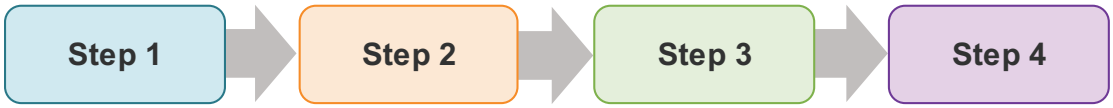
Review: Key Concepts

Seafloor spreading occurs at mid-ocean ridges, which form along cracks in oceanic crust.



- A crack forms in _____ crust.
- Molten rock rises up through crust.
- New material pushes older rock away from ridge.
- Molten rock _____ at center of ridge.

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Summary | Characteristics of the Seafloor

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Review: Key Concepts

Seafloor spreading and subduction are part of the process of plate tectonics.

• Occurs at mid-ocean ridges	• Occurs at deep-ocean trenches
• Creates new crust when magma rises and cools to form rock	• Causes old, dense crust to sink under lighter crust
• Pushes older crust away from ridge	• Destroys older crust when it melts in the mantle

Use this space to write any questions or thoughts about this lesson.

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