Chapter 9  Plate Tectonics

Section 9.5 Mechanisms of Plate Motion

This section explains what causes plate motion and the role played by unequal distribution of heat within Earth.

Reading Strategy

Identifying Main Ideas  As you read, write the main ideas for each topic. For more information on this Reading Strategy, see the Reading and Study Skills in the Skills and Reference Handbook at the end of your textbook.

<table>
<thead>
<tr>
<th>Topic</th>
<th>Main Idea</th>
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<tbody>
<tr>
<td>Slab-pull</td>
<td>a.</td>
</tr>
<tr>
<td>Ridge-push</td>
<td>b.</td>
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<tr>
<td>Mantle convection</td>
<td>c.</td>
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</tbody>
</table>

Causes of Plate Motion

1. ☐ Circle the letter of the basic force that drives plate tectonics.
   a. Earth’s magnetic field
   b. convection in the mantle
   c. tidal influence of the moon
   d. radiation from the sun

2. What happens to the material involved during convection?

3. The motion of matter called __________ results from convection.

4. ☐ The mechanism called __________ causes oceanic lithosphere to slide down the sides of the oceanic ridge.
5. The mechanism that is the primary downward arm of the mantle’s convection flow is ________________.

6. Is the following sentence true or false? The upwardly flowing arms in mantle convection consist of mantle plumes of rising hot rock.
   ________________

7. Select the letter of the figure that shows each of the following mantle convection models.
   ____ Whole-mantle convection model
   ____ Deep-layer model

8. Circle the letter of the statement that best describes the deep-layer model.
   a. Rock magnetism changes as rock layers melt under heat and pressure.
   b. Hot oceanic lithosphere descends into the mantle, and cold mantle plumes move heat toward the surface.
   c. Cold oceanic lithosphere descends into the mantle, and hot mantle plumes move heat toward the surface.
   d. Heat from Earth’s interior causes layers of convection to slowly swell and shrink in complex patterns.

9. Circle the letter of the statement that best describes the whole-mantle convection model.
   a. Rock magnetism changes as rock layers melt under heat and pressure.
   b. Hot oceanic lithosphere descends into the mantle, and cold mantle plumes move heat toward the surface.
   c. Cold oceanic lithosphere descends into the mantle, and hot mantle plumes move heat toward the surface.
   d. Heat from Earth’s interior causes layers of convection to slowly swell and shrink in complex patterns.

10. What causes thermal convection in the mantle?
Chapter 9    Plate Tectonics

**WordWise**

*Complete the sentences by using one of the scrambled vocabulary terms below.*

gentverdi dariensbou       tnegreycon seiradnoub
nagapae                    nouiusbdct eozns
chttrne                    entlanitcno itfrd
oth tops                   cinocae esrigd
veccontiev wflo           letasp
ngameopalstmie

Destructive plate margins called _______________ are where one oceanic plate is forced down into the mantle beneath a second plate.

Where two plates move together, _______________ occur.

A volcanic area of rising mantle material called a(n) _______________ is located below the island of Hawaii.

Wegener proposed that in the past, the continents were joined to form a supercontinent he named _______________.

_______________ occur where two tectonic plates move away from each other.

The motion of matter called _______________ results from convection.

An ocean _______________ is a surface feature produced by a descending plate.

Wegener’s _______________ hypothesis proposed that the continents changed position on Earth’s surface.

A record of _______________ is preserved in the sequence of lava flows at oceanic ridges.

Earth’s lithosphere is divided into _______________ that move and change shape.

Elevated areas of the seafloor called _______________ occur along well-developed divergent plate boundaries.