### Plate Boundaries & Resulting Landforms

**Divergent Plate Boundaries** (plates being pulled apart)

<table>
<thead>
<tr>
<th>Type: oceanic plates</th>
<th>Description:</th>
<th>rising magma gently lifts the crust creating a ridge. The flow of convection currents pulls the plate apart and creates a fissure (gap) that is filled by cooling magma. As it hardens new sea floor is created.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Landforms:</strong></td>
<td>Mid-ocean ridge and sometimes volcanic islands (ex. Iceland)</td>
</tr>
</tbody>
</table>

**Diagram: Diverging Plate Boundary**

---

<table>
<thead>
<tr>
<th>Type: continental plates</th>
<th>Description:</th>
<th>rising magma arches the crust upwards and spreads it until it is thin and brittle. The central block sinks creating a rift valley. At first lakes form and eventually it may sink below sea level and become a new ocean basin.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Landforms:</strong></td>
<td>Rift valleys and graben topography (see diagram)</td>
</tr>
</tbody>
</table>

---

**Diagram: Rift Valley & Graben Topography**
### Convergent Plate Boundaries (plates being forced together)

<table>
<thead>
<tr>
<th>Type: oceanic plates</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description:</strong> one of the plates will be forced beneath the other (subduction). A <strong>trench</strong> is formed where this occurs. The crustal material forced into the mantle melts and is forced upwards to form underwater volcanoes. Eventually volcanic debris builds up above sea level to create islands. <strong>Landforms:</strong> Deep sea trenches (Mariana’s trench) islands arcs (many in the South Pacific)</td>
<td></td>
</tr>
</tbody>
</table>

### Type: oceanic + continental

| **Description:** The oceanic plate will be subducted forming a deep sea trench. The oceanic plate will push the continental plate upwards creating mountains. Often volcanoes will form and earthquakes will occur. **Landforms:** coastal mountain ranges, deep sea trenches, volcanoes |  |

---

![Diagram of Oceanic-Oceanic Convergence](image1)

![Diagram of Oceanic-Continental Convergence](image2)
**Type:** continental plates  
**Description:** neither plate is subducted because continental plates are relatively light. They resist downward motion like icebergs would. Instead, the two plates buckle and get pushed upwards (folding). Form some of the highest mountain ranges in the world. Earthquakes are common  
**Landforms:** large mountain ranges, folded topography

**Transform Plate Boundaries** (plates sliding laterally)

**Description:** As the plates attempt to grind by each other in opposite directions a massive amount of energy builds up. When the plates slip large earthquakes occur.  
**Landforms:** Fissures are visible on the surface. Causes noticeable changes to surrounding area. Often causes folding and/or warping of terrain. San Andreas fault is an example.
Hot Spots

- Non-boundary volcanic activity caused by magma rising from the mantle through weak areas of continental or oceanic crust.
- A linear chain of volcanic islands is created as weak spot moves due to plate tectonics (ex. Hawaiian islands, Yellowstone).
Review Quiz

1) Which of the following is not created when an oceanic plate and a continental plate converge (subduction zone)?

a) deep sea trench  c) rift valley
b) volcano          d) mountain

2) Which of the following is accurate in describing the collision of continental plates?

a) folding will occur and large mountain ranges will be created
b) one plate will be subducted and will form mountains and volcanoes
c) magma will seep upwards and create new crust
d) island arcs will be created when volcanic debris reaches sea level

3) Hawaii was created by which process?

a) crustal hot spots
b) divergent plate boundaries
c) convergent plate boundaries
d) transform plate boundaries

4) Iceland is formed on top of the mid oceanic ridge (the border between the Eurasian and North American plates). This is an example of a:

a) crustal hot spot
b) divergent plate boundary
c) convergent plate boundary
d) transform plate boundary

5) Which of the following best describes a transform plate boundary?

a) Where two plates are moving laterally against each other
b) Where two plates are splitting apart
c) Where two plates are being forced together
d) Where one plate is being subducted beneath the other

6) Which of the following statements is false?

a) New oceans can be created in areas of continental divergence
b) The San Andreas fault is an example of a transform plate boundary
c) Island arcs are created by oceanic plate convergence
d) Hot spots create a series of islands because of the plate moving over the hot spots
e) Volcanoes occur in subduction zones (convergent plate boundaries)
f) None of the above statements are false

7) True or False – continental plates are subducted beneath oceanic plates in the event of a collision because continental plates are denser? _________________________