Name: _____ Date: _____

Plate Boundaries

Science Literacy Article

The Earth's crust is broken into sections referred to as **tectonic plates**. The location where two tectonic plates meet is called a **plate boundary**. Many changes to the Earth's surface occur at these locations. Tectonic plates can be **continental** (mostly dry land) or **oceanic** (mostly ocean floor). There are three types of plate boundaries:

1. A **convergent boundary** is a location where two tectonic plates move toward each other and collide. There are three main types of convergent boundaries:
   - **a)** **Continental-Continental** occurs when a tectonic plate made of continental crust collides with another tectonic plate that is also made of continental crust. Since both plates have *similar density*, this collision causes the crust to be thrust upward over time and eventually *forms mountains*.
   - **b)** **Continental –Oceanic** occurs when a tectonic plate made of continental crust collides with a tectonic plate made of oceanic crust. Since *oceanic crust is more dense,* it sinks beneath the continental crust and creates a **subduction zone**. This forms a deep ocean trench along the edge of the colliding plates. As the subducting plate (the one going under) melts, magma rises up and *volcanic mountains* are also formed.
   - **c)** **Oceanic-Oceanic** occurs when a tectonic plate made of oceanic crust collides with another tectonic plate that is also made of oceanic crust. The *older plate subducts* below the other because it is more dense. As the subducting plate melts, magma rises up and a line of volcanic islands is formed above. This chain of volcanoes is referred to as a **volcanic island arc**.

2. A **divergent boundary** is a location where two tectonic plates divide or separate from each other. There are two main types of divergent boundaries:
   - a) The first type of divergent boundary occurs when two continental plates drift away from each other. Tension builds up as the plates pull apart and a **rift valley** is formed.
   - b) The second type of divergent boundary occurs when an oceanic plate and another oceanic plate drift apart. Tension builds up under water and a **mid-ocean ridge** is formed as magma rises up and cools with colder ocean water. This type of divergent boundary causes seafloor spreading. **Seafloor spreading** is the formation of new oceanic crust by the rising of magma out of a mid-ocean ridge. As the plates continue to move apart, the sea floor to widens over time. Crust that is located *closer* to the ridge along the divergent boundary is *younger* than the crust that is located farther away.

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3. A **transform boundary** is a location where two tectonic plates slide past each other. Transform boundaries can occur with all tectonic plates no matter what type of crust the plates are made of. When two tectonics plates slide past each other, *tension builds up as the plates rub against each other*. This tension can cause the crust to break which results in earthquakes. The weak spots where the breaks occur are referred to as **faults**.

As you have read, plate boundaries have a significant impact on changes to the Earth's surface. Some of these changes are due to **constructive forces** which build up the Earth's surface (i.e. mountain building), while other types of changes are due to **destructive forces** which break down the Earth's surface (i.e. earthquakes). Plates are constantly moving.

To recap, here is the important vocab about plate boundaries:

- **Continental crust** – crust consisting of mostly dry land
- **Oceanic crust** – crust made up of ocean floor
- **Subduction zone** – place where one plate sinks under another and melts
- **Convergent boundary** – when plates come together
- **Divergent boundary** – when plates split apart
- **Rift valley** – a long narrow valley between two diverging continental plates
- **Oceanic ridge** – a long narrow valley between two diverging oceanic plates
- **Seafloor spreading** – the creation of new crust as magma rises and cools in an oceanic ridge
- **Transform boundary** – when plates slide past each other
- **Fault** – breaks in the crust at a transform boundary

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