Name: _____ Date: _____

Oreo Cookies and Plate Tectonics

Amateur geologists can simulate how plates move on the Earth's surface.

The term **tectonics** originates from the Greek word "tektõn," referring to a builder or architect. **Plate tectonics** suggests that large features on Earth's surface, such as continents, ocean basins, and mountain ranges, result from interactions along the edges of large plates of Earth's outer shell. This outer shell is called the **lithosphere** from the Greek "lithos," meaning hard rock. The plates, composed of Earth's crust and uppermost mantle, ride on a warmer, softer layer of the mantle, called the **asthenosphere.**

In our experiment, the upper cookie will represent the **lithosphere**, the creamy filling the **asthenosphere**, and the lower cookie the **lower mantle**.

Plates move in <u>three basic ways</u>. Let's look at them one by one.

Choose a cookie. Don't eat it…yet!

1. First, carefully remove the upper cookie (a "twisting" motion is required).
2. Slide the upper cookie over the creamy filling. This motion simulates the movement of a rigid lithospheric plate over the softer asthenosphere.
3. Next, break the upper cookie in half. As you do so, listen to the sound it makes.

What sound do you hear? _____

What does that breaking represent? _____

4. Let's look at **<u>divergent plate boundaries.</u>** Divergent means _____.

5. Now push down on the two broken cookie halves and slide them apart. What happens to the creamy filling?

_____

6. Now let's look at **<u>convergent plate boundaries.</u>**
Convergent means _____

7. Take the two cookie halves and slowly push them toward each other. What happens to the filling as the plates slide together?_____
_____

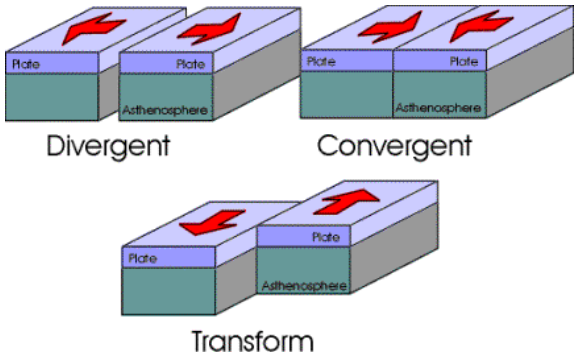
What happens to the cookies as they push against each other?_____

8. Now let's look at a **<u>transform plate boundary.</u>** Try sliding the two cookie pieces laterally past one another, over the creamy filling. What do you notice about the cookie edges?

_____
_____

(You can feel and hear that the "plates" do not slide smoothly past one another, but rather stick then let go, stick then let go. The cracking sound you hear each time is like an earthquake occurring along the San Andreas Fault in California.)

9. Some of Earth's landforms are created by **<u>hotspots</u>** where a plate rides over a fixed "plume" of hot mantle, creating a line of volcanoes. Imagine if a piece of hot, glowing coal were imbedded in the creamy filling – a chain of "volcanoes" would be burned into the overriding cookie.



Adapted from

FUN WITH FOOD!
PLATE TECTONICS AND OUR NATIONAL PARKS*

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