Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ APES

|  |  |
| --- | --- |
| Quiz  (14pts) |  |
| Completeness  (10pts) |  |
| **GRADE:** |  |

Mr. Crisci

**Lab: TASTY PLATE TECTONICS** Date: \_\_\_\_\_\_\_\_\_\_

**Introduction:** Plate Tectonics play a key role in the formation of the Earth in the way we see it. Plate movement on top of the asthenosphere is driven by convection cells, which occur deep within the Earth’s mantle. Plate tectonics is the force behind Alfred Wegner’s theory of Continental Drift. Plates basically move in three different directions (relatively speaking). In this activity, we will explore plate tectonics in a way you and your stomach will never forget.

**Objective:** Explain the 3 major types of plate movements, and the features created as a result.

**The parts of Earth for today’s activity will be performed by:**

**Frosting-** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Graham cracker –** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Rice Krispy –** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Procedure PART I: PLEASE READ WHOLE STEP BEFORE ACTING!**

Step 1: Lay the wax paper flat on your table so it will not roll.

Step 2: Take the frosting and spread a layer on the wax paper about 0.5 cm thick (high) in about a 4in. square. Make sure it’s a nice flat layer.

Step 3: Take a graham cracker, and CAREFULLY break it into 2 equal halves.

Step 4: Carefully lay the two pieces of cracker adjacent to each other. Slowly push the graham crackers down and away from each other at the same time. Draw a **profile** (side) view below of the results in the box and fill out the following information.

Crust represented: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Movement description: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Feature Created: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Describe** in detailwhat happens at this plate boundary:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ESRT example with plate names that border this boundary: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Step 5: Please HIGHLIGHT on the LAST page, in BLUE, all of this type of plate boundary.

Where on Earth are most of these boundaries located? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Step 6: Flatten out the frosting as close to the original dimensions as you can. Now, place the 2 graham cracker halves next to each other. The cracker should be positioned so the gap between the crackers is perpendicular to your body. Once they are set correctly, at the same time, push one cracker away and pull the other toward you while the ends are touching. This should rub the edges of the crackers. Draw an **overhead** (top) view below of the results in the box and fill out the following information.

Crust represented: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Movement description: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Feature Created: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What natural disaster(s) could happen at this boundary: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ESRT example with plate names that border this boundary: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Step 7: Please HIGHLIGHT on the LAST page, in YELLOW, all of this type of plate boundary.

Step 8: Flatten out the frosting as close to the original dimensions as you can. Place the graham cracker on the frosting and the rice krispy adjacent to it. Push the graham cracker and the rice krispy toward each other. Draw a **profile** view below of the results in the box and fill out the following information.

Crust represented: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Movement description: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Feature Created: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What natural disaster(s) could happen at this boundary: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ESRT example with plate names that border this boundary: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Step 9: Flatten out the frosting as close to the original dimensions as you can. Now, slightly wet one end of the graham cracker, but just a little. Place the 2 graham cracker halves (one wet) next to each other. Push the graham crackers. This represents an oceanic – oceanic convergent boundary. What feature(s) have been created?

Step 10: Please HIGHLIGHT on the LAST page, in GREEN, all of this type of plate boundary.

Where on Earth are most of these boundaries located? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Step 11: HIGHLIGHT all of HOTSPOTS on the LAST page with a YELLOW highlighter

Step 12: Hungry yet?! You can clean up and eat (if you want) your lab.

**ONLY DO THIS IF YOU HAVE TIME LEFT! ANSWER QUESTIONS FIRST!**

The **asthenosphere**: properties (DON’T EAT THIS; it’s edible but yucky)

1. Make a slurry (toothpaste consistency) of cornstarch and water (start with 50 mL of water) in a 250 mL beaker. You will need to add an equal amount of cornstarch (50 mL).
2. Poke the surface of your slurry with your forefinger. *What happens?*
3. Tip the beaker onto the wax paper. *What happens?*

**Laboratory Questions:**

1. What is the driving force behind these plate movements? **Explain** the type of energy transfer and the layer it occurs in:
2. **Describe** how the Atlantic Ocean will change in appearance as a result of plate tectonics over the next few million years. How will this impact the Pacific?
3. Find the approximate location of Sachem East. Do we have a lot of earthquakes here? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **Explain** why or why not:
4. What plate matches (almost perfectly) with the Ring of Fire, where most of the world’s earthquakes and volcanoes occur? (\*Hint\* - Ring of Fire follows longest line of convergent boundaries)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. When two oceanic plates converge, what type of structure forms? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   1. Give an example from the map. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. When two oceanic plates diverge, what type of structure forms? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   1. Give an example from the map. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. When an oceanic plate converges with a continental plate, name the two structures that form.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* 1. Give an example from the map. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. When two continental plates converge, what type of structure forms? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   1. Give an example from the map. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Which plate boundaries are the most likely to trigger a tsunami? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Which plate boundary creates violent volcanic eruptions? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   1. **Detail** how these volcanoes are created at this plate boundary (be sure to include the word subducts in your answer):

