**Cookie Tectonics: Using Oreos to Simulate Plate Movements**

Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Per.: \_\_\_\_\_

As we have discussed in class, the interior of the Earth is multilayered with the different physical layers alternating in their physical consistency and composition. Today, we will simulate the upper three layers of the Earth and explore how these layers impact continental drift. For all questions, please write in complete sentences.

**Materials (per person):** Student handout, one Oreo cookie

**Exercise A: Plate Tectonic Background**
Discuss with your lab group plate tectonics and why they are significant. In the space below record, in your own words…

1. The definition of the theory of plate tectonics:

2. Brainstorm a list of at least three impacts that make plate tectonics important.

3. What would the Earth be like if the continental and oceanic plates did not move?

4. Describe and synthesize two pieces of evidence for plate tectonic movement.

5. How, precisely, do the continental and oceanic plates move?

**Exercise B: Simulating Plate Movement**
Carefully remove the top cookie from your Oreo sandwich. Being careful not to shatter the entire thing, break the cookie into two roughly even halves. The entire Oreo will simulate the top three layers of the Earth’s physical interior (the entirety of the crust and mantle). Diagram your Oreo below.

Diagram of Oreo from the Side: Diagram of the interior of the Earth:

On the diagrams above, indicate which parts of the cookie sandwich correspond to which layers of the Earth.

**Questions:**
1. Why do these three layers of the Oreo cookie work well to simulate the upper three layers of the Earth’s interior?

2. Why did you break the top cookie in half? What does this represent?

3. Should the top cookie fit neatly together? Why or why not?

You are now ready to simulate each of the three types of plate boundaries.

**Boundary 1: Divergent**Fill in the table below with the characteristics of a divergent boundary using your notes.

|  |  |
| --- | --- |
|  | **Divergent Boundary** |
| How the plates move: |  |
| Is this movement constructive, destructive, or neutral? |  |
| What geography is created by this movement: |  |
| Any impacts this movement might have? |  |

Move the broken cookie halves in such a way that they simulate this type of plate movement. Diagram what your cookie looks like both before and after from the side and from above. Draw arrows to indicate how the “plates” are moving.

Above Before: Above After: In the space below, describe
 what is happening to your cookie
 and how this simulates plate
 movement:

Side Before: Side After:

**Boundary 2: Convergent**Fill in the table below with the characteristics of a divergent boundary using your notes.

|  |  |
| --- | --- |
|  | **Convergent Boundary** |
| How the plates move: |  |
| Is this movement constructive, destructive, or neutral? |  |
| What geography is created by this movement: |  |
| Any impacts this movement might have? |  |

Move the broken cookie halves in such a way that they simulate this type of plate movement. Diagram what your cookie looks like both before and after from the side and from above. Draw arrows to indicate how the “plates” are moving.

Above Before: Above After: In the space below, describe
 what is happening to your cookie
 and how this simulates plate
 movement:

Side Before: Side After:

**Boundary 3: Transform**Fill in the table below with the characteristics of a divergent boundary using your notes.

|  |  |
| --- | --- |
|  | **Transform Boundary** |
| How the plates move: |  |
| Is this movement constructive, destructive, or neutral? |  |
| What geography is created by this movement: |  |
| Any impacts this movement might have? |  |

Move the broken cookie halves in such a way that they simulate this type of plate movement. Diagram what your cookie looks like both before and after from the side and from above. Draw arrows to indicate how the “plates” are moving.

Above Before: Above After: In the space below, describe
 what is happening to your cookie
 and how this simulates plate
 movement:

Side Before: Side After:

**Conclusion Questions:**

1. Did any of the given plate movements give you trouble? Which movement was the hardest to simulate and why?

2. Compare and contrast the three types of plate boundaries.

3. Which boundary do you think could be most dangerous to humans and why? (Hint: there may not be a “right” answer!)

4. What other everyday items (foodstuffs or otherwise) might be useful in simulating geological movements? Brainstorm at least two!

**Extension:** On your own, research the boundary between any two plates on Earth. Describe in at least five complete sentences where the boundary is, what type of boundary it is, and how plate movement affects the people who live in the area of the boundary. Include your source(s) at the end of your paragraph.