

Name \_\_\_\_\_

Lab Grade \_\_\_\_\_/10

Date \_\_\_\_\_

Period \_\_\_\_\_

**Lab # \_\_\_\_\_ - Evidence for Plate Tectonics**

Background:

When developing a theory, a vast amount of data must be collected and analyzed. Today you will collect data. Then, you will analyze the data and conclude that the data supported or did not support the Theory of Plate Tectonics. Data will be collected from the DataStreme Ocean website which is part of the American Meteorological Society. You will record the following types of data: bathymetry, earthquake activity, volcanic activity and sediment thickness. Bathymetry refers to depth below sea level. Sediment thickness refers to the depth of unconsolidated materials (i.e. pebbles, sand, silt and clay) lying over the continental margins.

Objectives:

- (1) To collect and analyze data that may support the theory of plate tectonics
- (2) Conclude that the data supports or does not support the Theory of Plate Tectonics

Materials: Internet access and ESRT

Time: 2 Periods

Vocabulary:

Mid-ocean ridge:

Oceanic trench:

Mountain:

Volcano:

Rift valley:

Convergent plate boundary:

Divergent plate boundary:

Transform plate boundary:

Procedure:

**PART A - BATHYMETRY**

1. Go to <http://www.ametsoc.org/amstedu/DS-Ocean/home.html>. You will be brought to the DataStreme Ocean homepage.
2. Scroll down to the middle of the page to "Geological". Click on "[Bathymetry](#)"
3. You will view a large map of the world. *Imagine* that all of the world's surface waters were removed. This map is what the world would look like. The map is broken up into a grid of boxes. Go to the data table. There is a column with a list of places you will visit on the map.
4. On the map, select box containing Mexico. A larger map of Mexico will be viewed next. Now decide the type of feature along the west coast of Mexico. Are you viewing a mid-ocean ridge, an oceanic trench, a mountain, a series of volcanoes or a rift valley? If any of these features are viewed, then check off the box in the data table. Now look for the other locations listed in the data table.

**PART B - CURRENT EARTHQUAKE ACTIVITY**

5. Go back to the DataStreme Ocean website. Scroll down to "Geological". Click on "[Current Earthquake Activity](#)". This website shows a map of the world. Squares on the map are used to locate an earthquake. The larger the square, the (smaller, larger) the earthquake. A red square refers to an earthquake that occurred in the last \_\_\_\_\_. An orange square refers to an earthquake that occurred in the last \_\_\_\_\_. A yellow square refers to an earthquake that occurred in the last \_\_\_\_\_.
6. Decide if there has been any earthquake activity in the past week at the locations in data table. Write "Yes" or "No" in the box.
  - a. For a better view of what is happening in the Southern Atlantic Ocean, click on the "Southern Hemisphere" map listed under "World Regional Maps".
  - b. For a better view of what is happening in Iceland, click on the Europe map listed under "World Regional Maps".

**PART C - CURRENT VOLCANIC ACTIVITY**

7. Go back to the DataStreme Ocean website. Scroll down to "Geological". Click on "[Current Volcanic Activity](#)". At this site a world map is viewed with triangles

representing volcanic activity during this week. A red triangle represents \_\_\_\_\_ . A yellow triangle represents \_\_\_\_\_ .

8. Look for each location on the map that is listed in the data table. Decide if you should write "Yes" or "No" for volcanic activity in the data table.

#### **PART D - SEDIMENT THICKNESS**

9. At DataStreme Ocean's website, there is another source of data we can collect that can serve as evidence of tectonic activity. Next we will look for the "[Sediment Thickness](#)" in a location.
10. If a location were tectonically active, then the amount of time for sediment to be deposited and accumulate in an undisturbed location would (increase, decrease). At this location, the sediment thickness would be (larger, smaller) than at a location that is tectonically passive.
11. Go back to the DataStreme Ocean website. Scroll down to "Geological". Click on "[Sediment Thickness](#)". A world map will appear.
  - a. Blue represents (a large, little to no) accumulation of sediments.
  - b. Red represents (a large, little to no) accumulation of sediments.
12. For each location in the data table determine the approximate thickness of sediments.

Data:

		WEB LINK			
		Topography/ Bathymetry (Check off box)	Current Earthquake Activity in the Past Week (Yes or No)	Current Volcano Activity in the Past Week (Yes or No)	Sediment Thickness (Approximate Thickness)
1	West coast of Mexico	<input type="checkbox"/> Mid-ocean ridge <input type="checkbox"/> Oceanic trench <input type="checkbox"/> Mountains <input type="checkbox"/> Volcanoes <input type="checkbox"/> Rift valley			
2	West coast of South America	<input type="checkbox"/> Mid-ocean ridge <input type="checkbox"/> Oceanic trench <input type="checkbox"/> Mountains <input type="checkbox"/> Volcanoes <input type="checkbox"/> Rift valley			
3	India	<input type="checkbox"/> Mid-ocean ridge <input type="checkbox"/> Oceanic trench <input type="checkbox"/> Mountains <input type="checkbox"/> Volcanoes <input type="checkbox"/> Rift valley			
4	East coast of the United States	<input type="checkbox"/> Mid-ocean ridge <input type="checkbox"/> Oceanic trench <input type="checkbox"/> Mountains <input type="checkbox"/> Volcanoes <input type="checkbox"/> Rift valley			
5	South Atlantic Ocean	<input type="checkbox"/> Mid-ocean ridge <input type="checkbox"/> Oceanic trench <input type="checkbox"/> Mountains <input type="checkbox"/> Volcanoes <input type="checkbox"/> Rift valley			
6	Central Africa	<input type="checkbox"/> Mid-ocean ridge <input type="checkbox"/> Oceanic trench <input type="checkbox"/> Mountains <input type="checkbox"/> Volcanoes <input type="checkbox"/> Rift valley			
7	Iceland	<input type="checkbox"/> Mid-ocean ridge <input type="checkbox"/> Oceanic trench <input type="checkbox"/> Mountains <input type="checkbox"/> Volcanoes <input type="checkbox"/> Rift valley			

Analysis of Data:

13. What two locations both have oceanic trenches?

14. Find these locations in the ESRT, on the page "Tectonic Plates".

15. In terms of plate boundaries, how can an oceanic trench form?

16. What two locations both have mid-ocean ridges?

17. Find these locations in the ESRT, on the page "Tectonic Plates".

18. In terms of plate boundaries, how can mid-ocean ridges form?

19. What location has a series of mountains?

20. Find this location in the ESRT, on the page "Tectonic Plates".

21. In terms of plate boundaries, how can mountains form?

22. What location(s) have volcanic activity?

23. Find this location(s) in the ESRT, on the page "Tectonic Plates".

24. According to the ESRT, at what type of plate boundary could volcanoes be found?

25. Explain why volcanic activity is increased at this type of plate boundary.

26. What location(s) have earthquake activity?

27. Find this location(s) in the ESRT, on the page "Tectonic Plates".

28. According to the ESRT, what type of plate boundaries experience earthquakes?

29. Explain why volcanic activity is increased at this type of plate boundary.

30. Over time, what happens to the amount of sediment accumulated along a shore?

31. Why has more sediment accumulated on the east coast of the US than the west coast of the US? Describe in terms of active and passive continental margins.

