**NAMES:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Save the People of Chile!**

With recent earthquakes in the last few decades we’ve been able to map the placement of earthquakes of all sizes along the coast of South America. Chile is long overdue for a big earthquake in this area and that could trigger earthquakes up and down the coast. The other issue is the volcanic activity produced by subduction zones; we need to know where those will pop up to evacuate larger cities, if needed.

**We need your expertise to accomplish the following objectives:**

1. Graph the earthquakes from data and map.
2. Determine location of volcanic arc.
3. Identify and name the igneous rocks
4. Write up research summary.

**Part I.**

1. Graph the subducting Pacific Plate going under the South American Plate. Remember that earthquakes happen all along the subducting plate. Plot the information (Distance vs. Depth) by measuring the distance from the trench to each earth quake point.
2. After plotting at least 10 earthquakes, find the angle it dips into the earth. You’ll need a protractor to find that angle. Make sure to draw in a line within those dots as the average of all of them.

**Part II.**

1. We know on average the continental lithosphere is about 100 km thick. Once the oceanic crust reaches that depth it starts to melt. As seen here in this graphic. Now determine how far into the continental crust the volcanic arc will pop up.
2. Would you likely find volcanoes along the coast at that same distance from the trench? Why?
	1. Mark this chain with a triangle (Δ).

**Part III.**

1. Identify the igneous rocks’ names that were extracted near the volcanoes to determine the type of volcanoes and whether it’ll be explosive. Felsic are thick and more explosive due to being silica rich and mafic tend to be runny and more liquid. Felsic = light color, Mafic = dark color.
	1. Volcano Rock Name #1\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Felsic or Mafic
	2. Volcano Rock Name #2\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Felsic or Mafic
	3. Volcano Rock Name #3\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Felsic or Mafic
	4. Volcano Rock Name #4\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Felsic or Mafic
	5. Volcano Rock Name #5\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Felsic or Mafic
	6. Volcano Rock Name #6\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Felsic or Mafic

**Part IV.**

1. With your research about the subduction zone and where these volcanoes are and how dangerous they could be, write a half page summarizing your evidence and your recommendation on which areas to evacuate or avoid further development for the safety of the Chileans.

Use the distance scale and plot all the points within that distance from the trench to the dark colored earthquakes on the right.

Graph the earthquakes below. Use the distance from the trench to each earthquake along your drawn line and then determine the depth of each earthquake based on the color of each. Plot the distance against the depth below on the graph.

**Distance from the Trench in Kilometers**

0 50 100 200 300 400 500 600 700 800

0

100

200

300

400

500

600

700

800

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**Depth of the Earthquakes by Kilometers**