

The following lab activity requires the use of the ***Seismic Eruption*** software installed on the laptops.

**Procedure- Part I**

1. Begin the *Seismic Eruption* software by clicking **START, Programs, Seismology, Seismic Eruption**. Once it begins, click "**START**", then "**GO**".
2. Initially, we will look at the South America group, so click on **SOUTH AMERICA**.
3. The earthquakes and eruptions begin to appear immediately, though slowly. **Speed things up** by clicking the up arrow on the speed bar to 1 year/sec!

**Interpretation**

1. Note where the greatest concentration of earthquakes and eruptions appear. What feature is located here? \_\_\_\_\_
2. Using the KEY (upper right of screen), what is the greatest earthquake depth? \_\_\_\_\_

**Procedure**

4. Now, let's get a different view. From the menu bar (top), select **Control, Map View/3-D/Cross-Section**, then **3-D View**.

**Interpretation**

3. From this viewpoint, where have most earthquakes occurred, on land or in the ocean? \_\_\_\_\_

**Procedure**

5. Now, let's take a look at the **CROSS-SECTIONAL** view. Remember, a cross-section is similar to a profile- in this case, a slice of a certain width viewed from the surface down into the earth.
6. From the **Control** menu, select **Set up Cross-Section View**. Set **Azimuth** to 15, **Length** to 1500, and **Width** to 200. Click **Redraw**.
7. Now, click your mouse on the map. The Cross Section box should appear. Click and drag until the **center** of the box is at roughly 25 degrees south latitude and 65 degrees west longitude (latitude is on the right side of the map, longitude at the top).
8. Once placement is complete, select **Control** again, **Map View/3-D/Cross-Section**, then **Cross Section View**.

**Interpretation**

4. Record the approximate results of your cross-section below.

Depth	-500	0	500
0			
100			
200			
300			
400			
500			

5. Slow the speed down to 6 months/sec. Select **Repeat** and watch for volcanoes. Where along the X-axis do the volcanoes occur? \_\_\_\_\_
6. Is this location on land or in the ocean? (you may need to switch back to **Map** view) \_\_\_\_\_
7. How deep are the earthquakes that occur beneath the volcanoes? \_\_\_\_\_
8. Why do you suppose the volcanoes occur here, and not closer to the shallow earthquakes? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
9. Now, look on your [Tectonic Plates](#) reference tables. What two plates meet here, along the west coast of South America? \_\_\_\_\_ and \_\_\_\_\_ plates. What type of plate boundary is this? \_\_\_\_\_
10. In conclusion, state the relationship between earthquakes, volcanoes, and this type of plate boundary. Be specific! \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

### **Procedure- Part II**

1. Click the **Back** button (lower left corner) to return to the world map. We will now look at earthquake activity a little closer to home- California.
2. Select the **North America Group**, then the **California Group**, then **California**. Increase the speed a bit, and watch where the earthquakes occur.

### **Interpretations**

1. Notice the light blue lines on the map. These indicate the locations of **faults**. Describe the direction that most of these faults run. \_\_\_\_\_
2. Do most of the California earthquakes occur on or off of these faults? \_\_\_\_\_

### **Procedure**

3. Repeat the procedure to produce a cross section. This time, set the controls to an Azimuth of -30, Length 250, and Width 50. Draw the cross section anywhere you wish.

### **Interpretation**

3. What is the maximum depth of these earthquakes? \_\_\_\_\_
4. Describe the relationship between the depth of earthquakes and distance from the fault. \_\_\_\_\_  
\_\_\_\_\_
5. How does this compare to the South America earthquakes? \_\_\_\_\_  
\_\_\_\_\_
6. According to your reference tables, what type of plate boundary occurs here? \_\_\_\_\_
7. In conclusion, what is the difference between the two plate boundaries you have examined in this lesson? \_\_\_\_\_  
\_\_\_\_\_