

Virtual Earthquake Lab

Objective: In this lab, you will learn how to determine the location and magnitude of an earthquake.

Go to the following web site and do the exercise on virtual earthquake:

<http://www.sciencecourseware.com/>

Click on Virtual Earthquake. **DO NOT CLICK ON EARTHQUAKE!**

To begin, click on Execute Virtual Earthquake.

Using this web page, answer the questions below.

1. What is an earthquake? _____

2. What are seismic waves? _____

3. What are the two (2) types of seismic waves?
a.
b.

4. How are the two seismic waves different from each other? _____

5. What is a seismogram? _____

6. Which wave is recorded first, the p-wave or the s-wave? _____

7. How many seismic stations are needed in order to determine (triangulate) the epicenter of an earthquake?

8. What will you use to determine the distance the waves have traveled from the origin to that station?

1. **Click on JAPAN Region and submit your choice!** To determine the epicenter of an earthquake, you'll first have to determine the s-p interval for three seismograms taken from three different seismic stations.

9. Define what an s-p interval is? _____

II. **Click on View Seismograph. On this page, look at each seismograph and determine the s-p interval (the time from the start of the first wave to the start of the first wave to the start of the second wave). Record the s-p interval in the boxes below each graph. Try to be very accurate with your measurements. Each blue line is 2-seconds. When done, click on Convert s-p interval.**

III. Use the second graph to determine the distances traveled by the s-p waves and complete the table. **For each station, use the seconds to determine the distance traveled. Put the distance for each station in the box marked KM. Try to be very accurate with your measurements. Each blue line represents 20 km in distance. When done, click on Find Epicenter.**

10. Look at the graph, where is the epicenter (where all three circles meet) of the earthquake?

11. Does this method always result in an exact point? Why or why not. _____

IV. **Click on Compute Richter Magnitude.**

12. What is magnitude? _____

13. What two things are needed to determine the Richter Magnitude? _____

V. **Look at the graph to see how the maximum amplitude is determined. Go to the next page and read the instructions. When done, continue on to the next page.**

VI. **Calculate the amplitude (the highest point) for each of the seismograms. Each blue line represents 10mm. Try to be very accurate with your measurements. When done, submit your answers.**

The three lines should intersect each other on the middle graph. This is the magnitude of the earthquake.

14. What is the magnitude that you calculated? _____ **Put your answer in the box and CONFIRM it.**

15. What was the name of the earthquake you calculated? _____

16. When did it occur? _____

17. Was there loss of life? _____ If so, was it estimated to be significant? _____

18. Was there property damage? _____ If so, was it estimated to be significant? _____

VII. **Enter your name(s) and print or email your certificate to me (jmenghini@usd250.org).**