

Seismic Waves and Plotting Earthquakes

Earth Science

Mr. Traeger

Name: _____ Period: _____ Date: _____

Purpose

The purpose of this activity is to become familiar with the different kinds of earthquake waves. Knowledge of these waves will be used to locate and measure earthquakes.

Materials

▪ Slinky® or Spring	▪ Drafting compass	▪ Ruler
▪ Seismic Sleuths Packet	▪ Stopwatch	▪ Meter Stick

Part 1: Seismic Body Waves

Slinkies® are very good for demonstrating earthquake waves. Watch the demonstration of seismic body waves using Slinkies®. Answer the questions that follow.

1. What **is** a wave?
2. Describe and draw the motion that you saw when we simulated a P wave.
3. Describe and draw the motion that you saw when we simulated an S wave.
4. Why are the waves that we simulated called **Body** Waves?
5. What is the speed of P-waves? S-waves? State your answers in Km/sec and Miles/hour

P-waves?	S-waves?

6. How can you use the difference in P and S wave speeds to calculate the distance to an earthquake epicenter from a seismograph station? Think about the demonstration that Mr. Traeger did outside with the stopwatches.

Part 2: Seismic Surface Waves

Watch the demonstration of seismic surface waves using Slinkies®. Answer the questions that follow

1. Describe and draw the motion that you saw when we simulated a Love Wave.
2. Describe and draw the motion that you saw when we simulated a Rayleigh Wave.

Seismic Waves and Plotting Earthquakes

Earth Science

Mr. Traeger

3. After watching these demonstrations, which type of wave is more damaging to structures on the surface? Surface waves or Body waves? Why do you think this is?

Part 3: Analyzing Seismograms to Calculate Distance, Magnitude, and Epicenter

1. Explain how an older seismograph machine works. Drawing a picture is very helpful.
2. How does the Seismac seismometer work? How is it similar to an EKG heart monitor?
3. Define the 3 axes that Seismac measures. Make a drawing of them.
4. Which axis would be best for measuring the P-wave from an arriving earthquake? Why?
5. Which axes would be best for measuring the S-wave from an arriving earthquake? Why?
6. How did we make a bigger amplitude wave in Seismac?

Part 4: Using Seismic Waves to Find the Epicenter of an Earthquake

1. Complete the attached Internet Investigation ES1003: Where Was That Earthquake? Answer all of the questions on the internet investigation sheet.
2. What is the name of the place where all of your circles intersect? Don't think too much into this.
3. What is the **minimum** amount of circles needed to find the location of an earthquake?
4. What happens to the difference between P and S wave arrival times the farther you are from the earthquake?

Conclusion: What did you learn in this lab about the science of seismology?