



Curiosity Guide #208

Plate Tectonics

Accompanies Curious Crew, Season 2, Episode 8 (#208)

Spring Waves

Investigation #6

Description

Create earthquake waves with nothing more than a Slinky and a friend!

Materials

- Metal Slinky
- Friend

Procedure

- 1) Have a friend hold one end of the Slinky. You hold the other end.
- 2) Back up so that the Slinky isn't drooping.
- 3) Carefully pull the Slinky toward you. Then quickly push the Slinky toward your friend.
- 4) Do you see a wave traveling along the Slinky?
- 5) Now try it again, but this time, flick the Slinky up and down once.
- 6) Did you observe another wave? How was the second wave different from the first wave?

My Results

Explanation

The seismic waves that are released from an earthquake come in two waves. The primary waves are called **P-Waves**, and the secondary waves are called **S-Waves**.

Primary waves travel more quickly than secondary waves do, because primary waves travel in a straight line away from the source and can travel through any medium. When one person pulls part of the Slinky straight back and then releases the Slinky, or spring, the wave travels through the spring by compressing some parts of the wire and stretching or dilating others. The wave travels quickly from one end to the other of the Slinky.

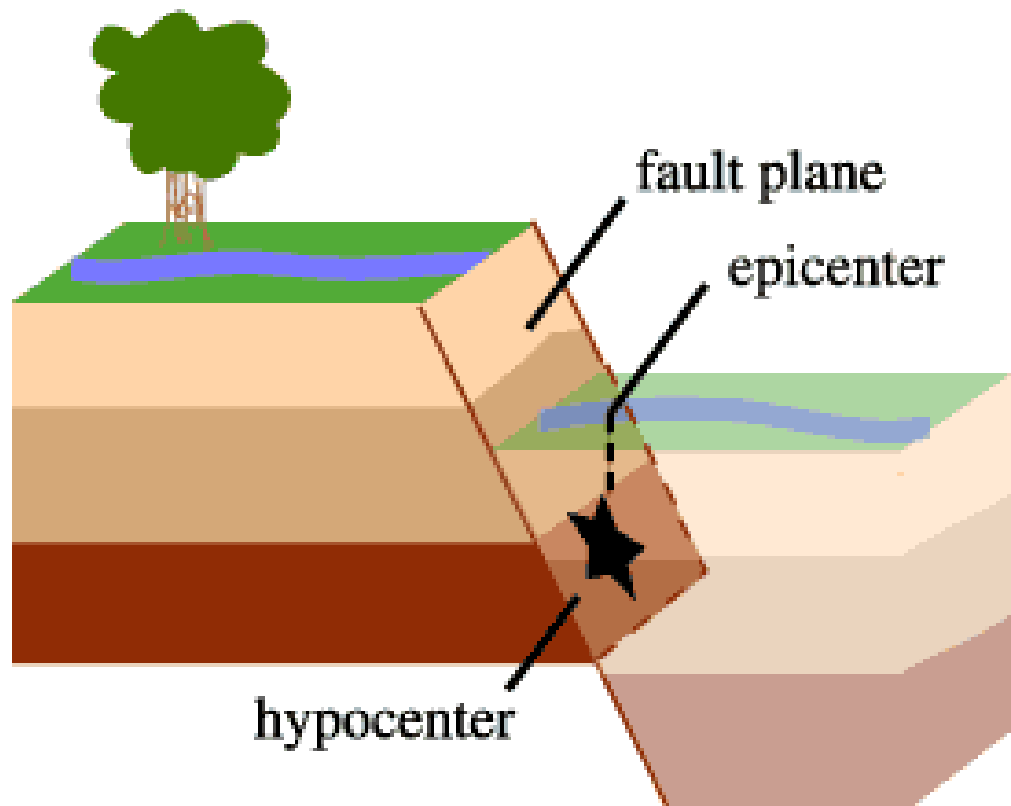
The secondary S-Wave travels in a less direct motion. The S-Wave can only travel through solids that are reflecting off fluids. When the Slinky is jerked up and down, the waves traveling up or down or side-to-side have more movement. You will notice that it takes longer to feel the slower S-Waves than it does to feel the quicker P-Waves.

Because the waves are felt at different times, it is possible to determine how far away an earthquake occurred from a seismograph. If multiple seismographs record the waves, it is possible to triangulate the different distances to locate the precise origin of the earthquake. That underground source point is called the **hypocenter**, while the point on the earth's surface directly above it is called the **epicenter**.

Something more to think about: Did you know that when an earthquake happens, sometimes there are smaller quakes before the main quake? Did you know that there are always **aftershocks**? Those aftershocks happen at the same place, called the hypocenter, along the fault line. An amazing fact is that the aftershocks can happen right away, or they can happen days, weeks, months, or even years after the

main shock—and that's pretty shocking! Take a look at the diagram below and think about the power of seismic waves!

Graphic of a fault line with emanating seismic vibrations



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