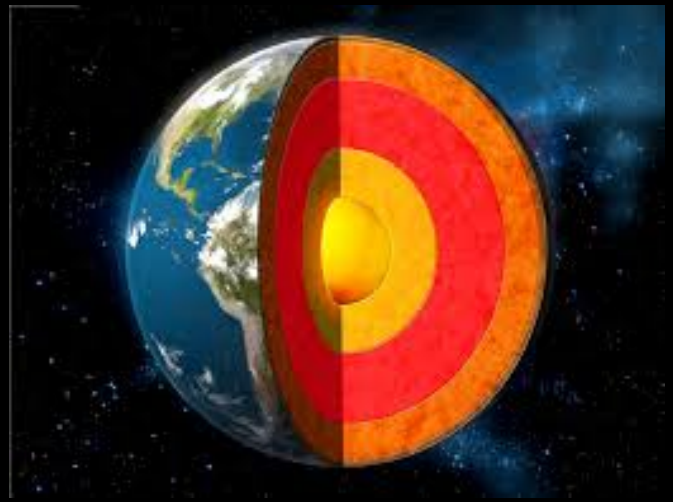
# How do scientist know what the inside of Earth looks like?



# Seismic Waves

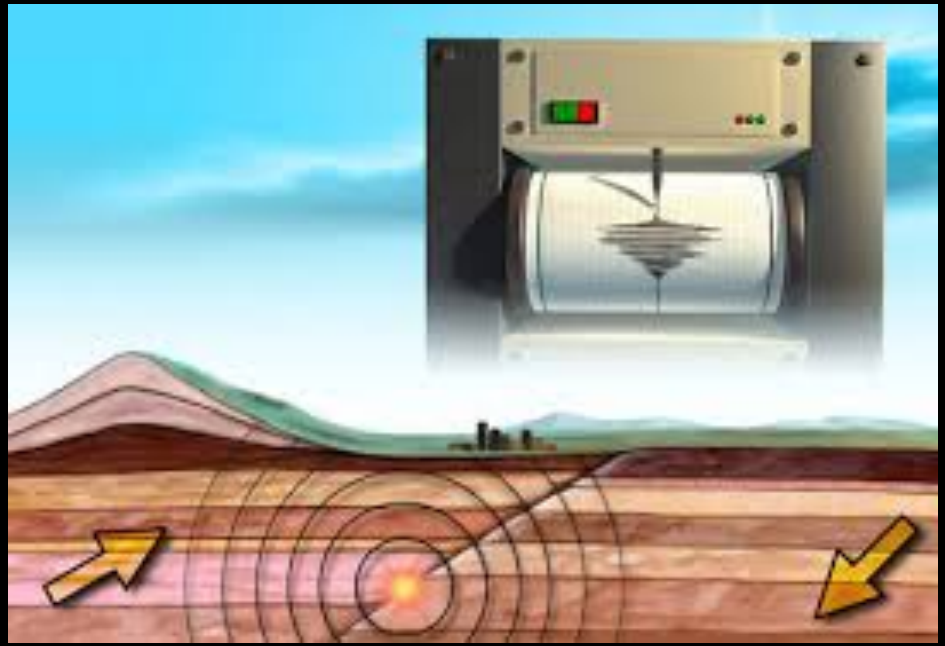
A seismic wave is a wave of energy that travels within the Earth that is caused by a large release of energy or movement.

- Earthquake
- Volcano
- Nuclear Explosions

Seismic waves have and will continue to help scientist understand the composition and density of the Earth by studying how the waves move through the Earth.

The different densities of material will cause the seismic waves to **change their speed and direction.**

Scientist use a seismograph to record the waves as they move through the Earth.

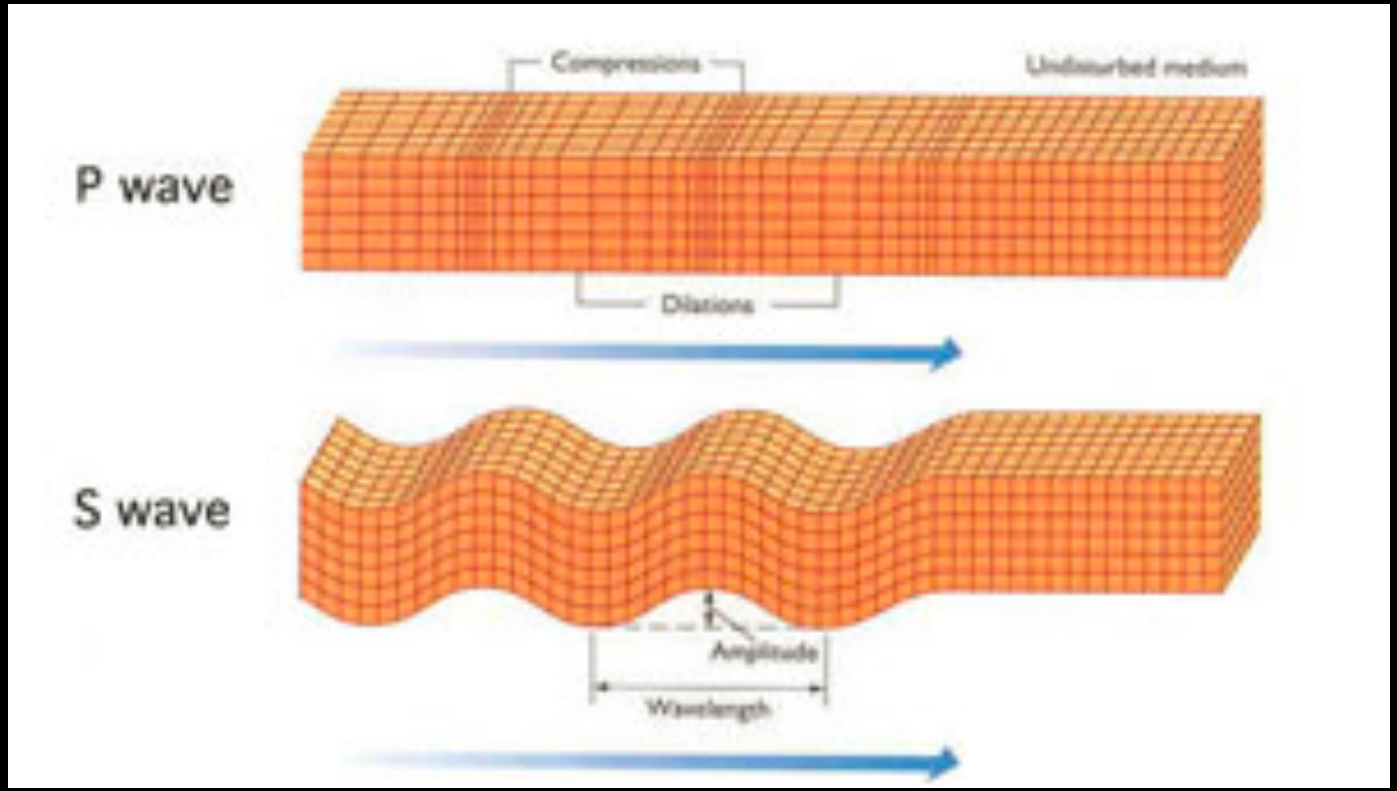


# Primary or P Waves

- Are the **fastest** and **first** waves to arrive at the seismograph.
- They are compressional waves, meaning they move in and out (like an inchworm)
- They can travel through all materials (solid and liquid), so they can go through all layers of the Earth.
- Speed up as they move through solid, more dense material and slow down through liquids.

# Secondary or S Waves

- Are the second to arrive at the seismograph.
- They move up and down (like a rolling hill).
- They can only travel through solid material. They can’t travel through liquid, so they STOP at the outer core.


P wave
Compressions
Undisturbed medium
Dilations
S wave
Amplitude
Wavelength

# Mapping Earth's Internal Structure