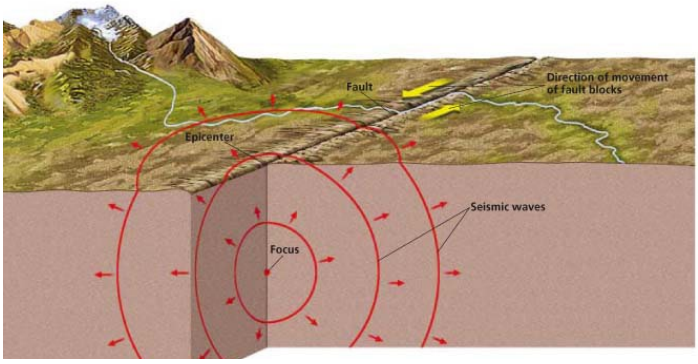
8th Science
Notes 8-1, 8-2, 8-3

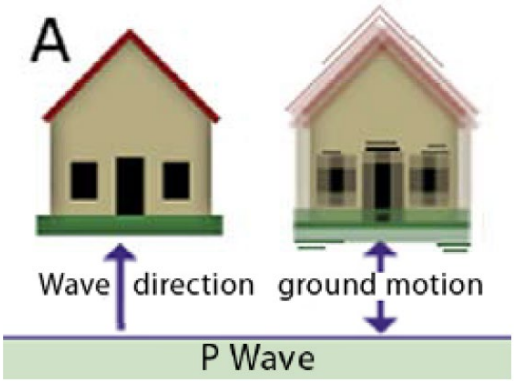
Earthquake = movement of the ground that is caused by a sudden release of energy when rocks along a fault move
aftershock = a smaller earthquake that happens after a major one
Fault = fractures in Earth where movement has occurred

A) Why earthquakes happen
1) Rocks on both sides of a fault become locked due to friction
2) Stress builds up and the crust **deforms**
3) Rock **fractures** and snaps back to its original shape (**Elastic Rebound**)

B) Anatomy of an Earthquake
1) **Focus** = The place in a fault where the earthquake actually happens
2) **Epicenter** = The point on Earth's surface directly above an earthquake's Focus.

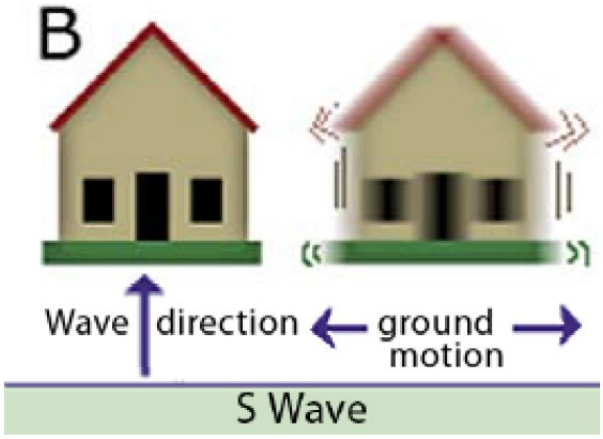


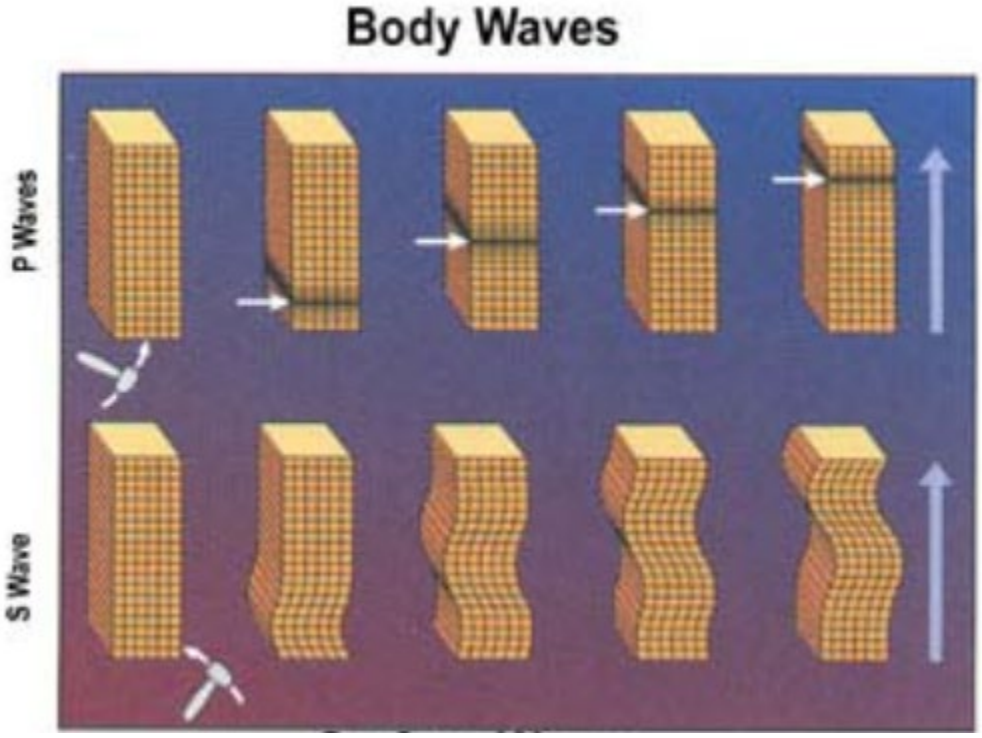
C) **Seismic Waves**
1) **Body Waves** = moves through the insides of Earth
a) **Primary Waves (P waves)/Compression waves** =
*the fastest wave & the first to be picked up by a **seismograph**.
*Come through the earth from the bottom up into a building
*Can go through solid, liquid, and gas
*Particles slam forward into neighbors, then backward



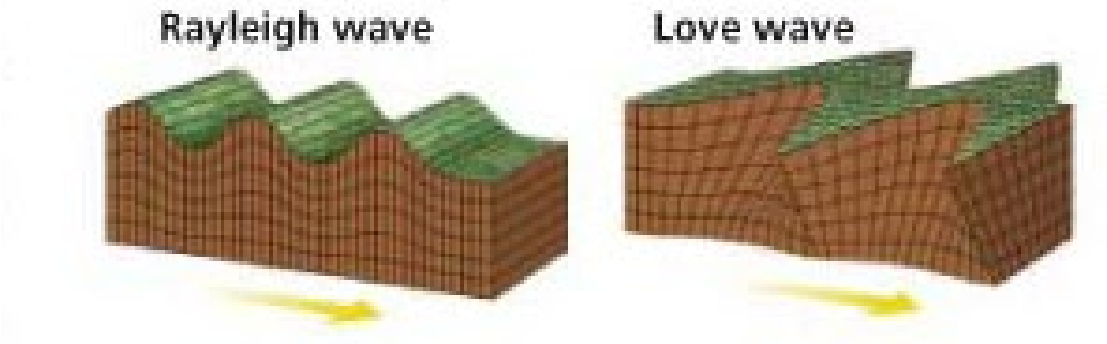
b) **<u>Secondary Waves</u> <u>(S waves)/Shear waves</u>** =

*the second wave to be picked up by a seismograph.
*Come through the earth from the bottom up into a building
*Move particles side to side like a snake
*Only travel through solids.

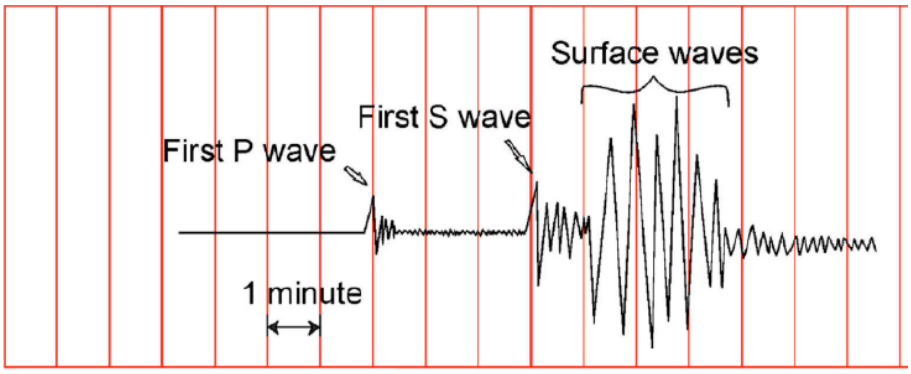




2) **Surface Waves** = Wave that travels along the surface of Earth
   a) **Love Waves** = Move rock side to side and up and down
      Hit the building from the side
      Do the most damage
   b) **Rayleigh Waves** = Rock moves in an elliptical, rolling motion.
      Hit the building from the side
      Do the most damage

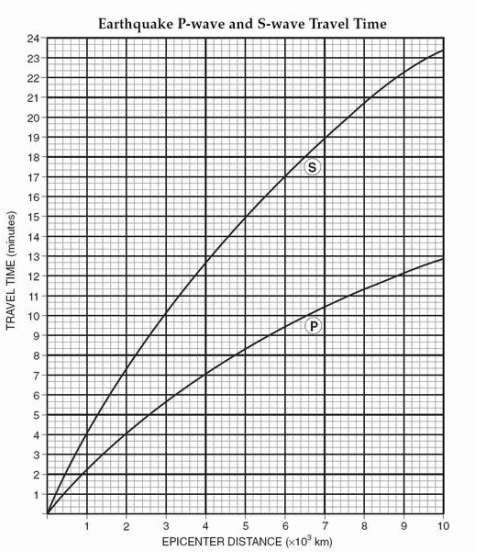


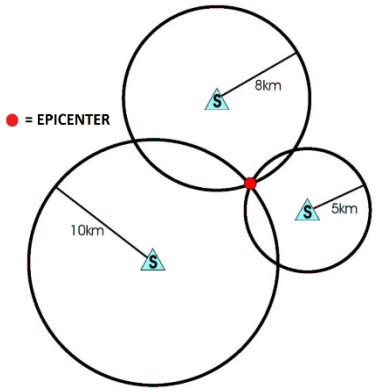
D) Measuring Earthquake sizes and location
   1) Tools used:
      a) **Seismogram**- instrument used to record earthquake waves
      b) **Seismograph** – the paper with the recorded seismic waves



   2) Scales used:
      a) **Richter scale** – describes the magnitude (strength) and each whole number represents an earthquake that is 10x larger
      b) **Moment magnitude scale** – measures displacement along a fault
      c) **Modified Mercalli Scale**--ranks earthquakes by destructiveness -- the greater the numbers, the bigger the earthquake

3) P/S interval method—used to calculate epicenters
    a) time between p and s wave is measured (**lag time**)
    b) using wedge method, find time gap on chart
    c) follow chart down to find distance waves travelled
    d) repeat for 2 other locations
    e) draw circles on map to find **epicenter**





E) Earthquake frequency
    1) occur most often near tectonic boundaries (many around ring of fire)
    2) thousands per day
    3) "predicted" by studying the **seismic gaps** – an area along a fault where there hasn't been an earthquake for a long time

F) Earthquake hazards
    1) **Seismic shaking**- ground vibrations
    2) **tsunamis**-large series of waves that can cause a lot of damage
    3) **liquefaction**- stable soil turns to liquid collapsing buildings, bridges, highways, etc.
    4) **landslides**-loose rock and soil slide downhill
    5) **mudflow**-soil and water mix then rapidly flow downhill

G) Earthquake safety
    1) crouch under sturdy table
    2) cover head
    3) avoid windows
    4) move to open area
    5) avoid trees, powerlines, vehicles