

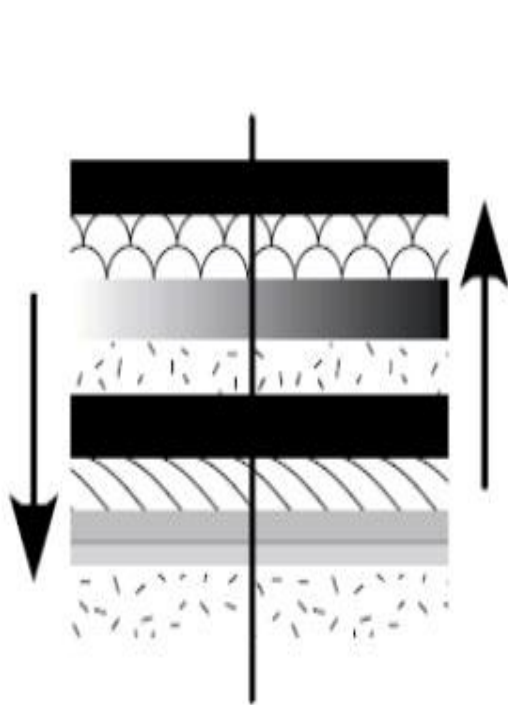
EARTHQUAKES

What Causes Earthquakes?

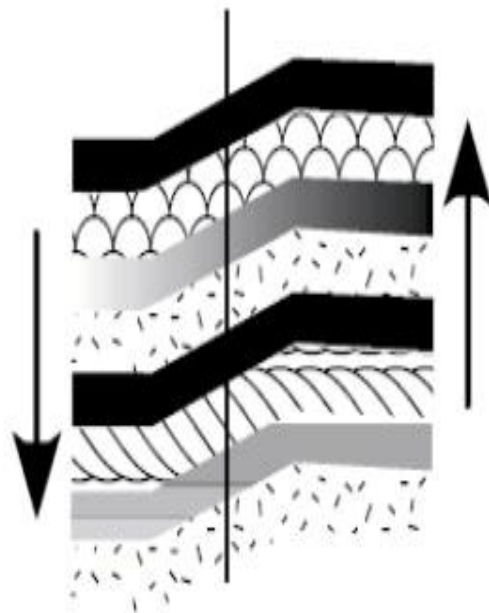
- ⦿ Vibrations of the earth's crust
- ⦿ Usually occurs when rocks under stress suddenly shift along a fault.
- ⦿ Earthquakes are caused when plates overcome friction and move

Elastic Rebound Theory

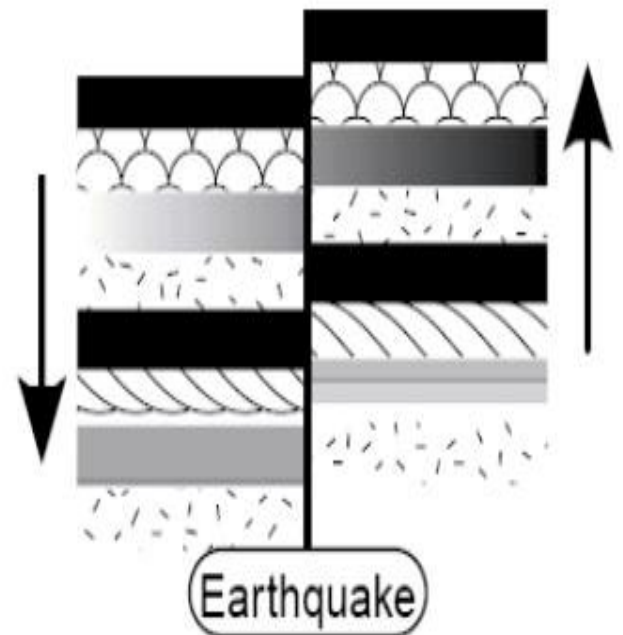
1. Stress builds between two plates that are locked in place by friction.
2. Plates overcome friction causing plates to move (earthquake).
3. Plates snap back to their former shape.



Rocks on each side of the fault are forced to move, but rocks at the fault are "locked" together.



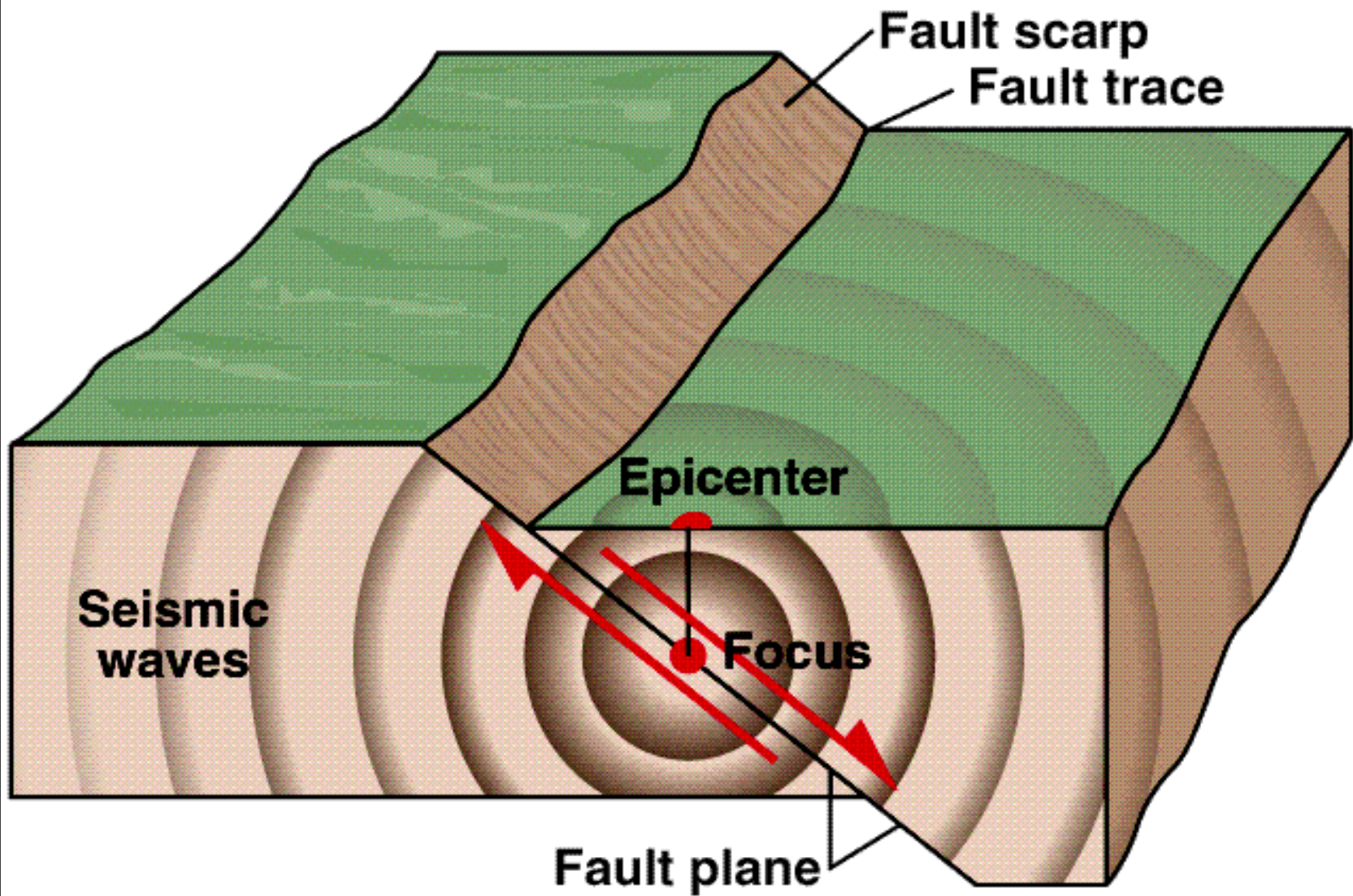
Because rocks are locked together, they bend, storing energy like a coiled spring.



Rocks suddenly "let go", springing back, causing an earthquake.

Parts Of A Quake

- ① Focus: point on the fault at which the first movement occurs.
- ① Epicenter: point on the surface directly above the focus.



Seismic Waves

Vibrations are called seismic waves. They radiate outward in all directions.

3 Types of Seismic Waves

1. 'P' waves (primary):

- Motion compresses and stretches materials.
- Can move through solids and liquids.
- First waves recorded by a seismograph.

2. 'S' waves (secondary):

- Side to side motion
- Can move through solids ONLY!
- Second waves recorded by a seismograph.

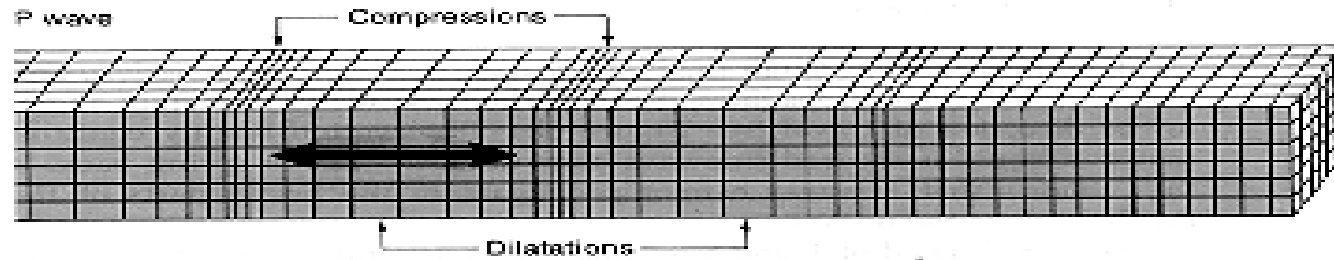
When P and S waves reach the surface, they become →

3. 'L' Waves (surface waves):

- Rolling motion
- Can only travel on earth's surface
- Last to reach seismograph
- Slow moving; cause the most damage

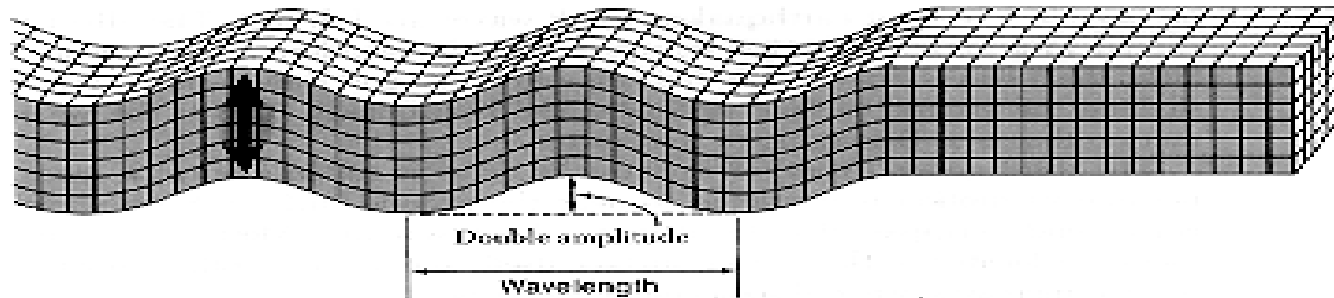
***'P' waves travel TWICE as fast as 'S' waves.**

P wave



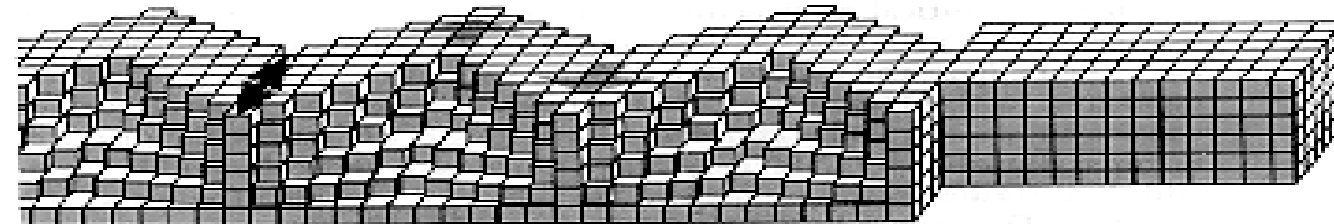
(a)

S wave



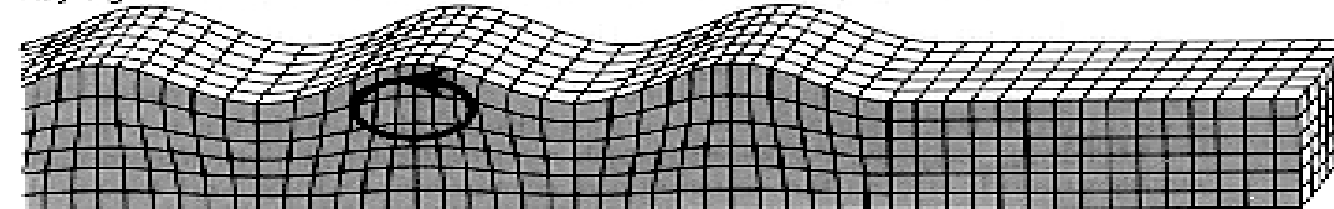
(b)

Love wave



(c)

Rayleigh wave

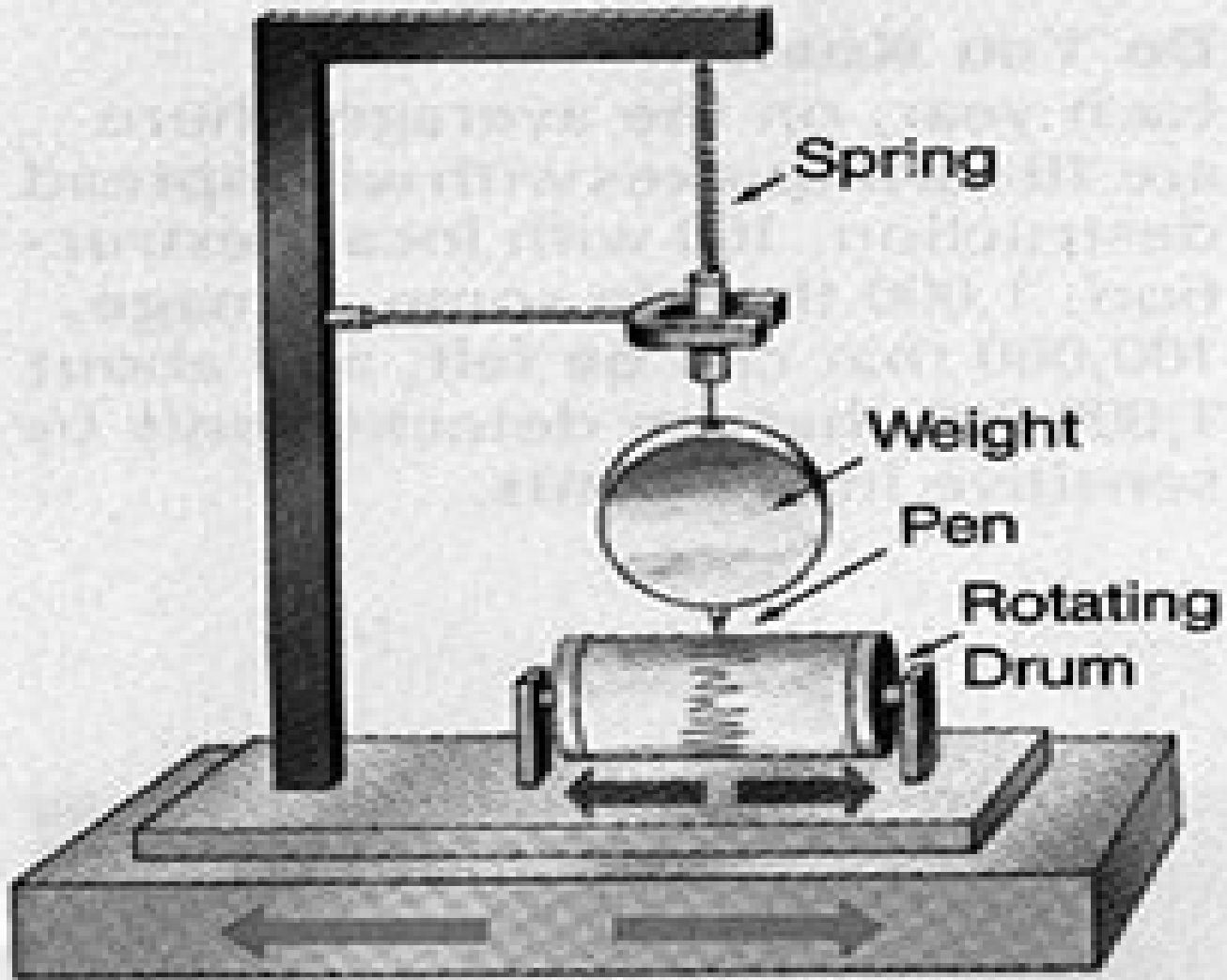


(d)

Seismographs

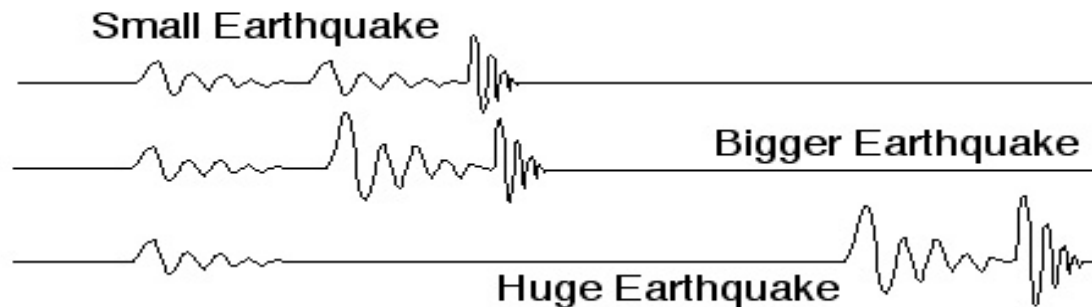
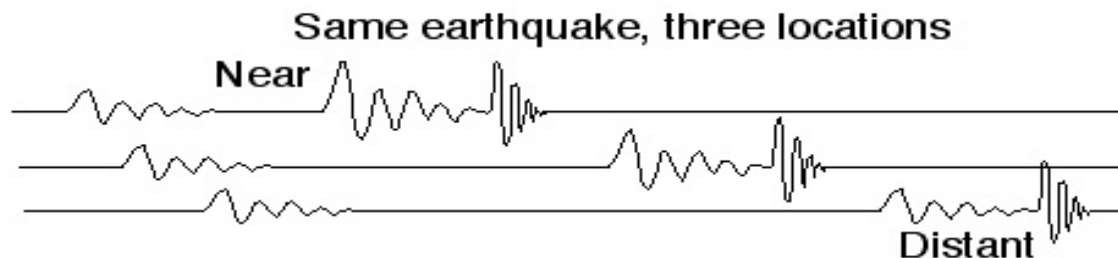
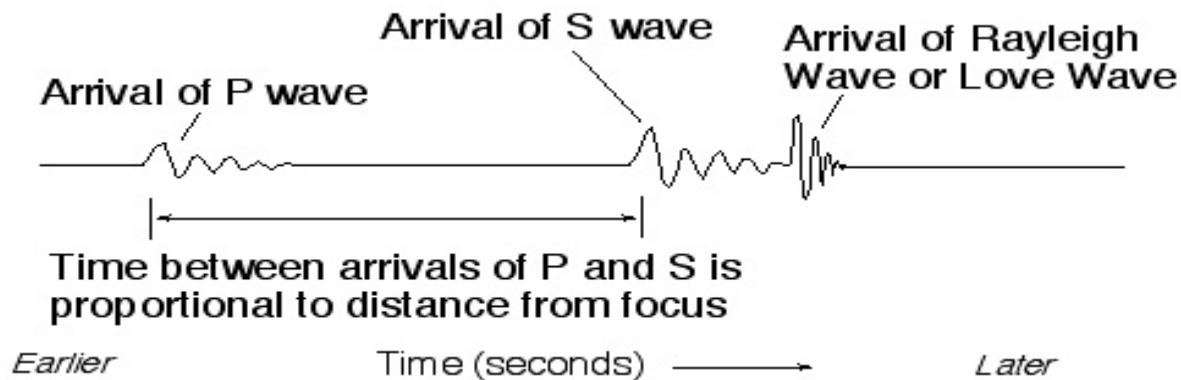
Instrument that detects and records earthquake waves.

1. Records up and down motion.
 2. Records E/W motion (side to side).
 3. Records N/S motion (side to side).
- Locates and measures an earthquake
 - Seismographs can tell how far away the epicenter is
 - Need 3 seismographs to determine exact location.
 - Seismographs are also used to determine the strength of a quake.



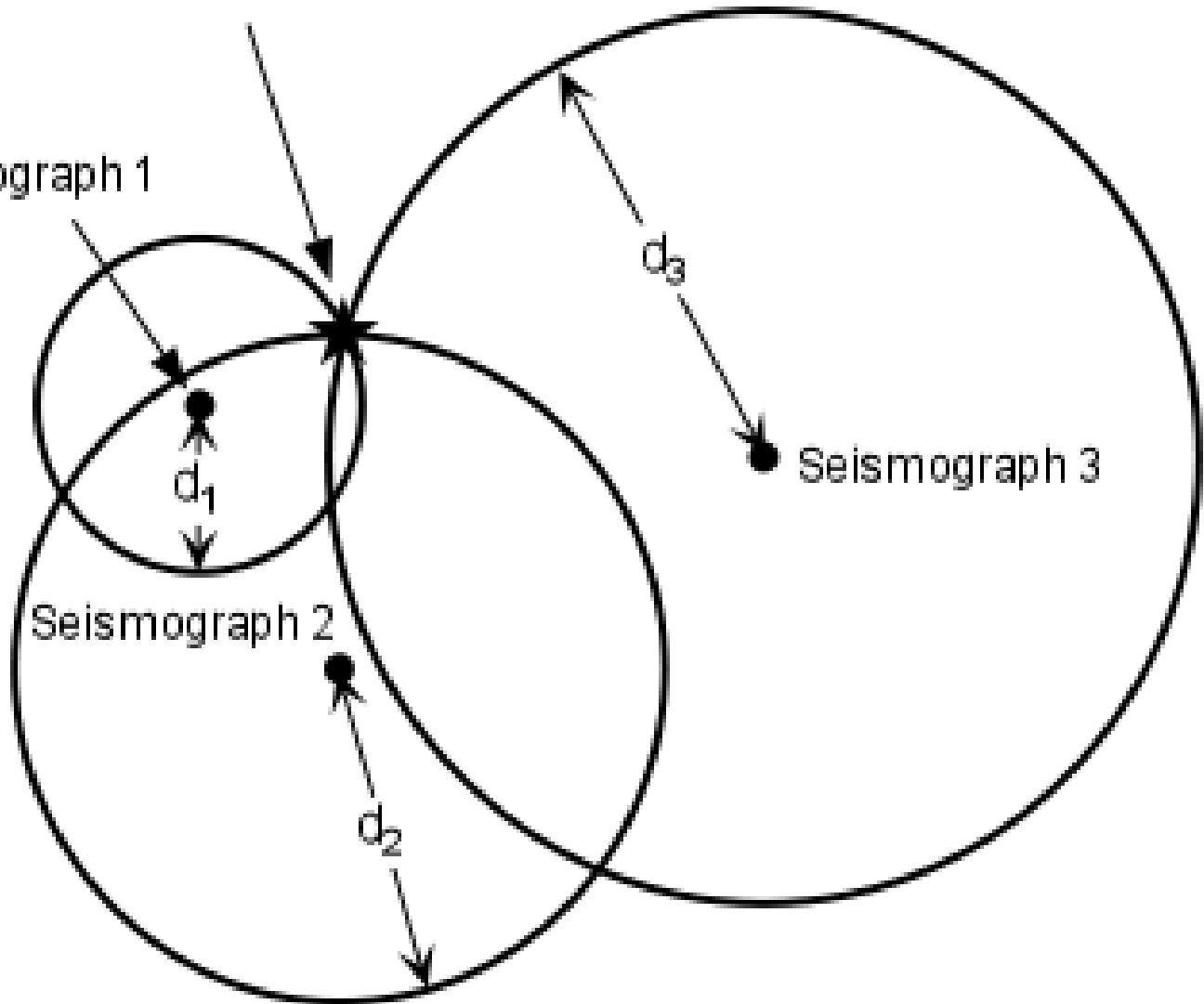
Horizontal Motion

Seismograms



Epicenter of Earthquake

Seismograph 1



Seismograph 2

Seismograph 3

Map

Richter Scale

- ① Measures magnitude
 - the amount of energy released
- ① Scale of 1-10 with each # representing 32 times stronger than the previous #.

Mercalli Scale & Rossi-Forel Scale

- ① Used to measure the intensity of the quake.
- ① Usually measured upon observing the damage done.