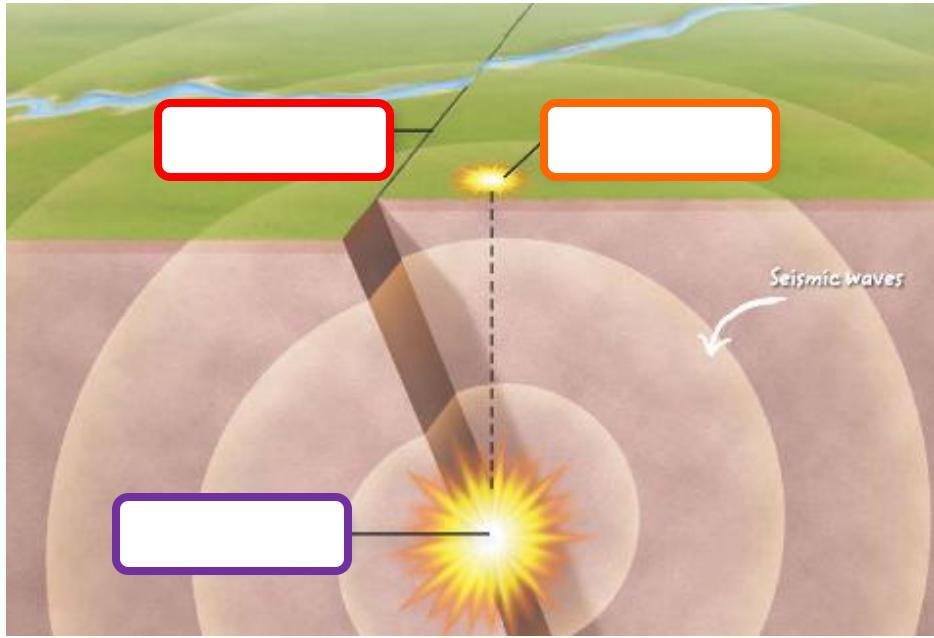


# Earthquakes



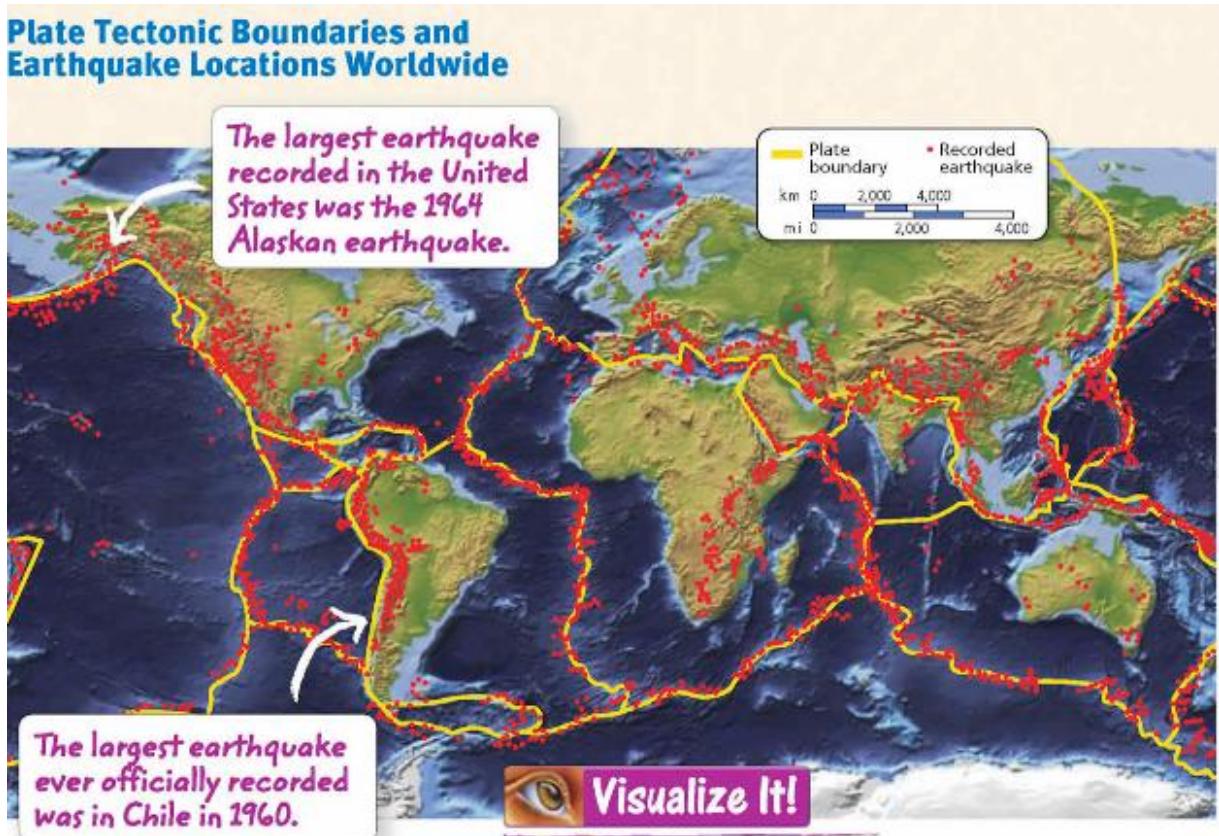
Label the following:

**FAULT**

**EPICENTER**

**FOCUS**

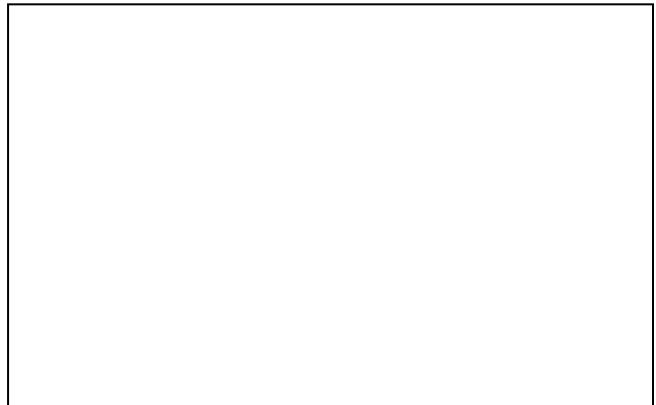
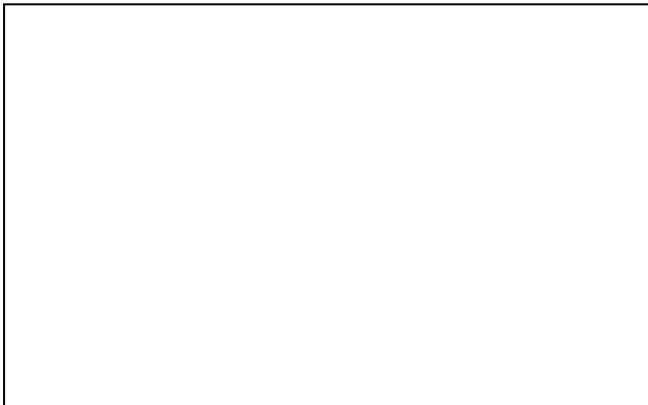
CIRCLE  
NORTH  
AMERICA



Most earthquakes are ( **NEAR PLATE BOUNDARIES** / **FAR AWAY FROM PLATE BOUNDARIES** ).

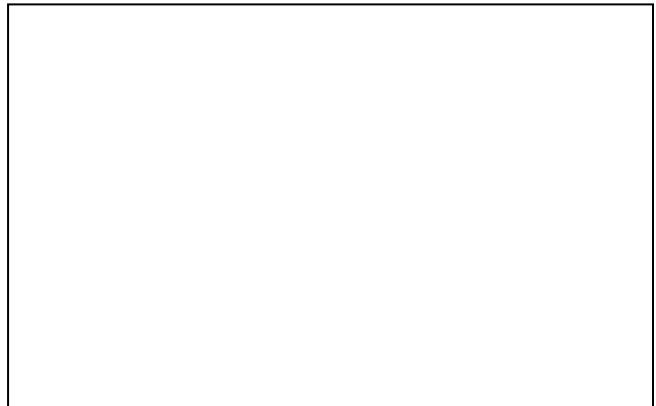
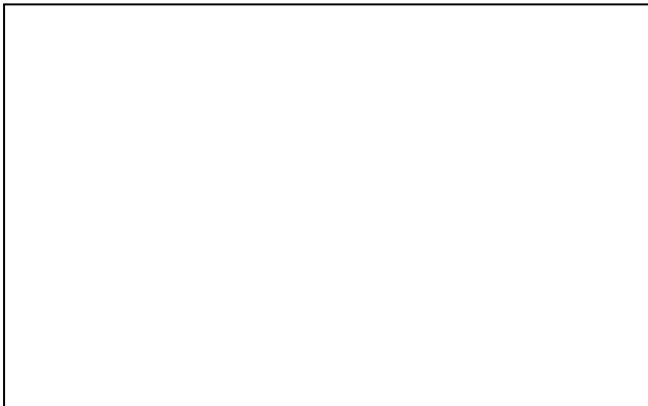
North America has **MANY** earthquakes. True or false? ( **TRUE** / **FALSE** )

Cut and paste or Velcro the appropriate plate location terms with their corresponding image. Then, **Circle** in **RED** the earthquake epicenters:



**Divergent Boundary**

**Convergent Boundary**



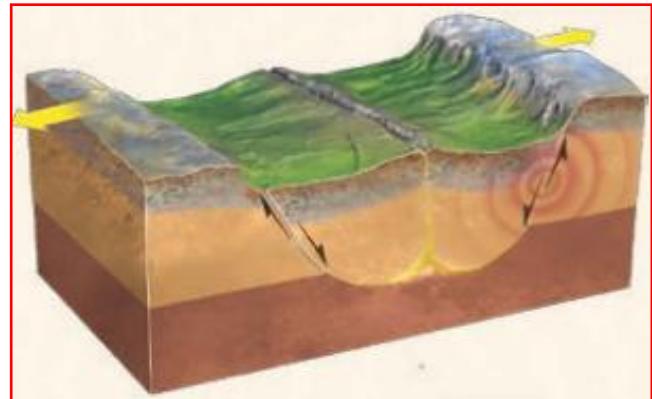
**Transform Boundary**

**Mid-Continental Zone (Old Fault Zone)**

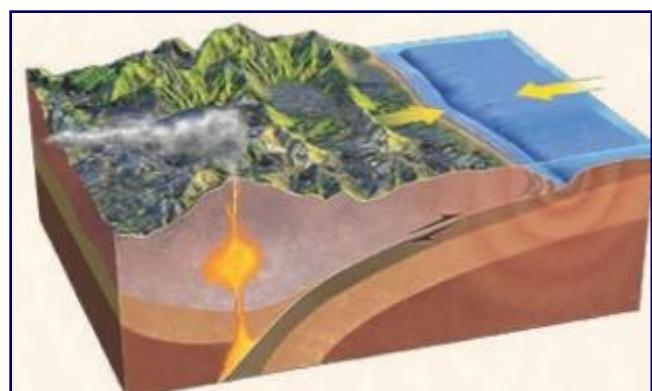
Most earthquakes occur where ( **PLATES** / **OCEANS** ) meet.

Sometimes earthquakes occur on old ( **ICEBERGS** / **FAULTS** ).

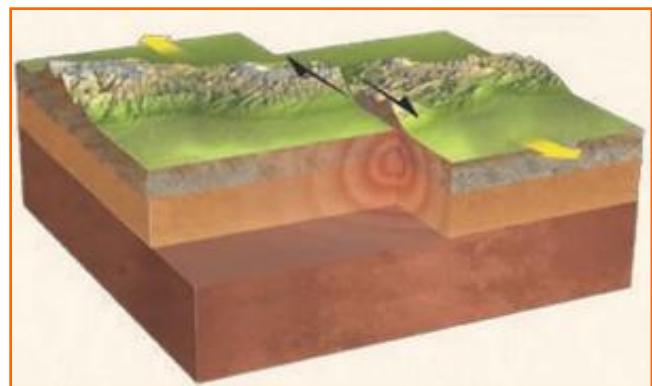
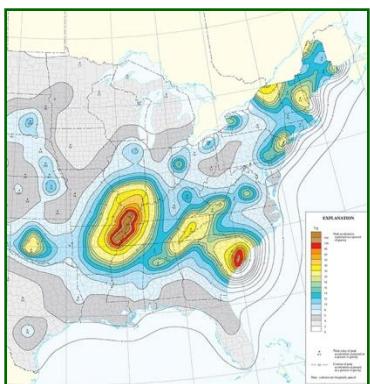
# FAULT



# EPICENTER



# FOCUS



# *Locating an Earthquake Epicenter*



**Seismometer**

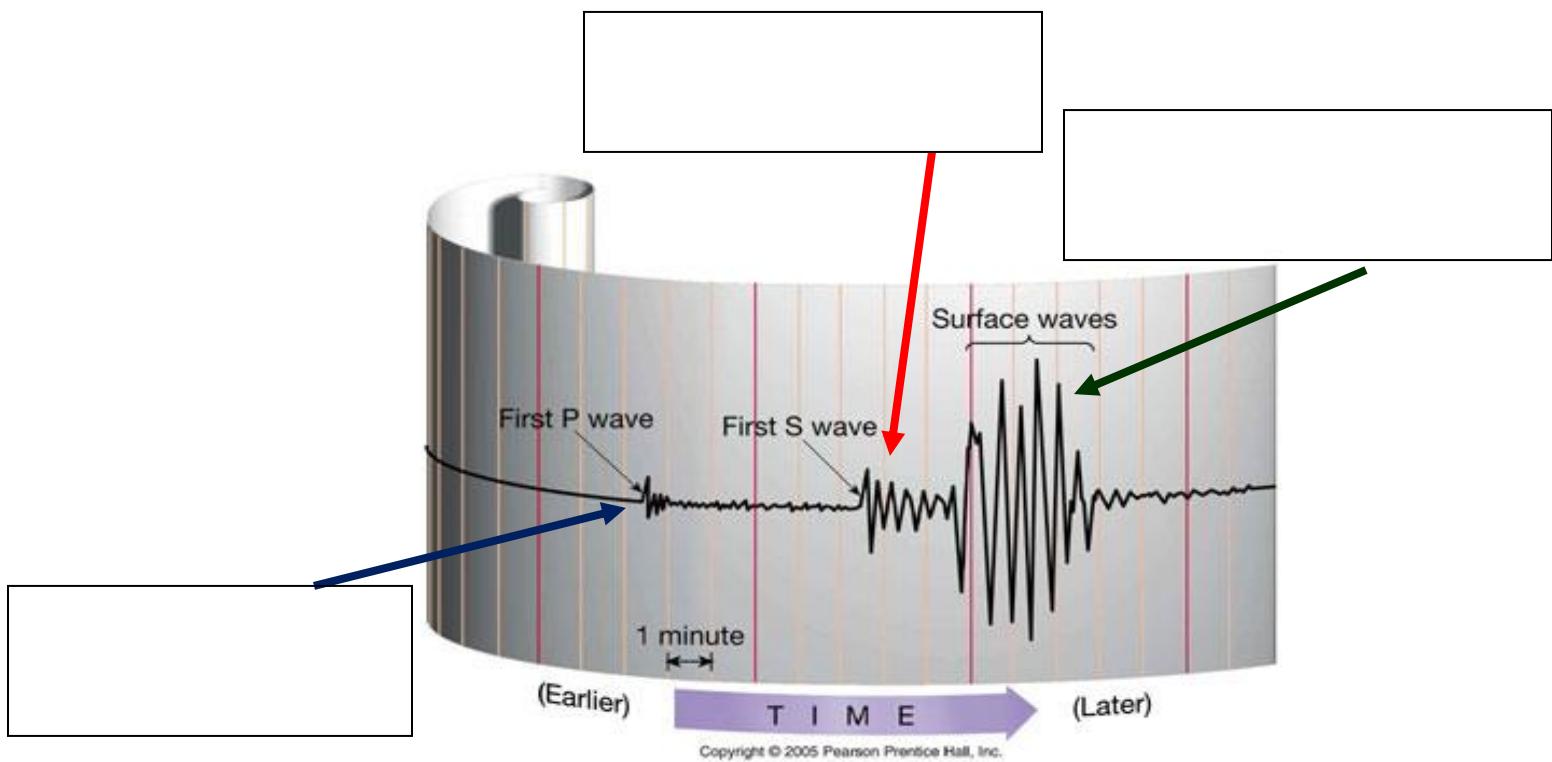


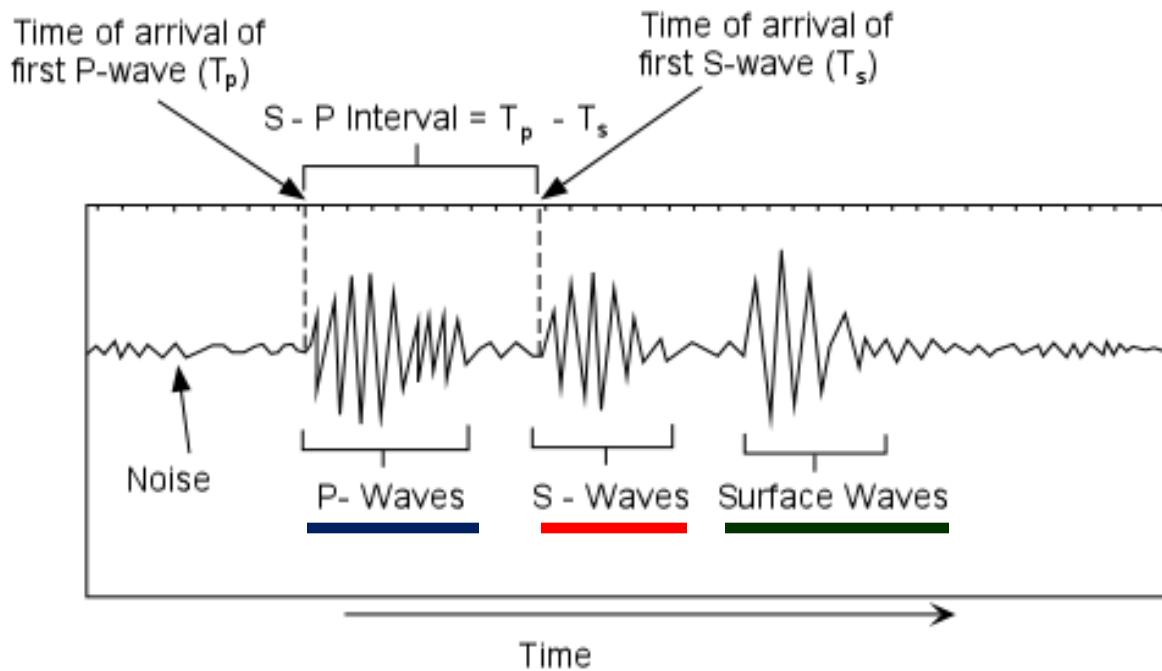
**Seismograph**

Circle in **BLUE** the P-wave.

Circle in **RED** the S-wave

Circle in **GREEN** the surface waves (L-waves)

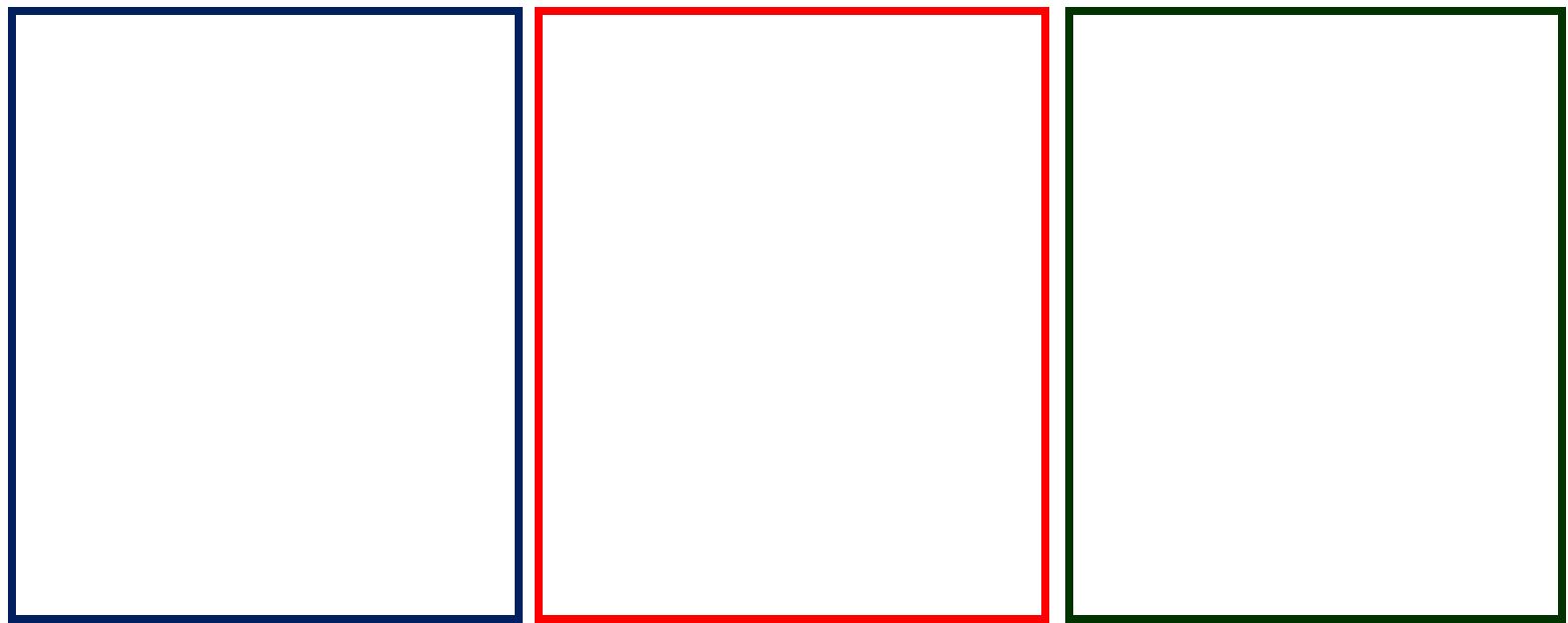




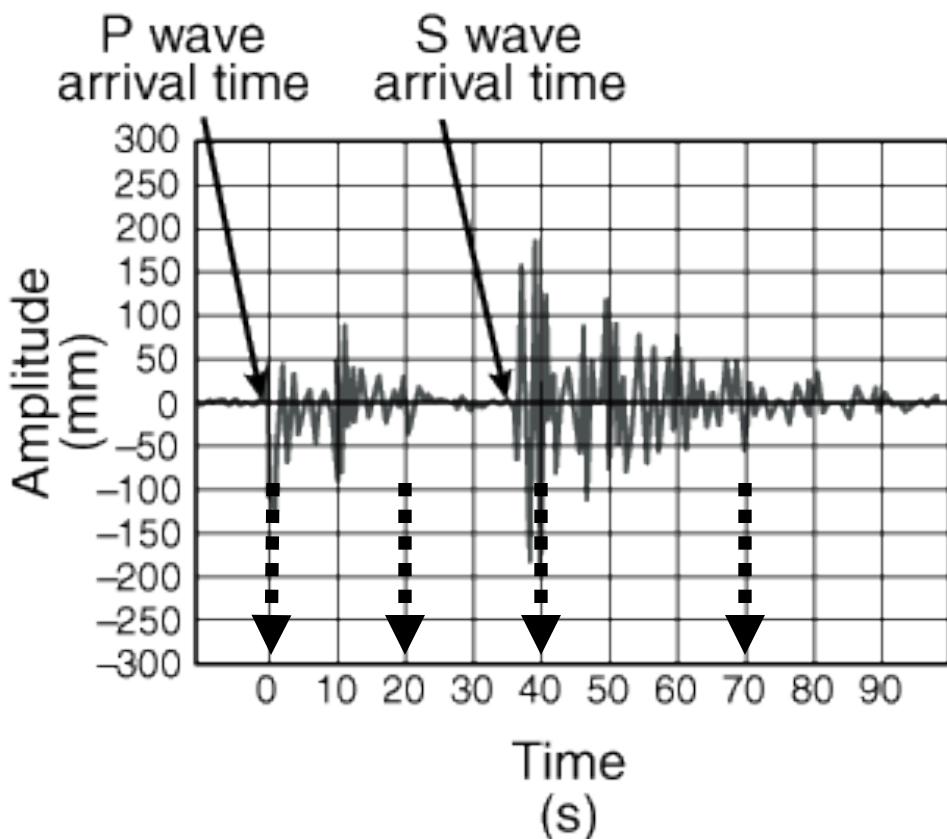
**P-wave (“JOLT”)**

**S-wave (“UP and DOWN and SIDE to SIDE”)**

**LOVE wave (“SIDE to SIDE”)**



# Seismogram



Trace the **P-wave** in **BLUE**

Trace the **S-wave** in **RED**



The **P-wave** begins at time \_\_\_\_\_ seconds

The **P-wave** ends at time \_\_\_\_\_ seconds

The **S-wave** begins at time \_\_\_\_\_ seconds

The **S-wave** ends at time \_\_\_\_\_ seconds

Once again,

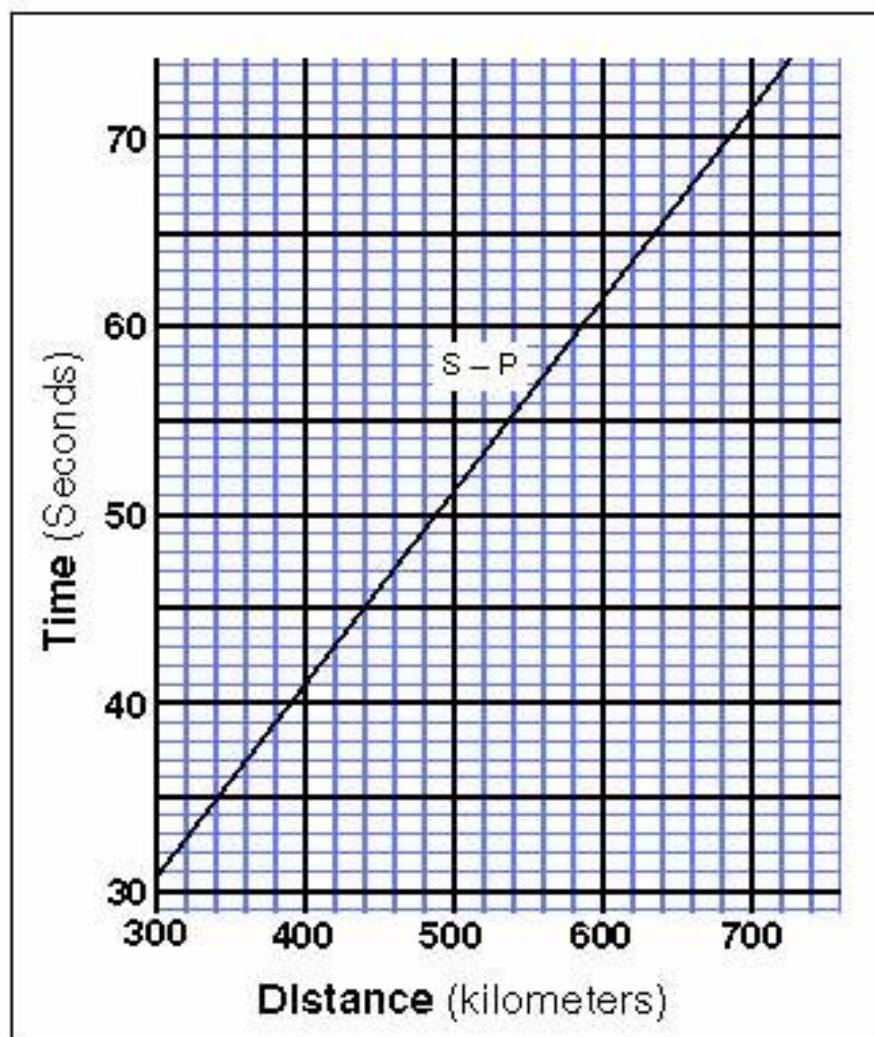
The **P-wave** began at time \_\_\_\_\_ seconds

The **S-wave** began at time \_\_\_\_\_ seconds

Now, subtract the **P-wave** time from the **S-wave** time:

**S – P = Distance from Epicenter of Earthquake (km)**

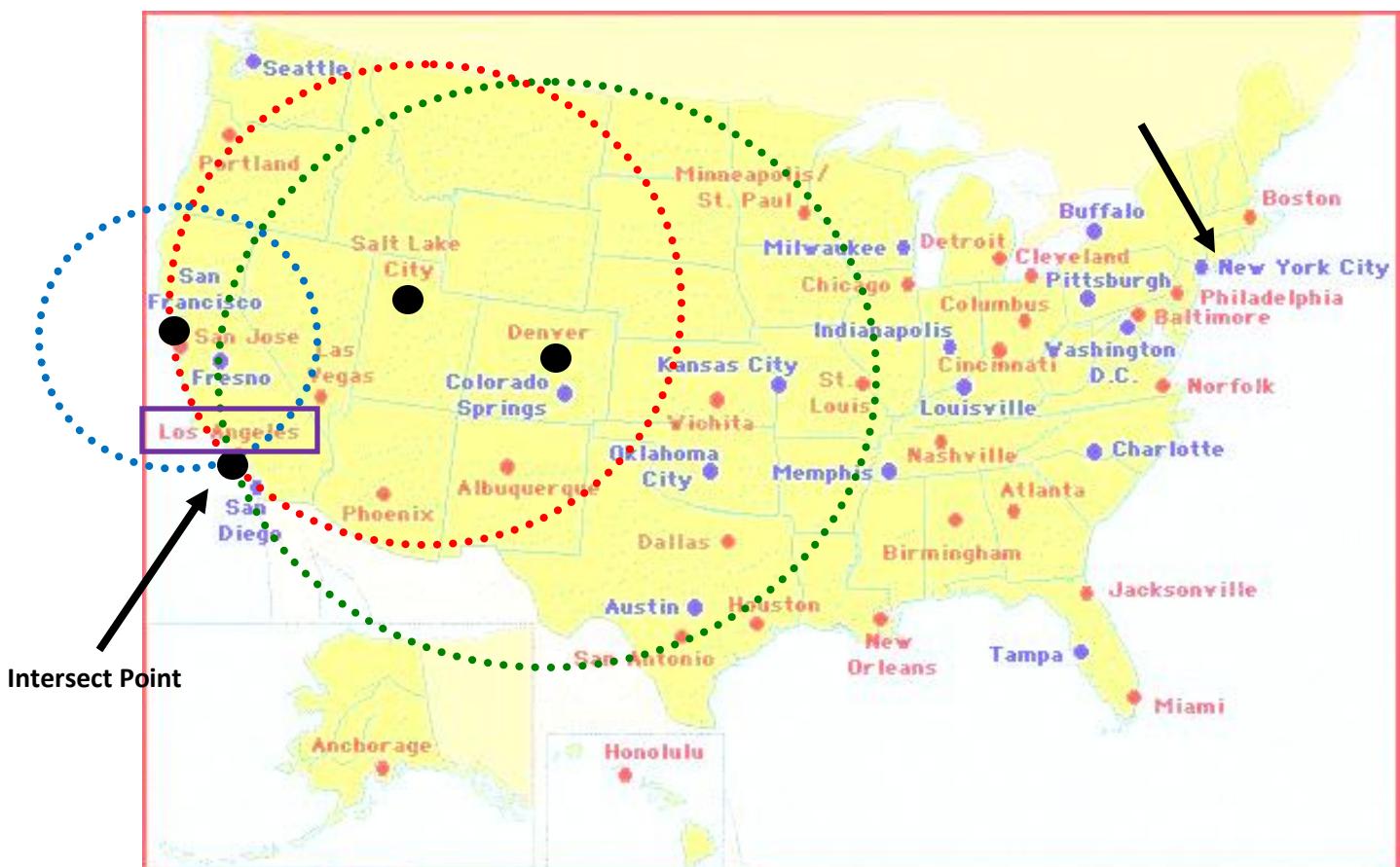
$$\underline{\hspace{2cm}} - \underline{\hspace{2cm}} = \underline{\hspace{2cm}} \text{ km}$$



## Example Only



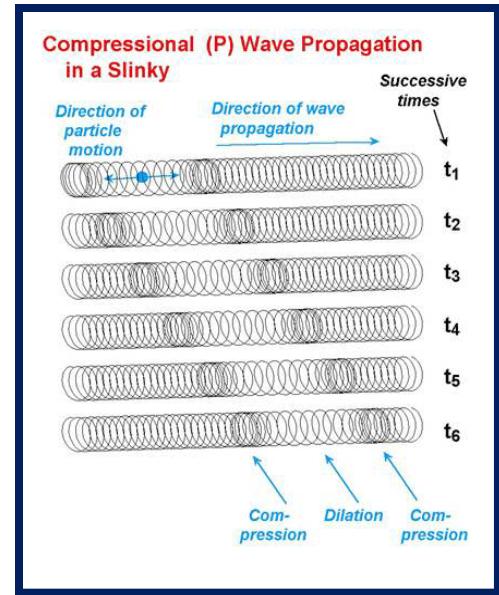
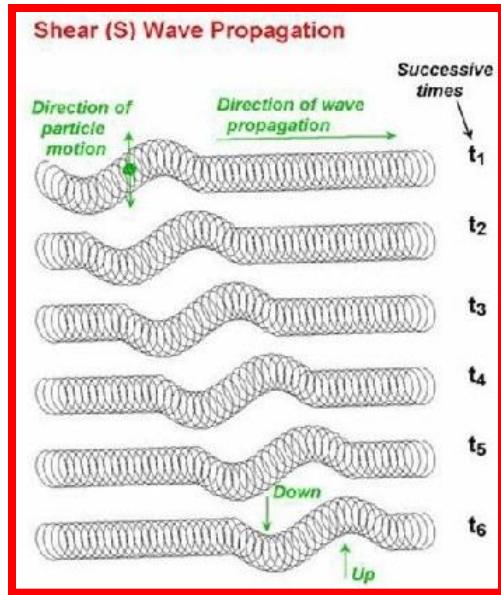
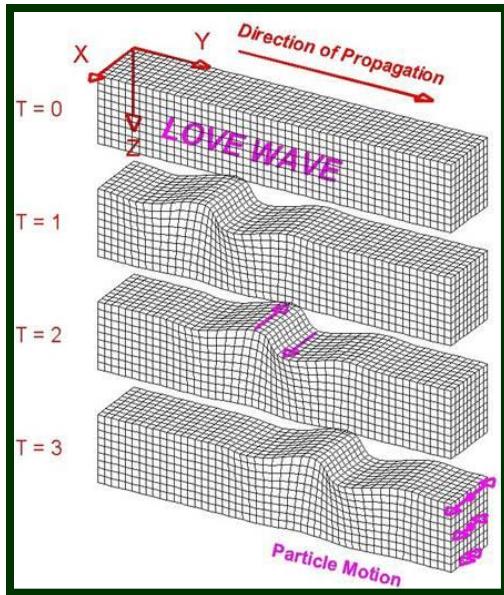
Trace the circles in their colors of **RED**, **BLUE**, and **GREEN**:



( NEW YORK CITY

OR

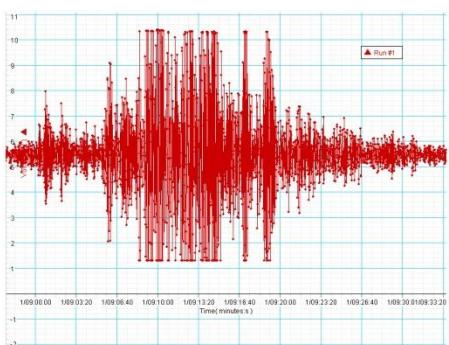
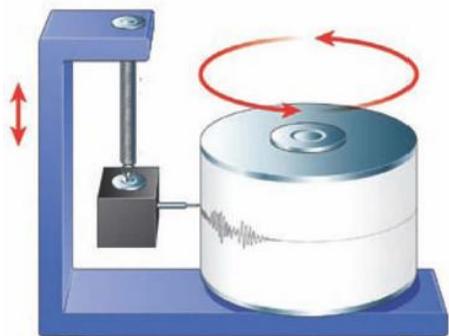
LOS ANGELES )



## P-wave

## S-wave

## Surface wave



# Answer Key

**Earthquakes**

Label the following:

**FAULT**  
**EPICENTER**  
**FOCUS**

Cut and paste or Velcro the appropriate plate location terms with their corresponding image. Then, **Circle** in **RED** the earthquake epicenters:

|                           |  |
|---------------------------|--|
|                           |  |
| <b>Divergent Boundary</b> | <b>Convergent Boundary</b>                   |
|                           |  |
| <b>Transform Boundary</b> | <b>Mid-Continental Zone (Old Fault Zone)</b> |

Plate Tectonic Boundaries and Earthquake Locations Worldwide

The largest earthquake recorded in the United States was the 1964 Alaskan earthquake.

The largest earthquake ever officially recorded was in Chile in 1960.

Visualize It!

**CIRCLE**  
NORTH AMERICA

most earthquakes are (**NEAR PLATE BOUNDARIES** / **FAR AWAY FROM PLATE BOUNDARIES**).

North America has **MANY** earthquakes. True or false? (**TRUE** / **FALSE**)

Time of arrival of first P-wave ( $T_p$ )  
S - P Interval =  $T_p - T_s$

Locating an Earthquake Epicenter

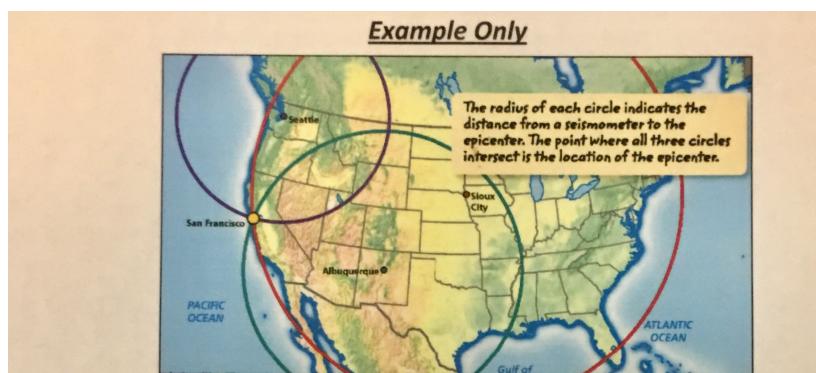
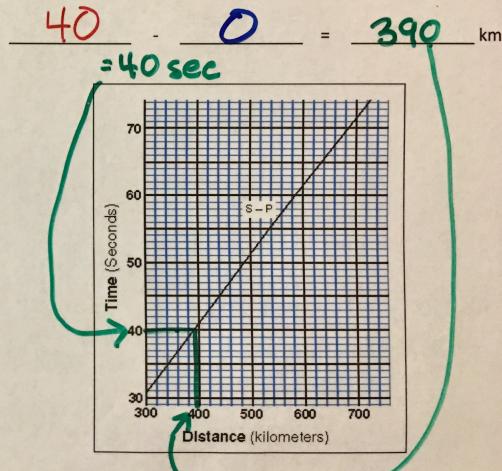
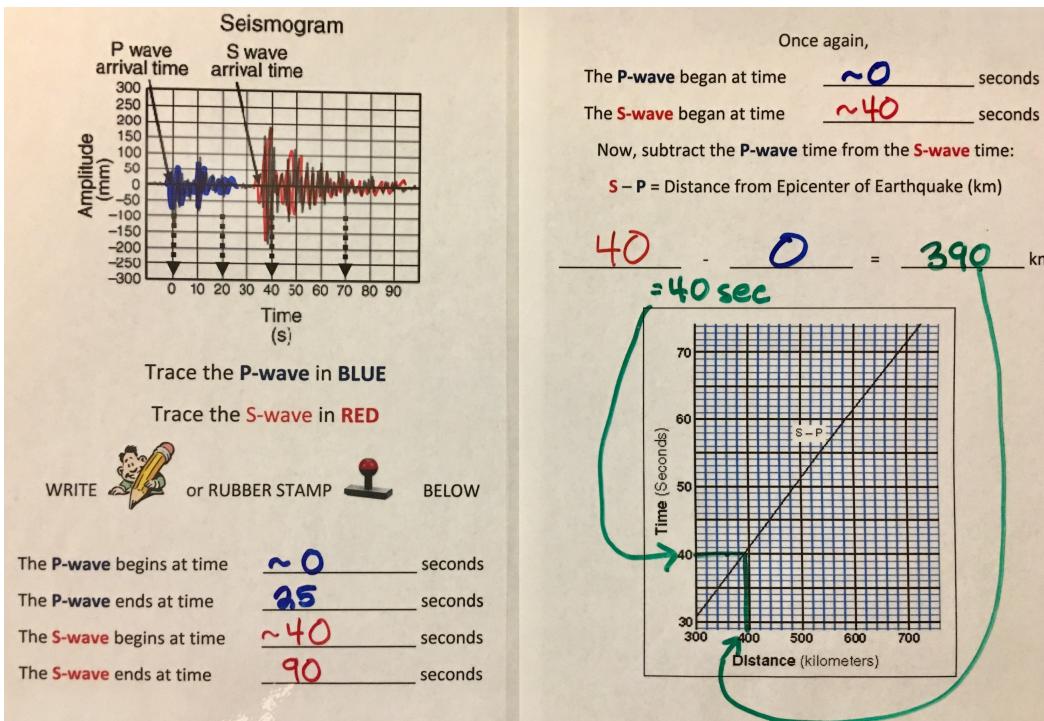
**Seismometer**: A device that detects seismic waves by measuring ground motion.

**Seismograph**: A device that records seismic waves onto a graph.

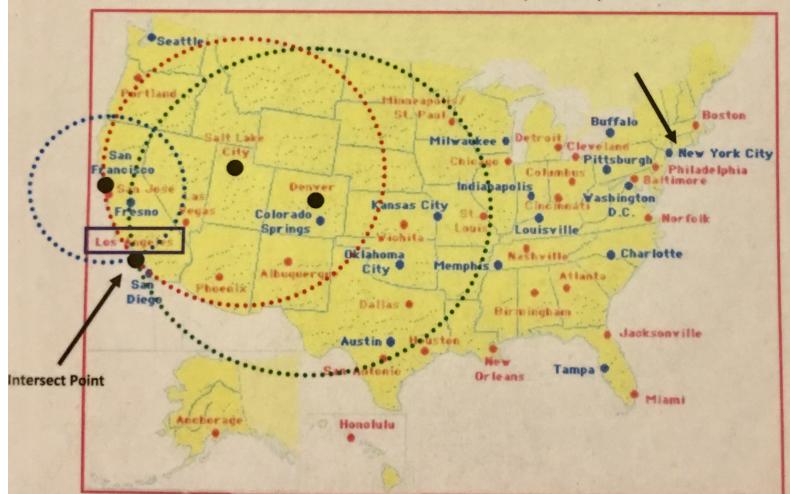
P-wave ("JOLT")  
S-wave ("UP and DOWN and SIDE to SIDE")  
LOVE wave ("SIDE to SIDE")

Compressional (P) Wave Propagation in a Slinky  
Shear (S) Wave Propagation  
LOVE wave ("SIDE to SIDE")

Circle in **BLUE** the P-wave.  
Circle in **RED** the S-wave  
Circle in **GREEN** the surface waves (L-waves)



Trace the circles in their colors of **RED**, **BLUE**, and **GREEN**:



In which city do the 3 circles intersect?

( NEW YORK CITY      OR      LOS ANGELES )