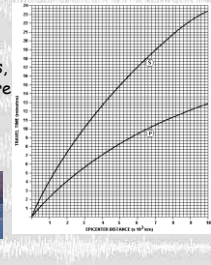


Lesson: P & S Wave Chart

THE FOLLOWING VIDEO HAS BEEN APPROVED FOR ALL AUDIENCES BY THE EARTH SCIENCE TEACHERS ASSOCIATION OF AMERICA, INC. THE VIDEO HAS BEEN RATED

I	INTELLIGENT
	UNDER 15 REQUIRES TEACHER ASSISTANCE
STRONG, EARTH SCIENCE LANGUAGE, DETAILED DIAGRAMS, AND SUPER ANSWERNESS	

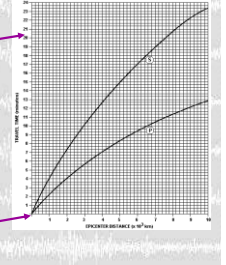
- P waves and S waves travel at different speeds, so scientists were able to make travel time graphs



Time goes by 20 seconds

ESRT Pg 11

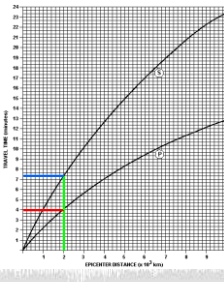
Distance goes by 200 km



Seismic station is 2,000 km from epicenter. How long did it take for P-wave to reach there?

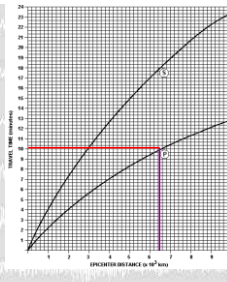
4 minutes

S wave travel = 7 minutes 20 sec



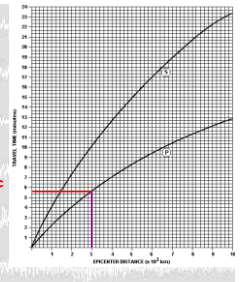
Approximately how long does an earthquake P-wave take to travel the 1st 6500 km after the earthquake occurs?

10 minutes

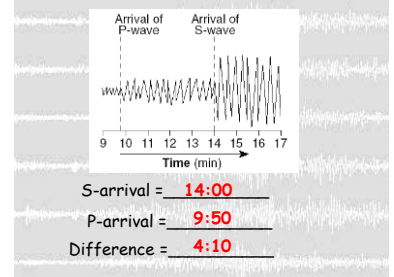
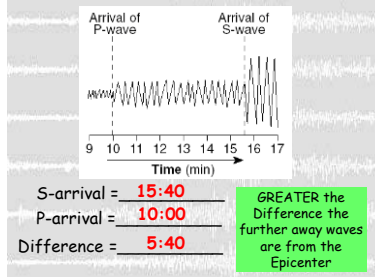
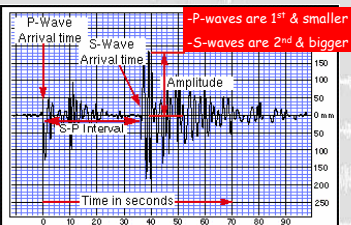


An earthquake occurred at 5:00:00 am. At what time would the P-wave reach a seismic station 3,000 km from the epicenter?

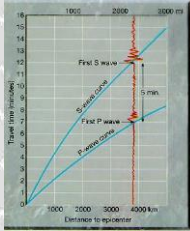
P-wave travel = 5 minutes & 40 sec
5:00:00
+ 5:40
5:05:40



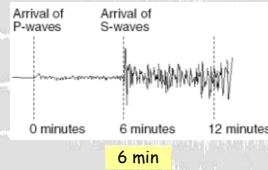
Reading a SEISMOGRAM



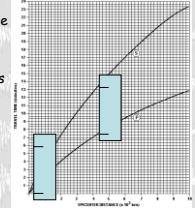
Calculating Epicenter Distance



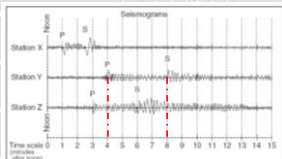
1. Measure the distance between the start of the first P wave and the start of the first S wave



2. Use the chart on page 11 and measure the time on the side of the chart with a piece of paper.
3. Put a dash at 0 & 6 mins
4. Keep moving your paper along the P-wave line until the 6 min dash is on the S-wave line & look down for DISTANCE



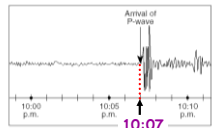
Distance to the epicenter is 4,400 km



Approximately how far away from Station Y is the epicenter?

Epicenter = 2,600 km

Sometimes they just give you the P-arrival time & ask you for distance

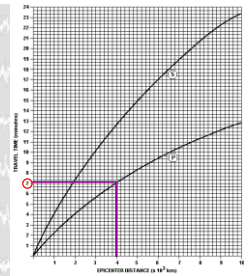


Difference = 7 minutes

If earthquake occurred at exactly 10:00 pm, approximately how far from the earthquake epicenter was Albany, NY?

- 1) Find the P-wave travel time on the LEFT of the Chart
- 2) Continue until you get to the P-line & look down to see Distance

4,000 km



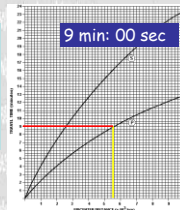
Calculate Origin Time

- Origin time is when the earthquake started
- It's determined by the epicenter distance & seismic wave travel time
- The **farther** away the epicenter is, the **wider the gap** will be between the P and S waves.

Example:

P wave arrived at a station at 10 hr: 12 min: 30 sec & the seismograph is 5600 km away from the epicenter, when did the earthquake occur?

10 hr: 12 min: 30 sec
 - 9 min: 00 sec
 10 hr: 03 min: 30 sec



Finding Earthquake Epicenters

- 3 seismic stations must be used
- Each seismic station only tells you the distance **NOT DIRECTION**

The epicenter could have occurred any where on that circle!



- Find epicenter distance for each seismograph station
- Distance is used as a radius and circles are drawn on a map
- Where the three circles meet is where the epicenter was

