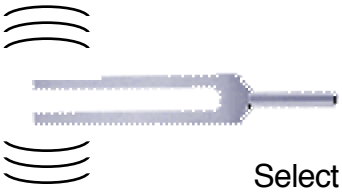
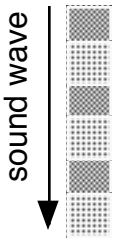
Name_____ Period___Lab station#____

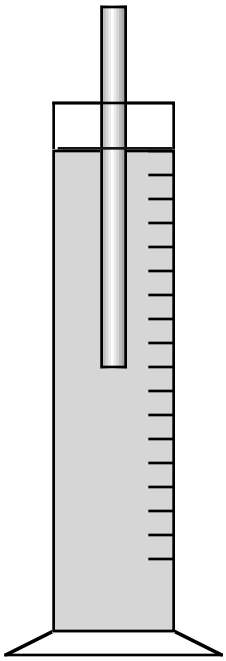
Determining the frequency of a tuning fork using resonance



Select a tuning for to test. Record the number stamped on the fork.



Fill the grad cylinder nearly to the top with water. Place the short resonance tube all the way in to the water line. Using the rubber mallet, strike the tuning fork sharply and hold it approximately 4.0 cm above the opening of the tube. Raise the tube and fork simultaneously, maintaining the same 4.0 cm. separation, until you hear amplification of the tone. Working the fork-tube apparatus up and down slightly, until you "home in" on the exact position that produces the greatest amplification. Mark the water level with a pencil mark on the outside of the resonance tube.

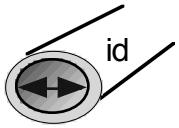


The shortest length of closed tube that produces an amplification should be 1/4 λ for the frequency you used. Measure the inside diameter (id) of the tube and record. Measure the length of the resonance tube that was above the water mark, add 1.2 pipe diameters (id x 1.2) to this value, and record as 1/4 λ.
Estimate the length of 3/4 λ for this fork. Decide if the short resonance tube is capable of finding a 3/4 λ resonance. If not, select the longer tube. Using the process above, find the next resonance point beyond the 1/4λ and record. This should be a 3.4 λ . **Note**: if you find it impossible to get 3/4 λ then find 5/4 and subtract to get a full wavelength. Just make a note in your table that you did this.

Using your measurements for 1/4λ and 3/4λ, subtract to get 1/2λ and calculate a full wavelength.
Measure the air temperature in the classroom and record.
Determine the velocity of sound in the classroom and record.
Calculate the frequency of the tuning fork.

Organize and show all calculations clearly on the reverse of this page. label all calculations. Keep track of significant figures. Make sure you read all instruments to the maximum accuracy allowed.

Repeat the above procedure for 3 more tuning forks of different frequencies.
ERASE ALL MARKS YOU MADE ON THE PIPES, DRY YOUR WORK AREA, AND RETURN ALL EQUIPMENT.



pipe diameter: _____

air temperature: _____

speed of sound: _____

fork #	1/4λ	3/4λ	1.0λ	Frequency
1 or 2				
3 or 4				
5 or 6				
7 or 8				