



Waves Lab (Student Sheet)
Demonstration Lab
PSI Physics

Name:_____ **Period:**_____ **Date:**_____

This is a demonstration lab. Your teacher will perform the lab and give you the necessary information. Record all of your own calculations, as well as the data given to you by your teacher in the charts below.

Purpose: The purpose of this demonstration is to:

- Calculate the speed of sound
- Calculate and discover the first resonating frequency of a closed and open tube set-up

Calculations Chart:

Record all of your calculations in the chart below.

Chart for Scenario One (Open Tube):

| Length of Open Tube | Resonating Frequency | Calculated speed of sound |
|---------------------|----------------------|---------------------------|
| m | Hz | m/s |

Chart for Scenario Two (Closed Tube):

| Length of Closed Tube | Calculated First Resonating Frequency | First Resonating Frequency from Demonstration |
|-----------------------|---------------------------------------|---|
| m | Hz | Hz |

Write your work for calculating the speed of sound in scenario one here:

Write your work for calculating the first resonating frequency of scenario two here:



Waves Lab (Student Sheet)
Demonstration Lab
PSI Physics

Name: _____

Conclusion Questions:

Now you are performing the sound wave demonstration on your own. The necessary equipment (sound resonating tube, sine wave generator, and the speaker) is assembled, but there is a problem; the sound resonating tube is stuck, causing it to remain at a length of 160 cm.

1. Describe how you would adjust the equipment so that you can find the speed of sound with an open tube.

2. Suppose you perform the experiment using the stuck sound resonating tube and find that the first resonating frequency of the tube is at 100 Hz.
 - a. What is the speed of sound?

3. The sound resonating tube becomes unstuck. You close the tube and set the length at 20 cm. Using the speed of sound calculated in the previous problem, calculate the first resonating frequency of the tube.

4. The value for the speed of sound you obtained from your experiment may not have matched with the speed of sound (340 m/s) given in textbooks. Give two possible reasons for the difference.