Resonance: The Speed of Sound – Closed Tube

Trial	Tuning Fork Frequency, Hz	Resonant Tube Length, m	Tube Diameter, m	Wavelength, m	Experimental Speed of Sound, m/s	Air Temp, °C	Accepted Speed of Sound, m/s	Percent Error, %
1								
2								
3								

FOR EACH TRIAL:

1. Calculate the wavelength of each resonant sound wave.
   Show the formula and calculations in the space below.

2. Calculate the experimental speed of sound.
   Show the formula and calculations in the space below.

3. Use the air temperature to find the accepted speed of sound.
   Show the formula and calculations in the space below.

4. Calculate the % error for each speed of sound trial. ***Show the formula and calculations in the space below.***

Resonance: The Speed of Sound – Open Tube

Trial	Tuning Fork Frequency, Hz	Resonant Tube Length, m	Tube Diameter, m	Wavelength, m	Experimental Speed of Sound, m/s	Air Temp, °C	Accepted Speed of Sound, m/s	Percent Error, %
1								
2								
3								

FOR EACH TRIAL:

1. Calculate the wavelength of each resonant sound wave.
   Show the formula and calculations in the space below.

2. Calculate the experimental speed of sound.
   Show the formula and calculations in the space below.

3. Use the air temperature to find the accepted speed of sound.
   Show the formula and calculations in the space below.

4. Calculate the % error for each speed of sound trial. ***Show the formula and calculations in the space below.***

You will now use the phenomenon of resonance to determine the unknown frequency of a tuning fork.

Trial	Resonant Tube Length, m	Tube Diameter, m	Wavelength, m	Air Temp, °C	Accepted Speed of Sound, m/s	Calculated Tuning Fork Frequency, Hz
1						
2						

FOR BOTH TRIALS:

1. Calculate the wavelength of the resonant sound wave. ***Show the formula and calculations in the space below.***

2. Use the air temperature to find the accepted speed of sound.
   Show the formula and calculations in the space below.

3. Use the experimental wavelength and temperature-based accepted speed of sound to calculate the frequency of your tuning fork. ***Show the formula and calculations in the space below.***

4. List sources of error in this lab.