

LAB QUIZ: SPEED OF SOUND IN AIR

TEMPERATURE (°C)	25	TUBE LENGTH L (M)	0.895	$\Delta x = 2L$ (m)	
TRIAL	t_1 (s)	t_2 (s)	$\Delta t = t_2 - t_1$ (s)	$v = \Delta x / \Delta t$ (m/s)	
1	0.0003	0.0054	0.0051		
2	0.0004	0.0056			
3	0.0053	0.0104	0.0051	351.0	
4	0.0054	0.0107	0.0053	337.7	
5	0.0056	0.0106	0.0050	358.0	
	PREDICTED SPEED (m/s)		AVERAGE SPEED (m/s)		

- The tube length is measured to be 0.895m. Calculate the travel distance Δx of the pulse.
- If room temperature is 25°C, what is the predicted value for the speed of sound in the room?
 A) 316 m/s B) 331 m/s C) 343.6 m/s D) 346 m/s
- For Trial 1, the calculated speed of sound is
 A) 337 m/s. B) 344 m/s. C) 346 m/s. D) 351 m/s. E) 358 m/s.
- For Trial 2, the time interval Δt is.
 A) 0.0050 s. B) 0.0051 s. C) 0.0052 s. D) 0.0053 s.
- For Trial 2, the calculated speed of sound is
 A) 337 m/s. B) 344 m/s. C) 346 m/s. D) 351 m/s. E) 358 m/s.
- The average experimental speed of sound is closest to
 A) 337 m/s. B) 344 m/s. C) 348 m/s. D) 351 m/s. E) 358 m/s
- What is the percent error in this result?
 A) 0.0058% B) 0.058% C) 0.58% D) 5.8%
- True or false: If the experiment was performed in a substantially colder room, the measured speed of sound would be greater.
- True or false: Your results could be improved by isolating the tubes from each other, making the individual pulses easier to hear.
- If the speed of sound in the room is 343 m/s, how long must the glass tube be in order to hear an echo? Assume a total travel time of 50 ms, or 0.050 s. The tube length should be
 A) 0.86 m. B) 8.6 m. C) 86 m. D) 860 m.