7. While the tuning fork is vibrating directly above the tube, slowly lower the reservoir about 20 cm or until you locate the position of the reservoir where the resonance is loudest. (Note: To locate the exact position of the resonance, you may need to strike the tuning fork again while the water level is falling.) Raise the reservoir to about 2 cm above the approximate level where you think the resonance is loudest. Strike the tuning fork with the tuning fork hammer and carefully lower the reservoir about 5 cm until you find the exact position of resonance.
8. Using the scale marked on the tube, record the level of the water in the tube when the resonance is loudest. Record this level to the nearest millimeter in your data table.
9. Repeat the procedure for several trials, using tuning forks of different frequencies.
10. Clean up your work area. Put equipment away safely so that it is ready to be used again. Recycle or dispose of used materials as directed by your teacher.

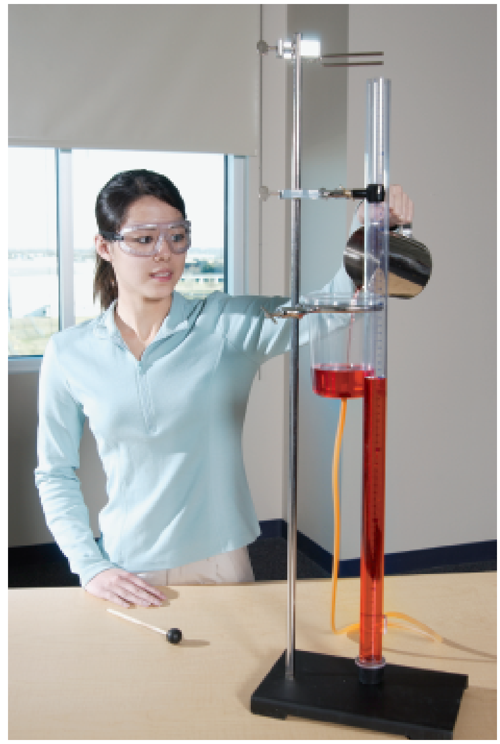

Figure 1
Step 7: From the position of greatest resonance, move the reservoir up 2 cm and down again until you find the exact position.

ANALYSIS

1. **Organizing Data** For each trial, calculate the wavelength of the sound by using the equation for the fundamental wavelength, $\lambda = 4L$, where L is the length of the tube.
2. **Organizing Data** For each trial, find the speed of sound. Use the equation $v = f\lambda$, where f is the frequency of the tuning fork.

CONCLUSIONS

3. **Evaluating Results** Find the accepted value for the speed of sound in air at room temperature (see **Appendix F**). Find the average of your results for the speed of sound, and use the average as the experimental value.
   a. Compute the absolute error using the following equation:
   $$\text{absolute error} = |\text{experimental} - \text{accepted}|$$
   b. Compute the relative error using the following equation:
   $$\text{relative error} = \frac{(\text{experimental} - \text{accepted})}{\text{accepted}}$$
4. **Analyzing Results** Based on your results, is the speed of sound in air at a given temperature the same for all sounds, or do some sounds move more quickly or more slowly than other sounds? Explain.
5. **Applying Ideas** How could you find the speed of sound in air at different temperatures?