 Speed of Sound Lab

*Use resonance to calculate the speed of sound in air.*

**Introduction**

In this activity, students in small groups will calculate the speed of sound using their knowledge of resonance, wavelength, frequency and longitudinal waves.

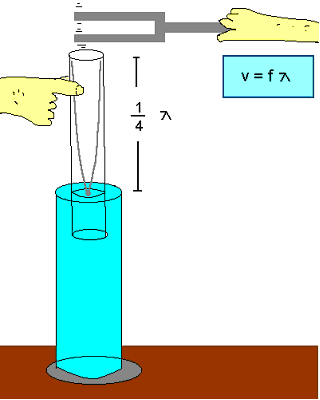
**Objectives**

Virginia Middle School Physical Science Standards:

* PS.8 – Sound waves
  1. wavelength, frequency, speed, amplitude, rarefaction, and compression;

c) the nature of compression waves; and

* PS.9 – Transverse Waves
  1. wavelength, frequency, speed, amplitude, crest, and trough;
* Students will recognize resonance by sound and theory.
* Students will be able to calculate velocity using wavelength and frequency.



**Materials, Setup**

Meter stick

Bucket full of water

Plastic resonant tube

Set of tuning forks

Physicslessons.com

**Procedure, Data, Calculations and Results**

1. Determine the wavelength and the wave speed of sound for different resonant frequencies and lengths.

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| **Tuning Fork Frequency** | **Length of pipe above the water when the sound is loudest.** | **Wavelength**  **(multiply length x 4)** | **Speed of Wave**  **v= λ\*f** |
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2. Average the calculated speeds and compare to the known value of 340 m/s.