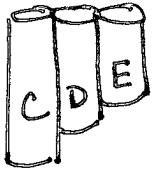


Sample Calculations

Suppose you want to build pan pipes. This is an example of an open-ended pipe instrument.



From your instruction page, determine that the length equation is:

$$L = \frac{1}{2}\lambda$$

So how long should you cut the pipe that will produce a 'C' note?

① Determine the frequency you want to produce.
Middle C is 262 Hz.

② Knowing that the speed of sound is constant (343 m/s), solve for the wave length:

$$v = f\lambda$$
$$\frac{343 \frac{\text{m}}{\text{s}}}{262 \text{ Hz}} = \frac{262 \text{ Hz} (\lambda)}{262 \text{ Hz}}$$

$$1.31 \text{ m} = \lambda$$

③ Now plug the wavelength in to the length equation:

$$L = \frac{1}{2}\lambda$$

$$L = \frac{1}{2}(1.31 \text{ m})$$

$$L = 0.65 \text{ m}$$

⇒ cut the pipe to 0.65 m (65 cm) to produce a 'C' note.

* If this is too long for the instrument you want to build, remember that frequency & wavelength are inversely related. Choosing a higher octave C will give a lower wavelength. Google "piano frequencies" to get frequency values for other octaves.