String (transverse): $v = \sqrt{\frac{T_s}{\mu}}$
Sound (longitudinal): $v = 343$ m/s in 20°C air
Light (transverse): $v = \frac{c}{n}$, where $c = 3.00{\cdot}10^8$ m/s is the speed of light in a vacuum and n is the materials **index of refraction**
The wave intensity is the power-to-area ratio: $I = \frac{P}{a}$
For a circular or spherical wave: $I = \frac{P_{source}}{4\pi r^2}$
The sound intensity level is $\beta = (10\,\mathrm{dB})\log_{10}\left(\frac{I}{1.0{\cdot}10^{-12}\,\mathrm{W/m^2}}\right)$
Doppler effect:
Approaching source: $f_+ = \frac{f_0}{1-v_s/v}$
Receding source: $f_- = \frac{f_0}{1+v_s/v}$
Observer approaching a source: $f_+ = (1 + v_o/v)f_0$
Observer receding from a source: $f_- = (1 - v_o/v)f_0$

Strings, electromagnetic waves, and sound waves in closed-closed tubes must have nodes at both ends: $\lambda_m = \frac{2L}{m}$, $f_m = m\frac{v}{2L} = mf_1$, where $m = 1,2,3,\ldots$

The frequencies and wavelengths are the same for a sound wave in an open-open tube, which has antinodes at both ends.

A sound wave in an open-closed tube must have a node at the closed end but an antinode at the open end. This leads to $\lambda_m = \frac{4L}{m}$, $f_m = m\frac{v}{4L} = mf_1$, where $m = 1,3,5,\ldots$

The beat frequency between waves of frequencies f_1 and f_2 is $f_{beat} = f_1 - f_2$