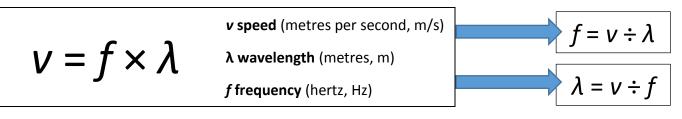
Name:

Using the wave formula: wave speed, frequency and wavelength



Worked example

- Q: A sound wave of frequency 220 Hz travels at a speed of 340 m/s in air. What is its wavelength?
- A: Wavelength, $\lambda = v \div f = 340 \div 220 = 1.55 \text{ m}$ (If the wave speed is in metres per second and the frequency is in hertz, the wavelength will be in metres)

Questions

- 1. Calculate the $\ensuremath{\textbf{wave speed}}$ (in m/s) for the following waves:
 - a) A sound wave in steel with a frequency of 500 Hz and a wavelength of 3.0 metres.
 - b) a ripple on a pond with a frequency of 2 Hz and a wavelength of 0.4 metres.
 - c) A radio wave with a wavelength of 30 m and a frequency of 10,000,000 hertz.
- 2. Calculate the **wavelength** (in metres) for the following waves:
 - a) A wave on a slinky spring with a frequency of 2 Hz travelling at 3 m/s.
 - b) An ultrasound wave with a frequency 40,000 Hz travelling at 1450 m/s in fatty tissue.
 - c) A sound wave with frequency 440 Hz travelling at 340 metres per second in air.
- 3. Calculate the **frequency** (in Hz) for the following waves:
 - a) A sound wave of wavelength 10 metres travelling at 340 metres per second in air.
 - b) A wave on the sea with a speed of 8 m/s and a wavelength of 20 metres.
 - c) A microwave of wavelength 0.15 metres travelling through space at 300,000,000 m/s.