

Physics

Nathan Alspaugh

December 9, 2024

Contents

1	Waves	2
1.1	Symbols	2
1.2	Formulas	2
1.3	Example Problems	2

1 Waves

Waves are a way to represent the movement of energy through a medium. They have a frequency and a wavelength. The frequency is the number of cycles per second and the wavelength is the distance between two peaks or valleys. The velocity of a wave is the product of the frequency and the wavelength.

1.1 Symbols

- v is the velocity of the wave ($\frac{m}{s}$)
- f is the frequency of the wave in Hertz ($\frac{1}{s} \vee s^{-1}$)
- λ is the wavelength of the wave (m)

1.2 Formulas

$$v = f * \lambda$$

$$f = \frac{v}{\lambda}$$

$$\lambda = \frac{v}{f}$$

1.3 Example Problems

Problem 1 Calculate the period of a wave whos frequency is 440Hz.

$$f = \frac{1}{T}$$

$$440 = \frac{1}{T}$$

$$T = \frac{1}{440}$$

$$T = 2.2\bar{7} = 0.00227s$$

Problem 2 A meteriological station informs that the waves along the coast have a separation of 8s. Calculate the frequency of the waves.

$$f = \frac{1}{T}$$

$$f = \frac{1}{8}$$

$$f = 0.125Hz$$

Problem 3 A mosquit emits a sound when it beats its wings 600 times per second.

(a) What is the frequency of the waves produced?

$$600Hz$$

(b) *What is the wavelength of the waves produced by the mosquito given that the speed of sound is 340m/s?*

$$\lambda = \frac{v}{f}$$
$$\lambda = \frac{340 \text{ m/s}}{600 \text{ s}^{-1}}$$
$$\lambda = 0.566\bar{6} \text{ m}$$