

Name: \_\_\_\_\_ Block: \_\_\_\_\_ Date: \_\_\_\_\_

## Calculating Wave Speed, Frequency, and Wavelength

Formulas:  $v = \lambda * f$   $f = \frac{v}{\lambda}$   $\lambda = \frac{v}{f}$

Where  $v$  stands for \_\_\_\_\_ and the units are meters per second (m/s).

$\lambda$  stands for \_\_\_\_\_ and the units are meters (m).

$f$  stands for \_\_\_\_\_ and the units are Hertz (Hz).

1. What is the speed ( $v$ ) of a wave that has a wavelength ( $\lambda$ ) of 2 m and a frequency of 6 Hz?

Solving for	Equation
Substitute	Answer w/ units

2. Calculate the speed of a wave with a frequency of 2 Hz (2/s), amplitude of 3m, and a wavelength of 10 m.

Solving for	Equation
Substitute	Answer w/ units

3. If two wavelengths pass a given point each second, and the distance between wave crests is 3 m, what is the wave speed?

Solving for	Equation
Substitute	Answer w/ units

4. The lowest pitch that the average human can hear has a frequency of 20 Hz. If sound with this frequency has a wave speed of 340 m/s, what is its wavelength?

Solving for	Equation
Substitute	Answer w/ units

5. A bottlenose dolphin can hear sounds with frequencies up to 150,000 Hz. If the speed of sound in sea water is approximately 1,500 m/s, what is the wavelength?

Solving for	Equation
Substitute	Answer w/ units

6. Waves in the ocean are 6 m apart and pass a surfer every 2 s. What is the wave speed.

Solving for	Equation
Substitute	Answer w/ units

7. A buoy on a lake bobs up and down. The waves that cross the buoy have a wavelength of 3 m and a frequency of 3 Hz. What is the speed of the waves?

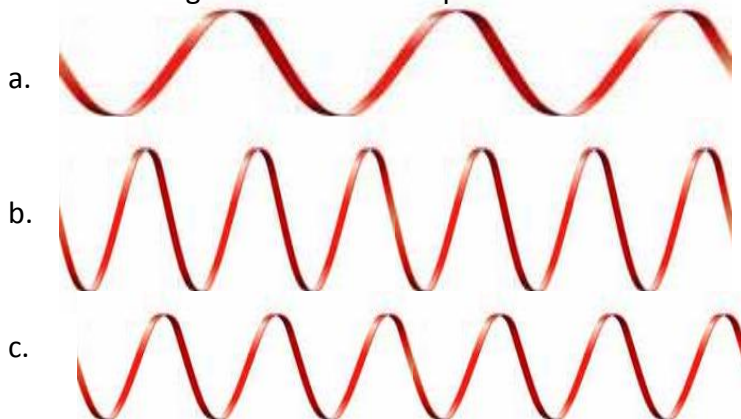
Solving for	Equation
Substitute	Answer w/ units

8. A ship anchored at sea rocked by waves whose crests are 14 m apart. The waves travel at 7 m/s. How often do the wave crests reach the ship?

Solving for	Equation
Substitute	Answer w/ units

9. Why should a wave, such as a light wave, bend when it passes from air into water?
- The wave does not actually bend, but only appears to bend.
  - The light wave interferes with other energy waves in the water.
  - Waves are usually reflected by water
  - The speed of light is slower in water.
10. Which of the following is an example of a mechanical wave?
- A water wave
  - A gravitational wave
  - A light wave
  - An electromagnetic wave.

Examine the following waves to answer questions 11-13.



11. Which wave has the highest energy? Why?
12. Which wave has the lowest energy? Why?
13. Calculate the frequencies of each wave given that each wave segment passed a given point in 2 seconds.