**Wave Properties**

AP Physics 1

1. Define each of the following terms and illustrate it or give an example:

*Wave:*

*Transverse Wave:*

*Longitudinal Wave:*

*Medium:*

*Wavelength:*

*Amplitude:*

*Frequency:*

2. Sketch a transverse wave. Label the crests, troughs, wavelength, and amplitude.

3. If the rate at which a disturbance is made is doubled, what is the effect on the period, frequency, amplitude, and wavelength of a wave?

4. If the amount of energy used to create a disturbance is doubled, what is the effect on the period, frequency, amplitude, and wavelength of a wave?

5. What factors influence the velocity of a given type of wave?

6. A wave has a frequency of 1500 Hz and a wavelength of 2.0 m. What is its velocity?

7. A radio wave has a wavelength of 2.94 m. What is its frequency? The speed of light is 3.00 x 108 m/s.

8. If the crests on an ocean wave are 3 m apart and pass by a fixed point on a jetty every 2.5 s, how fast are the waves moving? What is the frequency of the waves?

9. Bob creates a sound wave using a tuning fork whose frequency is 550 Hz. The speed of sound in air is 343 m/s.

a) What is the wavelength of Bob’s sound wave?

b) Bob uses the same tuning fork to create sound waves in helium. He measures the wavelength of the sound waves in helium to be 2.0 m. What is the speed of sound in helium?

10. Heimlich creates continuous waves on a stretched spring by flicking the spring with his finger repeatedly. He makes the following changes in how he creates his waves (shown in table). In each case he keeps everything else the same. Indicate if the velocity, frequency, wavelength, and amplitude increase, decrease, or remain the same in each response to each change.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Velocity** | **Frequency** | **Wavelength** | **Amplitude** |
| Flicks spring harder |  |  |  |  |
| Stretches spring more |  |  |  |  |
| Flicks spring more times per second |  |  |  |  |