Wave Basics   Name:_____
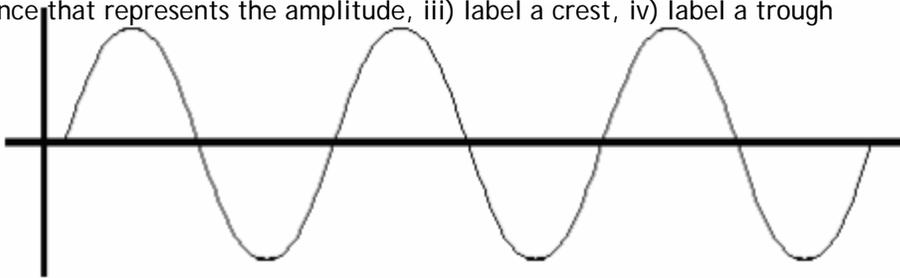
1) What is the top of a wave called?

2) What is the bottom of a wave called?

3) What is frequency?

4) What does amplitude measure?

5) On the diagram below, indicate the distance that represents the: i) a wavelength of the wave, ii) indicate the distance that represents the amplitude, iii) label a crest, iv) label a trough

6) How many complete waves are there in the diagram above?

7) The time from the beginning to the end of the wave train in each situation is **1 second**.
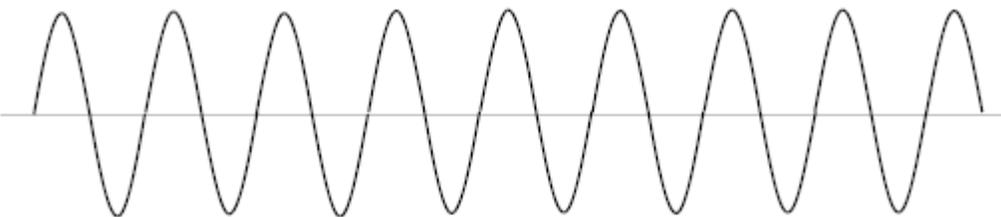
Wave 1
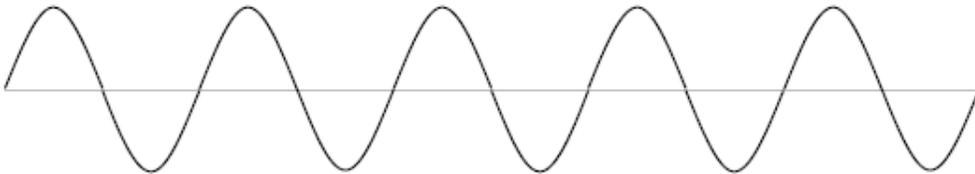
a) How many waves are there in this wave train? _____

b) Wavelength _____ cm   c) Amplitude _____ cm   d) frequency _____ Hz   e) speed _____ cm/s

Wave 2

a) How many waves are there in this wave train? _____

b) Wavelength _____ cm   c) Amplitude _____ cm   d) frequency _____ Hz e.) speed _____ cm/s

Wave 3
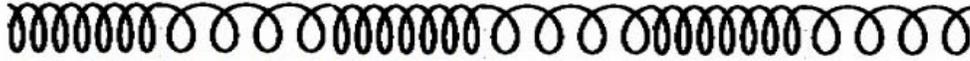

a) How many waves are there in this wave train? _____

b) Wavelength _____ cm   c) Amplitude _____ cm   d) frequency _____ Hz e.) speed _____ cm/s

8) A tuning fork produces a wave at 280 Hz and with a wavelength of 1.5 m. Calculate its velocity.

9) A wave moves toward shore at 5.0 m/s. What is its wavelength if its frequency is 2.5 Hz?

10) The speed of sound is 340 m/s. The wavelength of a sound produced by an instrument is 0.65 meters. What is its frequency?

Longitudnial Waves

A camera takes a picture of a longitudinal wave for one full second. You can use a ruler to measure in centimeters. For each wave answer the questions and measure the parts of the wave.
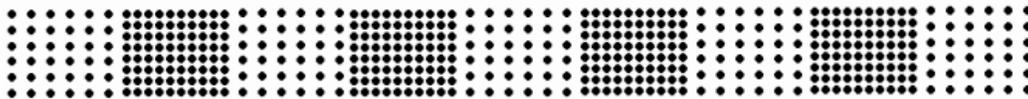
Wave 1

1. How many full wavelengths are there in this wave? _____

2. Measure one Wavelength: _____ cm

3. If this picture was taken over one second, what is the *frequency* of the wave? _____ Hz

4. If you were to time how long it takes one complete wavelength to pass you buy, you would have measured the _____.

5. What is the period of this wave?

G   U   E   S   S

6. You measured the wavelength and found the frequency of the wave. Use these two measurements to calculate the speed of the wave in centimeters per second (cm/s):

G   U   E   S   S

Wave 3

1. How many full wavelengths are there in this wave? _____

2. Measure one Wavelength: _____ cm

3. If this picture was taken over one second, what is the *frequency* of the wave? _____ Hz

4. If you were to time how long it takes one complete wavelength to pass you buy, you would have measured the _____.

5. What is the period of this wave?

G   U   E   S   S

6. You measured the wavelength and found the frequency of the wave. Use these two measurements to calculate the speed of the wave in centimeters per second (cm/s):

G   U   E   S   S

Physics: Waves   Name_____

This worksheet is designed to give you some practice using the general wave equation: $v=\lambda f$.

1. What is the v if λ = 8 m and f = 20 Hz?

6. What is the f if v = 120 m/s and λ = 3 m?

2. What is the λ if v = 50 m/s and f = 25 Hz?

7. What is the v if λ = 3 m and f = 10 Hz?

3. What is the f if v = 50 m/s and λ = 10 m?

8. What is the λ if v = 345 m/s and f = 790 Hz?

4. What is the v if λ = 1 m and f = 345 Hz?

9. What is the f if v = 345 m/s and λ = .25 m?

5. What is the λ if v = 100 m/s and f = 3 Hz?

10. Joe the whistle maker knows that the maximum volume for a whistle will occur if the length of the whistle is exactly ¼ of the wavelength. If Joe must make a whistle that plays at a pitch of 320 Hz, how long will the whistle be?

11. How long is the wavelength of KAJA radio whose broadcast frequency is 97.1 MHz? (97.1 MHz =97,100,000 Hz and v = 300,000,000 m/s)

12. Using the velocity of sound at 343 m/s and given the frequencies of a piano scale, compute the wavelengths of that scale.

Note	Frequency	Wavelength	Note	Frequency	Wavelength
C_4	261.6		G_4	392	
D_4	293.6		A_4	440	
E_4	329.6		B_4	493.9	
F_4	349.2		C_5	523.2	

13. What is the relationship of the frequencies of notes C4 and C5?

14. What is the relationship of the wavelengths of notes C4 and C5?

15. What happened to the wavelength as the frequency increased between notes C4 and C5?

16. What is the wavelength of a sound wave with a frequency of 50 Hz? (Speed of sound is 342 m/s)

17. A sound wave in a steel rail has a frequency of 620 Hz and a wavelength of 10.5 m. What is the speed of sound in steel?

18. Determine the frequency of a microwave 6.0 cm in length. (A microwave is an electromagnetic wave. It travels through space at a speed of 3.0 x 10 ^8 m/s)

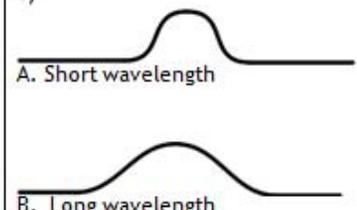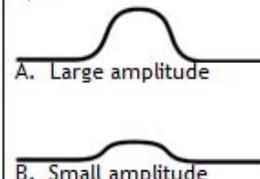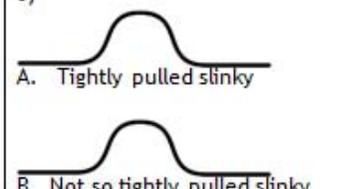19. What is the period of the microwave in problem 22?
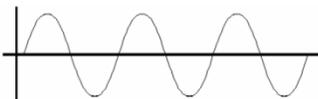
20. How many complete waves are there in the diagram above? Is it transverse or longitudinal?

21. What is the difference between a transverse wave and a longitudinal wave?

22. Are sound waves transverse waves or longitudinal waves? Why?

23. Predict which wave will win the race.

1) A. Short wavelength B. Long wavelength	4) A. Lowest note played by a tuba. B. Highest note played by a piccolo. 5) A. Sound in water B. Sound in air
2) A. Sound wave in hot air B. Sound wave in cold air	6) A. Large amplitude B. Small amplitude 6.5) A. Water wave traveling in center of ocean B. Water wave traveling near shore
3) A. Tightly pulled slinky B. Not so tightly pulled slinky	7) A. High frequency B. Low frequency 8) A. Loud sound B. Quiet Sound

24. Draw the "during" and "after" diagrams for the following images of wave interference.