Name: _____ Period: _____ Date: _____

Wave Speed Worksheet

Total Points: ____ / 56

Conceptual Questions

1. Complete the following chart regarding SI prefixes: (3)

Prefix Name	**Prefix Symbol**	**10^x**
Example: Mega-	*M*	*10^6*
Milli-		
Micro-		
Nano-		

2. What would a sound wave with a **large amplitude** and **large frequency** sound like?

(1)

3. What would a sound wave with a **small amplitude** and **large frequency** sound like?

(1)

4. What would a sound wave with a **large amplitude** and **small frequency** sound like?

(1)

5. What is the speed of sound in normal (dry) 20 °C air? _____ (1)
6. What is the speed of light in a vacuum? _____ (1)
    a. What variable is used to represent the speed of light? _____ (1)

(Note: When completing problems regarding the speed of sound or speed of light, these values will replace the variable v in the wave speed equation.)

Points: ____ / 9

Name: _____ Period: _____ Date: _____

Computational Problems – **No Work, No Credit. Box your Answers. Include Proper Units.**

7. A wave with a frequency of 14 Hz has a wavelength of 3 meters. At what speed will this wave travel? (3)

Knowns **Unknowns** **Formula**

8. The speed of a wave is 65 m/s. If the wavelength is 0.8 meters, what is the frequency of the wave? (3)

Knowns **Unknowns** **Formula**

9. A wave has a frequency of 46 Hz and a wavelength of 1.7 meters. What is the speed of this wave? (3)

Knowns **Unknowns** **Formula**

10. A wave traveling at 230 m/s has a wavelength of 2.1 meters. What is the frequency of this wave? (3)

Knowns **Unknowns** **Formula**

Points: ____ / 12

Name: _____ Period: _____ Date: _____

11. Tom goes outside on a 20 ^{0} C day and knocks two pieces of wood together. If he hears the echo 0.554 seconds later, how far away is the wall? (6)

Knowns **Unknowns** **Formula**

a. If Tom goes outside on a different day and tries this experiment again from the same spot, but this time he hears the echo 0.557 seconds later, what is the temperature outside in Celsius? (6)

Knowns **Unknowns** **Formula**

12. A wave has a frequency of 540 Hz and is traveling at 340 m/s. What is its wavelength? (3)

Knowns **Unknowns** **Formula**

13. Complete the following chart: (0.5 each)

Wavelength (m)	Frequency (Hz)	Wave Speed (m/s)
3.41		356
	264	331
5.28	66.7	
	20,000	343

Points: ____ / 17

Name: _____ Period: _____ Date: _____

14. What is the wavelength range for the FM radio band (88 MHz – 108 MHz)? (6)

Knowns **Unknowns** **Formula**

15. The portion of the visible spectrum that appears brightest to the human eye is around 560 nm in wavelength, which corresponds to yellow-green. What is the frequency of 560 nm light? (3)

Knowns **Unknowns** **Formula**

16. What is the frequency of highly energetic ultraviolet radiation that has a wavelength of 125 nm? (3)

Knowns **Unknowns** **Formula**

17. The Rutgers Crew team is rowing on the Raritan River one morning. If the river is producing waves such that three waves pass by a stationary observer on the banks every two seconds, and the crest-to-crest distance is 1.634 meters, and the boat is rowing upstream at a rate of 5 m/s, what is the crew team's velocity relative to someone standing on the banks? (6)

Knowns **Unknowns** **Formula**

Points: ____ / 18