**Worksheet for chapter 13**

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| T = 1/f  Pendulum: T = 2 π√(L/g)  Spring/mass T = 2 π√(m/k)  v = fl  Speed of sound at STP = 331 m/s  Speed of light = 3 x108 m/s | T = period  f = frequency  l= wavelength  v = speed  L = length g=accel. of gravity  M = mass k=spring constant |

1. A certain tuning fork has a frequency of 256 Hz. What is the wavelength of the sound in air?
2. What is the period of the tuning fork in problem 1?
3. Radio waves travel at the speed of light. How long are the waves of ratio station WINS which has a frequency of 1010 kHz?
4. A pendulum has a length of 28 cm. How long does it take for that pendulum to make one complete vibration?
5. A 0.32 kg mass attached to a spring undergoes simple harmonic motion with a frequency of 1.6 Hz. What is the spring constant of the spring?
6. If you quarter the length of a pendulum, by what factor will its period be changed?
7. Red light has a longer wavelength than blue, but they both travel at the same speed. Which color has the higher frequency?
8. If the length of a pendulum is doubled, what will happen to its period?
9. In order to double the period of a mass/spring system, by what factor would you need to increase the mass?
10. Suppose you drop a 1.00 kg mass on a spring scale which has a spring constant of 4.50 N/m. What period of oscillation will you expect to see?

Answers:

1. 1.29 m
2. 0.0039 s
3. 297 m
4. 1.06
5. 33 N/m
6. Half
7. Blue
8. Lengthened by factor of the square root of two.
9. 4
10. 2.96 s