Final Review Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Unit 6 - Momentum and Impulse

1. What is the formula for momentum?
2. What is the formula for impulse?
3. A 1000 kg car is moving at 20 m/s. The momentum of the car is:
4. A ball was hit by a bat. The impact force is 250 N, and the contact time is 0.2 s. What is the impulse received by the ball?
5. A car crashed into a wall. The impulse is 4000 N-s and the impact time is 0.5 s. What is the impact force on the car?
6. The momentum of a car is 35,000 kgm/s. The mass of the car is 1500 kg. What is the velocity of the car?
7. A 1000 kg car crashed into a garden and stopped. The impulse is 4000 Ns and the impact force is 2000 N.How long it takes for the car to stop?
8. A 2 kg model airplane travels with a velocity of 10 m/s north. A tail wind (blowing from behind) applies a force of 1 N to the north for 2 seconds. What is the final velocity of the airplane?
9. In an inelastic collision, a 900 kg car is at rest at a traffic light when a 760 kg car traveling at 10m/s crashes into its rear. Assuming that no breaks are used, what is the velocity of the cars after the collision?

UNIT 7- WAVES

1. A wave has a velocity of 7.4 m/s and a frequency of 34 Hz. What is the wavelength of the wave?
2. A transverse wave is traveling with a wavelength of .04 m and at a frequency of 12 Hz. What is the speed of the wave?
3. A wave is traveling at 8 m/s and is .025 m from crest to crest. How many cycles per second is the wave traveling?
4. Bananas are placed on a spring scale to weigh them. The mass of the bananas is .37 kg. The spring has a spring constant of 415 N/m. What is the distance that the spring stretched?
5. An ambulance is coming closer to the observer. If the ambulance is going 34 m/s and the frequency of the siren is 450 Hz, what is the frequency that is observed by the person? (Speed of sound is 340 m/s)
6. Label the wave



1. How are frequency and period related in simple harmonic motion?
2. A longitudinal wave has energy that is parallel or perpendicular to the wave?
3. How many nodes does a 207th harmonic standing wave have?
4. T or F: Hooke’s Law states that the force exerted by a spring is directly proportional to the amount it is stretched
5. T or F: The unit for period is Hertz, or cycles per second.

UNIT 8- Light

1. Fill in the chart:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **King** |  | **Died** | **by**  |  | **chocolate** | **milk** |
|  | **Hecto** |  |  | **deci** |  |  |

1. Convert 4 km to millimeters
2. Convert 3.8 gigahertz to nanohertz. Put your answer in scientific notation.
3. Fill in the EM wave Spectrum: 
4. An electromagnetic wave has a wavelength of 2,000 nm. What is the frequency of this wave?
5. The primary colors are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
6. The secondary colors are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
7. Find the angle of refraction for a ray of light that enters a bucket of water from air at an angle of 25o to
 the normal. Index of refraction of air = 1 Index of refraction of water = 1.333
8. Which color is produced by mixing green light and blue light?

1. Which wave from the electromagnetic spectrum has the longest wavelength?
2. An object located 30 cm in front of a lens forms an image on a screen 10 cm behind the lens. What is the focal length of the lens?
3. Find the height of an image when a 6 cm tall object placed 48 cm from a concave mirror that has a focal length of 18 cm. (Put answer in centimeters and meters).
4. ***For each problem draw a ray diagram and solve for the appropriate variables using the formulas provided.***
	1. Determine the image distance and image height for a 5.0 cm tall object placed 45 cm from a concave mirror having a focal length of 15cm.
	2. Determine the image distance and image height for a 5 cm tall object placed 20 cm from a concave mirror having a focal length of 15 cm.
	3. Be able to recognize what kind of images are produced from concave and convex mirrors as well as concave and convex lens.

UNIT 10 – Electricity

1. Define electrostatics
2. Formula for Coulomb’s law:
3. Formula for Ohm’s Law:
4. A negative charge of -2.0 x 10-4 C and a positive charge of 8.0 x 10-4 C are separated by 0.30m. What is the force between the 2 charges?
5. A walkman uses a standard 1.5 V battery. How much resistance is in the circuit if it uses a current of 0.01 A?