**WAVES UNIT ASSIGNMENT**

1. On a crisp fall day, a person chops firewood. He notices that there is a time delay of 4.5s between the time he chops the wood and when he hears an echo. If the air temperature is 8.0°C, how far away is the reflective surface?
2. Sketch pairs of sound waves that illustrate the following contrasts in sound.
   1. Pitch (low versus high)
   2. Loudness (quiet versus loud)
3. Compare and contrast mechanical resonance and damping. Give examples of each.
4. You are standing at a railway crossing. A bullet train approaching at 200 km/h sounds its horn. If the frequency of the horn is 442 Hz and the air temperature is 20.0˚C, what frequency do you hear when the train has passed by you?
5. Does the Doppler effect apply only to sound or can it apply to any form of wave motion? Explain.
6. If sound waves travel through the ground with an average speed of 6150 m/s and a powerful explosion occurs 5.00 km away, how much time will elapse between when you feel the vibration from the explosion and when you hear the explosion? Assume that the speed of sound in air is 344 m/s.
7. Radio waves travel at the speed of light, 3.0 x 108 m/s. If a radio wave has a period of 8.0 x 10-4 s, determine the wavelength.
8. A narrow plastic pipe is placed inside a large graduated cylinder filled with water. An 880 Hz tuning fork is held over the top end of the pipe. If the speed of sound in air is 340 m/s, calculate the length of the pipe the second harmonic is heard.
9. Choose a musical instrument. Identify if it is a stringed or wind instrument, and describe how the music is produced. Be sure to use words like resonator, vibrator, reed type, open or closed,…