

Chapter 14-16 Worksheet 1

1. What is the period of a pendulum?
2. The period of a pendulum depends on what two things?
3. Label the parts of the transverse wave (crests, trough, amplitude, wavelength)
4. What is the frequency of a wave?
5. What is the source of all waves?
6. What is a transverse wave? Give an example.



7. What is a longitudinal wave? Give an example.
8. What is constructive interference? Draw a picture.
9. What is destructive interference? Draw a picture.



10. What produces standing waves.
11. Label the parts of the standing wave
12. What is the Doppler effect? Give an example.
13. What is the difference between a bow wave and a shock wave?
14. What produces a sonic boom?
15. Why don't we hear a sonic boom from a slower-than-sound, or subsonic, aircraft?

Simple Harmonic Motion and Waves

1. A. What is the frequency, in hertz, that corresponds to the following periods: (a) 0.10s (**10 Hz**) (b) 5 s (**.2 Hz**) (c) 1/60 s (**60 Hz**) (d) 24 hours (**1.2×10^{-5} Hz**) B. What is the period, in seconds, that corresponds to the following frequencies? (a) 15 Hz (**.067 s**) (b) 2.25×10^{-5} Hz (**4.44×10^4 s**) C. A metronome is set to make 12 complete vibrations in 15 seconds. What is the frequency of the metronome? (**.8 Hz**)
2. Mr. Robbins does extreme pogo sticking on the weekends. His custom made pogo stick has a spring constant of 6500 N/m. As he jumps down a set of stairs, his pogo stick compresses 0.17 m with each jump. How much force did Robbins exert on the pogo stick? (**1105 N**)
3. As Ms. Harper, whose mass is 65.0 kg stands on a bathroom scale with a force constant of 250 N/m, the needle vibrates back and forth. What is the period of vibration of the needle? (**3.2 s**)
4. Byron places a 0.82 kg package on a scale, compressing the scale by 0.033 m. What is the force constant of the spring in the scale? (**240 N/m**)

5. Mr. Hinsley makes a 78 cm long simple pendulum. He uses his massive brain power to predict that it will take 35 seconds to make 20 complete oscillations. Is he correct? Show your work! (No, he needs $T = 1.75$ s)
6. Andrew, the astronaut, constructs a 1.00 m long simple pendulum on the moon. He times 15 complete swings in a time of 75 seconds. What is the acceleration due to gravity on the moon? $T = 5.0$ s, $g = 1.6$ m/s²)
7. John is pushing Adam on a swing that hangs from a tree branch by 2.25 m long ropes. With what frequency will John have to push Adam as he swings? ($f = .332$ Hz)
8. While sitting on a pier, John notices that the waves are 2.0 m between crests and they hit the pier every 0.75 s. What is the frequency and speed of the waves? ($f = 1.3$ Hz, $v = 2.6$ m/s)
9. A gamma ray is a form of electromagnetic radiation. Find the wavelength of a gamma ray with a frequency of 10^{22} Hz. (3×10^{-14} m)
10. The wavelength of a shade of yellow light is 5.80×10^{-7} m. Find the frequency of this light. (5.17×10^{14} Hz)
11. Your physics teacher says "Hello" to you from across the gym, 34 meters away. How long does it take the sound to reach you? (The speed of sound is 340.0 m/s) ($d/v = t$, .10 s)
12. If your physics teacher speaks with a frequency of 1200 Hz, what is the wavelength of the sound? (.28 m)