

Wave Motion Worksheets – Write complete answers and/or solving (K-U-E-S) on a separate piece of paper.

1. Distinguish among these different parts of a wave: amplitude, crest, trough, and wavelength.
2. Distinguish between the *period* and the *frequency* of a vibration or a wave. How do they relate to one another?
3. Does the medium in which a wave travels move along with the wave itself? Defend your answer.
4. How does the speed of a wave relate to its frequency and wavelength?
5. As the frequency of sound is increased, does the wavelength increase or decrease? Give an example.
6. Distinguish between a *transverse* wave and a *longitudinal* wave.
7. How far, in terms of wavelength, does a wave travel in one period?
8. What is the period of a pendulum?
9. What is the period of a pendulum that takes one second to make a complete back-and-forth vibration?
10. Suppose that a pendulum has a period of 1.5 seconds. How long does it take to make a complete back-and-forth vibration? Is this 1.5-second period pendulum longer or shorter in length than a pendulum with a period of 1.0 s?
11. A nurse counts 76 heartbeats in one minute. What are the period and frequency of the heart?
12. New York's 300.0 m high Citicorp tower oscillates in the wind with a period of 6.80 s. Calculate the frequency?
13. Calculate the speed of waves in a puddle that are 0.15 m apart and made by tapping the water surface twice each second.
14. Calculate the speed of waves in water that are 0.4 m apart and have a frequency of 2 Hz.
15. If you triple the frequency of a vibrating object, what will happen to its period?
16. While watching ocean waves at the dock of the bay, Otis notices that 10 waves pass beneath him in 30 seconds. He also notices that the crests of successive waves exactly coincide with the posts of the dock that are 5 meters apart. What are the period, frequency, wavelength, and speed of the ocean waves?
17. If a wave vibrates back-and-forth three times each second, and its wavelength is 2 meters, what is its frequency? Its period? Its speed?
18. Red light has a longer wavelength than violet light. Which has the greater frequency?
19. If a wave vibrates up and down twice each second and travels a distance of 20.0 m each second, what is its frequency? Its wave speed?
20. The lowest frequency we can hear is 20.0 Hz. Calculate the wavelength (in feet) associated with this frequency for sound that travels at 340.0 m/s.
21. When a wave source moves toward a receiver, does the receiver encounter an increase in wave frequency, wave speed, or both?
22. Does the Doppler effect occur for only some types of waves or all types of waves?