**Physics of Sound Quiz Answer Key**

1. **Label the transverse wave and the longitudinal wave.**

🡹 transverse wave 🡻 longitudinal wave

1. **Draw a transverse wave with axes of displacement and time.**
	1. **Label the amplitude.**
	2. **Label the period.**
2. **Calculate the speed of a wave with amplitude of 2 meters, frequency of 200 Hz,
and wavelength of 4 meters.**

$$f=\frac{v}{λ}$$

200 Hz x 4 meters = v

v = 800 meters/second because Hz = 1/s

1. **What is the difference between sound and noise?**

Sound consists of vibrations that travel through air or other media that can be heard when they reach the ear. Noise is unwanted or unpleasant sound, and is subjective.

1. **How does sound move through different media?**

Sound travels through media by vibrating molecules in the matter. Closely packed molecules, like in solids, transfer sound faster than loosely packed molecules, like in liquids and gases.

1. **Speakers, 1 meter away, produce a sound intensity of 0.01 W/m2.
Calculate the sound intensity level of the speakers.**

$$I\_{0}=10^{-12}\frac{watts}{m^{2}} β\left(dB\right)=10log⁡\left(\frac{I}{I\_{0}}\right)$$

$β $= 10 log (.01 W/m2 ÷ 10-12 W/m2)

$β$ = 100 dB

*Image sources:*

Transverse wave (boy, rope, tree): 2010 CK-12 Foundation, Wikimedia Commons CC BY-SA 3.0 [https://commons.wikimedia.org/wiki/File:Wave\_in\_a\_rope.png](https://commons.wikimedia.org/wiki/File%3AWave_in_a_rope.png)

Longitudinal wave (hands, springs): 2015 Wikimedia Commons CC0 1.0 universal public domain dedication [https://commons.wikimedia.org/wiki/File:Longitudinal\_wave\_jp.svg](https://commons.wikimedia.org/wiki/File%3ALongitudinal_wave_jp.svg)

Graph: 2016 Kent Kurashima, ITL Program, College of Engineering and Applied Science, University of Colorado Boulder (author)