

Sound Test Study Guide

- 1) Define the following vocabulary words
 - ◆ **Pitch** :The highness or lowness of a sound as determined by its frequency
 - ◆ **Amplitude**: The energy in a sound wave
 - ◆ **Frequency**: The number of times a sound source vibrates in one second
 - ◆ **Sound Wave**: An area of bunched-up and spread-out air particles that moves outward in all directions from a vibrating object
 - ◆ **Vibration**: The back and forth motion of an object.
 - ◆ **Volume**: How loud a sound is
- 2) What causes sound? Name an example. Sound is energy. It is caused by vibrations of things (matter). When a sound is made, object hit, etc. that reaction will vibrate the air, water, or gas around the incident. The vibration of the medium (air, liquid, or gas) eventually reaches our ear causing us to “hear” the sound. For example, when a ball hits the bat. The impact will vibrate the air around the ball / bat hit – it reaches our ear and we hear it and recognize it as the ball and bat making contact.
- 3) What are the three characteristics of a sound wave? Wave Length – (does not directly affect the sound, but the shorter the wave length – most often the higher the frequency, longer the wave length – lower the frequency), Frequency - is the speed of the wave length, faster the wavelength, faster or higher the frequency, & changes the pitch of the sound, and Amplitude – how intense, powerful, and loud the sound is, the “taller” the wavelength, the bigger the amplitude is
- 4) How are pitch and frequency related? Frequency changes the pitch of the sound. The higher the frequency (faster the wave length) – the higher the pitch. The lower the frequency (slower the wave length) – the lower the pitch.
- 5) How does frequency and pitch influence what we hear? Name an example. Frequency changes the pitch of the sound. The higher the frequency (faster the wave length) – the higher the pitch. Examples of high pitch sound - typically birds, babies crying, sopranos, chipmunks, piccolo, flutes, Chris Rock (example from class..) The lower the frequency (slower the wave length) – the lower the pitch. Examples of low pitch sound - typically bassoon, tuba, toads/frogs, thunder, bass drum, Barry White (example from class..)
- 6) What is the difference between high and low pitch? high vs. lower pitch is a difference in the sound we hear
- 7) How does amplitude influence what we hear? Name an example. The amplitude is the power, intensity, or loudness of the sound. The bigger the amplitude, the more intense, powerful, and loud the sound is...examples – music in front of the speaker at a rock concert, sound of an explosion, sound of an avalanche, or sonic boom. The smaller the amplitude, the less intense, weak, and quiet the sound is...examples – tip toeing on a carpet, small birds, snow falling, whispering etc.
- 8) What are the three mediums that sound travels through? (How does sound travel through different materials?) The three mediums that sound can travels through are gas, liquid, and solids. The sound waves cause the molecules of the mediums to vibrate, which bumps into each other causing the next to vibrate and so forth. Sound travels through solids the fastest and gas the slowest.
- 9) Which medium does sound travel fastest? Sound travels through solids the fastest and gas the slowest.
- 10) What type of objects demonstrates a sound wave? Sound waves travel like a spring or a Slinky.(Sound waves are a compression waves... you don't have to know that for the test)

11) How can we change objects to produce different types of sound? (think about rubber bands, bottles, glasses of water, metal bars, carpet, boom whackers....)

- Metal Bars: longer bars produce a lower pitch than shorter bars....
- Glass Bottles – tapping the bottles: more water produces lower pitch while less water produces higher pitch... more mass creates lower frequency which is a lower pitch
- Glass Bottles – blowing across the top: less water (more air in bottle) produces lower pitch while more water (less air in bottle) produces higher pitch... more air has less pressure and a slower vibration (lower frequency)
- Thick n Thin Stretched Rubber Bands (or string) : when stretched to the same size... thicker rubber bands produce a lower pitch while the thin rubber bands produce a higher pitch sound - thicker rubber bands have more of a surface area (more mass) and will produce a slower or lower frequency
- Metal / Plastic Buckets: making a sound into a metal bucket or any other hard surface (like plastic) will produce an echo because the sound wave bounces back
- Metal Bucket with Towel: the towel will absorb the sound wave and slow it down (or dissipates) or absorbs so much of the sound wave to the point that you may not hear it at all
- Megaphone: megaphones direct the sound wave; therefore, the sound is not only directionally directed, but collected and will produce a louder sound in the direction the megaphone is pointed
- Phone Cups: Cups and string can be used as a “phone” because your voice will vibrate the air which will vibrate the cup and string to the other person at the end of the cup/string

12) What is sound like in outer space? *There is no sound in outer space because there is no medium in the vacuum of outer space. There is no air; therefore no air molecules to vibrate to reach our ears to hear*