Physical Science
Week 12: Text pp. 334-349

True (+) or False (0): Write all answers on the answer sheet.

1. Sound waves are transverse waves.
2. Sound waves are only transmitted through air.
3. Sound waves consist of a compression pulse and a rarefaction pulse.
4. In a compression pulse, air molecules are bunched together.
5. A vibrating object, like a guitar string, produces a sound wave that has a different frequency than the vibrating object.
6. Sound waves require a medium in order to be transmitted.
7. There is no air on the moon, therefore there would be no sound.
8. Boyle proved that there can be no sound without matter to transmit it.
9. The strength of a sound wave is known as its wavelength.
10. Increasing the amplitude of a sound wave increases its intensity or loudness.
11. The decibel is a unit of sound intensity.
12. A decibel is 1/100 of a bel.
13. Prolonged sound levels of 100 decibels or more can cause temporary ear damage.
14. A typical rock concert can be 100-115 decibels.
15. Personal headphones at high volume can be 114-128 decibels.
16. Pitch is determined by sound amplitude.
17. The greater the frequency of sound waves, the higher their pitch.
18. Pitches above the audible range of hearing are called infrasonic.
19. As you go up the keyboard of a piano (to the right), pitch increases.
20. Under normal conditions at sea level, the speed of sound is about 500 feet per second.
21. The Doppler effect causes sound waves to be compressed in front of a moving object, thus raising the frequency and the pitch.
22. Sounds travel faster in solids than in gases.
23. Sound waves undergo reflection, refraction, and diffraction just like other waves.
24. Bats navigate by generating sound waves.
25. Sound waves can experience interference like water waves.

Fill in the answers on the answer sheet:

1. Sound requires a _?_ in order to be transmitted.
2. The intensity of a sound depends on the _?_ of its waves.
3. Immediate damage to unprotected ears occurs at _?_ decibels.
4. How many decibels are stereo headphones at high volume?

5. The range of audible sounds for humans is _?_ Hz to _?_ Hz.

6. The range of audible sound is (more/less) for a middle-aged person than for a young person.

7. The siren of an ambulance moving toward you will be higher pitched because of the _?_ effect.

8. If you see lightning, then hear the thunder 10 seconds later, how far were you from the lightning?

9. A device for producing pure musical sounds of a definite pitch is the _?_.

10. Sound travels faster through _?_ (warm/cold) air.

11. Mach 2 means _?_.

12. To produce an echo, the original sound must be more than _?_ from the reflecting surface.

13. Sonar is used by the navy for _?_.

14. The word “sonar” stands for _?_.

15. Boaters use pulses of ultrasonic sound to _?_.

16. How do doctors use “ultrasound”?

17. Look at the picture of the bat on p 344. How is the bat adapted for using sound?

18. Over the ocean, sound often refracts downward during what part of the day?

19. What kind of wall is best for absorbing sound?

20. When 2 musical notes interfere in a pleasing way, the result is called _?_.

21. The lowest frequency of a musical note is called the _?_.

Vocabulary - write the definitions for these terms on the answer sheet and be able to explain them next week from memory in your own words .

1. loudness
2. decibel
3. pitch
4. ultrasonic sound
5. Doppler effect
6. supersonic
7. sonar
8. fundamental
9. overtone