Sound Section 2 Properties of Sound Pages 650-655

1. *What two factors affect how loud a sound seems to you? The loudness of sound depends on two factors:*
   a. **the amount of energy it takes to make a sound (the more energy you put into making the sound, the louder the sound)**
   b. **the distance from the source of the sound (the closer the source of the sound, the louder it is to you)**
2. *When scientists measure the loudness of a sound, what unit do they use?*

   Scientists measure the loudness of a sound with the unit called <u>decibels</u>. (dB)

3. ***List 5 sounds in order from soft to loud. Tell how loud each sound is in decibels.***

   Rustling leaves = 10 dB
   Whisper = 15-20 dB
   Very soft music = 20-30 dB
   Normal conversation = 40-50 dB Heavy street traffic = 60-70 dB
   Rock Concert = 110-120 dB
   (Pg. 652)

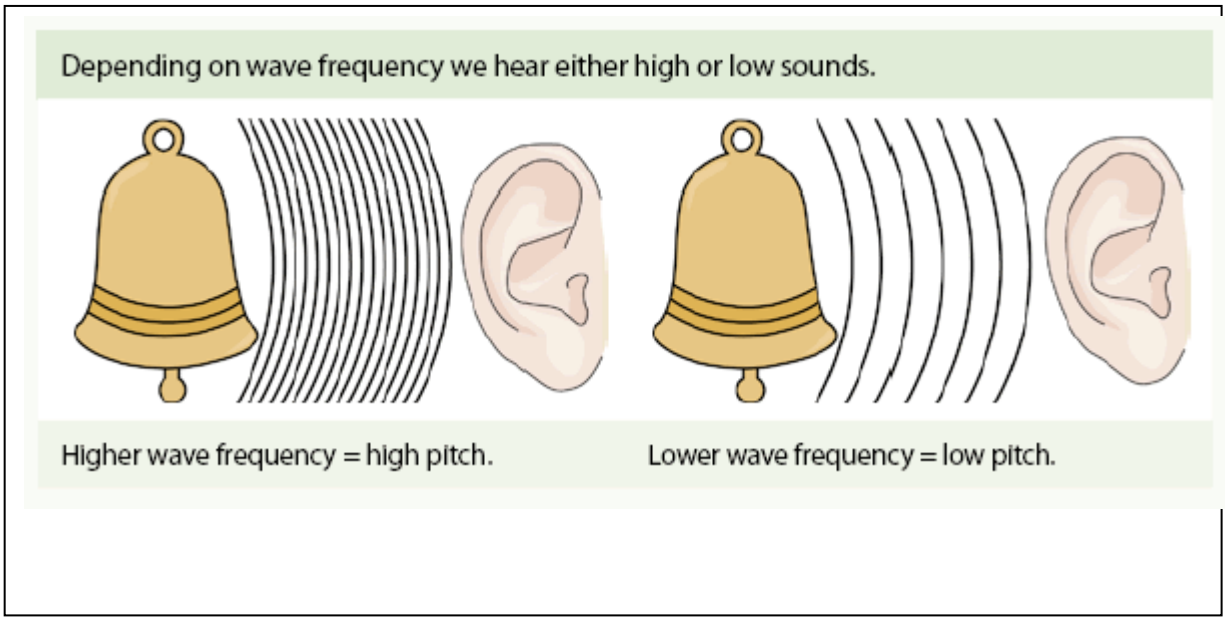
4. *Approximately how loud does a sound have to be to start causing damage to your ears?*

If you hear sounds louder than <u>100 dB</u>, it can cause damage to your ears, especially if you listen to those sounds for long periods of time often.

5. *What is pitch?*

It is a description of how <u>high</u> or <u>low</u> the sound seems to a person.

6. Draw and label a <u>high pitch</u> sound and a <u>low pitch</u> sound. Label one wavelength on each longitudinal wave.



7. *What range of frequencies do most people hear?*
Average people can hear from 20 Hz to 20,000 Hz. (Mrs. Earls can only hear 55 Hz – 14,000 Hz.)

8. *Video- How Old are your Ears? Explain why everyone loses their high frequency hearing as they age.*

Older people lose their high frequency hearing because the hair cells in the cochlea deteriorate over time.

9. ***Hearing Tests- What is your range of hearing in hertz? What range of hearing do your parents and grandparents have?***

10. ***See this website to view the top 10 animals with the best hearing:***

http://www.pawnation.com/2014/05/02/10-animals-with-great-hearing/

i. **Greater Wax Moth---can hear ultra sounds up to 300,000 Hz to evade bats!**
ii. **Dolphins ----75 Hz-150,000 Hz**
iii. **Bats---20 Hz-120,000Hz**
iv. **Rats----can hear up to 76,000 Hz**
v. **Dogs-----can hear up to 67,000 Hz**
vi. **Cats---can hear up to 64,000 Hz**
vii. **Elephants – can hear very low frequencies (16 Hz)**
viii. **Pigeons – can hear very low frequencies (0.5 Hz)**

11. How is an ultra sound different than an infra sound? What is an ultra sound and name 3 animals that hear ultra sounds.

Ultra sound is a sound above what humans can hear (above 20,000 Hz) (humans cannot hear ultrasounds)
Infra-sound is below what humans can hear (below 20 Hz)

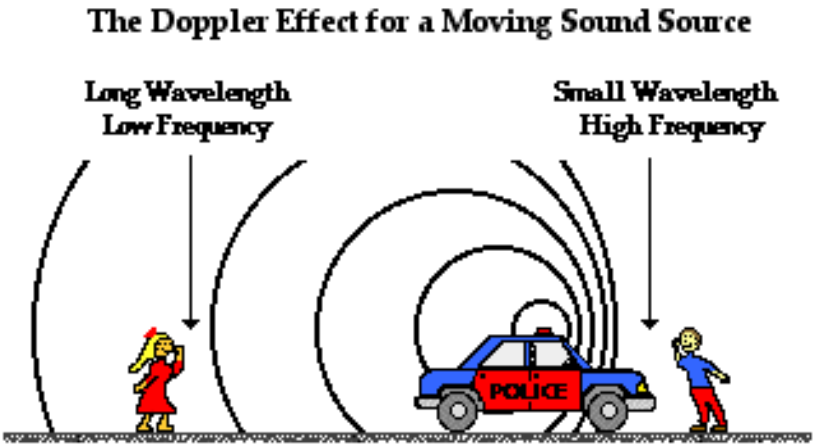
12. When you speak or sing what two things vibrate to create the sound waves?

The air from your lungs that rushes through the vocal cords vibrates and causes the vocal cords to vibrate.

13. What is the Doppler Effect and why does it occur?

It is the change in frequency of a wave as its source moves in relation to an observer. As the sound wave moves toward the observer the waves get compressed and the frequency increases, causing the sound to be higher pitch. As the sound wave moves past the observer, the sound waves spread out causing a lower frequency which lowers the pitch.

14. *Draw and label a picture which illustrates the Doppler effect.*



15. *What is a shock wave or sonic boom?*

Sonic boom- a loud explosive sound caused by the shock wave of an aircraft travelling at supersonic speed (faster than the speed of sound)

Shock Wave- sharp change of pressure in a narrow region traveling through a medium, especially air, caused by explosion or by a body moving faster than sound.

http://physics.info/shock/