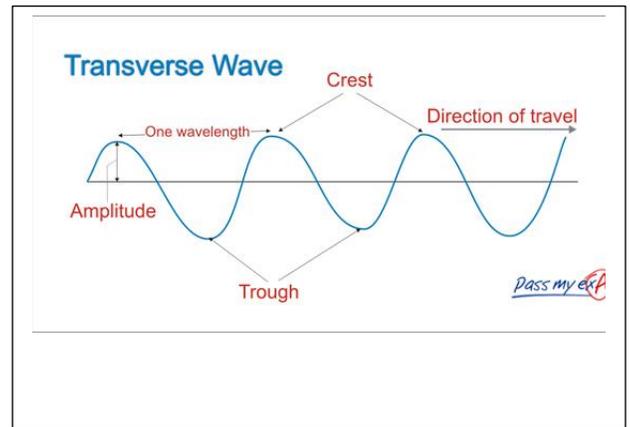
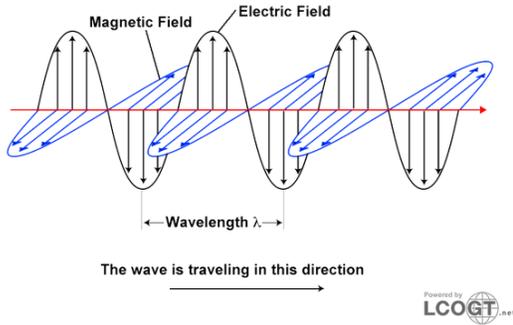


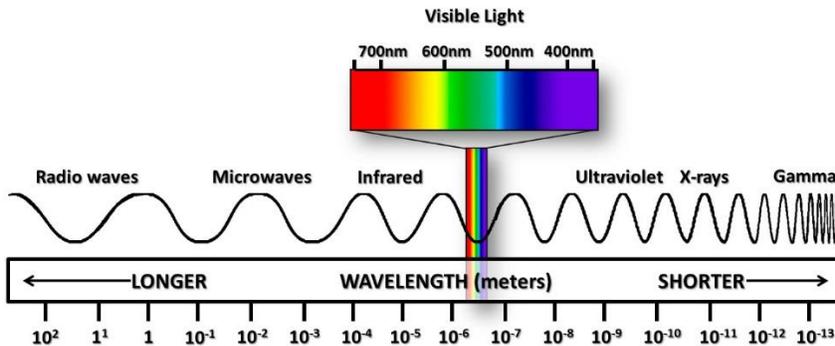
**Answers to Sound and Light Power Point**

1. Sound is a mechanical wave; it must have a medium to travel
2. Sound is a longitudinal wave; it has compressions and rarefactions
3. Yes, sound needs a medium in order to travel
4. In a sound wave the oscillation is parallel to the direction that the energy travels
5. No, matter does not move with the energy. The matter returns to its original position but the energy moves forward.
6. When a speaker pushes forward, it creates a compression in a sound wave
7. When the speaker pulls back, it creates a rarefaction in the sound wave
8. Hearing is movement detection. This means that when you hear something you are detecting vibrating air molecules.
9. Air is considered an elastic medium because when it moves or vibrates, it bounces back to its original position sort of like a rubber band
10. Yes, the ear drum is an elastic medium because it vibrates when the sound wave hits it and then bounces back to its original position.
11. According to this table, sound moves faster in lead than it does in water that is 20 degrees Celsius.
12. The chart and graph that we made from the red text book shows that sound moves faster in water than it does in lead. We found this to be an anomaly. But the computer slide table shows that sound moves faster in water (30 degrees Celsius) than in lead. There is a discrepancy or difference in data because the water in the book (30 degrees) is warmer than the water in the table (20 degrees). Sound moves faster in warmer water.
13. Sound moves faster in solids
14. Sound moves slowest in gases
15. According to this chart, sound moves fastest in lead.
16. Sound moves about 15 times faster in iron compared to air.
17. Sound moves about 13 times faster in a brick compared to air.
18. This statement is true. Sound travels faster in mediums that are denser or have molecules closer together.
19. Compressions are closer in a high frequency wave.
20. The low frequency wave would have a lower tone or lower pitch.
21. The high frequency wave has smaller wavelengths.
22. When you change the volume, it changes the amplitude of the wave (the distance from midpoint to crest or trough.)
23. Frequency is the number of wave per second; amplitude is the distance from the midpoint to the crest or trough.
24. Changing the frequency changes the pitch or tone of the sound.
25. Changing the amplitude changes the loudness of the sound.
26. Picture B would represent a loud sound made with a lot of energy because it has a high amplitude.
27. Bongo drums create a high pitch sound and a low pitch sound so the two pictures that represent this would be picture C and Picture D.
28. The auditory nerve carries the electrical signal to the brain.
29. Two outer ear parts are pinna and ear canal (auditory canal).
30. Four middle ear parts are: ear drum, hammer, anvil, stirrup
31. Three inner ear parts are: cochlea, semi-circular canals and auditory nerve
32. The auditory nerve is blue in this diagram
33. When the train passes you, the tone or pitch gets lower because the sound waves are spreading out; wavelengths become larger
34. When animals use echolocation, they are hearing reflected sound waves
35. Soft surfaces, like pads, blankets, carpet, towels, pillows absorb sound and reduce wave disturbance that why recording studios have padded walls
36. Smooth, hard surfaces like tile and hardwood reflect sound and cause wave disturbance and reverberation
37. A light wave moves differently than a sound wave. A light wave is a transverse wave where the oscillation moves up and down but the energy moves to the right. See diagram below or on backside of this paper.

## Electromagnetic Waves



38. In a light wave the oscillation is perpendicular to the energy (oscillation is moving up and down and the energy is moving to the right)
39. The forms of energy that have a longer wavelength than yellow are: orange, red, infrared, microwaves and radio waves (see diagram below to determine this)



40. We see lightening before we hear thunder because light travels much, much faster than sound!
41. Light travels about 881,742 times faster than sound!

42.

Sound	Light
Sound is a mechanical wave	Light is an electromagnetic wave
Sound needs a medium to travel	Light does not need a medium to travel; can travel through a vacuum
Sound travels much slower (671 miles per hour)	Light travels very fast (670,616,629 miles per hour)
Sound is a longitudinal wave	Light is a transverse wave
Sound travels faster in more dense mediums	Light travels slower in more dense mediums

43. When light passes through a prism it bends according to its wavelength. Red bends less and violet bends the most.
44. Orange and Red have longer wavelengths than yellow.
45. Reflection is a wave bouncing off of a hard surface and refraction is when a wave bends when it enters a new medium.
46. A leaf looks green because when light strikes it, the green wavelength is reflected to our eye and the other wavelengths are absorbed by the green leaf.
47. 1-pinna 2-ear canal 3-ear drum 4-hammer 5-anvil 6-stirrup 7-eustachian tube 8-cochlea 9-auditory nerve 10-semi-circular canals

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