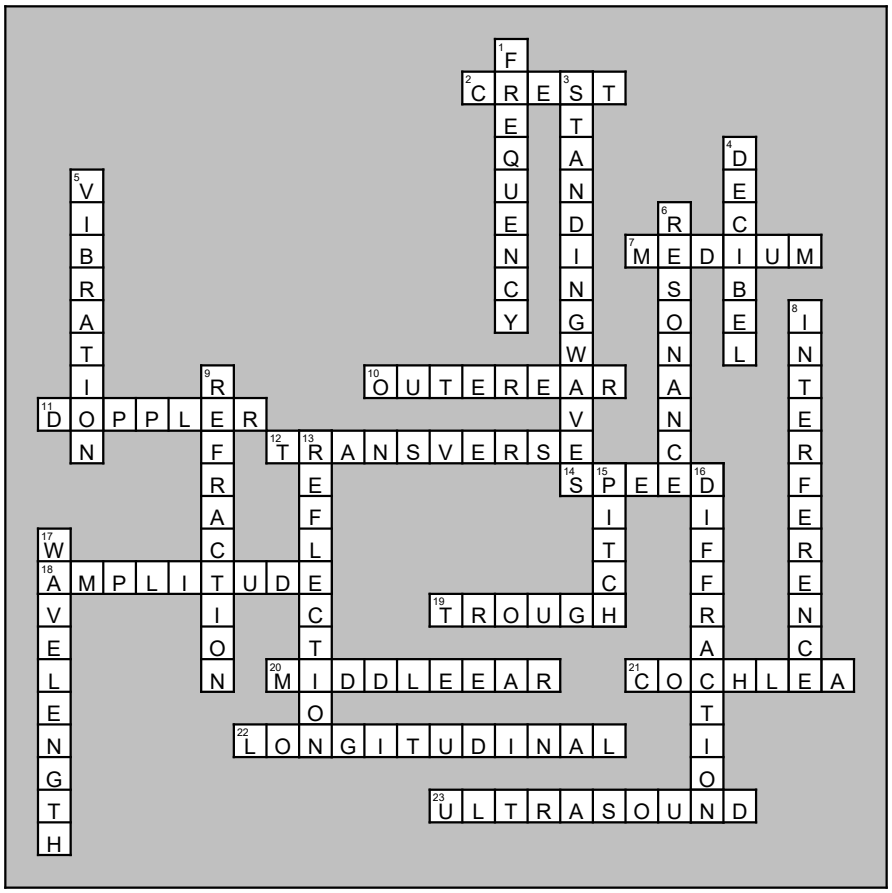
Sound Waves



Across

2. The high point of a wave (above rest position) as it travels. Also known as the peak.
7. The material through which a wave travels. Solids, liquids, gases.
10. Funnels sound waves through the ear canal (a tunnel) to the eardrum (tympanic membrane).
11. The effect produced when frequency (pitch) seemingly changes due to wave motion. When a car approaches you, the pitch is higher. When the car goes away from you, the pitch is lower.
12. Type of wave that causes the medium to vibrate at right angles to the direction of travel. e.g. sin curve with crests and troughs.
14. Property of a wave where: speed = frequency x wavelength. e.g. 342 m/s in dry 20 C air. Sound travels fastest in solids, slowest in gases.
18. The loudness of sound. On a graph it is the maximum displacement of a medium from rest position. e.g. decibels.
19. The low point of a wave (from rest position) as it travels.
20. Receives the vibration of the eardrum, acting as a lever system to amplify motion of the eardrum. Hammer (malleus) to anvil (incus) to stirrup (stapes).
21. Entrance of the inner ear that receives vibrations from the stapes (stirrup) ossicle (tiny bone) that transmits the sound vibration from the middle ear to the brain.
22. Sound waves vibrate parallel to the direction of wave travel. e.g. sound, springs. The wave compresses and expands (rarefaction).
23. Sound at frequencies higher than most people hear. e.g. Sonar determines distances in water. e.g. Imaging is an important medical technique detailing structures and organs of the body.

Down

1. The number of vibrations (cycles) per unit time. "Pitch." The number of wavelengths passing by per second is Hertz.
3. A wave caused by interference and reflection that appears to stay in one place as if stationary. A node is the non-moving portion of complete destructive interference, and the antinode is the crest or trough.
4. The unit used to measure loudness of sound (amplitude). The human ear hears ~20 to 140 db. This scale measures sound intensity using a logarithmic scale.
5. The source of waves based on a back and forth motion. Sound needs particles to propagate.
6. The response of a standing wave to another wave of the same frequency. e.g. singers shatter a glass. Sound amplifies in response to vibrations so it can be heard.
8. Two or more waves overlap or collide and continue. e.g. diffraction. Constructive ___ combines waves to produce a larger displacement from rest position. Destructive ___ produce smaller displacement or cancel out waves.
9. The bending of a wave due to a change in wave speed when it enters a new medium. e.g. In the summer, sounds tend to be louder at night due to cooler air temperature (slows the sound).
13. The rebounding of waves off a surface. e.g. echo & reverberation.
15. Another term for frequency of sound. As frequency increases, this goes higher.
16. The bending of a wave as it moves around an obstacle or passes through a narrow opening. e.g. musical notes interfere so we can hear them.
17. The distance between a point on one wave and the same point on the next cycle of the wave. Inversely proportional to the frequency of a sound wave. Equal to the speed of sound divided by the frequency.