Topic Page: Sound-waves

Definition: **sound wave** from *Merriam-Webster's Collegiate(R) Dictionary*

(1848) **1 :** [3]sound 1a **2** *pl* **:** longitudinal pressure waves in any material medium regardless of whether they constitute audible sound earthquake waves and ultrasonic waves are sometimes called *sound waves*

Summary Article: **sound wave**
From *The Hutchinson Unabridged Encyclopedia with Atlas and Weather Guide*

Longitudinal wave motion with which sound energy travels through a medium. It carries energy away from the source of the sound without carrying the material itself with it. Sound waves are mechanical; unlike electromagnetic waves, they require vibration of their medium's molecules or particles (manifested in air as compressions and rarefactions of the air), and this is why sound cannot travel through a vacuum.

In air, the pressure variations as an object vibrates travel at a speed of 330 m/1,080 ft per second, are detected by the ear, and interpreted by the brain as sound. A person with normal hearing can detect sounds with frequencies in the range of 20 to 20,000 hertz.

The energy of the air vibrating travels along the wave without transferring matter. A loosely-coiled spring can be used to demonstrate how sound waves travel through air. The disturbance produced by the vibrating object causes compressions and rarefactions of air particles to move in the same direction as the waves; they are called longitudinal waves. The pattern of longitudinal waves is produced when the spring is given a forward ‘push’. Sound can be produced by the vibrations of objects such as the stretched strings of a violin or air particles in wind instruments; the sounds of the voice are produced by air causing the ‘strings’ of the vocal cords to vibrate.

Sound can also travel through solids and liquids. For example, voices can be heard through a wall between one room and another. This effect is used when listening with a stethoscope to hear the sounds of heart and lungs through the walls of the chest. Porpoises use ultrasonic sound in water as an echo-guiding system.

Sound waves can be reflected to produce echoes, and diffracted to produce interference patterns of louder and softer sound.

essays

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sound wave, loudness and pitch

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