Music really does fill the air when sound travels from a source to the ears of a listener!

**Sound waves** are small variations in pressure, which travel from source to receiver. All sound carries energy, and familiar sounds such as speech and music carry information. Many sounds of speech (as well as singing) originate when the **vocal folds** ("vocal cords") in our **larynx** vibrate due to passage of air from our lungs. Similarly, the lips of a trumpet player vibrate when air passes between them.

The energy carried by a sound wave can create electric signals in a **microphone** or can cause the **eardrum** to vibrate so that the sound can be heard in the ear. The number of sound waves that arrive each second is known as the **frequency** of the sound.

The noisy vibrations of the speaker’s (or singer’s) vocal folds and the trumpet player’s lips don’t sound familiar, however, until they are modified by passing through the throat and mouth of the speaker or the trumpet held against the player’s lips. The trumpeter can change the effective length of the trumpet by means of valves, while the speaker (or singer) changes the resonances of the throat and mouth by means of throat muscle and especially the tongue.

Acoustics is the science of sound. Acousticians study how sounds are produced, transmitted and perceived. Speech scientists study how speech is produced, the acoustic signal that it produces, and how listeners understand speech. Musical acousticians study instruments of all types, from orchestra and band instruments to the singing voice and even electronic means of sound creation and control. All these sources give the composer and performer the control they need for artistic expression.

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