

Theatrical Design and Production

Acoustics of Sound

Sound Wave – a pressure wave created by the vibration of an object. They can be seen with a computer or some professional audio tools. Sound waves behave differently depending on the type of area they are in.

Acoustics – the sound transmission characteristics of a room or material. It can also refer to the study of how sound is transmitted

Soft materials such as carpet, curtains, padded seats, foam, and people absorb more sound waves

Hard materials such as wood, concrete, and brick reflect more sound waves

All materials transmit some sound

Reverberation – a reflection of sound that continues after the original sound has diminished. Reverberation is more noticeable when the sound wave has to travel over a farther distance. Acoustic treatments diminish reverberation by limiting the number of sound waves that are reflected. The effect you hear is called echo.

Nature of Sound

Intensity – Simply put the loudness of the sound. The intensity of the sound wave can be determined by the height. More intense waves have taller peaks than less intense waves.

Frequency – The number of waves contained in one second of sound. Frequency is measured in cycles or waves per second (hertz). The frequency of a sound can be determined by the width of each wave in a sound. The narrower the sound wave is, the higher the frequency of the sound is. Another name for frequency is pitch.

Timbre – The distinctive quality that makes one voice sound differently than another. Every sound wave has an overtone or harmonic. The original sound is called the fundamental frequency. The overtone is always a multiple of the fundamental frequency.