Name _____ Date _____ Class _____

CONNECTION TO ARCHITECTURE

Architectural Acoustics

The speed of sound waves depends on the medium in which the sound travels. The table below shows the speed of sound in some common materials. People who work in the field of architectural acoustics are concerned with controlling sound that travels in a closed space. Their goal is to make rooms and buildings quiet yet suitable for people to enjoy talking and listening to music.

Material	Speed (m/s)
Air	344
Water	1,433
Concrete	3,231
Glass	3,962
Hard wood	3,962
Brick	4,176
Aluminum	4,877
Steel	5,029

One factor that affects the acoustical quality of a room is the way the room reflects sound waves. Sound waves bounce off surfaces including floors, ceilings, and walls. Using materials that absorb sound reduces sound wave reflection. Materials that have small pockets of air that can trap the sound vibrations and keep them from reflecting are most sound absorbent. Sound-absorbing floor and ceiling tiles, curtains, and upholstered furniture all help to control sound wave reflection.

When the goal is to try to keep sound from leaving a room, standard approaches include absorbing vibrations, blocking the vibration path, and breaking the vibration path. Installing insulation materials such as fiberglass between the walls and floors can absorb vibrations. Building extra thick walls, floors, and ceilings also helps block the path of vibrations.

Your Turn to Think

1. Through which material does sound travel slowest?
2. If you wanted to control sound reflection in an office, would you install metal, wood, or cork partitions? Why?