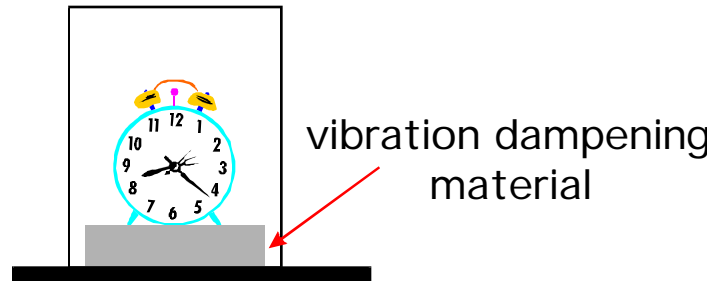


Demonstration 3

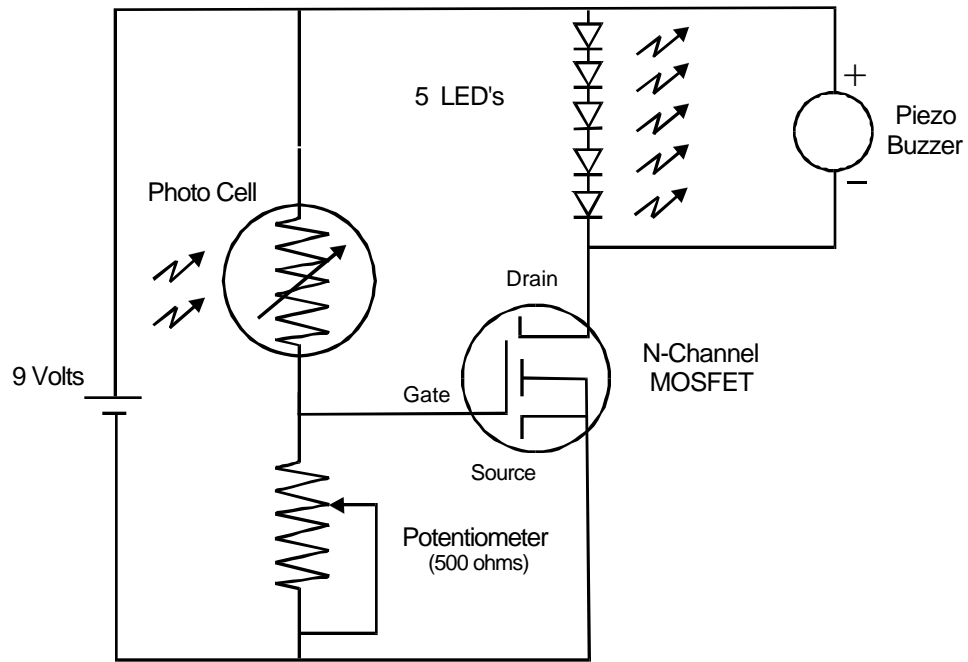
Transmission of Sound



Sound is transmitted through air or any other gas by collisions between the molecules making up the gas. The molecules close to the source of the sound move in unison with its vibration. The movement of the molecules has the same amplitude and frequency as the source. This motion is transmitted by successive collisions between these molecules and other gas molecules, resulting in a wave-like transfer of vibrations outward from the source to a receiver, with a gradual decrease in the amplitude of the vibrations. This means that if no air or other gas is present, the sound will not be transmitted.

The effect of air pressure on sound transmission can be demonstrated with any number of sound producing devices, such as a mechanical alarm clock with external clapper, a radio, or a bursting balloon . Regardless of the device used, however, it is important to provide as much vibration dampening as possible between the sound source and the vacuum chamber since any solid - solid contact can also act as a transmission medium.

A very effective device for demonstrating the difference between sound and electromagnetic radiation transmission is a battery powered photo sensitive device with light emitting diodes and a sound emitting piezo buzzer that can be controlled outside the vacuum chamber. With such a device the point can be made that while sound transmission is dependent on a gas or solid medium, electromagnetic radiation such as heat, light or radio waves require no medium for transmission. A schematic diagram for such a device is shown below.



Note: Adjust potentiometer in room light for no sound.