Vibration Encyclopedia Article

Vibration

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Vibration

Vibration is back-and-forth or up-and-down **motion** in a material or medium. The meaning of the word also includes any periodic physical process, such as the vibration of which we hear as sound, or the cyclical change of intensity of the electric **field** in a common alternating current circuit. A tuning fork is used for precise emission of a particular audio tone. When struck the fingers of the fork begin to vibrate at the specific frequency to which they are tuned. Such a device causes the air immediately around it to vibrate at a precise frequency. A musical cymbal, on the other hand, while it also vibrates, emits many frequencies, which are dependent upon the size, shape, and composition of the cymbal. While a tuning fork will sound like a pure tone, a cymbal emits a "crash" sound due to the various frequencies at which it vibrates. As materials around the vibrating device and the structural integrity of the device itself resist the vibrations, they slowly subside, causing the vibrations and the sound to eventually stop. A cymbal player during a concert will often help this dampening process along by grabbing the cymbal to stop the sound of it suddenly.

Even more complex vibrations take place when an elastic object, such as a ball is struck (or bounced on the ground), its **perimeter** begins to vibrate, but not in the symmetrical fashion seen in a tuning fork. Despite this, as with all other types of vibration, the amplitude of the vibration is the maximum **distance** a surface of the object is displaced and, mathematically, of vibration, while many cases are much more complex than the examples used here, is carried out in the same way no matter whether it be waves of **light** travelling through the vacuum of **space** or simple sound waves in air.