

Frequency Encyclopedia Article

Frequency

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Any process that is repetitive or periodic has an associated frequency. The frequency is the number of repetitions, or cycles, during a given time interval. The inverse of the frequency is called the period of the process.

Pendulums, as in a grandfather clock, also have a frequency of a certain number of swings per minute. A complete oscillation for a pendulum requires the pendulum bob to start and finish at the same location. Counting the number of these **oscillations** during one minute will determine the frequency of the pendulum (in units of oscillations/minute). This frequency is proportional to the square root of the **acceleration** due to **gravity** divided by the pendulum's length. If either of these are changed, the frequency of the pendulum will change accordingly. This is why you adjust the length of the pendulum on your grandfather clock to change the frequency, which changes the period, which allows the clock to run faster or slower.

Vibrating strings also have an associated frequency. Pianos, guitars, violins, harps, and any other stringed instrument requires a particular range of vibrational frequencies to generate musical notes. By changing the frequency, generally by changing the length of the string, you change the pitch of the note you hear.

In any type of wave, the frequency of the wave is the number of wave crests (or troughs) passing a fixed measuring position in a given time interval; and, is also equal to the wave's speed divided by the **wavelength**. As a wave passes by a fixed measurement point, a specific number of wave crests (or troughs) pass a fixed point in a given amount of time. In the case of **waves**, the frequency is also equal to the speed of the wave divided by the wavelength of the wave.

Light also exhibits the characteristics of waves; so, it too has a frequency. By changing this frequency, you also change the associated **color** of the light wave.