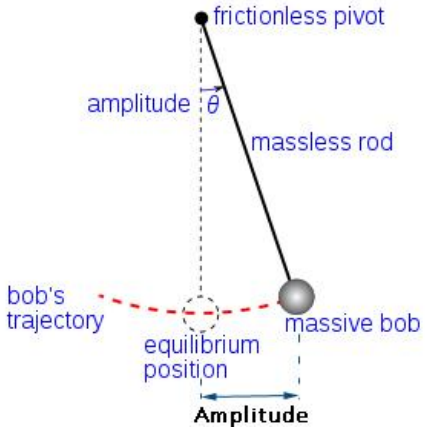

As a very simple example of such basic physical system that shows simple harmonic motion is mathematical pedulum (in detail about it here http://en.wikipedia.org/wiki/Pendulum). In this example the amplitude of the motion is the maximum deviation of the pendulum from the point of equilibrium (see figure attached). So that amplitude is the distance between the point of equilibrium and the point where the pendulum stops.

The frequency in this case is represented by the number of full cycles of motion (when the pendulum goes ahead and comes back to its starting position) of the pendulum per second. So that if in time t it makes N full cycles of motion, then frequency is

$$\nu = \frac{N}{t}$$

Such motion is called harmonic, because the horizontal coordinate of the pendulum is defined by the harmonic law of sin or cos:

$$x = A * \cos(\omega * t + \varphi)$$

A – amplitude

ω - angular frequency ($\omega = 2 * \pi * \nu$)

t – time

φ – initial phase