When I swing a pendulum like this, the motion of the apple is approximately that of a simple harmonic oscillator. What is a simple harmonic oscillator? When the displacement from equilibrium changes in time, either co-sinusoidal or sinusoidal fashion, then we call that a simple harmonic oscillator.

We'll let this be the equilibrium position-- I call that x equals 0-- and this could be the positive value for x, and that's my free choice of signs. It's is the negative direction of x. If this motion of the object in the x direction can be written as x equals a times the cosine of omega t plus alpha, or it could be a sine-- it makes no difference. In the case of the pendulum, theta would be theta max times the cosine of omega t plus alpha or the sine, then we call this a simple harmonic oscillation.

Theta, then, is the angle where x is simply the horizontal displacement of the apple away from equilibrium. Theta is the angle-- this would be theta 0, and this would be displacement from 0.

In this case, I would have a simple harmonic oscillation-- in x and here I would have a simple harmonic oscillation. In theta, and the case of the pendulum, it's both simple harmonic in x as well as in theta.

This omega that you see in this equation is the angular frequency, and the period of [UNINTELLIGIBLE] angular frequency is in radians per seconds. The period of one oscillation equals 2 pi divided by omega, and that would then be in seconds.