

AP Physics

Activity - Simple Harmonic Motion

BACKGROUND

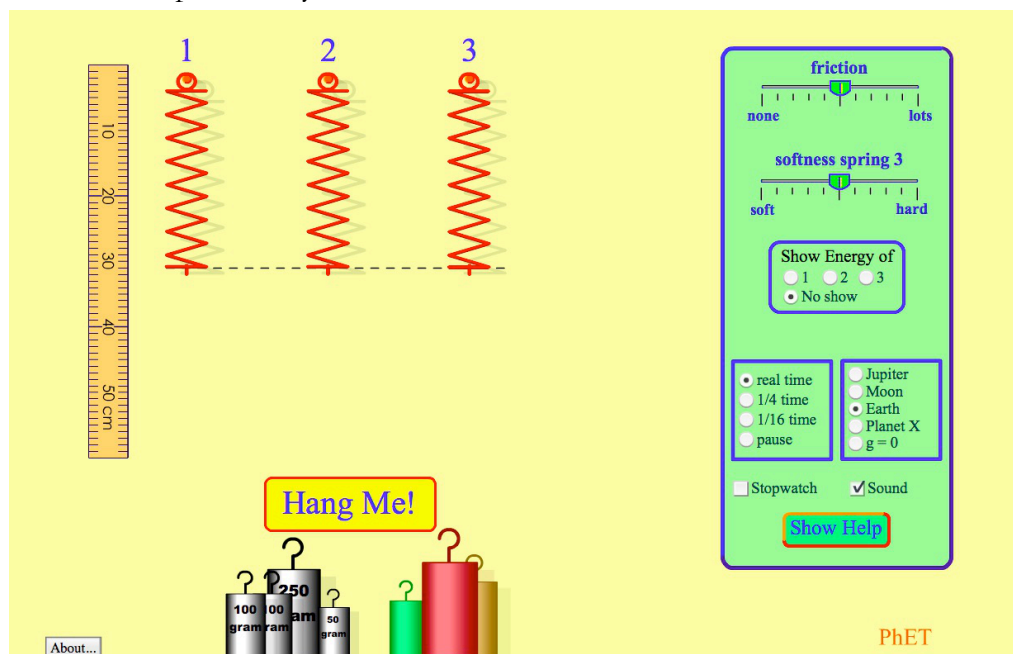
Many natural systems exhibit *simple harmonic motion*, including systems in which a mass is attached to the end of a spring.

OBJECTIVE

Using a computer simulation of a mass-spring system, identify for a given spring and mass the following quantities: maximum acceleration, maximum velocity, amplitude, angular frequency ω , period, frequency, and spring constant.

PROCEDURE

1. In a Flash-capable browser, go to phet.colorado.edu and navigate to the Physics demonstration **Masses and Springs**.
2. Set friction (damping) to “none”, and leave location set to “Earth”. Click-drag one of the known masses (50g, 100g, 250g) to either Spring 1 or Spring 2. The mass should begin oscillating at the end of the spring.
3. As tools you have a ruler that you can click-drag as needed, and an on-screen stopwatch that you can start and stop. You may find it convenient to run the simulation in 1/4 time or 1/16 as well.



4. Using the simulation and what you know about *simple harmonic motion*, collect data and perform calculations that will allow you to determine the values given here: maximum acceleration, maximum velocity, amplitude, angular frequency ω , period, frequency, and spring constant.