

COMPILATION: Unit 7 - Energy of Simple Harmonic Oscillator (SHM)

Date: Tue, 26 Feb 2002

From: Margaret Furdek <m_mfurdek@POWERWEB.NET>

Subject: Energy in SHM question

A colleague of mine wanted to try the "physics with computers" file for energy in SHM to illustrate that the total (elastic in spring + kinetic energy) in the system was constant during oscillation. We used SEVERAL different types of springs with varying masses and still the elastic energy was consistently 20% greater than expected so that the total energy as displayed versus time on a graph wavered significantly. We did zero the motion detector with the known mass and get expected spring constants following the steps in the procedure. We also modified the equations for kinetic and elastic energy according to our setup. The only thing we didn't try was hanging the harmonic springs with the wide end up. Would this matter?

Date: Tue, 26 Feb 2002

From: "Richard J. McNamara, M.Ed." <richmcn@EARTHLINK.NET>

Margaret Furdek wrote:

>We used SEVERAL different types of springs with varying
> masses and still the elastic energy was consistently 20% greater
> than expected so that the total energy as displayed versus time on
> a graph wavered significantly.

Did your springs have a pre-load? In other words, was the vertical intercept of the Spring Force vs. elongation a positive, non-zero value? If so, you need to add that into the determination of the spring's energy term.