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|  | [**DOING PHYSICS WITH MATLAB**](http://www.physics.usyd.edu.au/teach_res/mp/mphome.htm)  **MECHANICS**  **VIBRATION OF A SPRING**  **CONSERVATION OF ENERGY**    Ian Cooper  School of Physics, University of Sydney  ian.cooper@sydney.edu.au  [**DOWNLOAD DIRECTORY FOR MATLAB SCRIPTS**](http://www.physics.usyd.edu.au/teach_res/mp/mscripts)    **mec\_spring\_energy.m**  The mscript is used to create an **animated gif** of a vibrating spring. The animation shows the spring, and the time evolution of the kinetic energy of the object; the potential energy of the system and the total energy of the system.      **Energy in Simple Harmonic Motion**    Consider a system of an object of mass *m* vibrating at the end of a spring with a spring constant *k*. Ignoring any frictional effects, the total energy *E* of the system is conserved.    The kinetic energy *E­K* of the object is        and the potential energy *EP* of the system is        Total energy *E* of the system is        At the equilibrium position, *x* = 0, the objects moves with its maximum speed *vmax* and its kinetic energy is a maximum  and the potential energy of the system is zero .    At the points of extreme motion, the amplitude of the motion is *x* =  *A* =  *xmax*, the kinetic energy of the object is zero  and the potential energy of the system has its maximum value .    Therefore, we can write the statement of conservation of energy as        The kinetic energy *EK* and potential energy *EP* vary with time while the total energy *E* is time independent. The animated gif shows the time evolution of the energies. The animated gif was created with the mscript **mec\_spring\_energy.m**. |  |