Mr. Jenkins
Physics I

Assignment Sheet
Work and Energy

Objectives
You will be able to:

A. compute the change in kinetic energy of an object subjected to a known net force acting through a known distance.
B. compute the change in gravitational potential energy of an object as it is moved from one place to another.
   compute the elastic potential energy for a spring.
   distinguish between conservative and nonconservative forces.
C. give several examples in which potential and kinetic energy are interchanged.
   state what happens to the energy lost when work is done against frictional forces.
   use the principle of interconversion of mechanical energy to solve simple problems which involve the interchange of kinetic and potential energies in a system, including cases where external work is done on the system.
D. calculate work done by non-constant forces in simple situations.
E. compute power in simple situations.
   change from watts to horsepower and vice versa.
F. graph energy vs. position and explain key points on the graph.
G. compute ideal mechanical advantage and actual mechanical advantage, and efficiency of a simple machine when appropriate data are given.
   compute the work done on an object by a specified force when an object is moved through a given distance.

Reading

A. 7-2, Kinetic Energy and the Work-Energy Theorem, p. 197–201
B. 7-1, Work Done by a Constant Force, p. 191–197
   8-2, Potential Energy and the Work Done by Conservative Forces, p. 221–226
   8-1, Conservative and Nonconservative Force, p. 217–220
C. 8-3, Conservation of Mechanical Energy, p. 226–234
   8-4, Work Done by Nonconservative Forces, p. 234–239
D. 7-3, Work Done by a Variable Force, p. 202–206
E. 7-4, Power, p. 206–208
F. 8-5, Potential Energy Curves and Equipotentials, p. 239-242
G. Machines, p. notes

Laboratory
Pulley Lab
Semi-Atwood Machine

Focus Questions:

1. A bowling ball is hung from the ceiling by a steel wire. The instructor pulls the ball back and stands against the wall with the ball against his nose. To avoid injury, the instructor is supposed to release the ball without pushing it. Why?
2. When a superball is dropped, can it rebound to a height greater than its original height? Explain.
3. Describe the energy transformations that take place when a pendulum swings back and forth.