Answer the following questions about energy on a separate sheet of paper.

1. A 5.00 kg bowling ball is lifted from the floor to a height of 1.50 m. What is its increase in gravitational potential energy?
2. A 200.0 kg hammer of a pile driver is lifted 10.0 m. Find the gravitational potential energy of the system when the hammer is at this height?
3. A 60.0 kg shell is shot from a cannon to a height of 400.0 m.
   a. What is the gravitational potential energy of the earth shell system when the shell is at this height?
   b. What is the change in potential energy of the system when the shell falls to a height of 200 m?
4. A person weighing 630 N climbs a ladder to a height of 5.00 m.
   a. What work does the person do?
   b. What is the increase in the gravitational potential energy of the person at this height?
   c. Where does the energy come from to cause this increase in energy?
5. A person has a mass of 45 kg and is moving with a velocity of 10.0 m/s.
   a. Find the person's kinetic energy
   b. The person's velocity becomes 5.0 m/s. What is the kinetic energy of the person now?
   c. What is the ratio of kinetic energy in part a to part b? Why?
6. A child and bicycle have a mass of 45.0 kg. The child rides the bicycle 1.80 km in 10.0 minutes at a constant velocity. What is the kinetic energy of the system?
7. A 15.0 kg object is moving with a velocity of 7.50 m/s. A force of 10.0 N acts on the object and its velocity becomes 3.20 m/s. What is the displacement of the object while the force acts?
8. A baseball that weighs 1.60 N leaves a bat with a speed of 40.0 m/s.
   a. Calculate the kinetic energy of the ball.
   b. If the ball struck the bat at 30.0 m/s, how much work was done on the ball?
9. A 8.00 kg flower pot falls from a window ledge 12.0 m above the sidewalk.
   a. What is the kinetic energy of the pot just as it reaches the sidewalk?
   b. Using energy considerations only, determine the speed of the pot just before it strikes.
10. A 15.0 kg model plane flies horizontally at 12.5 m/s.
    a. Calculate the kinetic energy of the plane.
    b. The plane goes into a dive and levels off 20.4 m closer to the ground. How much potential energy does it lose during the dive.
    c. How much kinetic energy did the plane gain during the dive?
    d. What is the new kinetic energy?
    e. What is its new horizontal velocity?
11. A 10.0 kg test rocket is fired vertically from Cape Canaveral. Its fuel gives it a kinetic energy of 1960 J before it leaves the pad. How high will it rise?