Name_____

Date _____ Pd____

Unit VI: Worksheet 3

1. A baseball (m = 140 g) traveling at 30. m/s moves a fielder's glove backward 35 cm when the ball is caught.
   a. Construct an energy bar graph of the situation.

   b. What was the average force exerted by the ball on the glove?

2. A 60. kg student jumps from the 10. meter platform at Stanford's swimming complex into the pool below.
   a. Determine her GPE at the top of the platform.

   b. How much KE does she possess at impact? What is her velocity at impact?

   c. Repeat steps a and b for a 75 kg diver.

   d. If she jumped from a platform that was twice as high, how many times greater would be her velocity at impact?

   e. How much higher would the platform have to be in order for her velocity to be twice as great?

3. A 1000 kg car traveling at 30 m/s must come to a sudden stop. If the car provides a braking force of 5000 N, what distance does it take the car to stop?

4. If the car in #3 were traveling twice as fast, how many times greater would the braking distance be?

5. A bullet with a mass of 10. g is fired from a rifle with a barrel that is 85 cm long.
   a. Assuming that the force exerted by the expanding gas to be a constant 5500 N, what speed would the bullet reach?

6. A 24 kg child descends a 5.0 m high slide and reaches the ground with a speed of 2.8 m/s.
   a. How much energy was dissipated due to friction in the process?

   b. Construct an energy bar graph of the situation using an accurate % of the bar to represent the amount of heat.

7. A 50 kg circus performer is shot from a cannon straight upward with an initial velocity of +50 m/s.
   a. Assuming that all his initial KE was transformed into GPE, what is the maximum height he could reach?

   b. Suppose that 20% of his initial KE was lost due to friction with the air (air resistance). What is the maximum height he could reach?