Name: _____

Practice Calculating Potential and Kinetic Energy

Remember: include **units** throughout the problem!!!!

$$PE (J) = m(kg) \times g(m/s^2) \times h(m) \qquad KE (J) = \frac{1}{2} \times m(kg) \times v^2(m/s)$$

1. Calculate the gravitational potential energy in the following systems:
   A. a car with a mass of 1200 kg at the top of a 42 m high hill

   B. a 65 kg climber on top of Mount Everest (8800 m high)

   C. a 0.52 kg bird flying at an altitude of 550 m

2. A science student holds a 5 kg egg out a window. Just before the student releases the egg, it has 8.0 J of gravitational potential energy with respect to the ground. How far is the student's arm from the ground in meters? (**Hint:** convert the mass to kilograms before solving)

3. A diver has 3400 J of gravitational potential energy after stepping up onto a diving platform that is 6.0 m above the water. What is the diver's mass in kg?

4. Calculate the kinetic energy in joules of a 1500 kg car moving at the following speeds:
   A. 29 m/s

   B. 18 m/s

   C. 42 km/h (**hint:** convert the speed to meters per second before substituting into the equation!)

5. A bowling ball traveling 2.0 m/s has 16 J of kinetic energy. What is the mass of the bowling ball in kilograms?

6. Calculate the gravitational potential energy of a 93 kg sky diver who is 550 m above the ground.

7. What is the kinetic energy in joules of a 0.02 kg bullet traveling 300 m/s?

8. Calculate the kinetic or potential energy in joules for each of the following situations:
   - A 2.5 kg book held 2.0 m above the ground

   - A 15 g snowball moving through the air at 3.5 m/s

   - A 35 kg child sitting at the top of a slide that is 3.5 m above the ground

   - An 8500 kg airplane flying at 220 m/s