Group # _____ Members: _____

Activity Worksheet
Does the equality hold; Kinetic Energy = Potential Energy?

1. Calculate potential energy of object use (ball used in the experiment) at the tower height in Part 1 using Equation 1: m x g x h = PE.

   a. What is the mass of the ball? m =_____ kg

   b. What is the gravitation acceleration in proper units? g = _____ m/s^2

   c. What is the height of tower (measured from the bottom of the ball)? h = _____ m

   d. Multiply m, g, and h, you should get PE = _____.

2. Fill in the chart using data collected from the three trials:

Trial	Time from Port 1 (= T1)	Time from Port 2 (= T2)	Time difference between Port 1 & 4 (T1 – T2 = t)
#1			
#2			
#3			

3. Calculate ball's average velocity at the bottom of the ramp using velocity values from three trials.

Time difference between Port 1 & Port 4 (T)	**Velocity = distance / time**
Trial 1: t =	V1 =
Trial 2: t =	V2 =
Trial 3: t =	V3 =
	Average Experimental Velocity = (V1 + V2 + V3) / 3 =

4. Calculate ball's kinetic energy at the bottom of the ramp using Equation 2: KE = $\frac{1}{2} \times m \times v^2$

Velocity	**Kinetic Energy**
V1:	KE1:
V2:	KE2:
V3:	KE3:
	Average KE = (KE1 + KE2 + KE3)/3 =

5. Is the average kinetic energy found in Part 4 the same as the potential energy found in Part 1d? Yes or No? If no, what is the difference; subtract the two values.

6. Offer an explanation for what you observed and calculated.

7. Using the equality of PE = KE; m x g x h = $\frac{1}{2} \times m \times v^2$

   Assume we did not calculate velocity from our experiments. Instead the equality between PE and KE holds. Once we calculated PE from multiplying m x g x h. We set this value to be equal to our KE. Solve for velocity theoretical. The equation we need is:

$$v_{theoretical} = \sqrt{\frac{2 \times KE}{m}}$$

   Calculate the theoretical velocity that we should have gotten. How far is this value from the experimental velocity?