Lab Report

Name of the Experiment :

Your Name :

Your ID # :

Name of the Lab Partner :

Date :

Instructor's comments:

Data tables:

Table A

Drop Height, H_1 (m)		First Bounce height (m)					Mean bounce height, H_2 (m)	Ratio of heights, H_1/H_2
		Trial 1	Trial 2	Trial 3	Trial 4	Trial 5		
Tennis	1.0							
Golf								
Table Tennis								

Mass of the Tennis ball = kg

Mass of the Golf ball = kg

Mass of the Table Tennis ball = kg

Table B

Ball	$PE_1 = mgH_1$ (J)	$v_1 = \sqrt{2gH_1}$ (m/s)	$KE_1 = \frac{1}{2}mv_1^2$ (J)	E_1 $(PE_1 or\ KE_1)$ (J)	$PE_2 = mgH_2$ (J)	$v_2 = \sqrt{2gH_2}$ (m/s)	$KE_2 = \frac{1}{2}mv_2^2$ (J)	E_2 $(PE_2 or\ KE_2)$ (J)	Lost energy (J)	% Energy loss
Tennis										
Golf										
Table Tennis										

You have already learned how to calculate standard deviation, σ (see Experiment 1). The standard deviation of a distribution of measurements is defined as follows:

$\sigma = \sqrt{\frac{1}{N-1}\sum_{i=1}^{N}(H_i - \overline{H})^2}$ Where $\overline{H} = \frac{\sum_{i=1}^{N} H_i}{N}$

You can easily do it by using your scientific calculator in STAT mode.

Table C

Drop Height, H_1 (m)		First Bounce height (m)					Mean bounce height, H_2 (m)	Standard deviation, σ_{H2} (m)
		Trial 1	Trial 2	Trial 3	Trial 4	Trial 5		
Golf ball	1.0							
	0.9							
	0.8							
	0.7							
	0.6							

Calculations from graph:

$Slope^{-1}$ (coefficient of bouncing for golf ball) =

Interpolated bounce height for example at 0.85 m =

Extrapolated bounce height for example at 1.10m =

Results:

Questions:

1. Which ball was the most efficient? What characteristics does that ball have that you think helped it be efficient?

2. Why is it impossible for a ball to be 100% efficient?

3. How did the GPE change with height?

4. What percentage of the initial potential energy was 'wasted' as the ball was hitting the ground?

Discussion: