Conservation of Mechanical Energy Worksheet

As you work through the steps in the lab procedures, record your experimental values and the results on this worksheet. Use the exact values you record for your data to make later calculations.

Procedure A - Determining the experimental velocity $v_{2\texttt{exp}}$ using kinematics - Measurements

What is the height of the horizontal section of the ramp from the table top?

$h_2 =$ _____

What range did you use for d?

From $d = 0$ to _____

What is the corresponding range for $v_{2\text{kinematics}}$?

From $v_{2\texttt{kinematics}} = 0$ to _____

Using Excel, create a graph of $v_{2\text{kinematics}}$ versus d for the above two values of d. You will not submit this graph. However, you will use it to read the values of v_{exp} in Data Table 1 below.

CHECKPOINT 1: graph of v_2 versus d using Excel

Procedure A - Determining the experimental velocity $v_{2\texttt{exp}}$ using kinematics - Calculations

Complete the data table below. h_1 is the height through which the sphere falls.

Data Table 1

Mark #	$\boldsymbol{h_1}$ **(cm)**	**Horizontal Distance** $\boldsymbol{d}$ **(cm)**				$\boldsymbol{v_{\texttt{exp}}}$ **(cm/s)**
		Trial 1	**Trial 2**	**Trial 3**	**Average (cm)**	
1						
2						
3						
4						
5						

CHECKPOINT 2: Calculations of $v_{\texttt{exp}}$ in Data Tables 1

Procedure B - Using the Conservation of Mechanical Energy to predict the velocity v_{2CME}

Complete the data table below using the same values of h_1 as in procedure A. (Make sure to calculate percent difference using the exact values you enter into the table.)

Data Table 2

Mark #	$\boldsymbol{h_1}$	$\boldsymbol{v_{2CME}}$ **(cm/s)**	% **difference**
1			
2			
3			
4			
5			

CHECKPOINT 3: calculations of v_{2CME} in Data Table 2

Comparison

Compare the values of $v_{\texttt{exp}}$ in Data Table 1 and $v_{\texttt{2CME}}$ in Data Table 2. Which results are in close agreement? (A difference of $\pm 10\%$ would be considered acceptable in this situation.)

Data Table 3

Mark	**Agree?**	
1	Yes	No
2	Yes	No
3	Yes	No
4	Yes	No
5	Yes	No

What are some of the sources of uncertainty in this lab that could have contributed to a discrepancy in the two data sets?