FLINN SCIENTIFIC

Free Fall Worksheet

Data Table

Mass of small 5/8″ ball (g):_____ Drop height (m): _____

Mass of large 1⅓″ ball (g): _____ Mass ratio of large ball to small ball _____

Small Ball Drop Data

Trial Number	Drop Time(s)	Acceleration Due to Gravity (m/s^2)	Percent Error (%)
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
	Average		

Large Ball Drop Data

Trial Number	Drop Time(s)	Acceleration Due to Gravity (m/s^2)	Percent Error (%)
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
	Average		

Post-Lab Analysis

1. Use Equation 2 to calculate the acceleration of each drop. Fill in the data table for each size ball.
2. Use Equation 3 to calculate the percent error between the measured and accepted values for the acceleration due to gravity for each drop. Use 9.8 m/s^2 for the accepted value. Fill in the data tables.

$$\text{Percent error} = \frac{|\ \text{measured value} - \text{accepted value}\ |}{\text{accepted value}} \times 100\% \qquad \textit{Equation 3}$$

3. What are some of the sources of experimental error in this experiment?

4. Calculate the average acceleration for each size ball and enter the results in the data table. Compare the average acceleration of the small ball to that of the large ball. What conclusion can be drawn about the relationship between gravity and mass?