Name: _____ Chemistry Period: _____

Lab Partner: _____ Experiment Date: _____

Measurements in the Laboratory

Part A: Measuring the Dimensions of Regular Geometric Shapes

Experimental Data

Shape Sheet ID Code: _____

Shape	Dimensions	Precision	Measurement	# Significant Figures
Rectangle	Length			
	Width			
Circle	Diameter			

Data Analysis

1) Perform the conversions indicated. Show your work, and report your answers in **scientific notation**.

a. Convert the measured rectangle length to hm.

b. Convert the measured circle diameter to nm.

2) Calculate the areas of your rectangle and circle in **cm^2**. Show your work, and report your answers to the **correct number of significant figures**.

a. Area of rectangle

b. Area of circle

Part B: Measuring the Mass of Solids

Experimental Data

Table 1 – Mass of an Erlenmeyer Flask

Measuring Device	Mass Measurement	# Significant Figures
Triple-Beam Balance		
Electronic Balance		

Table 2 – Weighing by Difference

	Mass Measurement	# Significant Figures
Mass of Empty Beaker		
Mass of Beaker + Sugar		

Data Analysis

1) Compare your mass values obtained for the Erlenmeyer flask (in Table 1). Which balance, triple-beam or electronic, provides the more *precise* measurement? Explain.

2) Consider the data you obtained in Table 2.

a. Calculate the mass of sugar weighed out. Show your work.

b. Circle one: When performing the above calculation, <u>significant figures / decimal places</u> are the primary consideration.

3) Perform the conversions indicated below. Show your work, and report your answers in scientific notation.

a. Convert the mass of the sugar weighed out to dg.

b. Convert the mass of sugar weighed out to lbs.

Part C: The Volumes of Liquids and Solids

Table 1 – The Volume of Liquid Water

Measuring Device	Precision	Volume Measurement	# Significant Figures
Buret			
Beaker			
100-mL Graduated Cylinder			
10-mL Graduated Cylinder			

Table 2 – The Volume of a Regular Solid, shaped as a _____

Dimensions Measured	Measurement	# Significant Figures

Data Analysis

Use your measured block dimensions (in Table 2) to calculate the block volume, in **cm^3**. Show your work, and report your answer to the correct number of significant figures.

Part D: The Density of Water

Table 1 – The Density of Water

Mass of Empty, Dry Graduated Cylinder	
Mass of Graduated Cylinder + Water	
Mass of Distilled Water	
Volume of the Distilled Water in Graduated Cylinder	

Calculate the density of water, in **g/mL**. Show your work, and report your answer to the **correct number of significant figures**.

Part E: The Density of Aluminum and the Thickness of Foil

Experimental Data

Table 1 – The Density of Aluminum

Mass of empty beaker	
Mass of beaker and pellets	
Mass of pellets	
Initial volume of water in cylinder	
Final volume of water and pellets	
Volume of pellets	

Table 2 – The Thickness of Aluminum Foil

Mass of foil	
Length of foil	
Width of foil	

Data Analysis

1) Use your measured mass and volume of the aluminum pellets (in Table 1) to calculate the density of aluminum, in **g/cm^3**. Show your work, and report your answer to the correct number of significant figures.

3) Use your measurements for the aluminum foil (in Table 2) along with the true density of aluminum (D_{Al} = 2.70 g/cm^3) to calculate the foil thickness, in **cm**. Consider the foil to be a very flat rectangular box, where Volume of foil = **V = length x width x height** (thickness).
   Show your work, and report your answer in **scientific notation**.