

# Measurement, Significant figures, Error and Graphing Review

**MAKE-UP**



Name \_\_\_\_\_

Period \_\_\_\_\_

Group # \_\_\_\_\_

For each trial, have a different person measure the object.

**I. Measure the following with the different shoe for each trial! (be sure to estimate to the best of your ability and use units!)**

Trial 1

- 1) The length of a lab station. \_\_\_\_\_
- 2) The height of a lab station. \_\_\_\_\_
- 3) The length of the classroom \_\_\_\_\_

Now grab a piece of string from the front of the room. Cut it to be **Exactly** 1 meter. Determine how many shoe lengths will it take to make a meter (don't forget to estimate your uncertain number)

Using your data from #1,2, and 3; calculate each length in meters (show your units)

- 1a) The length of a lab station. \_\_\_\_\_
- 2a) The height of a lab station. \_\_\_\_\_
- 3a) The length of the classroom \_\_\_\_\_

Calculate the % error of the 'shoe' measurement.

$$\% \text{ error} = (\text{accepted} - \text{measured}) / (\text{accepted}) \times 100\%$$

- % error of length \_\_\_\_\_
- % error of Height \_\_\_\_\_
- % error of classroom \_\_\_\_\_

**II. Describe the correct way to measure liquid in a beaker, flask, graduated cylinder or volumetric flask. Draw a diagram to illustrate!**

A student takes the following data from a lab. Perform the correct calculations:

Measuring Device	Vol H <sub>2</sub> O	mass Container	(Mass H <sub>2</sub> O + Container)	Mass H <sub>2</sub> O
Beaker 250 ± 1.0ml	_100_ml_	_127.87_g_	_224.41_g_	_____
Graduated Cyl 100 ± 0.5ml	_100_ml_	_59.97_g_	_158.77_g_	_____
Volumetric Flask ± 0.01ml	_100_ml_	_47.37_g_	_148.02_g_	_____

If the density of water is 1.0 g/mL Determine how many mL of water you measured using the mass of water in the beaker, Graduated Cylinder, and Volumetric Flask.

Volume of water measured by Beaker. \_\_\_\_\_

Volume of water measured by Grad Cylinder \_\_\_\_\_

Volume of water measured by Volumetric Flask. \_\_\_\_\_

Using your data from above, calculate your % Error for each device. (use 100.00 mL for the accepted value)

Beaker

Graduated Cylinder

Volumetric Flask

**III. Cut a piece of string as long as your arm. Use it to measure the length of the room.**  
\_\_\_\_\_ (strings).

Based on the accepted value of the length of the room, how long is your string? How many significant digits should this answer have? **Why?** (Use a tape measure to get the actual length of the room)

How many significant units should be in your shoe measurements? \_\_\_\_\_

How many significant units should be in the meter stick measurements? \_\_\_\_\_

How many significant digits should be included in the beaker measurements? \_\_\_\_\_

How many significant digits should be included in the graduated cylinder measurements? \_\_\_\_\_

How many significant digits should be included in the volumetric flask measurements? \_\_\_\_\_

Draw a Circle graph of the colors of m&m's in a small bag (or any other type of candy). Properly label it in color and use a key to define the percentages.