Measurement Lab

Purpose: To learn how to measure with a vernier caliper, measure mass, use excel, excel graph.

Procedure: Obtained some pennies and different size metal spheres

Measure odd numbers of pennies stacked, at least five different amounts and recorded.

Measured the diameter of five different size metal spheres

Set up the data table as below with correct formulas in excel

Graphs in excel

calculations in excel

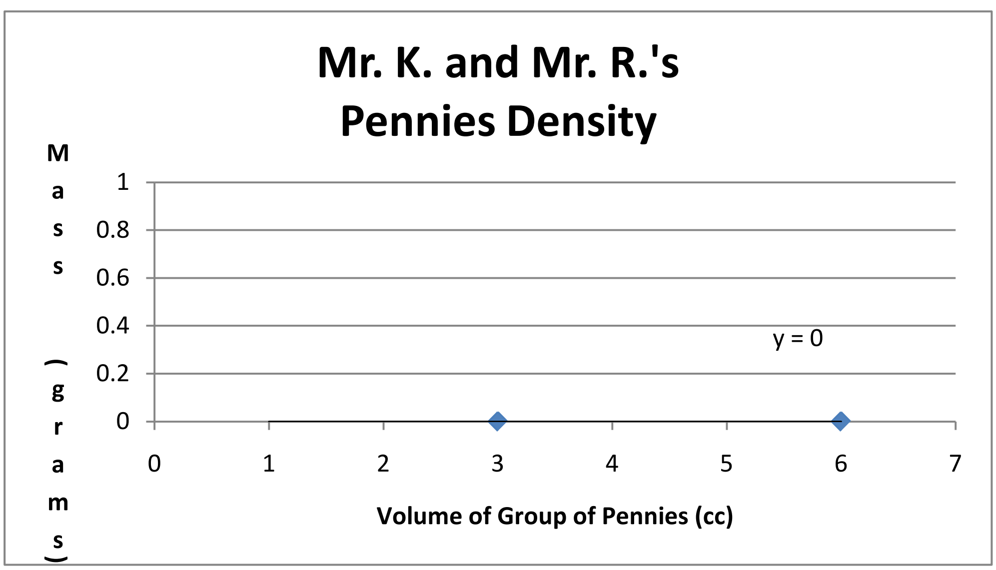
conclusion

summary

Slide from your H: drive to our correct R: drive location. One lab per group.

DATA TABLE #1: PENNIES

			(cm)	(cm)
		diameter	1.87 radius	0.935
pennies				
			calculated	calculated
	measured	measured	A=pi*r^2	V=B*h
# of	thickness	mass	Base Area	volume
pennies	(cm)	(g)	(sq. cm)	(cc)
0	0.00	0.00	2.7464588	0
3	0.41	7.7	2.7464588	1.126048
5	0.68	12.7	2.7464588	1.85386
7	0.95	17.6	2.7464588	2.609136
9	1.28	22.6	2.7464588	3.515467
11	1.57	27.6	2.7464588	4.31194



Calculations:

A=pi*r^2 =	3.14159*0.935^2=	2.7464588	sq. cm
V=B*h =	=2.937389*0.41=	1.1260481	cubic cm

Note from the equation of the graph: Our graph claims the density of pennies is 6.09

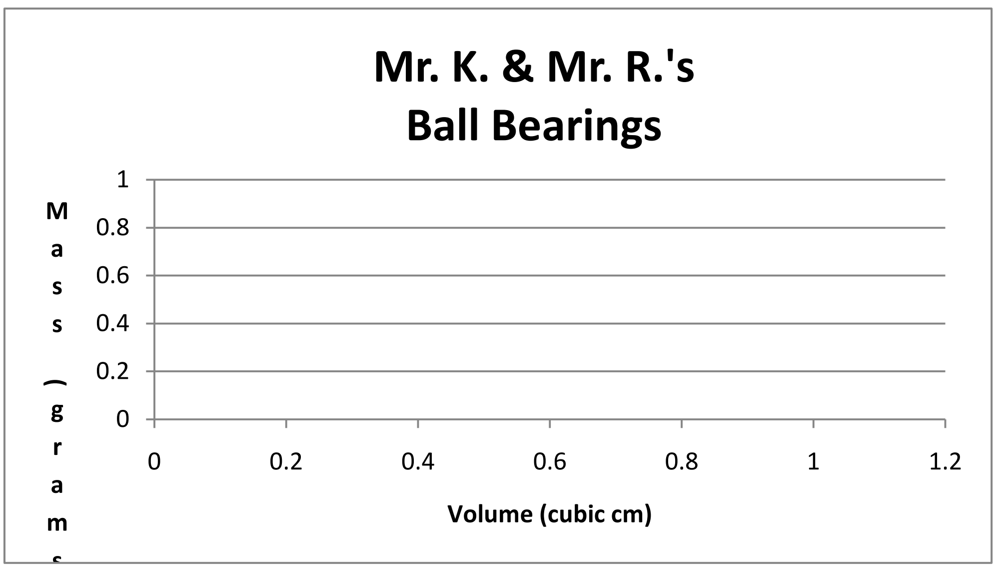
% error: =(6.09-5.7)/5.7 * 100 = 6.8421053

less than 10% so acceptable error

DATA TABLE #2: BALL BEARINGS

V=4*pi()*r^3/3

diameter thickness (cm)	radius thickness (cm)	mass (g)	volume (cc)
0.00	0.00	0	0
1.27	0.635	8.3	1.072531
1.75	0.875	21.7	2.806162
2.15	1.075	40.5	5.203721
2.54	1.27	67.2	8.580247
3.02	1.51	111.5	14.4218



% error: =(7.9-7.7591)/7.9 * 100 = 1.7835443

only 2% error! Cool, way to go Mr. R.!

Calculations:

V=4*pi()*r^3/3 = =4*pi()*0.635^3/3= 1.0725308

Density from Graph Equation is: 7.7591

% error: =(7.9-7.7591)/7.9 * 100 = 1.783544

only 2% error! Cool, way to go Mr. R.!

Questions:

1. Why might the way we measured the thickness of our penny by faulty?
   (and thus the volume of our penny)
2. Would the answer to #1 cause our volume to be to high or to low?
3. Would the answer to #1 cause your error to be higher or lower?

Group Conclusion:

Group Summary: