Collecting & Graphing Data

Using the guidelines for metric measurements and graphing from your notes, you will conduct three investigations. For each of the three investigations, use the data that you collect to make a graph. Then use your graph to answer the questions about your data. Staple this paper on top of your work before you turn it in.

Investigation #1

1. Place about (not exactly) 10 mL of water in a 50 mL graduated cylinder.
2. Record the volume in the appropriate place in data table provided below.
3. Measure the total mass of the water **and** the graduated cylinder to the nearest 0.01g.
4. Record the mass in the appropriate place in data table provided below.
5. Add about (again, not exactly) 10 mL more water to the graduated cylinder.
6. Repeat Steps 2-5. Stop when adding more water would make the volume more than 50 mL.

	Sample #1	Sample #2	Sample #3	Sample #4	Sample #5
Volume (mL)					
Mass (g)					

7. Graph the data above using an appropriate graph. For this graph, volume should be placed on the *x*-axis, and mass on the *y*-axis.
8. You may connect the data points, but you should also draw a best fit line that extends through the *y*-axis.
9. What is the value of the *y*-intercept? Explain the meaning of the value of the *y*-intercept in your notebook.
10. What is the mass of the graduated cylinder alone?
11. Compare your *y*-intercept value to the actual mass of the graduated cylinder and calculate the % error in your notebook. Use the equation and show your work.

$$\%\ \text{error} = \frac{|\text{approximate value} - \text{exact value}|}{\text{exact value}} \times 100\%$$

Investigation #2

1. Place 5 dice in a cup.
2. Measure the total mass of the dice and the cup to the correct limit of precision.
3. Record the mass in the appropriate place in data table provided below.
4. Remove 1 die from the cup.
5. Repeat Steps 2-4. Stop once you have measured the mass of one die and the cup.

	5 dice	4 dice	3 dice	2 dice	1 die
Mass (g)					

6. Graph the data above using an appropriate graph. For this graph, # of dice should be placed on the *x*-axis, and mass on the *y*-axis.
7. You may connect the data points, but you should also draw a best fit line that extends through the *y*-axis.
8. What is the value of the *y*-intercept? Explain the meaning of the value of the *y*-intercept in your notebook.

Investigation #3

1. Find 5 circular objects of different sizes.
2. Measure both the circumference (with a piece of string and ruler or meter stick), and the diameter as accurately as possible. Record your measurements in the following table.

	Circle #1	Circle #2	Circle #3	Circle #4	Circle #5
Circumference (cm)					
Diameter (cm)					

3. Graph the data above using an appropriate graph. For this graph, the diameter should be placed on the *x*-axis, and circumference on the *y*-axis.
4. You may connect the data points, but you should also draw a best fit line that extends through the *y*-axis.
5. Calculate the slope of the best fit line and show your work in your notebook. Explain the meaning of the value of the slope in your notebook.

Investigation #4

1. With a partner's help, use the stacked meter sticks to determine your height to the nearest centimeter.
2. Record your height as instructed by the teacher.
3. Tally the height values for all of the students in your class and complete the data table below in your notebook.
4. Once your data table is complete with all values, create a histogram to illustrate the results of the data collected.

Height (cm)	Number of Students
<140	
141 – 145	
146 – 150	
151 – 155	
156 – 160	
161 – 165	
166 – 170	
171 – 175	
176 – 180	
181 – 185	
186 and up	