



BIO-BITES Data Collection and Analysis NAMES: Science Standards: SCSH 2, 3 and 4

Today you will have your first encounter with BIO-BITES. These are delicious treats that are given out to students as rewards and incentives for increased academic achievement in Biology. In reality BIO-BITES are gummy worms and other candies that consist of proteins made from amino acids and monosaccharides, which are simple sugars. The purpose of this lab is to use the scientific method to make qualitative and quantitative observations of BIO-BITES and to collect and analyze data.

Purpose: The purpose of this activity is to practice collecting and analyzing data using common lab equipment and the metric system. You will also be practicing creating and interpreting data tables and graphs.

Copy down all of your data in the spaces below:

Be sure to use the metric system, which includes: meters (m), liters (L) and grams (g)

Helpful Calculations if you need them:

Finding the average: take the sum of all of the measurements (such as length) divided by the total number of measurements. Ex: $(4.5\text{cm} + 3.5\text{cm} + 4\text{cm})/3 = 4\text{cm}$

Finding the volume (mL): properly fill a graduated cylinder with water to exactly 20 mL. Place the bio-worm in the water and record the amount of water displacement (final volume – initial volume) = volume of the bio-worm.

Finding the volume (mm³): length (mm) x height (mm) x width (mm)

	Length of one color (cm)	Length of the other color (cm)	Total Length (cm)	Width (mm)	Height (mm)	Stretch to Maximum length (cm)	Number of Ridges	Weight (g)	Volume (mL)	Volume (mm ³)
Bio-worm 1									X	
Bio-worm 2									X	
Bio-worm 3										
averages										

Other Bio-worm calculations (show all work and be sure to include appropriate units in your answer):

1. Calculate the percentage of each different color for ONE of your Bio-bite gummy worm using the following equation:
Length of one color ÷ Total length x 100 = percentage of color
Length of the other color ÷ Total length x 100 = percentage of color
2. Using the data for Bio-worm #3, Calculate the percentage of change in length when the Bio-bite gummy worm was stretched using the following equation: $(\text{Stretched length} - \text{Total length}) \div \text{Total length} \times 100 = \% \text{ change}$
3. Create the appropriate graph to show the average length, width and height for your bio-worms.

Lab Safety Review!

1. What lab equipment would be used for holding, manipulating, and observing the bio-bite gummy worms during the lab?
2. According to lab safety rules, if the bio-worm were placed in a beaker would the specimen be edible?
3. What do you think is the most important lab safety rule? Explain your answer.

Graphing Practice---Line graph, bar graph, pie chart...Oh my!

1. Heart Attacks and Smoking Habits

Some doctors made a study to determine the relationship between cigarette smoking and heart attacks. They checked the smoking habits of 1000 women. The women were grouped according to how many cigarettes they smoked each day. The doctors kept track of how many heart attacks there were in each group. Records were kept for each woman until she became 62 years old. The table shows the data that were collected.

Cigarettes Per Day	# of Heart Attacks per 1000 Women
0	40
10	60
20	75
30	130
40	150

Answer the following questions:

1. Sketch a graph of this data. Make sure that you label both of the axes on your graph.
2. What is the number of heart attacks per 1000 women that may occur after 15 cigarettes?
3. What is the number of heart attacks per 1000 women that may occur after 65 cigarettes?
4. Which answer, #2 or #3, are you more sure of? Explain.

2. Favorite foods Graph

A class survey revealed that out of 30 students, 13 listed their favorite lunch item as pizza, 9 chose cheeseburgers, 6 picked lasagna, and 2 chose tacos.

- a. Create a bar graph to display the information above.
- b. Create a pie chart to display the information above. Hint: you must calculate the percent for each type of food ($\frac{\# \text{ of students for a food}}{\text{total } \# \text{ of students}} \times 100$)