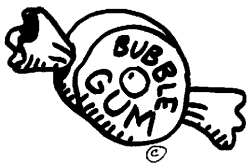
Biology / WLHS

Name_____
Date_____Per_____

LAB: Chewing Gum! (& the Scientific Method)



Introduction: Winterfresh, Juicy Fruit, Big Red, and Bubblicious! There are so many choices when it comes to chewing gum. Have you ever wondered which gum is the best? In this lab you will find out the answer to this age-old question.

Research Question: Does the size (mass) of a piece of gum influence how flavorful a piece of gum is? (i.e. bigger gum = more flavor?).

In this lab you will follow directions and compare the starting and ending mass for each of the 3 flavors of gum in order to find the "best" gum.

Purpose: (in your own words, what are you trying to do in this lab?)_____

_____

_____

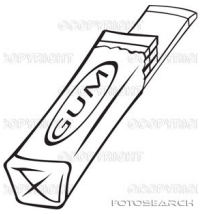
Hypothesis: (should be stated as: "If….and….then…")_____

_____

_____

Materials:

- 2 pieces of gum, 3 different brands of gum
- electronic balance
- wax paper
- graph paper



*******Read the lab first and then answer the following pre-lab questions******

Pre-Lab Questions (These must be answered before you can start the lab)

1) How many times must your instructor initial this lab?

2) How many sticks of each brand of gum do you need?

3) What units of measurement are being used in this lab?

4) What does tare mean?

5) What does T_0 mean? T_2?

6) Why do you want the gum to be dry?

7) How do you calculate change in mass? % change in mass?

When finished with the pre-lab questions, have your instructor initial this line_____.

Procedure:

1) Obtain 2 pieces of 3 different brands of gum from the instructor.
2) Obtain 3 square pieces of wax paper from lab counter.
3) Unwrap your two sticks of gum (make sure you wash your hands first before touching the gum).
4) Place the wax paper on the electronic balance and push the "Tare" button. The reading on the scale should read "0.00g". (***make sure the scale is in grams!!!***)
5) Place both pieces of unwrapped gum on the wax paper and record the mass in the data table ***(include units).***
6) Remove the gum and wax paper from the balance.
7) Place **BOTH PIECES** of gum in your mouth and chew for 2 minutes.
8) When the 2 minutes is up, place the gum between your teeth and suck it dry. (Why would you want the gum to be dry??)
9) Repeat steps 4-6 in order to determine its new mass.
10) Continue steps 7-9 until your gum has lost ALL of its flavor.
11) Once the gum has lost its flavor record the final mass as you did in steps 8 and 9.

*******Clean up: Throw gum and wax paper into the trash can and then have your teacher initial this line_____**

Data Table / Results

Table 1: Mass of 3 brands of gum after 2 minute intervals of chewing.

Time	Brand 1: Orbit Bubble Gum MASS (g)	Brand 2: Wrigley's Doublemint MASS (g)	Brand 3: Dentyne Fire MASS (g)
T_0	3.52	5.25	2.73
T_1	2.09	2.47	1.50
T_2	1.91	1.74	1.22
T_3	1.68	1.65	1.13
T_4	1.63	1.54	1.10
T_5	1.56	1.54	1.07
T_6	1.55	1.46	1.05
T_7	1.51	1.47	1.02
T_8			1.02
T_9			
T_{10}			
T_{11}			
T_{12}			
T_{13}			
T_{14}			
T_{15}			
T_{16}			
T_{17}			
T_{18}			
T_{19}			
T_{20}			
End Mass (grams)			
Change in Mass (see below)			
% Change in Mass (see below)			

Sample Calculations:

For each stick of gum, determine the **change in mass** by subtracting the end mass from the initial mass (T_0). For example, if the initial mass was 3.6 g and the end mass was 2.7 g, then the change in mass is:

3.6 g – 2.7 g = 0.9 g

To determine the **% change in mass**, divide the change in mass by the initial mass. Then multiply your answer by 100.

For example, **0.9 g / 3.6 g x 100 = 25.0%**

DATA ANALYSIS / GRAPHS:

For each graph, make to sure to include: label the x-axis (horizontal) and y-axis (vertical), units for each axis, legend, and a descriptive title of the graph.

1) Create a **BAR GRAPH** comparing the "before" and "after" mass for each brand of gum.

2) Make a **LINE GRAPH** to show the change in the gums' mass over the time chewed. Put all 3 brands of gum on the same graph. Use a different color for each line.

CONCLUSION:

1) Restate the purpose of the lab:_____

2) Which brand had the longest lasting flavor? Why do you think it did?

3) Which brand had the least flavor (or shortest duration)? Why do you think it did?

4) Did the data support your hypothesis? Why or why not?

5) Why is the gum losing mass as you chew the gum?

6) What were some errors with this lab?

7) What do you think would happen to the mass of the gum if you kept chewing the gum for a few hours?

8) What other information would you need to know to perform a more complete analysis of each gum?