Bubble Gum Lab - Percent Composition by Mass of Sugar in Bubble Gum name: _____

Introduction: Read this whole lab BEFORE you commence with your experiments. Failure to do so will result in wasting of time and of improper educational practice, likely leading to your total and complete academic destruction, which would be a real shame. If you are not allowed to chew gum, you may gather data without chewing, you still do all of the lab.

BACKGROUND: Packaged foods, such as bubble gum, are required by law to list all ingredients but not the exact amounts of them. The ingredients are listed in order of largest amount to smallest. (The first ingredient makes up the biggest part of the food.) The actual amounts of each ingredient are protected as business secrets. In this lab experiment you will determine the ACTUAL mass of sugar in your gum, and the PERCENT COMPOSITION BY MASS of sugar in your gum.

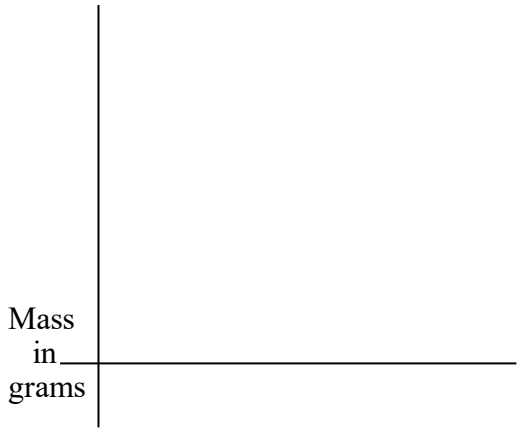
SAFETY: no goggles required, do not put gum in mouth if it gets unclean.

Procedure:
1. Get one piece of bubble gum from your teacher
2. Mass the gum inside the wrapper (in grams only)
3. Mass just the wrapper (hold gum safely in hand)
4. Create a simple data table showing number of chews and mass of gum (below left is the model)
5. Chew gum 25 times, mass the chewed gum (put it in the wrapper, do not put gum onto scale)
6. Mass gum again and again after every 25 more chews. Keep chewing until the mass stops changing or 600 chews, which ever comes first.
7. You may keep the gum, or dispose of it PROPERLY

Data Analysis:
You will need to draw a graph plotting mass as a function of number of chews as shown below. Do not connect the dots—rather, draw a <u>smooth curved line that will best approximate your data points</u>, which will show THE TREND OF THE DATA (not the tiny errors in measuring. This graph must have an <u>excellent title</u>, labels with units, and be neat. Make a full page sized graph.

This is a model, get some paper and count out to at least 450 chews before you start.

Total Number of Chews	Mass in Grams
0	original mass
25	
50	
75	
100	
keep going ↓	



These 8 problems are included into the middle section of your lab.
The formulas count, so do SF!

1. Calculate the mass of sugar in your gum. (show the math, from your data) (1)
2. Calculate the % Composition by mass of sugar in the gum (show formula + math) (3)
3. If your gum is actually 71.5% sugar, what is your percent error? (write the formula) (1)
4. How many chews did it take for all the sugar to be removed from the gum and how can you be pretty sure that this is true? (1)
5. What is the percent composition by mass of calcium in the compound calcium hydroxide? (1)
6. What is the percent composition by mass composition of carbon in C_7H_{14} (1-HEPTENE). (1)
7. What is the % composition by mass of phosphorous in ammonium phosphate? (1)
8. Write empirical formulas for 3-octene (C_8H_{16}), glucose ($C_6H_{12}O_6$), and 1-hexene (C_6H_{12}),? (1)

Page Number	What is included	Total Points
1	Cover page - descriptive title for lab report, describe in a sentence what this experiment is about, and what you did. Do NOT conclude here.	title = 1 intro = 1
2	Graph: on graph paper, include title, units, labels, and the data table in an appropriate place. Title must be descriptive of what the graph shows.	graph = 5 data table = 3
as many as needed	10 Questions from above show your work!	12 total
Last	Conclusion - Clearly state: what did you measure (the mass of the gum, the pink stuff only, the sugar only), what did you calculate (% comp of sugar in your gum), what is your % error, and - what can you conclude that you learned about chemistry during this lab experiment. You must include YOUR numbers! Your Details! All of the Facts!	3
THIS LAB IS DUE ON: _____		25 maximum