

LAB: PERCENT COMPOSITION OF BUBBLE GUM

Students: Please read the following information given below, and then come to class on your lab day with the following already prepared in your notebooks:

- 1) Date, 2) Partner, 3) Title, 4) Purpose, 5) Materials, 6) Safety,
- 7) Procedures/Observations, and 8) Data & Calculations (collect data in your notebooks)

The last 2 pages need to be printed out. These pages will be turned in. Data for this lab should be collected in your notebooks and later, rewritten in the Data and Calculations section. The data, calculations, and questions will be due three days after performing the lab in class.

What is bubble gum made up of? A quick read of the nutrition label on a typical pack of bubble gum will show that one piece has a mass of about 8 grams, and of that mass, about six grams is sugar. Sugar dissolves readily in water, and about equally well in saliva. Did you ever wonder why gum loses its flavor so quickly? Most of the flavor in gum is due to the sugar, which dissolves in saliva and is swallowed, never to be tasted again. You may have also noticed that the size of a wad of gum decreases considerably in the first 10 or 15 minutes of chewing. This change in volume is due to that same loss of sugar. In the case of sugarless gum, the sweetener used is typically a synthetic compound known as sorbitol, which may be listed as "sugar alcohol" on the nutrition label. It occurs in about the same proportion as does sugar in regular gum.

A piece of bubble gum will be chosen from the four flavors provided. The wrapper must be saved for use in the experiment so do not tare it up. The mass of the wrapper should be recorded. The piece of gum should be placed on the wrapper and the mass should be recorded. The mass of the gum by itself should be determined and recorded. The gum should then be placed into your mouth and chewed constantly until it no longer has any flavor left. (This should take a couple of minutes). The chewed piece of gum should be placed back onto the wrapper and the mass should be recorded. The amount of sugar that was contained in the gum should be determined and recorded. The percent composition of sugar in the piece of gum should be calculated. After gathering the data, the gum and wrapper should be thrown out in the garbage can and the balance pan should be washed with water before putting the balance away.

The data table should be completed by gathering data from two other students. NOTE: Each student should have a different flavor of gum and it cannot be the same as the flavor you chose.

DATA TABLE 1: Copy table into your notebooks and record data in notebooks.

Remember to use proper significant figures and units.

NAMES	Flavor of Gum	Mass of Wrapper (g)	Mass of Original Gum (g)	Mass of Chewed Gum (g)	Mass of Sugar (g)	% composition of sugar

Use the data that has been collected to complete the calculations on the following page.

LAB: PERCENT COMPOSITION OF BUBBLE GUM**Data & Calculations:** SHOW ALL WORK BELOW. INCLUDE ALL UNITS!

Calculate the % Composition of sugar in each of your pieces of gum.

(Your piece and the 3 other flavored pieces) SHOW ALL WORK FOR EACH CALCULATION!
PERCENTAGES CAN BE ROUNDED TO A WHOLE NUMBER OR ONE DECIMAL PLACE.A) 1st piece: Flavor: _____.B) 2nd piece: Flavor: _____.C) 3rd piece: Flavor: _____.D) 4th piece: Flavor: _____.

LAB: PERCENT COMPOSITION OF BUBBLE GUM**Conclusions:**

- 1) How does your data compare with your partners? What can you attribute any differences to?
- 2) Suppose the gum wasn't chewed long enough (until all the flavor was gone). How would this affect your results?
- 3) What have you learned about bubble gum today? Explain your answer thoroughly. Is density a physical or chemical property? _____
- 4) What is the percent composition of sugar ($C_{12}H_{22}O_{11}$)?
- 5) What is the molar mass of sugar?
- 6) Convert the mass of your dissolved (chewed) sugar to moles (chewed).

LAB: PERCENT COMPOSITION OF BUBBLE GUM**Questions: Use references to help you answer the following:**

1. North American Indians first chewed this substance that served as “gum”.
2. Early American settlers made a chewing “gum” from these substances.
3. Who, When, and What name was the first commercial chewing made?
4. Who became the first person to patent a chewing gum?
5. What brand name gum was created in 1899 in New York?
6. This famous Gum company was the 1st to add mint and fruit extracts to gum.
7. The gum used in today’s lab, Double Bubble, was created by who? When?
8. After World War II, chemists learned to make synthetic rubber that could be used in chewing gum. Name 2 examples of synthetic rubber.
9. Frequent gum swallowing could contribute to the formation of these, a sort of intestinal stone.
10. Name a well-known movie that showed a type of chewing gum that could contain a 3-course meal (Soup, Entrée, and Dessert).