

CONSERVATION OF MASS LAB

(Keeping track of atoms and molecules)

Science 6

NAME _____ Period _____

The Law of Conservation of Mass states that mass in a closed system will remain constant (same). Matter can NOT be created or destroyed. A closed system is one to which nothing can be added or taken away.

Purpose: To show that in a chemical reaction that where a gas is produced that the MASS does not change.

Materials: Balance | Zip Lock Baggie | Alka-Seltzer tablet | Water | Electronic Balance

DATA COLLECTION:

Do this column BEFORE doing the experiment	THE EXPERIMENT
<p>Volume of water used _____ mL (between 50mL and 75 mL)</p> <p>Pour water into zip lock baggie</p> <p>Mass of Baggie & water _____ g</p> <p>Mass of Alka-Seltzer _____ g</p>	<p>PROCEDURE:</p> <ol style="list-style-type: none"> Drop ONE Alka-Seltzer tablet into the baggie and QUICKLY close up the zip lock baggie. WAIT until the fizzing has stopped and the Alka-Seltzer tablet has completely dissolved. <p>DO NOT OPEN</p>
<p>DATA</p> <p>Add the Mass of the these items & record in the space below.</p> <p>Baggie + Water + Alka-Seltzer</p> <p>TOTAL MASS _____ g</p>	<p>DATA</p> <p>Baggie + Water + Alka-Seltzer (CLOSED)</p> <p>TOTAL MASS _____ g</p> <p>Baggie + Water + Alka-Seltzer (OPENED)</p> <p>TOTAL MASS _____ g</p> <p>Volume of water _____ mL</p>

Conclusion Questions:

1. Is the ending mass of the beaker, water, and Alka-Seltzer exactly the equal or close to the calculated starting mass BEFORE doing the experiment? YES or NO

2. Complete the chart below to compare the BEFORE and AFTER Measurements:

Measurement	BEFORE	AFTER	Difference
Volume of Water			
Total Mass of Baggie & Contents	BEFORE CLOSED SYSTEM	AFTER CLOSED SYSTEM	AFTER OPEN SYSTEM

3. What differences or changes (before & after) did you find by looking at your Data Table above?

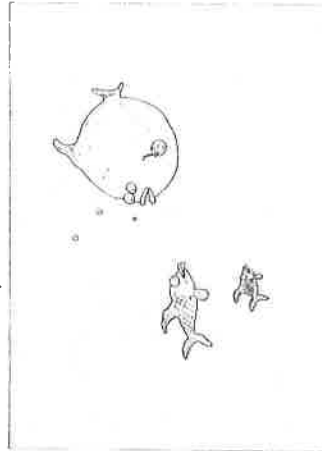
Volume of Water: _____

Mass of Contents: _____

3. Restate the Law of Conservation in your own words:

4. According to the Law of Conservation of Mass, the starting and ending mass if ingredients should be the same. Give your best explanation as to WHY the masses are different after you removed the cap?

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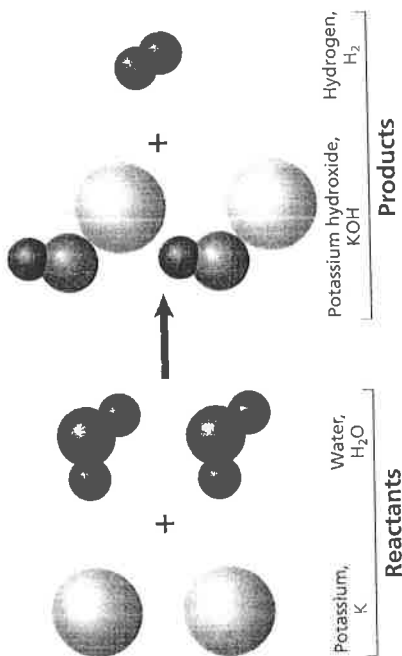


"I'm not a puffer fish. I swallowed an Alka-Seltzer."

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Visualizing the Conservation of Mass

Use with Chapter 3, Section 3.2



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Name _____

CONSERVATION OF MASS

In chemical reactions, mass is neither gained nor lost. The total mass of all the reactants equals the total mass of all the products. Atoms are just rearranged into different compounds.

Using this idea, solve the following problems.

1. $2\text{KClO}_3 \rightarrow 2\text{KCl} + 3\text{O}_2$
If 500 g of KClO_3 decomposes and produces 303 g of KCl , how many grams of O_2 are produced?

2. $\text{N}_2 + 3\text{H}_2 \rightarrow 2\text{NH}_3$
How many grams of H_2 are needed to react with 100 g of N_2 to produce 121 g of NH_3 ?

3. $4\text{Fe} + 3\text{O}_2 \rightarrow 2\text{Fe}_2\text{O}_3$
How many grams of oxygen are needed to react with 350 g of iron to produce 500 g of Fe_2O_3 ?

4. $\text{CH}_4 + 2\text{O}_2 \rightarrow \text{CO}_2 + 2\text{H}_2\text{O}$
16 g of CH_4 react with 64 g of O_2 , producing 44 g of CO_2 . How many grams of water are produced?

5. $\text{CaCO}_3 \rightarrow \text{CaO} + \text{CO}_2$
How much CO_2 is produced from the decomposition of 200 g of CaCO_3 if 112 g of CaO are produced?

Visualizing the Conservation of Mass

Use with Chapter 3, Section 3.2

- How many potassium atoms are in the reactants of the chemical reaction shown? How many are in the products? _____
- How many oxygen atoms are in the reactants of the chemical reaction shown? How many are in the products? _____
- How many hydrogen atoms are in the reactants of the chemical reaction shown? How many are in the products? _____
- Assume that the chemical reaction shown started out having a total of 15 g of potassium and water. How much potassium hydroxide and hydrogen gas will be produced by the chemical reaction? Show your work.

- Assume that the chemical reaction shown started out having 6 atoms of potassium and 6 molecules of water. How many molecules of potassium hydroxide will be produced by the chemical reaction? How many hydrogen atoms will result?

- Assume that you are working with a chemical reaction that decomposes water into hydrogen and oxygen. You begin with 36 grams of water and end with 32 grams of oxygen. If all of the water decomposes, how many grams of hydrogen gas will result?

- Assume that you are working with a chemical reaction that synthesizes salt from sodium and chlorine. You begin with 70.9 g of chlorine. You synthesize 116.90 grams of salt. If all of the reactants were used up, how many grams of sodium did you begin with?
