

Lab: **Does the Mass Add Up?**

Name: _____

Date: _____

During a chemical reaction, chemicals react to produce new substances. Is any mass lost in this process?

Purpose: to determine if mass is gained or lost during chemical reactions

Hypothesis: If two compounds react together to produce new products, **then** the mass of the products will be _____ to the mass of the reactants, **because** mass can be neither created nor destroyed.

Materials and Apparatus:

Erlenmeyer flask with rubber stopper	small test tube	2 small glass beakers
electronic balance	scoopula	paper towels
2 graduated cylinders (10 mL)	plastic dropper	vinegar
baking soda (sodium hydrogen carbonate)	sodium hydroxide (NaOH)	iron (III) nitrate (Fe(NO ₃) ₃)

Method - Part A:

- Using the scoopula, place a small amount (~ 2 scoops) of baking soda in one of the small beakers.
- Measure 5 ml vinegar into the other small beaker, using a clean graduated cylinder.
- Place a paper towel on the electronic balance, and place the 2 glass beakers on the paper towel.
- Record the mass of the reactants in table 1.
- Carefully pour the vinegar into the baking soda.
- Wait 30 seconds and record the mass of the 2 plastic beakers in the table 1.
- Clean everything up: pour materials down the sink, and wash all apparatus thoroughly.

Method - Part B:

- Measure 5 ml of sodium hydroxide (NaOH) into the Erlenmeyer flask, using a clean graduated cylinder.
- Measure a dropper full of iron (III) nitrate (Fe(NO₃)₃) into the small test tube using the second graduated cylinder.
- Carefully **slide** the test tube **into** the Erlenmeyer flask. Do not allow the test tube contents to spill.
- Place a stopper on the flask.
- Measure and record the total mass of the flask and its contents in the table 1.
- Slowly tip the flask back and forth to allow the two solutions to mix.
- Measure and record the total mass of the flask and its contents once more.
- Pour the contents of the flask into the waste container provided, being careful not to dispose of the small test tube.
- Wash the flask, test tube, and stopper thoroughly. **Be careful of the small test tube due to fragility!**

Observations:

Table 1: Reactant and Product Masses before and after Chemical Reactions

	Part A baking soda + vinegar	Part B NaOH + Fe(NO ₃) ₃
Predicted change in mass (increase, decrease, no change)		
Mass of reactants (g)		
Mass of products (g)		
Calculated difference in mass, + / - , (g) (mass of reactants - mass of products)		

Analyze and Evaluate:

1. Provide evidence that a chemical change occurred in the following parts of the lab?

Part A: _____

Part B: _____

2. Were the predictions correct? **(Yes or No)**

Part A: _____ Part B: _____

3. Mass can be neither created nor destroyed. Why did the mass change is Part A? **(Full Sentences)**

4. The products of the reaction in **Part B** are sodium nitrate and iron(III) hydroxide.

- A) Write a **word equation** to describe this reaction.
- B) Write a **chemical equation** to describe this reaction.

Word:

Chemical: