

Open and Closed Systems Lab

Name: _____ Date: _____ Period: _____

Purpose: To observe and identify how mass can change in open and closed mass systems during chemical interactions. Observe the exchange of energy during chemical reactions.

Research:

Sodium Bicarbonate (_____) or Baking _____. Used for _____.

Acetic Acid (_____) is a weak _____.

Steel Wool or Iron (_____) . Same metal found in _____.

Oxygen (_____) is formed from a _____ bond. This forms a _____ of Oxygen.

Experiment:

Safety Issues:

- **Wear your safety goggles at all times.**
- **Do not play with the lit candle and be sure to pull hair back.**
- **Please clean up after your experiment and put ALL of the materials back in the bin. Rinse ALL glassware thoroughly.**
- **Wipe the table of any chemicals before you leave the room.**
- **Follow provided task card and/or teachers directions to complete the lab**

Materials:

- Plastic zip-lock bag
- Sodium Bicarbonate
- Acetic Acid
- Small Beaker
- Medium Flask
- Balloon
- Steel Wool
- Mass Scale
- Metal Tongs

Table: Mass Measurements For Open and Closed Mass Systems			
	<u>Experiment 1</u> Rusting Reaction	<u>Experiment 2</u> Vinegar and Baking Soda (Closed Bag)	<u>Experiment 3</u> Vinegar and Baking Soda (Open Bag)
Start Mass	_____ g	_____ g	_____ g
End Mass	_____ g	_____ g	(After bag is opened) _____ g
Change in Mass	_____ g	_____ g	_____ g
Type of System (Open or Closed)			
Was there mass input or output?			
Temperature of System (During interaction)			

Analysis: ANSWER IN COMPLETE SENTENCES

1. What evidence supports that a chemical reaction occurred in both experiments. **List** your observations below that identify any change that occurred during the reaction.

Rusting Reaction	Baking Soda and Vinegar Reaction

2. What type of reaction do you think the rusting reaction was: Decomposition, Synthesis, Single or Double Replacement? Explain your answer (hint: think about the reactants and the product.)

3. If we burned a match in a jar with the lid off, how would the mass of the system change after the interaction? Explain your reasoning.

Conclusion:

**Write a claim, evidence, and reasoning scientific conclusion to answer the focus question:
“How is mass affected during chemical reactions in open and closed mass system?”**

Claim: (Answer to focus question)

Evidence: (Support your claim with ALL of the available data from the lab)

Reasoning: (Justify why the data counts as evidence which supports the claim)