Name_____

Target Stoichiometry Lab Worksheet

Data Table

Mass of test tube (g)	
Mass of test tube + sodium bicarbonate (g)	
Mass of sodium bicarbonate before heating (g)	

Time when the heating of the test tube started: _____

Predicted mass of final product and test tube (g):_____

Actual mass of final product and test tube (g):_____

Final mass of product only measured (g):_____

Scoring Table

If you are within…..	Your grade will be ……
0.03g	10/10
0.10 g	9/10
0.20 g	8/10
0.30 g	7/10
0.50 g	6/10
1.00 g	5/10
5.00 g	4/10
10.00 g	3/10
20.00 g	2/10
50.00g	1/10
>50.00 g	0/10

Observations and Questions

1. What color change occurs, if any, when the brush with the universal indicator solution is inserted into the test tube (step 9)?

2. The chemical formula of sodium bicarbonate is $NaHCO_3$. What common oxide is being produced in the test tube?

3. What do you observe in the upper half of the test tube (step 10)?

4. What common substance appears to be a second product of this reaction?

5. The third product of the reaction is sodium carbonate. What is the correct formula for sodium carbonate? *Hint:* Remember to balance the charges.

6. Write the balanced chemical equation for the reaction that took place in the test tube. *Note:* Check with your instructor before balancing to make sure the products are correct.

7. Starting with the mass of $NaHCO_3$ you started with in the test tube (see the Data Table), use stoichiometry and your balanced equation to calculate the mass of sodium carbonate you should have in the test tube. Show your calculations.

8. Assuming all the baking soda you started with has been converted into sodium carbonate (with the product gases driven off), what should the test tube and contents weigh now?

9. Observe the sodium carbonate left in the test tube; compare and contrast the product to some fresh sodium bicarbonate. Record your observations.

Post-Lab Questions

10. How would the final results be affected if the test tube had not been heated long enough? Explain.

11. CO_2 is denser than air. Why did the CO_2 produced from the reaction rise upward and out of the mouth of the tube?

12. Using the original mass of $NaHCO_3$, determine the mass of H_2O produced in this reaction. Show your calculations.

13. Using the original mass of $NaHCO_3$, determine the mass of CO_2 produced in this reaction. Show your calculations.

14. Add the two masses from Questions 12 and 13 above along with the calculated mass of Na_2CO_3 from Question 7. What is the total mass of products in this reaction?

15. How does the mass from Question 14 compare with the initial mass of sodium bicarbonate you put in the test tube? Explain why this makes sense.

16. Using your data from lab, calculate the percent error for the sodium carbonate measured at the end of lab. Show all work.