AP Chemistry Lab 6 - Gravimetric Analysis of a Mixture (Guided Inquiry Lab)

Background:
Sodium carbonate (Na_2CO_3) and sodium bicarbonate ($NaHCO_3$) are both white powders with pretty much the same properties. Both will decompose when heated, but there is one key difference that will help you differentiate between these two compounds. The purpose of this lab is to try to figure out the % mass of a mixture of Na_2CO_3 and $NaHCO_3$ using your knowledge of chemical reactions and stoichiometry.

Pre Lab:

1. Write the balanced chemical reaction for the decomposition of BOTH Na_2CO_3 and $NaHCO_3$, you will use these in your lab calculations.
2. One of these compounds is preferred over the other for baking. Using the internet or AI, explain which one is the preferred compound and why. Based on your research, how do you plan to differentiate these two compounds? A brief citation (just a URL) is required.

Problem to Solve:
Determine the % mass of these two compounds in the mixture

Procedure:
Write a procedure for the lab that includes the use of a Bunsen burner, ring stand, ceramic triangle, and crucible. Come up with a detailed procedure for how you are going to solve the problem.

a. Make sure it's numbered by steps.
b. The starting amount of mixture should fit easily into an empty crucible.
c. Because we are good analytical scientists, you should **perform your experiment 3 times** for the precision of data.
d. Don't forget to include the disposal of waste material
e. Search on the internet or the provided material safety data sheets (MSDSs) for the proper disposal technique of the waste material. Here are the MSDSs for $NaHCO_3$ and Na_2CO_3.

Data Table:
Make sure you include a data table for all of your findings

Calculations:
You need to show the calculations for how you determined the % mass of each of these compounds in the mixture. It is easiest if this is neatly hand-written, scanned, and then uploaded into your report.

Results and Conclusion
This section needs to explain your data table and the results of your calculations in paragraph form. Explain the purpose of the lab. Make sure you include a statement about how you determined how to differentiate the two compounds and why you took the step you need to separate them. The purpose of this section is to explain your results to a normal, nonscientific, person. Draw conclusions for the audience.