

TITLE: CONSERVATION OF MASS

We have long known that atoms can be neither created nor destroyed during a chemical reaction. The number of atoms of each element must be the same before and after the chemical reaction.

If the number of atoms of each element remains the same, then the mass can never change in a chemical reaction. The total mass of the reactants must equal the total mass of the products. This observation that mass must remain constant in a chemical reaction as known as the *law of conservation of mass*.

OBJECTIVE: Students investigate and identify the law of conservation of mass. (TEKS 8C)

PROBLEM: When the substances are combined in a plastic bag, how can the law of conservation of mass be observed?

HYPOTHESIS: (Record in your journal.)

MATERIALS:

- 1 zip lock bag
- 2 small plastic cups
- vinegar (acetic acid)
- baking soda (sodium bicarbonate)
- triple beam balance

PROCEDURES:

1. Fill one cup halfway with vinegar.
2. Fill a second cup halfway with baking soda.
3. Put both cups in the plastic bag. Take care NOT to spill the contents of either cup.
4. Determine the mass of the cups and their contents, and the plastic bag. Write the values in your data table.
5. Seal the plastic bag.
6. Without opening the bag, pour the vinegar into the cup of baking soda.
7. Without opening the bag, record the mass of the contents of the plastic bag. Take care not to break the seal of the plastic bag.

DATA/OBSERVATIONS: (Draw and record the table below in your journal.)

| Initial Mass (g) | Final Mass (g) | Change in Mass (g) |
|------------------|----------------|--------------------|
| | | |

ANALYSIS/CONCLUSIONS: (Record in your journal.)

1. Describe what happens when the vinegar was poured into the cup of baking soda.
2. What is a chemical reaction?
3. The gas that is produced in this reaction puts out fires. Can you make an educated guess about its identity? What is the name of the gas?
4. What is conservation of mass and how does it relate to this exercise?

