

# Messing With Mass

What is mass, and how can masses react with each other? Is mass gained or lost during a chemical reaction? These are the questions you will consider during this activity.

You will be investigating the reaction of two common chemicals—citric acid and baking soda. In a chemical reaction, the substances that are mixed together are called reactants, and the substances resulting from the reaction are called products. You will be asked to describe (to the best of your ability) what is occurring inside the bag where the reaction is happening. Use all your senses (**except taste!**) to make your observations.

## Procedure

- 1 Describe the two chemicals involved in the chemical reaction (citric acid and baking soda) on a separate sheet of paper. You may smell the chemicals but *DO NOT taste them*.
- 2 Add 1/4 teaspoon of citric acid to a 1-quart plastic bag.
- 3 Add 1/4 teaspoon of baking soda to the bag.
- 4 Place the open container of water inside the bag. Be careful not to spill the water inside the bag. Place the bag in the bowl, then center the bowl on the balance. Record the total mass of the bag and its contents to the nearest tenth of a gram: \_\_\_\_\_ g
- 5 *Carefully* take the bag out of the bowl (without spilling the water) and seal it well. Mix the contents of the bag together. Then hold the bag in your hands without squeezing or manipulating it in any way.
- 6 On a separate sheet of paper, write down as many observations of the chemical reaction as you can.
- 7 Place the closed bag in the bowl on the balance and find its mass again after the reaction has occurred. Record the mass to the nearest tenth of a gram: \_\_\_\_\_ g

## Questions

Write your answers on a separate sheet of paper.

- 1 When a reaction gives off heat, it is called *exothermic*. When a reaction absorbs heat, it is called *endothermic*. Is the reaction you observed endothermic or exothermic?
- 2 How did the mass of the reactants compare to the mass of the products? Use this formula to calculate any percent difference in the mass between the two:  

$$\frac{\text{absolute value of the difference between the two masses}}{\text{mass before reaction}} \times 100 = \text{percent difference}$$
- 3 What might have caused any difference in mass that you found?
- 4 What evidence would you give to show that a chemical reaction did indeed occur?

