# Investigating Chemical Reactions

Student Name

Date

## Data

## Activity 1: Synthesis Reaction

Data Table 1

| **Activity** | **Observations and Data** |
| --- | --- |
| Synthesis reaction |  |
| Decomposition reaction |  |
| Single-replacement reaction |  |
| Double-replacement reaction |  |
| Combustion reaction |  |
| Precipitation reaction |  |
| Combustion reaction |  |

1. Describe all of the signs that indicated a chemical reaction occurred.
2. Describe the temperature change that occurred during this reaction. Is heat required or produced during the reaction?
3. Describe any other changes that were observed in the steel wool. What reaction might create such a change?
4. Write a balanced equation for the reaction of the steel wool with oxygen. Be sure to include heat energy in the reaction.

## Activity 2: Decomposition Reaction

1. What two gases could potentially be produced from decomposing hydrogen peroxide? Which gas was actually produced? What non-gaseous product formed from the reaction?
2. Write a balanced equation for the decomposition of hydrogen peroxide.

## Activity 3: Single-Replacement Reaction

1. What gases could potentially be produced from hydrochloric acid (HCl)? Which gas was actually produced?
2. Why did the splint need to be tilted at a 45-degree angle?
3. a. Write a balanced equation for the reaction initiated by the burning splint.

b. Classify the reaction initiated by the burning splint.

1. Write a balanced equation for the reaction of magnesium with hydrochloric acid.

## Activity 4: Double-Replacement Reaction

1. What is the name and molecular formula of the gas formed when baking soda was combined with vinegar, which you identified using flaming and glowing splints?
2. Write a balanced chemical equation for the double-replacement reaction that occurred when baking soda was combined with vinegar.
3. One of the two products of the reaction of baking soda and vinegar is carbonic acid (H2CO3), which immediately forms water and the gas you identified after exposure to the flaming and glowing splints. Write a balanced equation showing the decomposition of carbonic acid.

## Activity 5: Combustion Reaction

1. Explain why water appeared on the inside of the glass test tube.
2. Write a balanced equation for the combustion reaction.

## Activity 6: Precipitation Reaction

16. Write a balanced equation for the precipitation reaction. Which product is the precipitate?