Chemical Change Activity Guide

In a chemical reaction, chemicals make and break bonds. The bonds are attachments that hold the parts of chemicals together. These new arrangements of bonds produce new chemicals that are different from the ones that reacted. Some reactions just happen on their own when chemicals are put together. Others need energy such as heat or light to begin. The new substances that come from a chemical reaction can have different colors, temperatures, appearance, smell, or even make light or a gas. This activity explores just a few examples of chemical reactions. These are reactions between iron and various liquids.

These directions will get you started. Your teacher will be in contact to guide you and provide information.

Materials From The Bag

- 1 steel wool pad
- 6 plastic cups, 4 oz.
- 1 graduated medicine cup, 30mL

You Will Supply These Materials

- water, 60 mL
- vegetable oil, 60 mL
- clear soda (sprite or 7-up), 60mL

Part 1: Exploration, Iron and Water

This part of the lesson explores what happens when steel wool is put in water.

1. Cut with scissors or tear the steel wool into 8 pieces of about the same size.
2. Place a piece of steel wool in two plastic cups, one piece per cup. Save the other pieces for part 2.
3. Use the graduated cup to measure out 60mL of water into one of the cups with steel wool. Add nothing to the other cup with steel wool.
4. Note the time, and place both cups on a sheet of paper. Record observations of both cups, including any differences in appearance between the steel wool in water and the one with no water. Let the cups sit until the same time tomorrow (24 hours).
5. After 24 hours, record observations of each cup. Observe what happened to both the water and the steel wool, and anything in either cup that wasn't there before.
6. Let sit for a couple more days. Each day at about the same time, record your observations.

Part 2: Steel and other liquids

This part of the lesson explores what happens when steel wool is placed in other liquids.

1. Place a piece of steel wool in 4 different plastic cups. Each cup will get 60mL of a different liquid.
2. Label each cup with one of the following: vinegar, clear soda, vegetable oil, water. Add 60mL of the corresponding liquid to each cup.
3. Place the cups on a sheet of white paper and note the time. Leave them to sit until this time tomorrow.
4. After 24 hours, record observations of each cup. Observe what happened to the water and the steel wool, and anything in any of the cups that wasn't there before.
5. Let all 4 cups sit for a couple more days. Each day at about the same time, record your observations.

Part 3: Chemical and Physical Changes

Your teacher will provide you with definitions of chemical and physical changes. As much as possible, discuss these definitions until you feel that you understand them.

1. For each cup: water, vegetable oil, soda, and vinegar, determine whether you think you have evidence in your observations for a chemical change or a physical change, or both.
2. Support each of your claims for physical and/or chemical changes with evidence from the observations you wrote down. If you think there was no change, provide evidence to support this.

3. During step 1 of part 1 you cut the steel wool into 8 pieces. Is this an example of a physical or chemical change? Explain your answer.

Correlations to North Carolina Science Standards

8.P.1.3 Compare physical changes such as size, shape and state to chemical changes that are the result of a chemical reaction to include changes in temperature, color, formation of a gas or precipitate.