

Grade 5 - Lesson 3.5
Activity Sheet
Reactions with Different Changes

Name: _____

Date: _____

Safety: Wear safety goggles and be sure to follow all safety instructions given by your teacher. Wash your hands after completing the activity.

ACTIVITY

Question to investigate:

What are the similarities and differences in the reaction between citric acid and baking soda, and in the reaction between calcium chloride and baking soda?

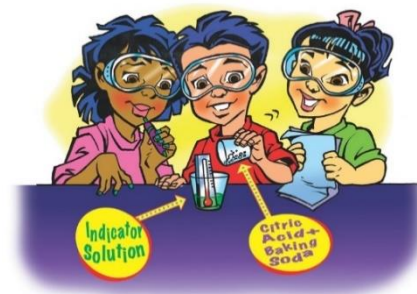
Materials

- Citric acid
- Baking soda
- Calcium chloride
- Universal indicator
- Water
- Graduated cylinder or plastic tablespoon
- Thermometers
- Measuring spoon, ½-teaspoon size
- 2 Clear plastic cups
- 2 Small cups

Baking soda and citric acid

Procedure

1. Use a graduated cylinder or a plastic tablespoon, to measure 15 mL (one tablespoon) of universal indicator solution and pour it into one of the clear plastic cups.
2. Place a thermometer in the indicator solution and record the initial temperature on the activity sheet.
3. In a separate small cup, combine 1/2 teaspoon of citric acid and 1/2 teaspoon of baking soda.
4. While the thermometer is still in the indicator solution, pour the citric acid and baking soda mixture into the indicator solution. Observe and record any color changes and/or temperature changes that occur.



WHAT DID YOU OBSERVE?

1. What changes did you observe when you mixed baking soda with citric acid in the universal indicator solution?

The indicator solution turned red and bubbled a lot. The temperature went down.

Baking soda and calcium chloride

Procedure

1. Use a graduated cylinder or Tablespoon to measure 15 mL (one tablespoon) of universal indicator solution and pour it into the second clear plastic cup.
2. Place a thermometer in the indicator solution and record the initial temperature on the activity sheet.
3. In a separate small cup, combine 1/2 teaspoon of calcium chloride and 1/2 teaspoon of baking soda.
4. While the thermometer is still in the indicator solution, pour the calcium chloride and baking soda mixture into the second indicator solution. Observe and record any color changes and/or temperature changes that occur.



WHAT DID YOU OBSERVE?

2. What changes did you observe when you mixed baking soda with calcium chloride in the universal indicator solution?

The indicator turned pink but was cloudy. There was bubbling but not as much as there was with the citric acid and baking soda. The temperature went up.

EXPLAIN IT WITH ATOMS & MOLECULES

3. You mixed citric acid with baking soda, and in a separate test you also mixed calcium chloride with baking soda. Why do you think the reactions you observed were different?

Since citric acid and calcium chloride are different substances, they react with baking soda differently. They also must interact with the indicator differently.

TAKE IT FURTHER

You saw a demonstration in which an Alka Seltzer tablet was placed in a universal indicator solution.



4. What changes did you observe?

The indicator bubbled a lot and turned red and then orange-ish-yellow.

5. Was this reaction similar to what you expected? Why or why not?

Since Alka Seltzer is made mostly of baking soda and citric acid, this reaction makes sense since it is similar to the reaction we saw with citric acid and baking soda in the experiment.