

Station 1

Name \_\_\_\_\_

The citric acid and baking soda reacted and made new chemicals. How do you know that something new was made? Justify your response with qualitative observations from the lab.

When the citric acid was added it bubbled & fizzed.

The foam is a product of a gas bubbling up out of the solution during the reaction. If you wanted to make more gas, what could you do? (Hint - you have to keep the amount of detergent solution the same).

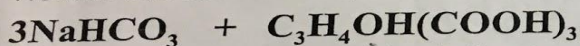
You could increase the amount of citric acid or baking soda.

Reactants

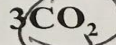
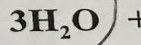
Products

Carbon dioxide

Here is the chemical equation for the reaction you are observing.



water



2

baking soda

citric acid

Based on this information, the gas created in this reaction is most likely which compound?

gas

Sodium bicarbonate

Station 2

Name \_\_\_\_\_

What do you know about the pH of the powders in each cup? Justify your response with qualitative and quantitative observations.

Citric acid is a weak acid b/c it turned red.

Sodium carbonate is a base b/c it turned purple.

Predict what color the solution would be if you were to mix the citric acid and sodium carbonate solutions. Justify your prediction.

It would probably be yellow or green as they change the pH closer to neutral.

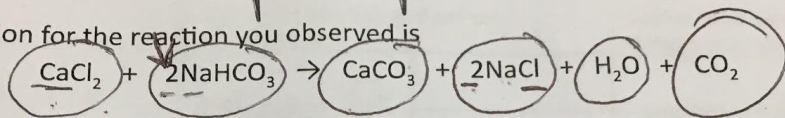
Station 3

Name \_\_\_\_\_

What sign of a chemical reaction did you observe at this station?

Formation of a precipitate

The chemical equation for the reaction you observed is



Fill in the chart below based on the chemical equation

Type of Atom	Number of Atoms in Reactants	Number of Atoms in Products
Calcium	1	1
Chlorine	2	2
Sodium	2	2
Hydrogen	2	2
Carbon	2	2
Oxygen	6	6

Station 4

4A

Name \_\_\_\_\_

4B

Chemical Reaction	Citric Acid solution and sodium bicarbonate	Sodium bicarbonate solution and calcium chloride
Starting Temperature ( $^{\circ}\text{C}$ )	Temp ↓	Temp ↑
Final Temperature ( $^{\circ}\text{C}$ )		
Difference in Temperature ( $^{\circ}\text{C}$ )		

- If the temperature increases during the chemical reaction it is called an exothermic reaction. The prefix "ex" means to leave (like "exit"). In these reactions, heat is being released.
- If the temperature decreases during the chemical reaction it is called an endothermic reaction. The prefix "en" means to go into (like "entrance").

Based on this information, classify each reaction as either exothermic or endothermic.

Citric acid + Sodium bicarbonate – endothermic  
 Sodium bicarbonate + Calcium chloride – exothermic

Based on your experiment, predict why road crews often spray calcium chloride on the streets when we are experiencing winter weather. TO make roads not freeze

Station 5

Name \_\_\_\_\_

Which sign of a chemical reaction did you observe at this station?

Giving off light

The luminol mixture and the oxidizer are the reactants. Are these chemicals the same at the end of the chemical reaction? Why or why not?

No, they have created new products as evidenced by the color change & glow.

The light only lasted a short time. Why do you think the light stopped?

The reaction ran out of reactants so the reaction stopped.