

# Carbon Dioxide

## Student Worksheet

Name \_\_\_\_\_

**Overview** Why did you save that mysterious limewater from your Acids and Bases experiment? You'll find out today, as you use it as an indicator!

**What to Learn** You will need to know that limewater is an indicator that tests for the presence of carbon dioxide.

### Materials

- Limewater from "acids and bases" lab ([MSDS](#))
- One-hole rubber stopper
- 90° bend glass tubing
- Test tube rack
- 2 Test tubes
- Sodium hydrogen sulfate ( $\text{NaHSO}_4$ ) ([MSDS](#)) **Sodium hydrogen sulfate is very toxic. Respect it, handle it carefully and responsibly. Do not take it for granted.**
- Sodium carbonate ( $\text{Na}_2\text{CO}_3$ ) ([MSDS](#))

### Lab Time

1. In test tube #1: Place limewater liquid (NOT solids) from "Acids and Bases" experiment. Place test tube in test tube rack.
2. In test tube #2:
  - a. Make a solution of sodium hydrogen sulfate ( $\text{NaHSO}_4$ ) by first adding 5 milliliters of water to the test tube, then a spoon tip of sodium hydrogen sulfate. Mix. (Distilled white vinegar may be substituted for this solution).
  - b. Add a spoon tip of sodium carbonate ( $\text{Na}_2\text{CO}_3$ ) to the sodium hydrogen sulfate solution. Mix.
3. Immediately cap test tube #2 with a one-hole rubber stopper that has a 90° glass tubing placed in the hole.
4. Put the other end of the 90° glass tubing into the limewater liquid in test tube #1. Observe.

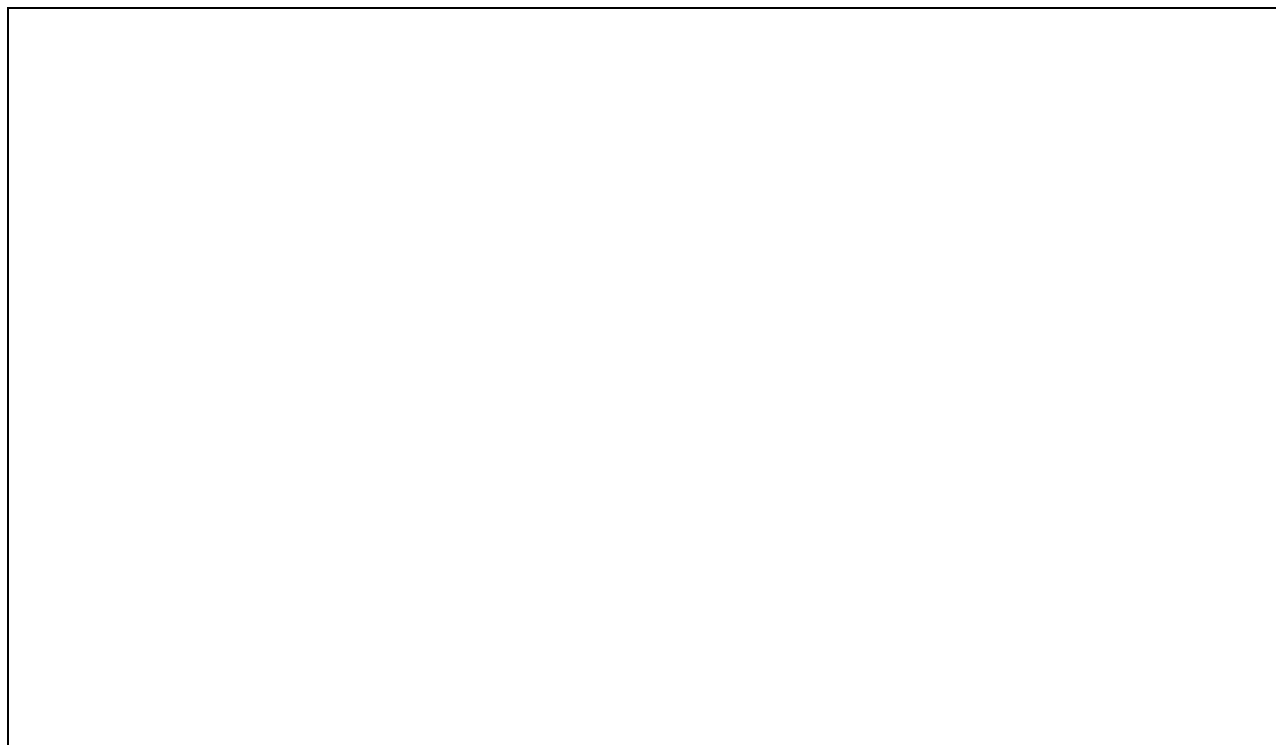
**Cleanup:** Clean everything thoroughly after finishing the lab. After cleaning with soap and water, rinse thoroughly. Chemists use the rule of "three" in cleaning glassware and tools. After washing, chemists rinse out all visible soap and then rinse three times more.

**Storage:** Place cleaned tools and glassware in their respective storage places.

**Disposal:** Liquids can be washed down the drain. Solids are thrown in the trash.

## Carbon Dioxide Data Table

Make a diagram of this experiment. Label both test tubes, rubber stopper, 90° glass tubing, limewater, sodium hydrogen sulfate, sodium carbonate, and carbon dioxide.



**Exercises** Answer the questions below:

1. How was limewater used in this experiment?
2. How do you know if carbon dioxide was actually produced?
3. What else could you combine and then test for carbon dioxide using limewater?

## Exercises

1. How was limewater used in this experiment? (It was an indicator that tested for the presence of carbon dioxide)
2. How do you know if carbon dioxide was actually produced? (The limewater turned cloudy which it does in the presence of carbon dioxide gas)
3. What else could you combine and then test for carbon dioxide using limewater? (Answers may vary. For example: vinegar and baking soda)

**Closure** Before moving on, ask your students if they have any recommendations or unanswered questions that they can work out on their own. Brainstorming extension ideas is a great way to add more science studies to your class time.