



The Dynamics of Carbon Dioxide in the Aquarium

Student Worksheet

Part 1: Creating Carbon Dioxide

Materials (Per group)

Empty plastic or glass bottle
Balloon
1 cup of vinegar
 $\frac{1}{3}$ cup of baking soda
Funnel
Goggles (per student)

Procedure

1. Wear your safety goggles.
2. Use the funnel to add the $\frac{1}{3}$ cup of baking soda into the balloon.
3. Twist the neck of the balloon a few times to keep the baking soda from spilling out and set the balloon aside.
4. Rinse the funnel and then use it to add 1 cup of vinegar to the bottle.
5. Next, carefully stretch the mouth of the balloon over the bottle opening. Be sure to keep the neck of the balloon twisted to keep any of the baking soda from falling into the bottle and reacting with the vinegar.
6. Once the balloon is securely attached to the bottle, allow the balloon to drape over to one side.
7. When you are ready, lift the balloon directly over the opening of the bottle, secure it to the bottle and untwist the balloon.
8. Quickly shake out the baking soda.
9. Step back and observe.

What did you notice?

What filled up the balloon? How do you know?

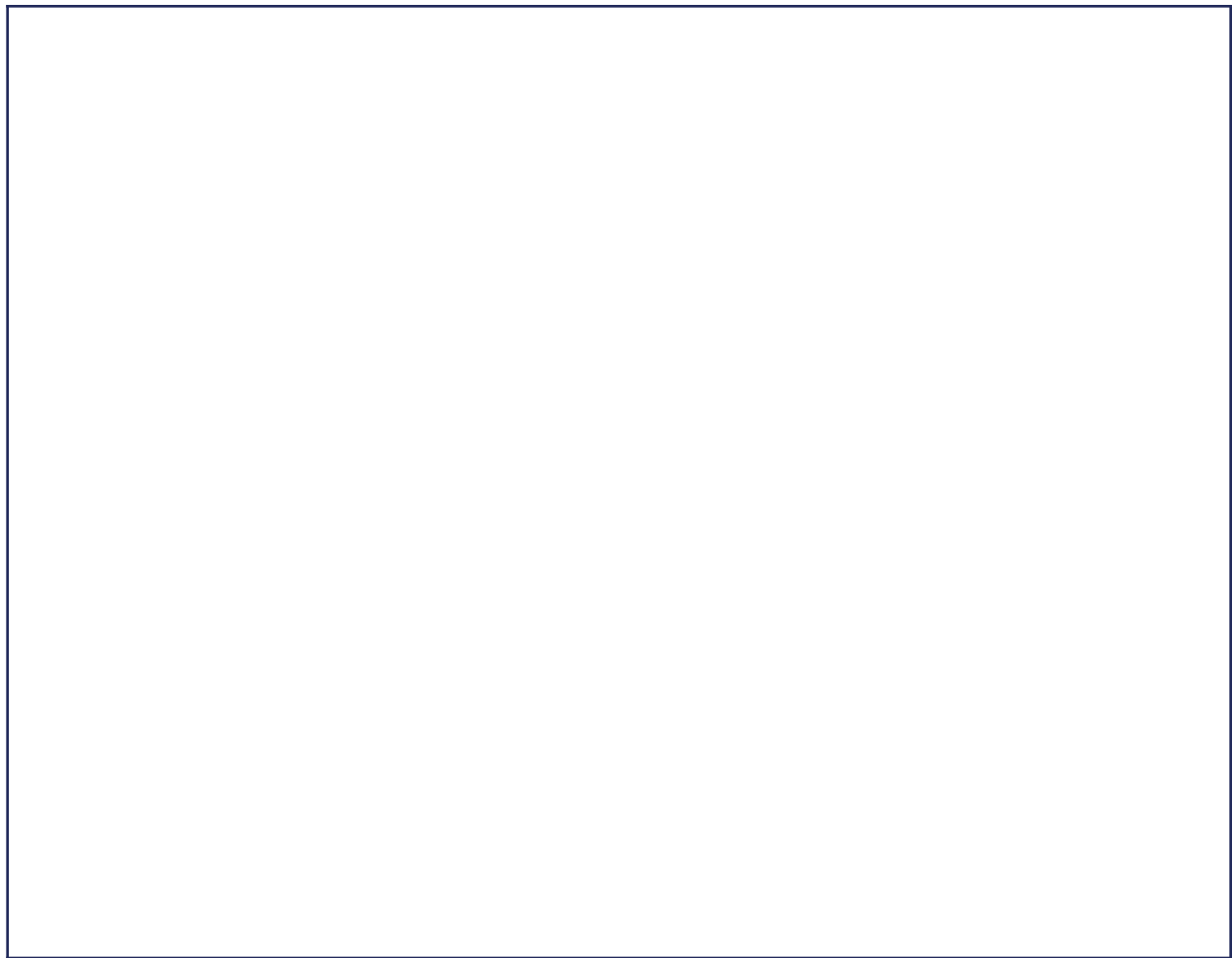
Design a carbon dioxide reactor to dispense carbon dioxide into your aquarium. Be very detailed - label all parts and explain their significance. You will present your design to the class.

Data Collection

Date	temp	pH	Plants	
			Heights	Qualitative observations
Base-line				

GRAPH IT

Create a bar or line graph of the pH over time.



ANALYZE IT

1. How was plant growth changed during the experiment? Why do you think this happened?

2. Is it always beneficial for there to be increased plant growth? Explain the positive and negative effects increased plant growth could have on an aquarium? What about a natural ecosystem?

CONCLUSION: Write a narrative that explains the experiment, describes the results, and explains the outcome. Use data to support your explanation.

