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## Circulatory/Respiratory: Exercise & Carbon Dioxide

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### Introduction

When you exercise you breath faster than when you are at rest. Does exercise also affect the concentration of carbon dioxide in the air you exhale?

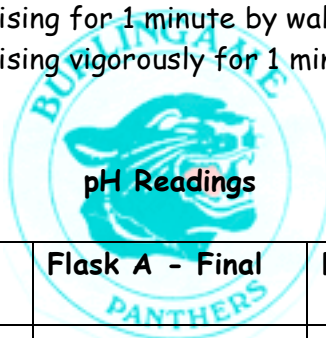
You can test for the presence of carbon dioxide by bubbling your breath through water. Carbon dioxide in you breath combines with water to form carbonic acid.

The unbalanced chemical equation is  $\text{CO}_2 + \text{H}_2\text{O} \rightarrow \text{H}_2\text{CO}_3$ .

### Procedure

1. Label two flasks A and B
2. Place 100 ml of tap water in each flask
3. Record the initial pH of the water in each flask
4. Put a drinking straw in the water in flask B. Sit quietly for 1 minute and then gently blow air from your lungs through the straw into the water for 1 minute.
5. Swirl the flask
6. Record the pH in both flasks
7. Discard the water
8. Repeat steps 2-7 after exercising for 1 minute by walking in place.
9. Repeat steps 2-7 after exercising vigorously for 1 minute.

### Data



Experimental Condition	Flask A - initial	Flask A - Final	Flask B - initial	Flask B - final
At rest				
Mild exercise				
Vigorous exercise				

### Analysis Questions

1. In which flask was the pH decrease greatest? Why?
2. In which flask was the pH decrease smallest? Why?
3. How is the production of carbon dioxide related to activity?
4. What factors other than exercise might play a part in determining the amount of carbon dioxide given off?
5. What is the source of carbon dioxide in your breath?
6. What was the purpose of Flask A in this lab?

### Conclusion