

# Mini-Lab: CO<sub>2</sub> and Exercise

You must put this lab work in your notebook!

When you exercise you breathe faster than when you are at rest. Does exercise also affect the concentration of CO<sub>2</sub> in the air you exhale? You can indirectly measure this by using a straw to blow into a pink solution until it turns colorless. The longer it takes to turn colorless, the less carbon dioxide in your breath.

**Hypothesis** Read the procedure for the investigation and complete the statement.

If carbon dioxide is a waste product of cellular respiration, then when I breathe out CO<sub>2</sub>... (describe what will happen AND WHY.)

**Materials** (per team of 2)

- 250 mL flask
- drinking straw
- watch or clock with a second hand
- 3 samples of 25 ml of pink solution (phenolphthalein and NaOH)

**CAUTION: The pink solution is an irritant. Avoid skin/eye contact; Do not ingest. Flush spills and splashes with water for 15 minutes; rinse mouth with water. Call your teacher.**

## Procedure

- 1) Measure 25 mL of pink solution and transfer it to a flask.
- 2) Sit quietly for 1 minute. Put a drinking straw in the solution. Gently blow air from your lungs through the straw into the solution until it turns colorless. Record the number of seconds onto your data table. **Do not inhale any materials into your mouth through the straw.**
- 3) Discard this sample and rinse the flask and the straw.
- 4) Measure a new 25-mL sample of pink solution. Exercise moderately for 1 minute (pushups or running stairs). Immediately blow air into the solution until it turns colorless. Record the number of seconds needed. Discard the sample and rinse the flask and throw away the straw.
- 5) Repeat step 4 with more intense exercise.
- 5) Wash your hands thoroughly before leaving the laboratory.

**Analysis:** *You need to make the question clear in your notebook!*

- 1) Make a bar graph of your experimental data. Include one bar for each of the two experimental conditions. Be sure to include a *title* and *label* the x-axis and y-axis.
- 2) How is production of CO<sub>2</sub> related to exercise/activity?
- 3) What factors other than exercise might affect the amount of CO<sub>2</sub> given off by a person?
- 4) Compare your results with the results of other students in your class. Try to explain any differences that may have occurred.
- 5) What do you think the source of CO<sub>2</sub> in your breathe?

Explain to 2 classmates what happens to the amount of CO<sub>2</sub> released after exercise AND why you think this occurs.

Have them initial your paper!