

## CARBON DIOXIDE INQUIRY LAB

When carbon dioxide ( $\text{CO}_2$ ) is slowly and consistently exhaled through a straw into a solution of water with a few drops of a chemical indicator called “bromthymol blue”, the water changes colour from blue to green and finally to yellow. This is because carbon dioxide is acidic and bromthymol blue changes colour in the presence of an acid.

Your assignment is to design an experiment in which you determine how a change in ONE variable (INDEPENDENT VARIABLE) affects the results (turning yellow, DEPENDENT VARIABLE). It could involve how long it takes for the solution to turn yellow.

How should you proceed? What variables in the experiment could affect the time it takes for the solution to turn yellow? Would the volume of bromthymol blue be a factor (ie. the # of drops added to water)? How about the volume of carbon dioxide exhaled? The diameter of the straw you exhale through? The rate at which you exhale? The initial volume of water in the beaker? The temperature of the solution? Would exercise be a factor?

Study the diagram and think about how you would set up your experiment. What would you need to control (CONTROLLED VARIABLES) and what would you need to vary? How many times should you repeat the experiment to get good results? How will you record your results? How will you present your results?

Working with your partner, begin to rough-out your experiment. Have the following rough ideas written down for discussion with your teacher by next class and be ready to perform the experiment.

- Purpose
- Hypothesis/Prediction
- Materials and Methods
- Observations: Data Table + Graph
- Conclusions

