Purpose: Using bromothymol blue and distilled water, our mission has been to design an experiment that tests how movement and exercise has an effect on the carbon dioxide concentration in your breath.

Background Knowledge: Before starting the experiment, we knew a few simple things.

1. Bromothymol blue tests the acidity of things, turning from blue to yellow when it detects acid. The more vibrant and the faster the color changes show more acidity.
2. We knew you breathe CO_2, and the more exercise you do, the more you breathe.

What we knew was very minimal, but we did know that when the bromothymol blue turns yellow, there is more CO_2 in your breath. We were hoping that this would turn out vivid in our results.

Hypothesis: When doing exercise, the CO_2 concentration in your breath will increase. This is due to the fact that you are taking in more air, and so you must let more air out. Because of this, with more air you will have more CO_2 in your breath.

Materials:

- 3 test tubes
- A 2 hole stopper
- 3 straws
- 60ml of distilled water
- 45 drops of bromothymol blue
- 1 stop watch
- 3 pairs of safety goggles

Procedure:

1. Gather all materials and lay them in front of you in an easy to reach manner.
2. Have one person (person A) run 84m while the other person (person B) pours 20ml of distilled water into one of the test tubes.
3. When person A is done running, let them catch their breath for 10 sec.
4. While person A is doing this, have person B drop 15 drops of bromothymol blue into the test tube that contains the distilled water.
5. Cover the test tube that contains all materials with a 2 hole stopper. Insert a straw into one of the holes.
6. Have the 3rd person (person C) put a pair of safety goggles onto person A.
7. Have person A blow slowly and lightly into the straw that is inserted into the test tube. This person may take breaths, but have person B time how long it takes for the bromothymol blue to change colors to a shade of yellow. This color does not have to be completely yellow before person A stops blowing.
8. Make sure person C is recording observations during this process.
9. Repeat steps 1-8 with person B, making sure the recording, preparation, and timing steps are divided between person A and C. When you repeat with person C, do all of the above steps except for steps 2 and 3. Again, divide the recording, preparation, and timing steps between person A and B.