



## Teacher's Answer Key

What's Happening? Challenge:

# Acids and Bases

The Scientist releases an exhaled breath into a basic, aqueous solution that contains an acid-base indicator. When the carbon dioxide in the scientist's breath dissolves in the solution the carbon dioxide molecules combine with water molecules to form carbonic acid molecules, which then dissociate (or break apart) and release hydrogen ions into the solution. This causes the solution to become more acidic and thus the indicator color changes because the pH changes.

### Question:

Can you think of a controlled experiment using these materials to determine how exercise affects the amount of carbon dioxide your body produces?

### Answer:

We could exhale a breath into a balloon and measure the circumference and then direct the breath into an indicator solution until the color changes. We would then measure the circumference again. Next, we could exert ourselves for about 1 minute by jogging in place and then perform the same experiment. If we think that exertion should lead to more carbon dioxide production we would expect the change in the circumference of the balloon to be smaller relative to the non-exercise condition.

[Watch Video](#)