Oxygen in Lungs

What is the concentration of oxygen in your lungs? Does the concentration change when you hold your breath? Is mouth-to-mouth even possible?

What you need
- plastic bag
- Vernier O2-BTA Oxygen Sensor

Tasks

1. Connect the sensor and leave the default settings (1 measurement per second, duration 300 s).

2. Start the measurement. The graph starts to plot the value of concentration of oxygen in the room.

3. Prepare the plastic bag as shown in the figure, so that there is no air in the bag and it is possible to inflate the bag with air from your lungs.

4. Take a deep breath in and exhale deeply three times ("all the way out"). Do not hold your breath. During the third exhale, first exhale little air (of about the same volume as the volume of the bag) OUT OF THE BAG. This is the air from a "dead space" of the trachea, which is not participating in metabolism in the lungs and is uninteresting for our experiment. Then inflate the bag with air from your lungs. Put the sensor into the bag. Proceed quickly and be careful not to mix the air in the bag with ambient air. Then close the bag with your fingers.

5. It takes a few seconds until the air from the bag reaches the interior of the sensor. Hold the sensor sealed in the bag and watch the change in concentration plotted in the graph.

6. Once the value is stable, take the sensor out of the bag, "squeeze" the air out of the bag and perform the same measurement once more; this time, however, hold your breath before inflating the bag - for example for 30 s .

Questions

1. By how many percentage points did the concentration of oxygen change compared to air in the room

   a) when you did not hold your breath

   b) when you held your breath

2. Try to explain why the concentration values in the two previous measurements differ.

3. On the basis of this experiment explain why mouth-to-mouth is possible.