**Spirometer Lab**

**Purpose:**

To build a device and test lung capacity

**Materials:**

* 2L Bottle
* Masking Tape
* Pen
* Length of Hose
* Bucket
* 100mL beaker

**Procedure:**

1. Place masking tape along the whole length of the bottle.
2. Pour 100mL of water into the bottle. Use the pen to mark the height of the water. Repeat this step, each time carefully marking the height of the water. You should end up with a filled bottle that has clear markings for every 100mL.
3. Fill the bucket with water until it is about 3cm high. Leave room for more water.
4. Cover the opening of the bottle with your thumb or fingers and CAREFULLY turn it upside down into the bucket, trying not to spill.
   1. If you do spill, make sure to mark down how much air is in the bottle before you begin writing down your measurements
5. Slip one end of the hose into the bottle, keeping one end for you to blow into.
6. Blow one breath into the bottle. Look at the data table for instructions.
7. Measure the amount of air in the bottle. Record that amount.
8. Repeat the experiment until you’ve filled the table.

**Data:**

|  |  |  |  |
| --- | --- | --- | --- |
| Measurement: | Vital Capacity:  Take as deep a breath as possible. **Then exhale all the air you can.** | Expiratory Capacity:  Inhale normally then exhale normally. **Then exhale the REST of the air.** | Tidal Capacity:  Take in a normal breath. Exhale into the balloon only as much air as you would normally exhale. **DO NOT force your breathing.** |
| Breath 1 |  |  |  |
| Breath 2 |  |  |  |
| Breath 3 |  |  |  |
| Breath 4 |  |  |  |
| **Average Breath Size** |  |  |  |

**\***Reminder to find an average, you take the sum of the data and divide by the number of data points you have.**\***

**Analysis Questions**:

1. Compare the volumes of the average breaths. Which has the greatest volume: Vital capacity, Expiratory volume, or Tidal volume?
2. Compare your results to someone else in the room. How are their results the same or different compared to yours?
3. Why do you think different people have different lung volumes?
4. What were some of the difficulties you had in doing this lab? Do you think you made any mistakes? (If you did, explain how)