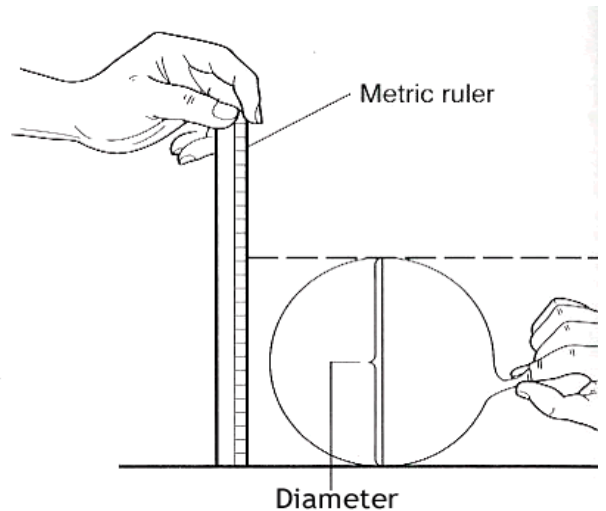


# Measuring the Capacity of Your Lungs

The amount of air that you move in and out of your lungs while breathing normally is called **TIDAL VOLUME**. This amount of air provides enough oxygen for a person who is resting. It is possible to inhale and exhale more forcefully - the maximum amount of air moved in and out of the lungs is called the **VITAL CAPACITY**. In this activity, you will be measuring the vital capacity and the tidal volume of your own lungs, this actual number can then be compared with a number derived from an equation that measures vital capacity. In effect, you are measuring an actual number, based on laboratory measurements, to a theoretical number, based on an equation. If you have any breathing difficulties (asthma or other condition), you should not participate in this activity, instead only take the data on your lab partner.



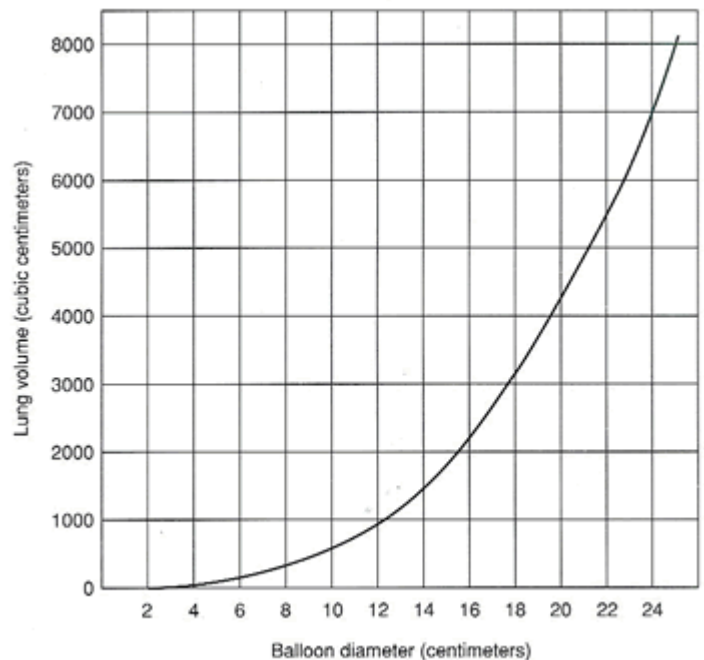
## Materials

Balloons	metric ruler
metre stick	bathroom scale (optional)

1. **Measuring Tidal Volume** -- Stretch a round balloon several times to stretch it out. Inhale normally and then exhale normally into the balloon. Do not force your breathing. Pinch the end of the balloon and measure its diameter. Be careful with the measurements to be sure you do not flatten the balloon. Repeat this so that you have 3 total measurements and can take the average and record in the data table.

2. **Measuring Vital Capacity** - Repeat the procedure, only this time inhale as much air as you can and exhale forcefully. Record three measurements in the data table.

3. Convert the diameters to a volume using the graph and record this in your table.



From: **The Biology Corner** <http://www.biologycorner.com/worksheets/lungcapacity.html>  
Shannan Muskopf [smuskopf@biologycorner.com](mailto:smuskopf@biologycorner.com)

# Measuring the Capacity of Your Lungs

## Student Worksheet

### Measuring Tidal Volume:

1. Record the three balloon diameters you measured for your tidal volume.

Trial 1: \_\_\_\_\_ cm

Trial 2: \_\_\_\_\_ cm

Trial 3: \_\_\_\_\_ cm

2. Calculate the average diameter: \_\_\_\_\_ cm

3. Use the graph to find your **tidal volume**: \_\_\_\_\_ cm<sup>3</sup>

### Measuring Vital Capacity:

1. Record the three balloon diameters you measured for your vital capacity.

Trial 1: \_\_\_\_\_ cm

Trial 2: \_\_\_\_\_ cm

Trial 3: \_\_\_\_\_ cm

2. Calculate the average diameter: \_\_\_\_\_ cm

3. Use the graph to find your **vital capacity**: \_\_\_\_\_ cm<sup>3</sup>

### Questions:

1. Why is it important to measure tidal volume and vital capacity three times and then get an average?
2. Compare your data to other members of the class. How can you account for differences?
3. How might an athlete's vital capacity compare to a non-athlete? Explain your reasoning.