

LUNG CAPACITY LAB

Human lung capacity can be measured in several ways. One way, is by using a piece of laboratory equipment called a spirometer. However, lung capacity can also be measured using a balloon. The data obtained may be even more inaccurate as those obtained using a spirometer.

Several different lung volume measurements can be made. The largest possible amount of air that can be exhaled after drawing a deep breath is the **vital capacity**. The amount of air that remains in the lungs after exhaling normally but which can be expelled is the **expiratory reserve**. The amount of air taken in or expelled during normal breathing is called the **tidal volume**. A certain amount of air in the lungs cannot be expelled. This is the **residual volume**.

Purpose: To determine your lung capacity.

Procedure:

First get familiar with the spirometer and reading/resetting the dial. Notice that it has to be turned to zero before each reading. Once you've measured a few test breaths move on to taking the data.

Part A Vital Capacity

1. Take as deep a breath as possible. Then exhale all the air you can into the spirometer
2. Measure and record your vital capacity in cubic centimeters in column A of the Data Table.
3. Do three more trials and calculate your average .

Part B Expiratory Reserve

1. Exhale normally.
2. Without inhaling as you normally would, put the spirometer to your mouth and exhale all the air still left in your lungs.
3. Measure and record your expiratory reserve in cubic centimeters in column B of the Data Table.
4. Do three more trials and calculate your average.

Part C Tidal Volume

1. Take in a normal breath. Exhale into the spirometer **only** as much air as you would **normally exhale**. DO NOT force your breathing.
2. Record your tidal volume in cubic centimeters in column C of the Data Table.
3. Do three more trials and calculate your average tidal volume.

Results:**Data Table**

	Lung Volume (cm ³)		
Trial	Column A Vital Capacity	Column B Expiratory Reserve	Column C Tidal Volume
1			
2			
3			
4			
total			
average			

Analysis: Compare results to normal (average) lung volumes for males and females.

“Average” Lung Volumes Measured with a Spirometer

	Male	Female
Vital Capacity	5000 cm ³	4000 cm ³
Expiratory Reserve	1200 cm ³	1000 cm ³
Tidal Volume	525 cm ³	475 cm ³

Conclusion: Answer the following **in complete sentences**. If you are worried about the neatness point, you may type the answers on a separate sheet.

1. What was the purpose of this investigation?

2. Compare/contrast your results with the average values. Why do you think there are differences?

