

# BREATHING AND RESPIRATORY VOLUMES AND CAPACITIES

## PART A

Complete the following statements:

1. Breathing also can be called \_\_\_\_\_.
2. The weight of air causes a force called \_\_\_\_\_ pressure.
3. The weight of air at sea level is sufficient to support a column of mercury within a tube \_\_\_\_\_ mm high.
4. If the pressure inside the lungs decreases, outside air is forced into the airways by \_\_\_\_\_.
5. Nerve impulses are carried to the diaphragm by the \_\_\_\_\_ nerves.
6. When the diaphragm contracts, the size of the thoracic cavity \_\_\_\_\_.
7. The ribs are raised by contraction of the \_\_\_\_\_ muscles, which increases the size of the thoracic cavity.
8. Only a thin film of lubricating serous fluid separates the parietal pleura from the \_\_\_\_\_ of a lung.
9. A mixture of lipoproteins, called \_\_\_\_\_, acts to reduce the tendency of alveoli to collapse.
10. The force responsible for normal expiration comes from \_\_\_\_\_ of tissues and from surface tension.
11. The pressure between the pleural membranes is usually \_\_\_\_\_ than the atmospheric pressure.
12. Muscles that help to force out more than the normal volume of air by pulling the ribs downward and inward include the \_\_\_\_\_.
13. The diaphragm can be forced to move higher than normal by contraction of the \_\_\_\_\_ muscles.

## PART B

Match the air volumes in column A with the definitions in column B. Place the letter of your choice in the space provided.

Column A		Column B	
a. Expiratory reserve volume	_____	1. Volume in addition to tidal volume that leaves the lungs during forced expiration	
b. Functional residual capacity	_____	2. Vital capacity plus residual volume	
c. Inspiratory capacity	_____	3. Volume that remains in lungs after the most forceful expiration	
d. Inspiratory reserve volume	_____	4. Volume that enters or leaves lungs during a respiratory cycle	
e. Residual volume	_____	5. Volume in addition to tidal volume that enters lungs during forced inspiration	
f. Tidal volume	_____	6. Maximum volume a person can exhale after taking the deepest possible breath	
g. Total lung capacity	_____	7. Maximum volume a person can inhale following exhalation of the tidal volume	
h. Vital capacity	_____	8. Volume of air remaining in the lungs following exhalation of the tidal volume	

**PART C**

1. Test results for respiratory air volumes and capacities:

<b>Respiratory Volume or Capacity</b>	<b>Expected Value* (approximate)</b>	<b>Test Results</b>	<b>Percent of Expected Value (test result/expected value × 100)</b>
Tidal volume (resting) (TV)	500 mL		
Expiratory reserve volume (ERV)	1,100 mL		
Vital capacity (VC)	4,600 mL (or enter yours from the table)		
Inspiratory reserve volume (IRV)	3,000 mL		
Inspiratory capacity (IC)	3,500 mL		
Functional residual capacity (FRC)	2,300 mL		

*\*The values listed are most characteristic for a tall, young adult.*

2. Complete the following:

a. How do your test results compare with the expected values? \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

b. How does your vital capacity compare with the average value for a person of your sex, age, and height?

\_\_\_\_\_

\_\_\_\_\_

c. What measurement in addition to vital capacity is needed before you can calculate your total lung capacity?

\_\_\_\_\_

3. If your experimental results are considerably different than the predicted vital capacities, propose reasons for the differences. As you write this paragraph, consider factors such as smoking, exercise, respiratory disorders, and medications. (Your instructor might have you make some class correlations from class data.)

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_