

Name: \_\_\_\_\_

## Spirometer Lab Student Data Sheet

**Activity 1:** Breaths Per Minute: \_\_\_\_\_

**Activity 2-3 Data Table:**

Volume Measurement	Individual (L)	Class Average – Male (L)	Class Average – Female (L)
Tidal Volume (TV)			
Inspiratory Reserve Volume (IRV)			
Expiratory Reserve Volume (ERV)			
Vital Capacity (VC) $VC = TV + IRV + ERV$			
Residual Volume (RV)	1.5	1.5	1.5
Total Lung Capacity (TLC) $VC + RV$			

### **Lab Questions:**

1. Define Tidal Volume. What was your Tidal Volume (TV)?
2. What would you expect your Tidal Volume to be if you inhaled a foreign object which completely obstructed your right mainstem bronchus?
3. a. Calculate your Minute Volume at rest.  $(TV \times \text{breaths/minute}) = \text{Minute Volume at rest}$ . *Show your work!*  
  
b. Pretend you are taking shallow breaths ( $TV = 0.20 \text{ L}$ ) to avoid severe pain from rib fractures you got while playing rugby, what respiratory rate will be required to achieve the same minute volume as the one you calculated above? *Show your work!*

3. Describe the difference between lung volumes for males and females. What might account for this?
4. Forced Vital Capacity is the total amount of air that can be forcibly blown out after a full inspiration (usually measure in liters). The typical range is between 3 to 5 liters. Compare your results with this range.
5. What factors can affect Vital Capacity (VERY IMPORTANT QUESTION)?
6. If you compared your Vital Capacity to an OLD wizard like Dumbledore (I realize he is a fictional character in a book, but play along!) how do you think it would compare?
7. Exposure to occupational hazards such as coal dust, silica dust, and asbestos may lead to *fibrosis*, or scarring of lung tissue. With this condition, the lungs become stiff and have *increased* "recoil." What would happen to TLC and VC under these conditions? **Why?**
8. In severe emphysema there is destruction of lung tissue and *reduced* recoil. What would you expect to happen to TLC and VC? **Why?**
9. What would you expect to happen to your Expiratory Reserve Volume when you are treading water in a lake? **Why?**