

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

**Ex 37B: Respiratory System Mechanics:  
Computer Simulation**

**Data Sheet  
Bio 2402 Lab: PhysioEx**

Ziser, 2001

**Activity: Measuring Respiratory Volumes:**

Record the respiratory volumes in the table below:

<b>Tidal volume: TV</b>	
<b>Expiratory Reserve Vol : ERV</b>	
<b>Forced Vital Capacity: FVC</b>	
<b>Inspiratory Reserve Vol: IRV</b>	
<b>Residual Volume</b>	
<b>Minute Respiratory Vol (ml/min)</b>	

Does expiratory reserve volume include tidal volume? Explain.

**Activity: Examining the Effect of Changing Airway Resistance on Respiratory Volumes:**

Record your data on the table below:

<b>FEV<sub>1</sub> as Percent of Vital Capacity</b>			
<b>Radius</b>	<b>FEV<sub>1</sub></b>	<b>Vital Capacity</b>	<b>FEV<sub>1</sub> (%)</b>
<b>5.00</b>			
<b>4.50</b>			
<b>4.00</b>			
<b>3.50</b>			
<b>3.00</b>			

What happened to the FEV<sub>1</sub> (%) as the radius of the airways was decreased? Explain.

**Activity: Examining the Effect of Surfactant:**

How did the airflow change compared to the baseline run?

Explain why premature infants often have difficulty breathing.

**Activity: Investigating Intrapleural Pressure:**

What happened to the lung on the left side of the bell jar?

How did the pressure in the left lung differ from that in the right lung? Explain.

How did the total air flow in this trial compare with that in the previous trial in which the pleural cavities were intact?

What do you think would happen if the two lungs were in a single large cavity instead of separate cavities?

After closing the valve you opened earlier did the deflated lung inflate? Explain.

Why did lung function in the deflated (left) lung return to normal after you clicked reset?

**Activity: Exploring Various Breathing Patterns:**

What happened to  $PCO_2$  during hyperventilation? Explain.

What happened to  $PCO_2$  during the entire time of the rebreathing activity?

Did the depth of the breathing pattern change during rebreathing? (Carefully examine the tracing for rate and depth changes: the changes can be subtle.) Explain.

What happened to  $PCO_2$  during breath holding?

What happened to the breathing pattern when normal respirations resume?

Printing your Data: When you have finished, print your data for at least one activity and attach it to this report.