Respirometry notebook

## Respirometry Notebook

You may work LabChart and data analysis as part of your group, but your analysis and answers to the questions below should be your own work and in your own words.

Download the [MS Word version of this](./Respirometry_notebook.docx).

# Data Notebook

## Table 1. Lung Volumes and Capacities

| Respiratory Parameter | Experimental & Calculated Value | Spirometry Extension Value |
| --- | --- | --- |
| **Respiratory Rate** (RR) |  |  |
| **Expired Minute Volume** (VE) |  |  |
| **Tidal Volume** (VT) |  |  |
| **Inspiratory Reserve Volume** (IRV) |  |  |
| **Inspiratory Capacity** (IC) |  |  |
| **Expiratory Reserve Volume** (ERV) |  |  |
| **Expiratory Capacity** (EC) |  |  |
| **Predicted Vital Capacity** (from table) |  |  |
| **Vital Capacity** (VC) |  |  |
| **Residual Volume** (RV) |  |  |
| **Total Lung Capacity** (TLC) |  |  |
| **Functional Residual Capacity** (FRC) |  |  |

## Table 2. Pulmonary Function Tests – Your Data – Normal Respiration

| Respiratory Parameter | Experimental & Calculated Value | Spirometry Extension Value |
| --- | --- | --- |
| **Peak Inspiratory Flow** (PIF) |  |  |
|  |  |  |
|  |  |  |
| **Peak Expiratory Flow** (PEF) |  |  |
|  |  |  |
|  |  |  |
| **Forced Vital Capacity** (FVC) |  |  |
|  |  |  |
|  |  |  |
| **Forced Expired Volume in One Second** (FEV1) |  |  |
|  |  |  |
|  |  |  |
| **(FEV1 / FVC) x 100** |  |  |

## Table 3. Pulmonary Function Tests – Group Members’ Data – Normal Respiration

| Respiratory Parameter |  | Group Member 1 | Group Member 2 | Group Member 3 |
| --- | --- | --- | --- | --- |
| **Peak Inspiratory Flow** (PIF) | **Experimental & Calculated Value** |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  | **Spirometry Extension Value** |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| **Peak Expiratory Flow** (PEF) | **Experimental & Calculated Value** |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  | **Spirometry Extension Value** |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| **Forced Vital Capacity** (FVC) | **Experimental & Calculated Value** |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  | **Spirometry Extension Value** |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| **Forced Expired Volume in One Second** (FEV1) | **Experimental & Calculated Value** |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  | **Spirometry Extension Value** |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| **(FEV1 / FVC) x 100** | **Experimental & Calculated Value** |  |  |  |
|  | **Spirometry Extension Value** |  |  |  |

## Table 4. Pulmonary Function Tests – Your Data – Obstructed Respiration

| Respiratory Parameter | Experimental & Calculated Value | Spirometry Extension Value |
| --- | --- | --- |
| **Peak Inspiratory Flow** (PIF) |  |  |
|  |  |  |
|  |  |  |
| **Peak Expiratory Flow** (PEF) |  |  |
|  |  |  |
|  |  |  |
| **Forced Vital Capacity** (FVC) |  |  |
|  |  |  |
|  |  |  |
| **Forced Expired Volume in One Second** (FEV1) |  |  |
|  |  |  |
|  |  |  |
| **(FEV1 / FVC) x 100** |  |  |

## Table 5. Pulmonary Function Tests – Group Members’ Data – Obstructed Respiration

| Respiratory Parameter |  | Group Member 1 | Group Member 2 | Group Member 3 |
| --- | --- | --- | --- | --- |
| **Peak Inspiratory Flow** (PIF) | **Experimental & Calculated Value** |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  | **Spirometry Extension Value** |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| **Peak Expiratory Flow** (PEF) | **Experimental & Calculated Value** |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  | **Spirometry Extension Value** |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| **Forced Vital Capacity** (FVC) | **Experimental & Calculated Value** |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  | **Spirometry Extension Value** |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| **Forced Expired Volume in One Second** (FEV1) | **Experimental & Calculated Value** |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  | **Spirometry Extension Value** |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| **(FEV1 / FVC) x 100** | **Experimental & Calculated Value** |  |  |  |
|  | **Spirometry Extension Value** |  |  |  |

## Follow up Questions

1. Comment on the differences between the experimental and predicted values for VC, FRC, and TLC in Table 1. What could cause these differences, if any?
2. In quiet breathing, muscular effort is mainly in inspiration, and expiration is largely passive, due to elastic recoiling of the lung. Can you relate this fact to the pattern of expiratory and inspiratory flow? Hint: The normal pattern of breathing is efficient in that it requires muscular effort for only a short time.
3. Explain why RV cannot be determined by ordinary spirometry.\*\*
4. What factors do you think could contribute to differences in pulmonary parameters between the members of your group?
5. What values were affected by simulated airway obstruction, and why?
6. Explain the physiological events that occurred during the simulated asthma attack. Hint: Think about what it felt like and how it would affect your general state of well-being and activity level.