

Respiratory System Mechanics



1. Define each of the following terms:

- respiration _____
- ventilation _____
- alveoli _____
- diaphragm _____
- inspiration _____
- expiration _____

2. Explain how the respiratory and circulatory systems work together to distribute oxygen to, and remove carbon dioxide from, the cells of the body.

3. Match each of the definitions in Column A with the appropriate term in Column B.

Column A

- _____ the percentage of vital capacity exhaled during a 1-second period of the FVC test
- _____ the amount of air that can be taken into the lungs beyond the tidal volume
- _____ the amount of air that can be expelled from the lungs beyond the tidal volume
- _____ the volume of a normal breath
- _____ the maximum amount of air that can be voluntarily moved in and out of the lungs
- _____ the proportion of pressure that a single gas exerts within a mixture
- _____ the amount of air that can be expelled completely and rapidly as possible after a maximum inspiration
- _____ the amount of air left in the lungs after a maximum exhalation
- _____ vital capacity plus residual volume

Column B

- a. tidal volume
- b. partial pressure
- c. inspiratory reserve volume
- d. expiratory reserve volume
- e. vital capacity
- f. residual volume
- g. total lung capacity
- h. forced vital capacity (FVC)
- i. forced expiratory volume (FEV₁)

4. Fill in the typical values (in ml) for each of the following terms.

tidal volume: _____

inspiratory reserve volume: _____

expiratory reserve volume: _____

vital capacity: _____

residual volume: _____

total lung capacity: _____

5. Circle the correct boldfaced term.

Emphysema is a lung problem that causes a(n) **decrease** / **increase** in tidal volume.

6. How do you calculate minute respiratory volume?

7. What was the effect of reducing the radius of the air flow tube on respiratory volumes?

8. What is the role of surfactant in respiration?

9. What would happen if surfactant were not present?

10. What happens in pneumothorax?

11. Why is it important that intrathoracic pressure be kept lower than atmospheric pressure?

12. What happens to the partial pressure of carbon dioxide in the blood during rapid breathing?

13. What happens to the partial pressure of carbon dioxide during rebreathing?

14. What happens to the partial pressure of carbon dioxide during breathholding?
