Key



## MECHANISM OF BREATHING

1. a) The movement of air into and out of the lungs is called respiration.
   b) The two phases of this movement are inhalation and exhalation.
2. The respiratory centers are located in the brain, in the medulla and pons.
3. The respiratory muscles are:
   1) the external and internal intercostal muscles, which are supplied by the cranial nerves.
   2) the diaphragm, which is supplied by the phrenic nerves.
4. Contractions of the respiratory muscles produce changes in pressure within the bronchial tree and alveoli to bring about ventilation.
5. Match each air pressure with the statements that apply to each.

***Use each letter once. Each answer line will have two correct letters.***

1) Atmospheric pressure B, D
2) Intrapleural pressure C, F
3) Intrapulmonic pressure A, E

A. The pressure in the bronchial tree and alveoli
B. The pressure of the air around us
C. The pressure within the potential pleural space
D. 760 mmHg at sea level
E. Fluctuates below and above atmospheric pressure during breathing
F. Always slightly below atmospheric pressure

don't worry about these

## INHALATION (INSPIRATION)

1. With respect to normal inhalation, number these events in proper sequence.

1 The medulla generates motor impulses.
4 The chest cavity is enlarged in all directions.
3 The diaphragm and external intercostal muscles contract.
6 Intrapulmonic pressure decreases.
2 Motor impulses travel along the phrenic and intercostal nerves.
5 The chest wall expands the parietal pleura, which expands the visceral pleura which in turn expands the lungs.
7 Air enters the lungs until intrapulmonic pressure equals atmospheric pressure.

2. A deep breath (more than normal) requires a more forceful contraction of the respiratory muscles, which in turn would bring about greater expansion of the lungs.

## EXHALATION (EXPIRATION)

. With respect to normal exhalation, number these events in proper sequence.

1 Motor impulses from the medulla decrease.

3 The chest cavity becomes smaller, and the elastic connective tissue around the alveoli recoils.

5 Intrapulmonic pressure rises above atmospheric pressure.

4 The lungs are compressed.

2 The diaphragm and external intercostal muscles relax.

6 Air is forced out of the lungs until intrapulmonic pressure equals atmospheric pressure.

2. Normal exhalation is considered a passive process because it does not require the contraction of the respiratory muscles.

3. A forced exhalation requires contraction of the internal intercostal muscles to pull the ribs down + in, or contraction of the abdominal muscles to compress the abdominal organs and push the diaphragm upward.

don't worry

## EXCHANGE OF GASES

. a) External respiration is the exchange of gases between the air in the alveoli and the blood in the pulmonary capillaries.

b) Internal respiration is the exchange of gases between the blood in the capillaries and the tissue fluid (cells).

2. The two respiratory gases are oxygen and carbondioxide

3. a) Inhaled air (the atmosphere) is approximately 21 % oxygen and 0.04 % $CO_2$.

b) Exhaled air is approximately 16 % oxygen and 4.5 % $CO_2$.

don't worry

4. The value that is used to express the concentration of $O_2$ and $CO_2$ in the air or in body fluids is called partial and is abbreviated pressure.