

Breathing and Exchange of Gases



TRY YOURSELF

ANSWERS

1. Two differences between breathing and respiration are:
(i) Breathing is simply an intake of fresh air and removal of foul air, while respiration is an oxidation of food to release carbon dioxide, water and energy.

(ii) Breathing is a physical process in which no energy is released, rather energy is used, while the respiration is a biochemical process in which the energy is released and gets stored in the form of ATP.

2. Arytenoid cartilages are the paired cartilages of the larynx (sound box), situated at the back of the larynx. The greater part of the arytenoid cartilages comprises of hyaline cartilage but their apical parts are made up of elastic cartilage.

3. Epiglottis is a leaf-shaped cartilage which projects into the pharynx. During eating (swallowing) and drinking, epiglottis closes glottis to check the entry of food into it.

4. The sequence of movement of fresh air into the lungs is as follows :

External nares → Nasal chambers → Internal nares
Bronchi ← Trachea ← Larynx ← Glottis ← Pharynx ←
↳ Bronchioles → Alveolar ducts → Alveoli

5. The quantities of air that the lungs can receive, hold or expel under different conditions are called lung or pulmonary volumes.

6. During inspiration, the diaphragm contracts, becomes flat and moves downward by contraction of its muscle fibres. Thus, increases the space in the chest cavity.

7. Partial pressure of a gas is the pressure it exerts in a mixture of gases and is equal to the total pressure of the mixture divided by the percentage of that gas in the mixture. It is extremely important in predicting the movement of gases.

8. Factors that affect the rate of diffusion are: (i) pressure (concentration) gradient; (ii) solubility of the gas in fluid medium and (iii) thickness of the respiratory membrane.

9. Following three factors influence the oxygen dissociation curve of haemoglobin :

- (i) Hydrogen ion (H^+) concentration,
- (ii) Partial pressure of carbon dioxide and
- (iii) Temperature.

10. Nearly 70 percent of carbon dioxide is transported in plasma as bicarbonate (HCO_3^-) with the help of the enzyme carbonic anhydrase.

11. Carbaminohaemoglobin is formed by the combination of carbon dioxide with the amine radical (NH_2) of polypeptide chain of haemoglobin, while the oxyhaemoglobin is formed by the combination of oxygen with the iron (Fe^{2+}) part of haemoglobin.

12. The pneumotaxic centre is located in the dorsal part of the pons varolii.

13. Functions of respiration are :

- (i) It maintains temperature as large amount of heat is lost with expiration.
- (ii) It maintains acid-base balance in the body by eliminating carbon dioxide.

14. Silicosis is an occupational respiratory disorder caused by inhalation of dust containing silica. It is characterised by proliferation of fibrous connective tissue of upper part of lung, causing inflammation.

15. Pulmonary tuberculosis (TB) is caused by the bacterium *Mycobacterium tuberculosis*. It is a contagious disease that easily spreads from an infected person to a healthy person. Tuberculosis bacteria spread through the air droplets from a cough or sneeze of an infected (diseased) person.

