

# WORKSHEET 2

## CHAPTER 14 – THE RESPIRATORY SYSTEM

### A. Give reasons.

1. Rate of breathing increases after vigorous exercise.
2. Breathing at high altitude is difficult.
3. Expired air contains more water vapour.
4. Trachea does not collapse even on removal of air from it.
5. Breathing through nose is advisable than mouth.

### B. Match the items in Column A with those in Column B and write down the matching pairs.

#### Column A

1. Voice box
2. Respiratory pigment
3. Energy currency
4. Functional unit of lungs
5. Protective covering of lungs

#### Column B

- a. alveoli
- b. larynx
- c. haemoglobin
- d. pleura
- e. ATP

### C. Name the following.

1. Site of glycolysis in a cell.
2. End product of anaerobic breakdown of glucose in muscles.
3. The condition in which oxygen supply to the respiratory system is cut off.
4. Additional volume of air, a person can inspire by a forcible inspiration.
5. The air remaining in the respiratory passage.

### D. Choose the correct option.

1. A condition in which wall separating alveoli breaks down due to smoking is  
a. hypoxia.                      b. emphysema.                      c. asphyxiation.                      d. necrosis.
2. Lungs have a large number of alveoli for  
a. more nerve supply.                      b. maintaining proper texture and shape.  
c. increased surface area for diffusion of gases.                      d. more space to increase volume of inspired air.
3. During respiration, there is  
a. gain in dry weight.                      b. loss in dry weight.  
c. no change in dry weight.                      d. increase in overall weight.

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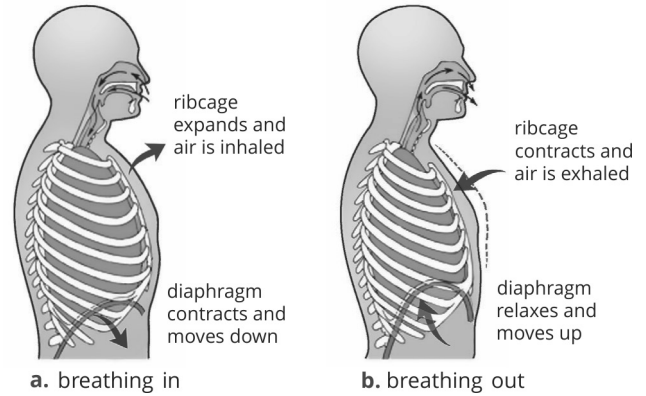
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4. The ultimate end of trachea is
  - a. bronchi.
  - b. bronchioles.
  - c. larynx.
  - d. alveoli.
5. Residual volume is
  - a. 500 ml.
  - b. 1500 ml.
  - c. 3000 ml.
  - d. 3500 ml.

**E. Given below is the relative position of ribs, diaphragm and sternum after breathing in and out.**

1. Differentiate between inspiration and expiration with reference to intercostal muscle and diaphragm.
2. What is the composition of inspired air? How is it different from the expired air?
3. How will you prove that water is released during breathing?
4. "When we hold our breath, the exchange of gases does not stop for some time." Give reason.
5. What is dead airspace?



# ANSWERS

## WORKSHEET 2

### A. Give reasons.

1. During vigorous exercise the muscles of our body need more energy. Thus more oxygen is required to breakdown glucose to generate more energy. Hence, the rate of breathing increases during physical exercise.
2. The concentration of oxygen is low at high altitude. The air we breathe-in decreases in pressure making breathing movement difficult. Hence, breathing is difficult at high altitude.
3. Respiration is a biochemical process during which glucose breaks down to release carbon dioxide and water vapour,  $C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O + \text{Energy}$ . The water vapour so formed is expelled out during exhalation. Hence, exhaled air has more water vapour. The amount of water vapour present in air is in traces. So inhaled air has less water vapour.
4. Trachea is lined with C-shaped cartilaginous ring which keeps the trachea distended all the time. This prevents trachea from collapsing even if air is not present in it.
5. Nose is lined with ciliated epithelium and mucus-secreting cells. Both cilia and mucus check the entry of microbes and dust particles in the respiratory passage and keeps the inhaled air moist and warm. Thus, breathing through nose is advisable.

### B. Match the items in Column A with those in Column B and write down the matching pairs.

1. b.                      2. c.                      3. e.                      4. a.                      5. d.

### C. Name the following.

1. Cytoplasm
2. Lactic acid
3. Asphyxiation
4. Inspiratory reserve volume
5. Dead airspace

### D. Choose the correct option.

1. b.                      2. c.                      3. b.                      4. d.                      5. b.

### E. Given below is the relative position of ribs, diaphragm and sternum after breathing in and out.

1. During inspiration, the diaphragm and intercostal muscles contract, raising the ribcage upward and flattening the diaphragm. Thus, increasing the volume of thoracic cavity.

During expiration, the diaphragm and intercostal muscles relax, pulling in the ribcage and returning the diaphragm to its arched position, thus, decreasing volume of thoracic cavity.

2. Inspired air has 21% Oxygen, 0.04% Carbon dioxide, 78% Nitrogen and low water vapour. In contrast, expired air has 12% Oxygen, 4% Carbon dioxide, 78% Nitrogen and high water vapour.
3. Gently breathe upon a cold surface, such as a piece of glass. The water droplets appear on the surface proving the presence of water vapour in expired air.
4. This is because there is always a residual volume of air present in the lungs.
5. The air remaining in the respiratory passage like trachea and bronchi where no diffusion of gases occur is known as dead airspace.