

13 Breathing - answers

- 1 (a) Energy is obtained from food by a process called *respiration* (A).
(b) The intake of oxygen and output of carbon dioxide at a respiratory surface is called *gaseous exchange* (B).
(c) The process of renewing air in the lungs is called *ventilation* (C).
(d) The processes B and C are included in the term 'breathing'.
- 2 From the nasal cavity the air would pass through the (pharynx, glottis), larynx, trachea, bronchi and bronchioles to reach the alveolus.
- 3 The cartilage rings hold the air passages open.
- 4 The lining of the air passages produces *mucus* which traps dust particles. *Cilia* in the lining flick to and fro to carry the mucus up and out of the passages.
- 5 (b) When we inhale our diaphragm muscles contract and the ribs move up.
- 6 Blood in the pulmonary artery will contain less oxygen and more carbon dioxide than blood in the pulmonary vein.
- 7 Breathing becomes deeper and more rapid, thus exposing the capillaries to a greater volume of air in a given time.
- 8 Exhaled air contains approximately 16% oxygen.
- 9 (i) vital capacity: 5000 cm^3 , (ii) tidal Volume: 500 cm^3 , (iii) residual air: 1000 cm^3 .
- 10 Four characteristics of an efficient respiratory surface are: thin epithelium, large surface area, abundant capillaries, ventilation mechanism.
- 11 *Diffusion* is the process by which oxygen passes from the alveoli to the lung capillaries.
- 12 (b) Tuberculosis and (d) colds are unlikely to be caused by smoking (but it doesn't help).

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- 1 (a) Energy is obtained from food by a process called(A).....
(b) The intake of oxygen and output of carbon dioxide at a respiratory surface is called(B).....
(c) The process of renewing air in the lungs is called(C).....
(d) Which of the processes A-C are included in the term 'breathing'?
- 2 Name, in the correct order, the structures that incoming air would pass through between the nasal cavity and the alveolus.
- 3 What is the function of the rings of cartilage in the respiratory passages?
- 4 Using the words 'cilia' and 'mucus', describe, very briefly, how the body gets rid of dust which enters the lungs.
- 5 Which of the following is correct:
When we inhale
(a) our intercostal muscles contract and our ribs move down
(b) our diaphragm muscles contract and the ribs move up
(c) our diaphragm muscles contract and the ribs move down
(d) our intercostal muscles contract and the diaphragm muscles relax.
- 6 In what two ways will the composition of blood coming from the pulmonary artery differ from that going to the pulmonary vein?
- 7 The percentage of oxygen absorbed from the air in the lungs is always about the same, so how can the oxygen supply to the blood be increased during vigorous activity?
- 8 Inhaled air contains about 21 % oxygen. What is the approximate percentage concentration of oxygen in exhaled air?
- 9 Which of the terms (i) vital capacity, (ii) tidal volume, (iii) residual air, could reasonably apply to each of the volumes given below?
(a) 500 cm^3 , (b) 5000 cm^3 , (c) 1000 cm^3 .
- 10 State four characteristics of an efficient respiratory surface.
- 11 What process causes oxygen to pass from the alveoli into the lung capillaries?
- 12 Which of the following diseases are unlikely to be caused by smoking: (a) lung cancer, (b) tuberculosis, (c) bronchitis, (d) colds, (e) heart attacks?