

GASEOUS EXCHANGE AND RESPIRATION

1. Which one of the following is the best description of respiration?

- A. Breathing in oxygen and breathing out carbon dioxide.
- B. Absorption of oxygen in the alveoli.
- C. Release of energy in the cell
- D. Gaseous exchange

2. Which one of the following processes needs energy?

- A. Absorption of water by root hairs.
- B. Gaseous exchange in the alveoli.
- C. Loss of turgidity by plant cell.
- D. Absorption of mineral salts by root hairs.

3. By which one of the following processes does carbon dioxide leave the blood capillaries into the alveoli?

- A. Osmosis
- B. Active transport
- C. Diffusion
- D. Capillary

4. In one –day old tadpoles, gaseous exchange is performed by

- A. lungs
- B. external gills
- C. internal gills
- D. skin of the tail.

5. An athlete has just finished a race. The phrase “oxygen debt” refer to

- A. the amount of oxygen originally present in the muscles of the athletes before the race.
- B. The amount of oxygen taken in after the race and used to complete the combustion of some of the lactic acid.
- C. The total amount of oxygen taken in during panting after the race.
- D. The amount of oxygen needed by the lungs after the race for combustion of glucose.

6. Which of the following are respiratory surfaces in toads and frogs?

- A. The mouth, webbed toes and skin
- B. Nostrils, mouth and skin
- C. Webbed toes, lungs and mouth
- D. The mouth, lungs and skin.

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8. Which of the following is the best description of the term double circulation in a mammal?

- A. Blood flows into the two lungs and then into the body.
- B. Blood passes through two chambers of the heart.
- C. Blood passes through the heart twice in one circulation.
- D. Blood first through arteries and then through veins.

9. When blood passes from the lungs to the kidney it has to go through the

- A. pulmonary artery, tricuspid valve and aorta.
- B. pulmonary vein, bicuspid valve and aorta.
- C. anterior venacava, tricuspid valve and aorta.
- D. posterior venacava, bicuspid valve and aorta.

10. Which one of the following statements is the most appropriate definition of respiration?

- A. The oxidation of sugar to produce energy and water.
- B. Breathing in oxygen, oxidation of food and release of water, carbon dioxide and energy.
- C. The exchange of oxygen and carbon dioxide in the lungs.

D. The oxidation of sugar to produce carbondioxide and energy.

11. Which one of the following groups of animals uses gills, skin, buccal cavity and lungs for gaseous exchange at some stage in their lifecycle?

- A. Fish
- B. Amphibians
- C. Reptiles
- D. Mammals

12. The best explanation for panting of an athlete immediately after a race is to

- A. allow fast blood flow to the lungs.
- B. restore the used up energy.
- C. take in more oxygen.
- D. allow fast blood flow from the muscles.

13. A mosquito larva breathes by means of

- A. spiracles
- B. gills
- C. segments
- D. nostril.

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16. Which one of the following is common respiration and photosynthesis?

- A. Energy is released.
- B. Both occur in all living cells.
- C. Food oxidations is common to both.

D. Oxygen, carbondioxide and water are involved.

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- B. Absorption of oxygen in the alveoli.
- C. Release of energy in the cell
- D. Gaseous exchange

19. A. the rate of respiration is low during the day.

- B. Some of the carbon dioxide produced is used up internally for photosynthesis.
- C. Transpiration interferes with carbon dioxide evolution by leaves.
- D. Most stomata close due to strong heat during the day.

20. Which one of the following is true of respiration but not of photosynthesis?

- A. Oxygen is given out
- B. Carbondioxide is taken in.
- C. Glucose is synthesizes.
- D. Carbon dioxide is released.

21. In plants, anaerobic respiration is less efficient than aerobic respiration because during anaerobic respiration

- A. not all the carbohydrates are broken down.
- B. the amount of carbondioxide released is less than in aerobic respiration.
- C. there is less energy released per unit weight of carbohydrates broken down.
- D. less water is produced in anaerobic respiration.

21. What are the final products of anaerobic respiration?

- A. Carbon dioxide, water and energy.
- B. Carbon dioxide, water and alcohol.
- C. Carbon dioxide, alcohol and energy.
- D. Carbon dioxide and alcohol.

22. Which one of the following statements is the most appropriate definition of respiration?

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- B. Breathing in oxygen, oxidation of food and release of water, carbon dioxide and energy.
- C. The exchange of oxygen and carbon dioxide in the lungs.
- D. The oxidation of sugar to produce carbon dioxide and energy.

23. Aerobic respiration is more efficient than anaerobic

- A. uses more oxygen.
- B. yields lactic acid.
- C. uses less oxygen.
- D. yields more energy.

24. The following are products of tissue respiration in living organisms.

- (i) energy
- (ii) carbon dioxide
- (iii) water
- (iv) ethanol
- (v) lactic acid

Which of them are common to both aerobic and anaerobic and anaerobic respiration in plants?

- A. (i) and (ii)
- B. (ii) and (iii)
- C. (i), (ii) and (iii)
- D. (ii), (iv) and (v)

25. Which one of the following is true of both photosynthesis and respiration?

- A. Involve enzymes.
- B. Need light energy.
- C. Are exothermic.
- D. Occur in all organisms.

26. Which one of the following forms part of the insect respiratory system?

- A. Trachea, tracheoles and bronchioles.

- B. Spiracle, trachea and tracheoles.
- C. Spiracles, trachea and bronchioles.
- D. Trachea, bronchus and bronchioles.

27. Under what condition is lactic acid likely to be accumulated in man?

- A. During sleep
- B. When engaged in a vigorous physical exercise.
- C. After breathing in excess and carbon dioxide.
- D. After consuming a lot of malt.

28. Which fins in fish are used for creating a current of water to facilitate breathing while the fish is stationary?

- A. Dorsal fins.
- B. Pectoral fins
- C. Pelvic fins
- D. Caudal fins.

29. The part of the brain that controls breathing is the

- A. cerebellum
- B. medulla oblongata
- C. cerebrum
- D. hypothalamus.

30. The condition known as “oxygen debt” occurs during active physical exercise in animals because of the

- A. accumulation of carbon dioxide during physical exercise.
- B. the high rate of breathing during physical exercise.
- C. Accumulation of lactic acid in the body.
- D. Accumulation of alcohol in the body.

31. The data below shows the amount of carbon dioxide in inhaled air, rate of breathing at rest and volume of air in a breath in humans:

Percentage of carbon dioxide to inhaled air = 0.025%

Number of breaths per minute = 36

Volume of one breath taken in at rest = 500cm^3

The volume of carbon dioxide inhaled per minute while at rest is

- A. 0.9 cm^3
- B. 45 cm^3
- C. 12.5 cm^3
- D. 450 cm^3

32. Which one of the following is the correct response to increased carbon dioxide in human blood? The rate of

- A. breathing is slowed.
- B. heartbeat is slowed down.
- C. heartbeat is increased.
- D. the pulse is slowed down.

33. Green plants produce less carbon dioxide during the day because

- A. the rate of respiration is low during the day.
- B. Some of the carbon dioxide produced is used up internally for photosynthesis.
- C. Transpiration interferes with carbon dioxide evolution by leaves.
- D. Most stomata close due to strong heat during the day.

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35. 2g of food substance was burnt, and the heat produced raised the temperature of 50cm^3 of water from 25°C to 37°C . What is the energy content of the food substance in joules per gram? (Specific heat capacity of water = 4.2J per gram).

- A. 1260 joules
- B. 2520 joules
- C. 300 joules
- D. 105 joules

36. Which one of the following forms part of the insect respiratory system?

- A. Trachea, tracheoles and bronchioles.
- B. Spiracle, trachea and tracheoles.
- C. Spiracles, trachea and bronchioles.
- D. Trachea, bronchus and bronchioles.

37. (a) What is “tissue respiration”?
(b) Explain why tissue respiration is an important process.

(c) Describe an experiment to show that germinating seeds liberate carbon dioxide.

38. (a) What is anaerobic respiration?
(b) What is the difference between internal and external respiration?

(c) How does gaseous exchange occur in bony fish? Green plants produce less carbon dioxide during the day because

39. Describe an experiment you would carry out to show that heat is liberated by germinating seeds.

40. Describe an experiment to show that carbon dioxide is given out during exhalation

41. (a) How does gaseous exchange take place in an insect?

(b) How does gaseous exchange in insects differ from that in mammals?

42. How does gaseous exchange occur in amphibians in aquatic and terrestrial habitats?

43. (a) Explain how the action of muscles causes air to pass from the atmosphere into the lungs.

- (b) How does oxygen move from the air in the lungs into the cells of the blood?
 (c) Give three characteristics of an efficient respiratory organ.

44. The table below show the percentage composition of inhaled and exhaled air, in a human being at rest and also the composition of exhaled air, during exercise. Use the information in the table to answer the questions that follow.

Inhaled Air at rest	Water vapour	Nitrogen	Carbon dioxide	Oxygen
	Variable	79%	0.03%	20.96%
Exhaled Air at rest	0.8%	79%	4.1%	16.2%
Exhaled Air during exercise	0.92%	79%	4.5%	15.5%

45. (a) State the differences in composition between inhaled and exhaled air at rest
 (b) Give a reason for each difference stated in (a).
 (c) State the changes that occur in the composition of exhaled air in a human who is previously at rest, then takes an exercise.
 (d) Give a reason why each change stated in (c) occurs.
 (e) During exercise, the breathing rate increase. From the information provided, suggest why this happens.
 (f) Why is the percentage of nitrogen constant in inhaled and exhaled air?

46. (a) Give five differences between respiration and photosynthesis.
 (b) Give three ways in which respiration is important to living organisms.

- (c) Name two commercial uses of anaerobic respiration.

47. (a) What is respiration?
 (b) State three differences between aerobic and anaerobic respiration.
 (c) Describe gaseous exchange in a frog.

48. (a) What is anaerobic respiration?
 (b) What is the difference between internal and external respiration?
 (c) How does gaseous exchange occur in bony fish?

49. (a) Explain how the action of muscles causes air to pass from the atmosphere into the lungs.
 (b) How does oxygen move from the air in the lungs into the cells of the blood?
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50. (a) Outline the mechanism of (bony fish)
 (i) Inspiration
 (ii) Expiration
 (b) How are gills adapted for gaseous exchange in a bony fish?

51. (a) Describe Gaseous exchange in plants
 (b) Describe the structures for gaseous exchange in plants