

## Biology 12 - Respiration

- + Part A: Definitions: Define the following terms, **IN YOUR OWN WORDS, IN AS FEW WORDS AS CLARITY ALLOWS.**

1. breathing	
2. external respiration	
3. internal respiration	
4. cellular respiration	
5. inspiration	
6. expiration	
7. vocal cords	
8. trachea	
9. bronchi	
10. bronchioles	
11. alveoli	
12. ventilation	
13. diaphragm	
14. pleural membranes	
15. hemoglobin	
16. negative pressure	
17. breathing center	
18. dead air	
19. residual air	
20. influenza	
21. bronchitis	
22. strep throat	
23. emphysema	
24. tuberculosis	
25. pneumonia	

### Part B - Short Answers

1. Inspiration and expiration are involved in the process of **BREATHING**.
2. During inspiration, the rib cage moves up and **OUT**; the diaphragm moves **DOWN**.
3. The primary stimulus for breathing is the amount of **CARBON DIOXIDE** in the blood.
4. Oxygen moves from the alveoli to the capillaries by means of **DIFFUSION**.
5. Carbon dioxide is carried in the plasma as the **BICARBONATE** ion.

6. Hemoglobin readily takes up oxygen in the lungs, where the pH is **NEUTRAL** and the temperature is **COOL**.
7. At the tissues, **OXYGEN** diffuses out of the blood and **CARBON DIOXIDE** diffuses into the blood.
8. In which structures does gas exchange actually occur? **ALVEOLI**
9. When food is swallowed, the respiratory passage is closed off. How are the nasal passages closed off? **SOFT PALATE MOVES BACK**
10. How is the trachea (larynx) closed off? **EPIGLOTTIS COVERS THE GLOTTIS**
11. Make a sketch that includes the following parts. Be sure to label all the parts:

- a. sinus
- b. nasal cavity
- c. hard palate
- d. opening to eustachian tube
- e. soft palate
- f. epiglottis
- g. glottis
- h. larynx
- i. trachea



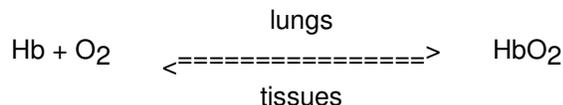
12. Indicate whether the following phrases describe INSPIRATION or EXPIRATION:
  - i) lungs expanded  
**INSPIRATION**
  - ii) muscles (diaphragm and ribs) relaxed  
**EXPIRATION**
  - iii) diaphragm dome-shaped  
**EXPIRATION**
  - iv) chest enlarged  
**INSPIRATION**
  - v) less air pressure in lungs than environment  
**INSPIRATION**

13. Put these statements in the proper sequence:

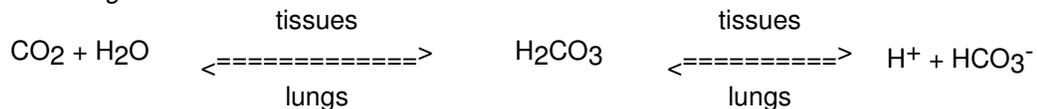
	Event
a	Respiratory center stops sending messages to diaphragm and rib muscles
b	Respiratory center sends excitatory message to diaphragm and rib muscles
c	Diaphragm becomes dome-shaped and rib muscles relax
d	Chest expands as diaphragm goes down and rib cage goes out.
e	Air goes rushing out as lungs recoil.
f	Air comes rushing in as lungs expand
g	Expanded lungs send message to respiratory system

Correct sequence: **B,D,F,G,A,C,E**

14. Where does oxygen enter the blood? **LUNGS**. Where does oxygen leave the blood? **TISSUES**
15. Where does carbon dioxide enter the blood? **TISSUES** Where does it exit from the blood? **LUNGS**
16. Give the equation that describes how oxygen is transported in the blood. Label one arrow *lungs* and the reverse arrow *tissues*.



17. Give the equation that describes how most carbon dioxide is transported in the blood. Label one arrow *lungs* and the reverse arrow *tissues*.



18. What is the name of the enzyme that speeds up the above reaction? **CARBONIC ANHYDRASE**
19. Carbon dioxide combining with water produces hydrogen ions. Why does the blood not become acidic? **HEMOGLOBIN COMBINES WITH EXCESS HYDROGEN IONS**
20. Hemoglobin is remarkably suited to the transport of oxygen. Why? **IT EASILY COMBINES WITH OXYGEN IN THE LUNGS AND EASILY GIVES IT UP IN THE TISSUES**
21. Why does a person die from carbon monoxide poisoning? **HEMOGLOBIN COMBINES WITH CARBON MONOXIDE PREFERENTIALLY TO OXYGEN**
22. How does hemoglobin help with the transport of carbon dioxide? **IT COMBINES WITH CARBON DIOXIDE, TO A DEGREE, TO FORM CARBAMINOHEMOGLOBIN, AND PICKS UP HYDROGEN IONS PRODUCE IN THE REACTION OF CO<sub>2</sub> AND WATER.**
23. Rewrite these false statements to make true statements:

i. Diffusion of gases occurs in the lungs but not in the tissues
<b><u>DIFFUSION OF GASES OCCURS IN BOTH THE LUNGS AND THE TISSUE</u></b>
ii. The trachea is held open by cartilaginous rings so that food can pass down more easily.
<b><u>THE TRACHEA IS HELD OPEN BY CARTILAGINOUS RINGS SO THAT AIR CAN ALWAYS PASS DOWN IT</u></b>
iii. The glottis opens wide during swallowing.
<b><u>THE EPIGLOTTIS COVERS THE GLOTTIS DURING SWALLOWING.</u></b>
iv. An alveolus is a thin-walled air sac surrounded by a layer of poorly vascularized tissue.
<b><u>AN ALVEOLUS IS A THIN-WALLED AIR SAC SURROUNDED BY A LAYER OF HIGHLY VASCULARIZED TISSUE.</u></b>
v. The respiratory center is sensitive to low oxygen content in the blood.
<b><u>THE RESPIRATORY CENTER IS SENSITIVE TO HIGH CARBON DIOXIDE CONTENT IN THE BLOOD.</u></b>
vi. A person can commit suicide by holding his or her breath.
<b><u>A PERSON CANNOT COMMIT SUICIDE BY HOLDING HIS OR HER BREATH.</u></b>
vii. The direction in which gases move between the lungs and the blood is determined by temperature.
<b><u>THE DIRECTION IN WHICH GASES MOVE BETWEEN THE LUNGS AND THE BLOOD IS DETERMINED BY THE LAW OF DIFFUSION.</u></b>

24. List the four steps that lead to bronchiogenic carcinoma.

<b><u>THERE IS A THICKENING OF CELLS (CALLOUSING)</u></b>
<b><u>CILIA DISAPPEAR</u></b>
<b><u>CELLS WITH ATYPICAL NUCLEI APPEAR (CANCER IN SITU)</u></b>
<b><u>ATYPICAL CELLS BREAK LOOSE AND PENETRATE OTHER TISSUES (METASTASIS)</u></b>

25. Smoking cigarettes a) cause tuberculosis b) leads to emphysema and cancer c) increases the vital capacity of the lungs d) leads to super health and a long, happy life **B**

