

## NOTES: Respiratory System

### Objectives

- \* \_\_\_\_\_
- \* \_\_\_\_\_
- \* \_\_\_\_\_
- \* \_\_\_\_\_

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### Breathing

- \* Breathing is the process of taking in essential gasses and releasing the waste gasses from the body.
- \* Breathing, or **respiration**, can be divided into 2 types:

- \* \_\_\_\_\_
- \* \_\_\_\_\_

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### External Respiration

- \* External respiration is \_\_\_\_\_  
\_\_\_\_\_
- \* This process is accomplished by the lungs, but many structures are involved in regulating or enabling it.
- \* The best way to understand these structures is to follow the path of air into the body.

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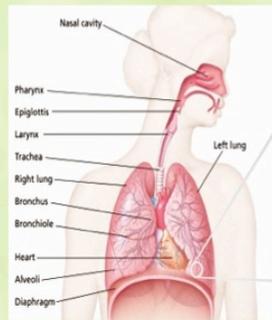
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## Pathway of External Resp.

- \* Air enters through the \_\_\_\_\_
- \* From there it moves into the \_\_\_\_\_
- \* It passes the \_\_\_\_\_ which is a flap of cartilage that prevents other substances from entering the trachea.



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## Pathway of External Resp.

- \* The air enters the \_\_\_\_\_, or voice box and passes into the \_\_\_\_\_, or wind pipe.
- \* The trachea divides into 2 tubes called \_\_\_\_\_, each leading to a lung.
- \* The bronchi branch off into several smaller tubes called \_\_\_\_\_



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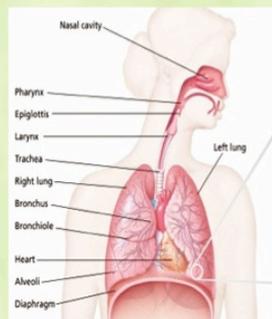
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## Pathway of External Resp.

- \* The bronchioles lead the air to small sacs called \_\_\_\_\_
- \* The alveoli are surrounded on the outside by \_\_\_\_\_, or small blood vessels.
- \* The capillaries bring blood containing  $\text{CO}_2$ . They drop off the  $\text{CO}_2$  and pick up  $\text{O}_2$ .



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## Internal Respiration

- \* The blood that has now been enriched with oxygen returns to the heart to be sent throughout the body to deliver the  $O_2$ .
- \* The process by which the cells of the body exchange  $O_2$  from the blood with  $CO_2$  from cellular respiration is called \_\_\_\_\_
- \* The blood then returns to the heart to be sent to the lungs to get more  $O_2$  and do it again.

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## In and Out

- \* The way that the lungs draw in air and get rid of the waste air from the body is unique.
- \* \_\_\_\_\_ is the process of bringing air into the lungs.
- \* \_\_\_\_\_ is the process of pushing air out of the lungs.

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## Inspiration

- \* To draw air into the lungs, the \_\_\_\_\_ muscle contracts and moves downward.
- \* This creates a vacuum which “sucks” the air into the open spaces of the lungs.
- \* When the alveoli fill with air \_\_\_\_\_

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## Expiration

- \* When the diaphragm \_\_\_\_\_
- \* This causes the open spaces in the lungs to close forcing the air out.
- \* The air follows \_\_\_\_\_
- \* The rate of inspiration and expiration are controlled by the brain based on the body's need for oxygen.
  - \* EXAMPLE: \_\_\_\_\_

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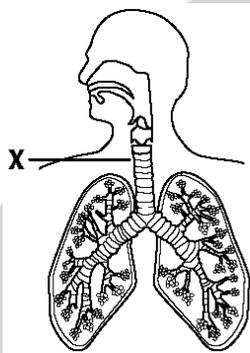
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## Part II: Respiratory System

1.



Refer to the illustration above. The structure labeled "X" is the

- a. epiglottis.
    - c. trachea.
  - b. pharynx.
    - d. larynx.
2. During swallowing, the air passageway of the pharynx is covered by the
- a. larynx.
    - c. trachea.
  - b. epiglottis.
    - d. bronchi.
3. Alveoli in the lungs are connected to the bronchi by a network of tiny tubes called
- a. arterioles.
    - c. capillaries.
  - b. venules.
    - d. bronchioles.
4. The actual exchange of gases occurs at the site of the
- a. trachea.
    - c. larynx.
  - b. nasal passageway.
    - d. alveoli.
5. Each alveolus
- a. contains many air sacs.
    - c. is surrounded by capillaries.
  - b. attaches directly to the larynx.
    - d. is a large air sac.
6. Gas exchange occurs when
- a. oxygen in the alveoli diffuses into the blood in the capillaries.
  - b. oxygen binds with hemoglobin in the red blood cells.
  - c. the red blood cells give up oxygen to the cells of the body tissues.
  - d. All of the above
7. Carbon dioxide is transported in the blood in all of the following ways *except*
- a. dissolved in plasma.
    - c. as bicarbonate ions.
  - b. combined with hemoglobin.
    - d. by white blood cells.
8. The dome-shaped muscle below the chest cavity is called the
- a. soleus.
    - c. diaphragm.
  - b. biceps.
    - d. popliteus.
9. When the diaphragm and rib cage muscles relax,
- a. the chest cavity enlarges.
    - c. expiration occurs.
  - b. inspiration occurs.
    - d. it is impossible to breathe.

\_\_\_\_\_ 10. Which of the following occurs as air rushes into the lungs from the environment to equalize air pressure?

- a. inspiration
- b. contraction
- c. expiration
- d. None of the above

\_\_\_\_\_ 11. The breathing center in the brain is most sensitive to the

- a. concentration of oxygen.
- b. concentration of carbon dioxide in the lungs.
- c. concentration of carbon dioxide in the blood.
- d. amount of oxygen in the cells.

12. The \_\_\_\_\_ is a long, straight tube that carries air from the back of the throat to the lungs.

13. Hemoglobin in red blood cells binds to both oxygen and \_\_\_\_\_.

14. Breathing is regulated mainly by response to the level of \_\_\_\_\_ detected in the blood.

15. \_\_\_\_\_ respiration is the exchange of gases between the atmosphere and the blood, while \_\_\_\_\_ respiration is the exchange of gases between the blood and the cells of the body.

16. How is air moved in and out of the lungs? Write your answer in the space below.

17. Draw a diagram of the human respiratory system. Label the parts and direction of air flow.

