



Objectives

- ✿ Describe the structures involved in breathing.
- ✿ Trace the path of air through the respiratory system.
- ✿ Distinguish between internal and external respiration.
- ✿ Explain how air is moved into and out of the lungs.



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:
 - ✿ **External Respiration**
 - ✿ **Internal Respiration.**

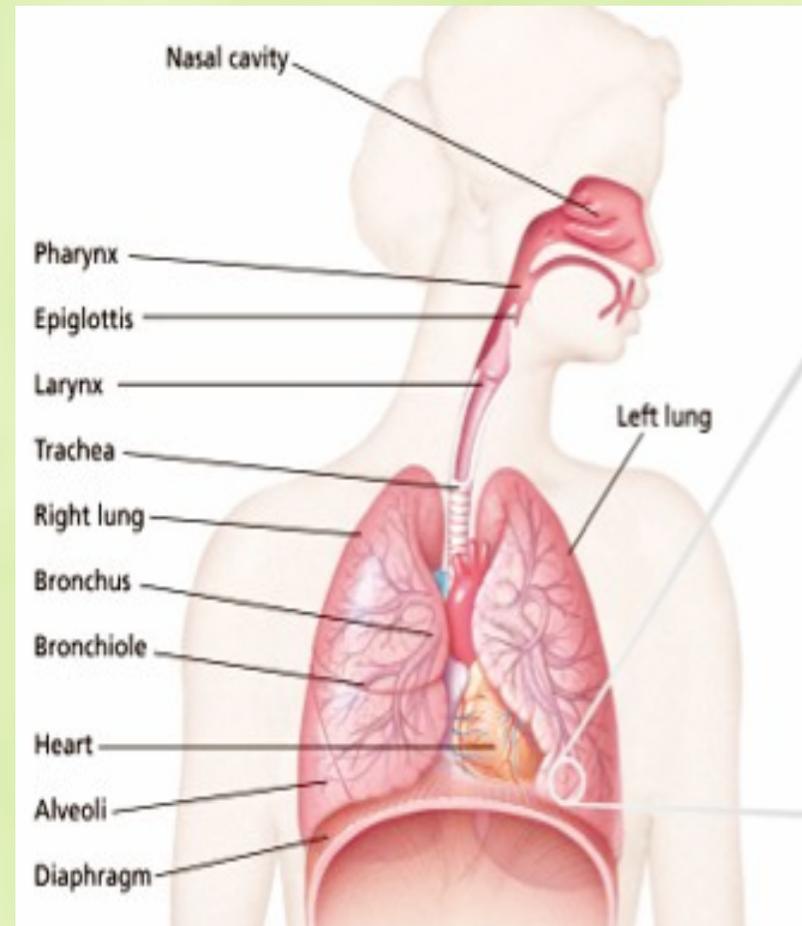


External Respiration

- ✿ External respiration is the exchange of gasses between the atmosphere and the blood.
- ✿ 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.

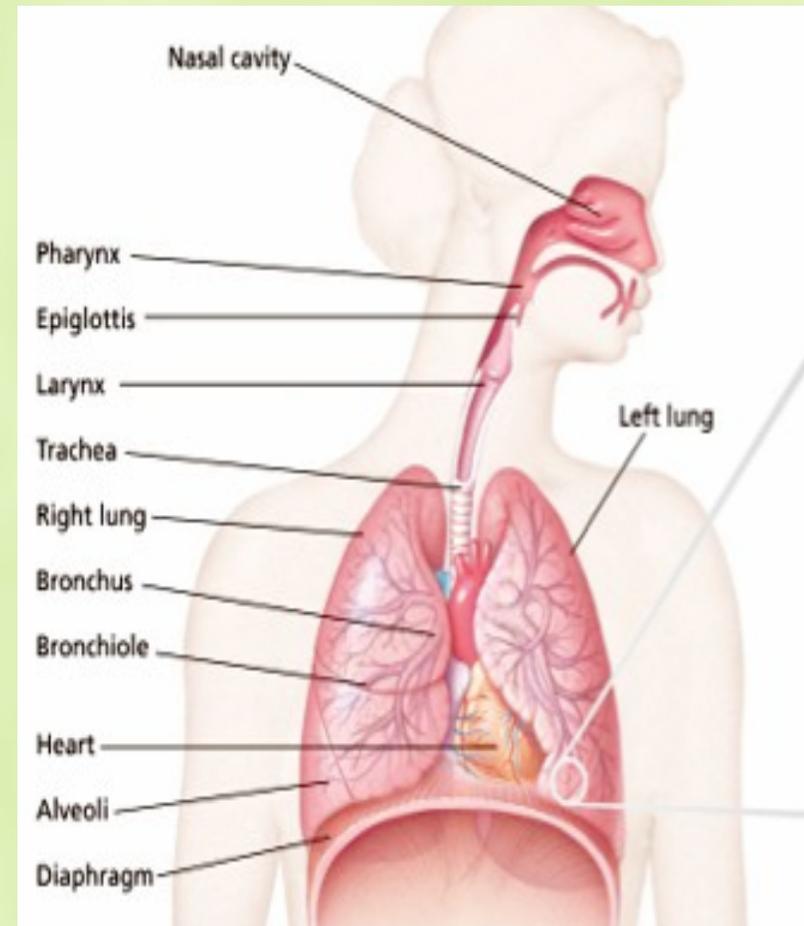
Pathway of External Resp.

- ✿ Air enters through the **nasal cavity** or the mouth.
- ✿ From there it moves into the **pharynx**.
- ✿ It passes the **epiglottis**, which is a flap of cartilage that prevents other substances from entering the trachea.



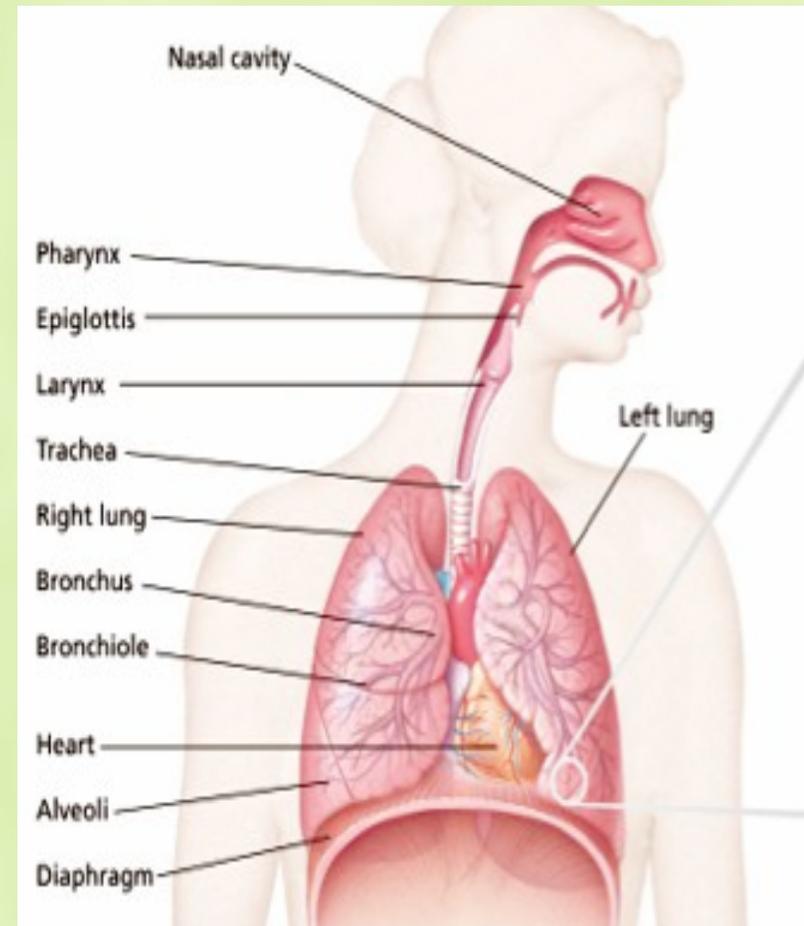
Pathway of External Resp.

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



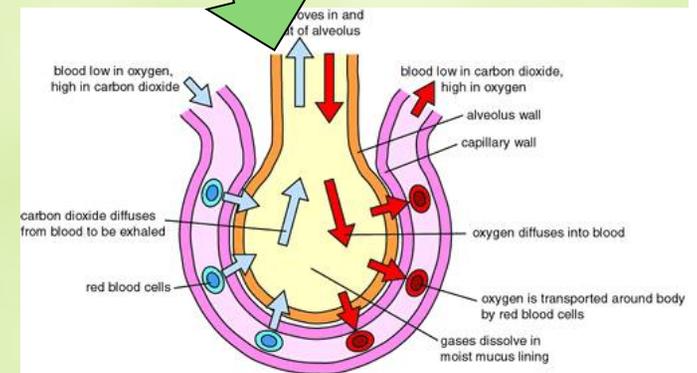
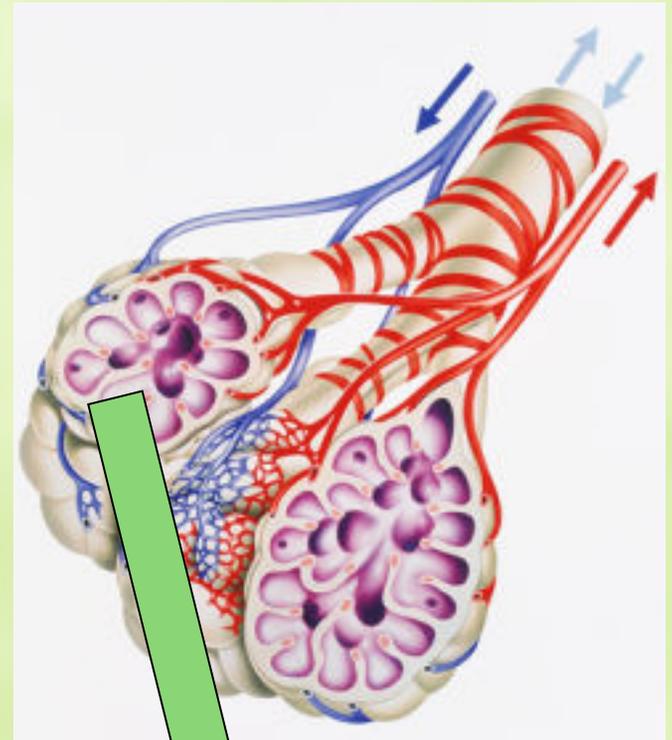
Pathway of External Resp.

- ✿ The bronchioles lead the air to small sacs called **alveoli**.
- ✿ The alveoli are surrounded on the outside by **capillaries**, or small blood vessels.
- ✿ The capillaries bring blood containing CO_2 . They drop off the CO_2 and pick up O_2 .



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 **internal respiration**.
- ✿ The blood then returns to the heart to be sent to the lungs to get more O_2 and do it again.





In and Out

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



Inspiration

- ✿ To draw air into the lungs, the **diaphragm** 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 gasses are exchanged.



Expiration

- ✿ When the diaphragm relaxes it moves upward.
- ✿ This causes the open spaces in the lungs to close forcing the air out.
- ✿ The air follows the reverse path out as it did on the way in.
- ✿ The rate of inspiration and expiration are controlled by the brain based on the body's need for oxygen.
 - ✿ EXAMPLE: Exercise requires more oxygen; Breath faster.



Objectives

- ✿ Describe the structures involved in breathing.
- ✿ Trace the path of air through the respiratory system.
- ✿ Distinguish between internal and external respiration.
- ✿ Explain how air is moved into and out of the lungs.