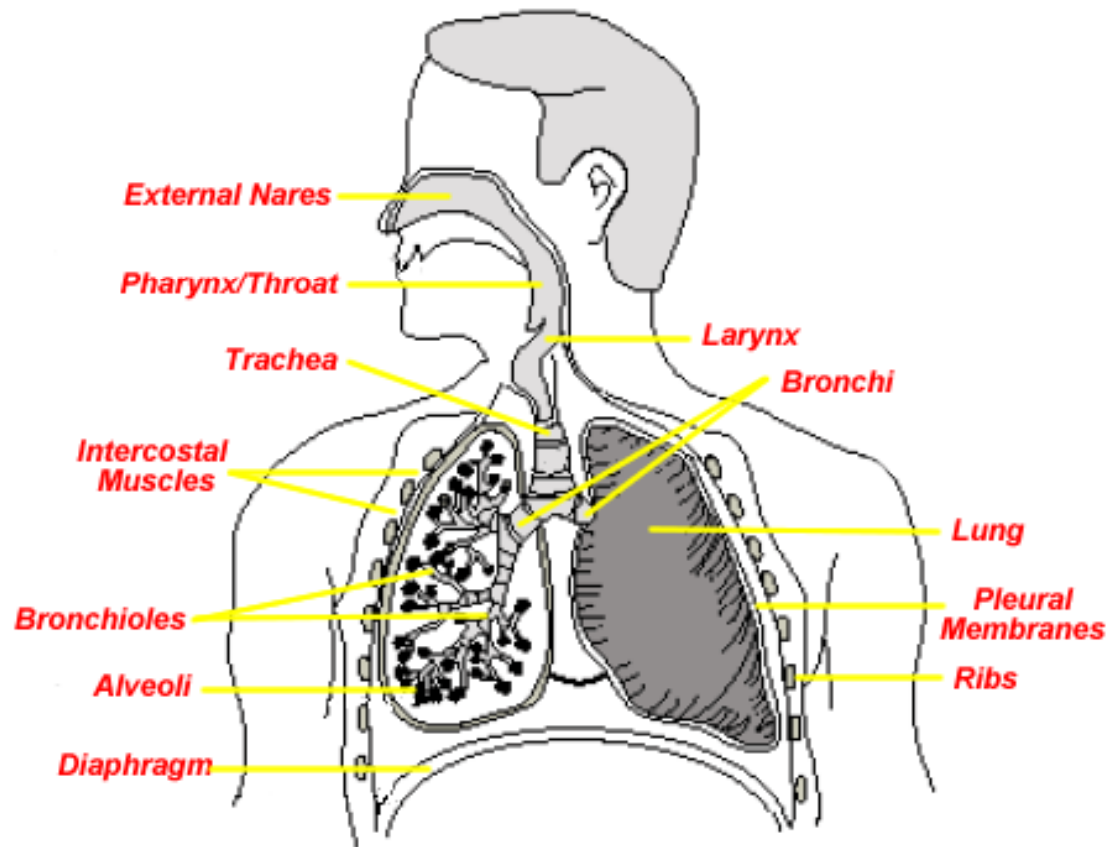


RESPIRATORY SYSTEM

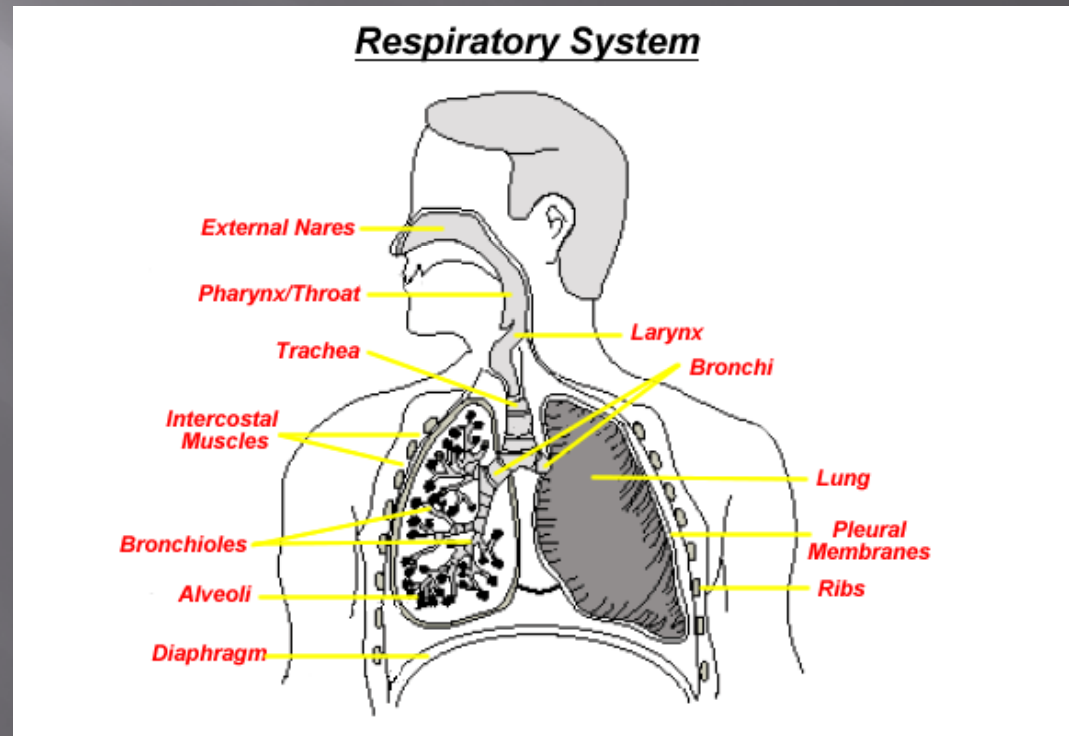
Structures of the Respiratory System

Respiratory System



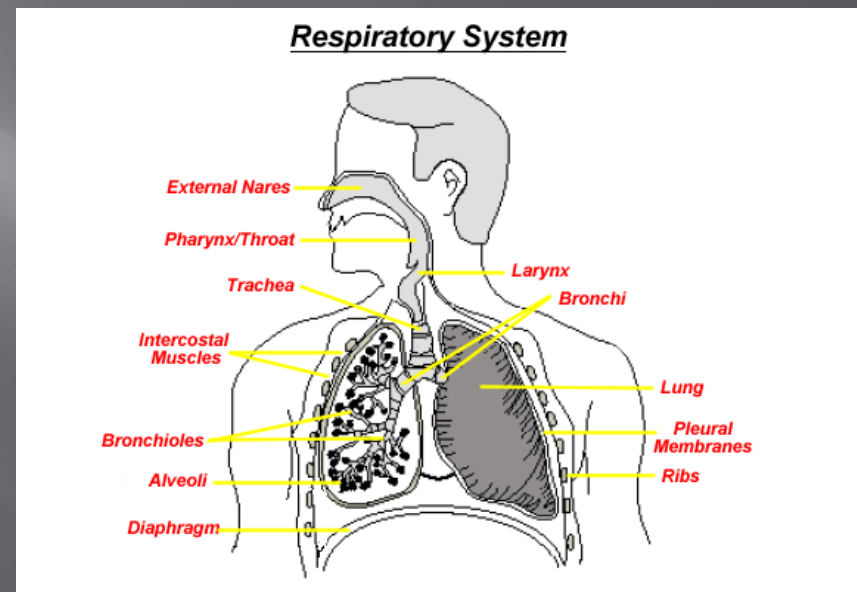
Pharynx or Throat

- ▣ A common passage way for the respiratory and digestive systems



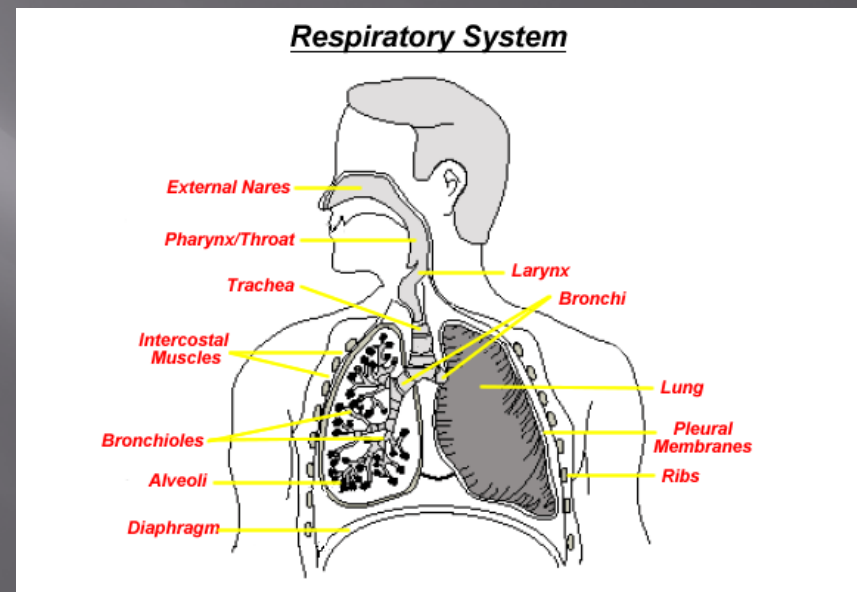
Larynx or Voice Box

- ▣ Located below the epiglottis
- ▣ Acts as a passage way for air between the pharynx and trachea
- ▣ Contains the vocal cords



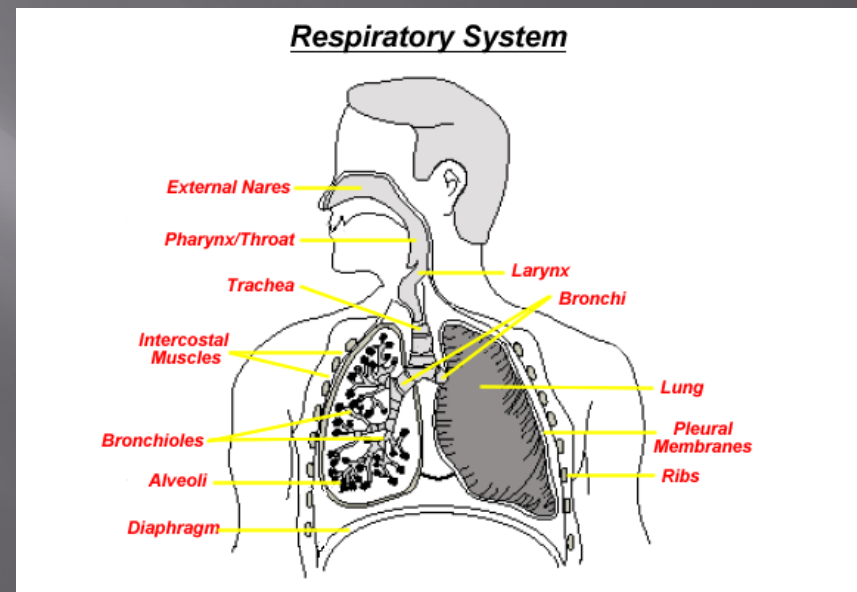
Trachea

- ❑ Located in front of the esophagus
- ❑ Passageway for air between the larynx and the bronchi
- ❑ Made up of cartilaginous rings stacked on top of each other that prevent the trachea from collapsing



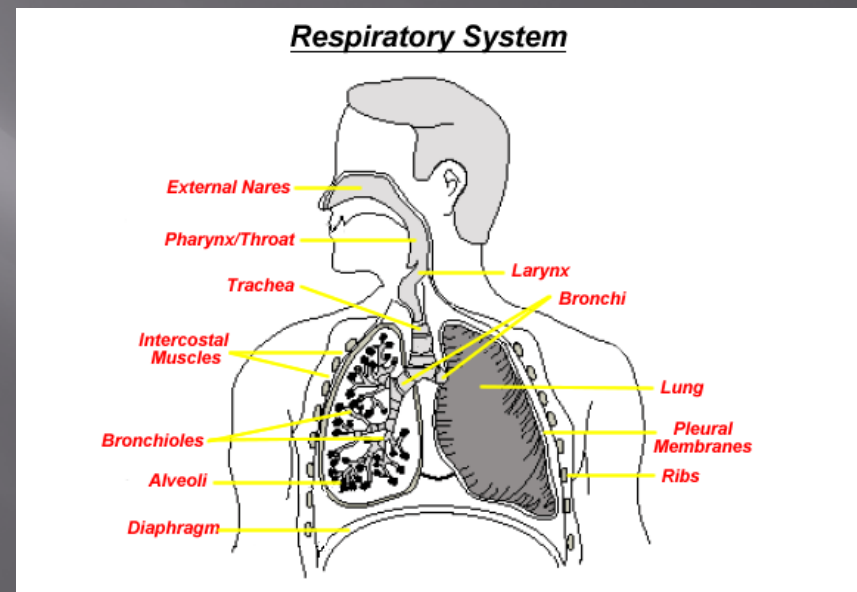
Bronchi (one is a bronchus)

- ▣ Branch off the trachea to supply air to both lungs
- ▣ Each main bronchus branches into many secondary bronchi that have smaller diameters, thinner walls, and less cartilage for support
- ▣ Secondary bronchi lead to the smaller tubes called bronchioles.



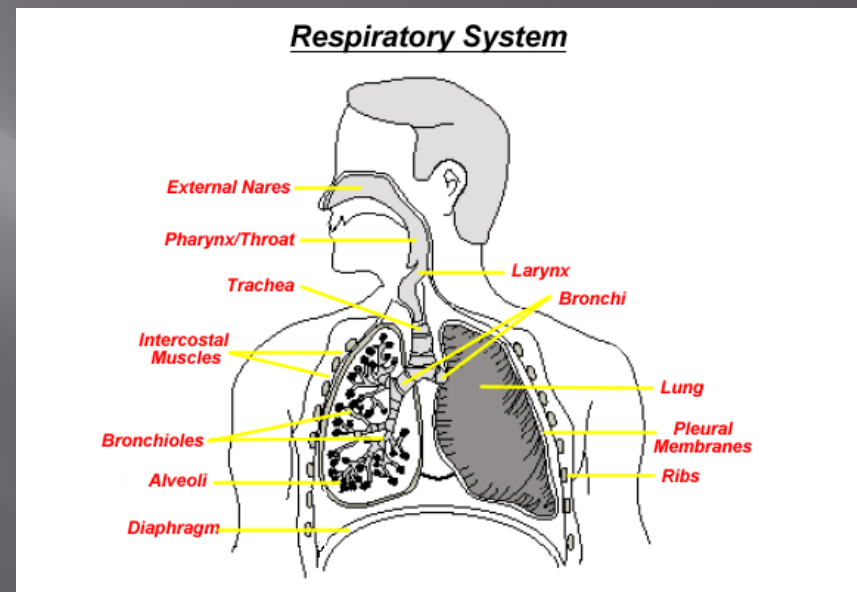
Bronchioles

- ▣ The smallest tubes within the lungs
- ▣ Carry air to the alveoli
- ▣ Each bronchiole will supply air to a lobule within the lung that contains many alveoli.



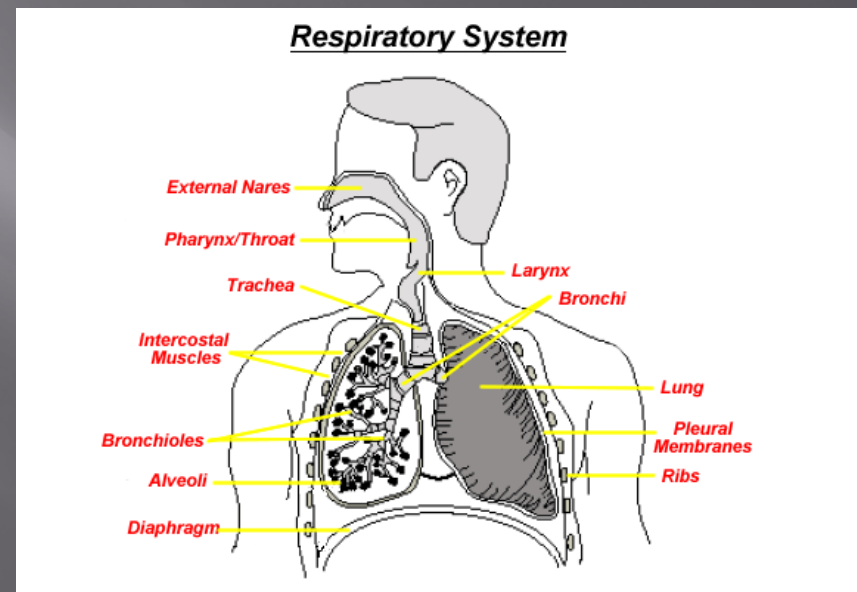
Alveoli (one is an alveolus)

- ▣ The air sacs of the lungs
- ▣ They have thin walls made of simple squamous epithelial cells and are surrounded by blood capillaries (another layer of simple squamous epithelium).
- ▣ Gas exchange occurs in the alveoli.



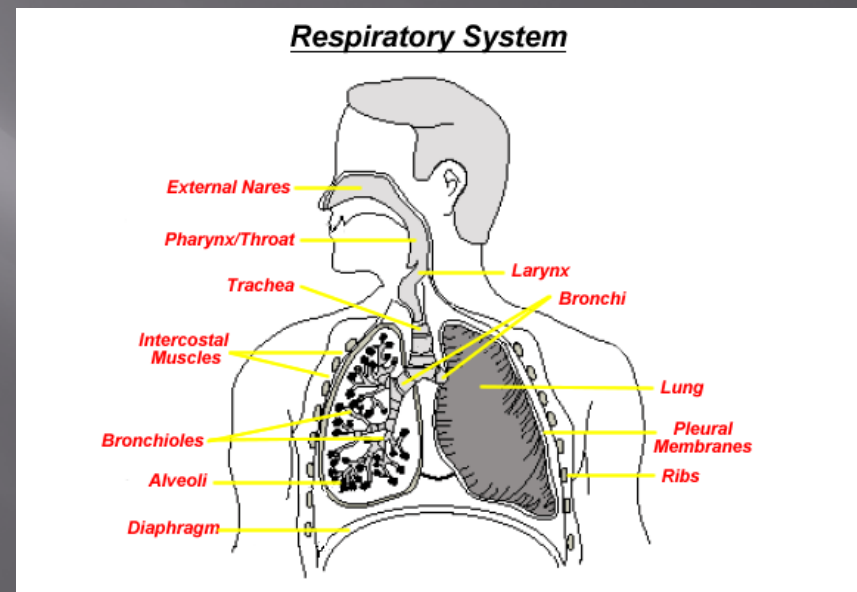
Thoracic Cavity

- ▣ The enclosed space formed on the top and sides by the ribs and the diaphragm on the bottom
- ▣ Functions in breathing and protects vital organs like the heart and large blood vessels



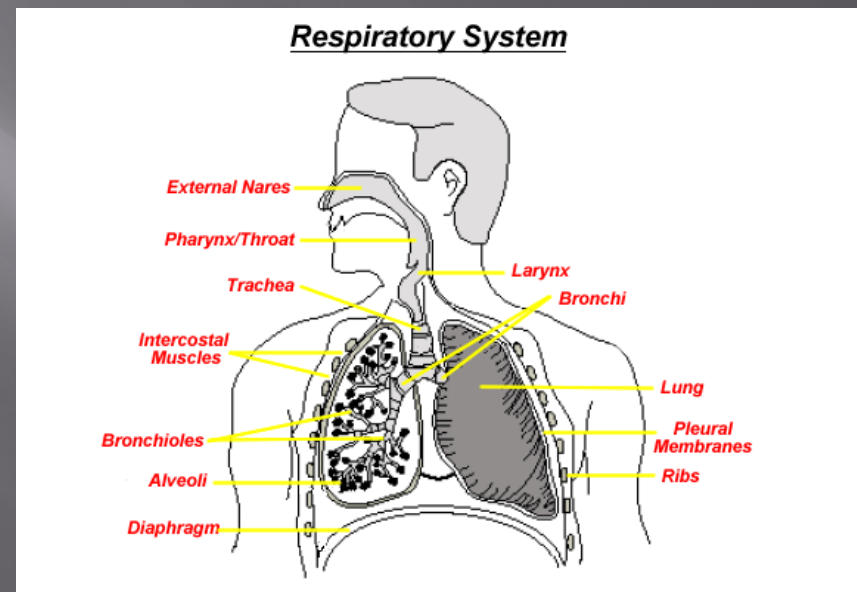
Diaphragm

- ▣ A dome-shaped muscle that separates the thoracic (chest) cavity and abdominal cavity
- ▣ When the diaphragm contracts, the muscles shorten and flatten out the dome-shaped diaphragm increasing the volume of the thoracic cavity and pushing down on the abdomen



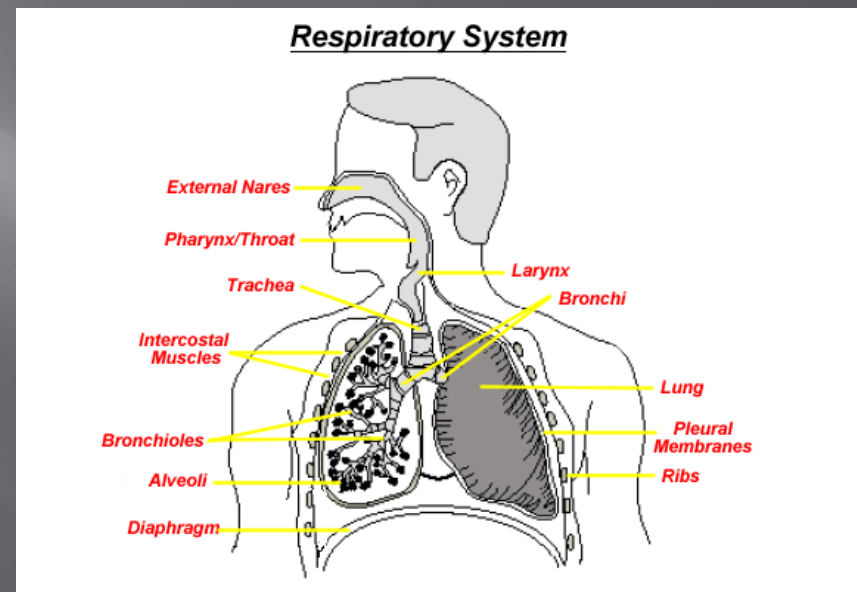
Ribs and Intercostal muscles

- ▣ The ribs are bones attached to the spine and sternum that form the structure of the thoracic cavity
- ▣ Intercostal muscles between the ribs contract to pull the ribs up and out during inhalation and relax during exhalation



Pleural Membranes

- ❑ Two membrane layers that lie between the lungs and the chest wall
- ❑ The inner membrane encases the lungs while the outer membrane adheres to the chest wall
- ❑ A thin layer of fluid between the two membranes that prevents friction and allows easy movement between the lungs and chest wall
- ❑ The complete seal and low pressure between the layers prevent the lungs from collapsing

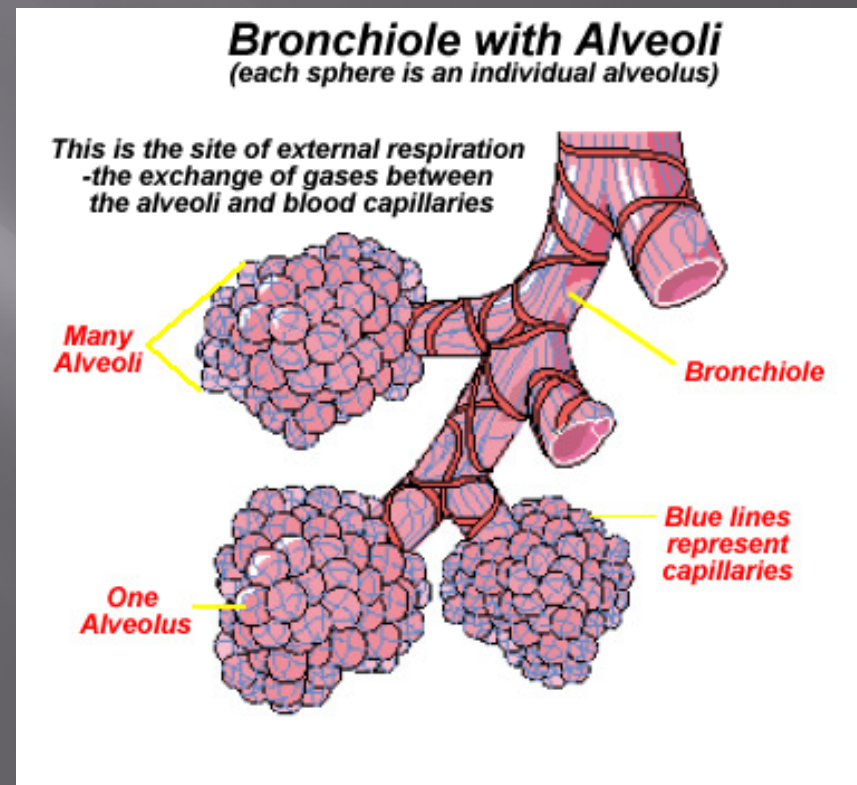


Role of Cilia & Mucus

- ▣ The tubes of the lungs contain goblet cells that produce mucus (similar to the digestive system)
- ▣ Mucus traps foreign particles
- ▣ Cilia are short hair-like structures that are able to produce movement
- ▣ Epithelial cells with cilia line the tubes of the lungs
- ▣ The movement created by the cilia sweep mucus and trapped debris out of the lungs

Alveoli Structure & Function

- Alveoli have thin walls made of simple squamous epithelial cells and are surrounded by blood capillaries



Gas exchange occurs in the alveoli

- ❑ Oxygen gas is in higher concentration in the alveoli than in the blood and so it diffuses into the blood
- ❑ Carbon dioxide is in higher concentration in the blood than the alveoli and so it diffuses into the alveoli
- ❑ The surface of alveoli are covered in a thin lipoprotein layer (called pulmonary surfactant) that prevents them from collapsing during exhalation

Alveoli Structure and Function Summary

Structural Component	Functional Benefit
Alveoli are arranged in grape-like clusters	Greatly increases surface area for gas exchange
Thin walls - one cell thick	Increases rate of diffusion of oxygen and carbon dioxide between alveoli and blood
Densely covered with blood capillaries	Large contact area between alveoli and blood supply

Alveoli Structure and Function Summary (2)

Structural Component	Functional Benefit
Inner walls are lined with pulmonary surfactant	Lowers the surface tension within the alveoli and prevents them from collapsing
Walls of alveoli are moist	Aids rate of diffusion of gases
Alveoli contain stretch receptors	Prevents alveoli from overfilling with air and causing damage to the thin walls