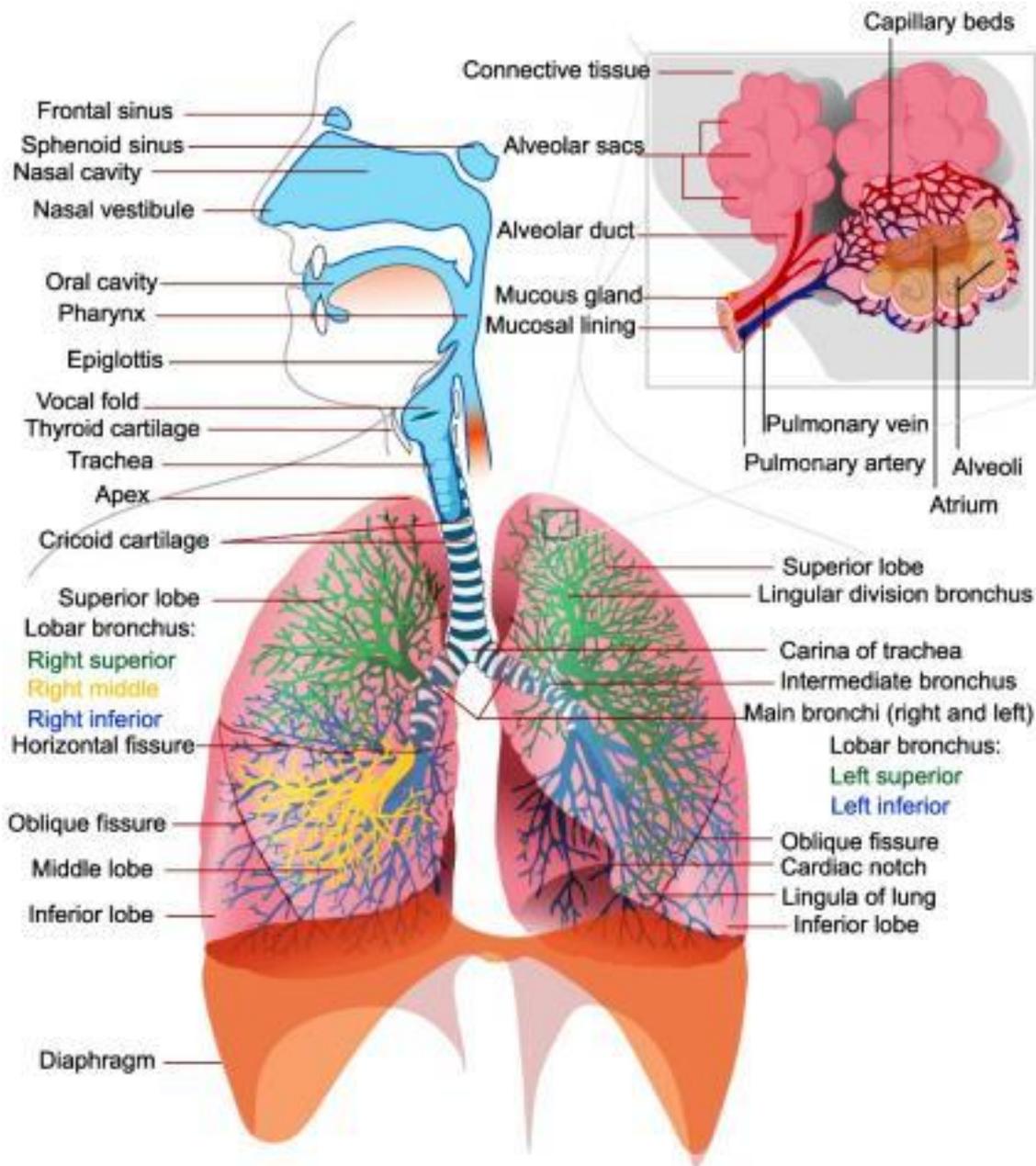# Introduction

The respiratory system is made up of the lungs, trachea, bronchi, bronchioles and alveoli. Air enters the respiratory system through nasal cavities. These are lined with ciliated epithelial cell which secretes mucus. These cells also have cilia (hair-like projections) on their surfaces. The cilia help to sweep away mucus, to remove dirt, so that only clean air enters the lungs. The air is warmed and moistened before passing to the pharynx.

RESPIRATORY SYSTEM

Capillary beds

Connective tissue

Frontal sinus
Sphenoid sinus
Nasal cavity
Nasal vestibule

Alveolar sacs

Alveolar duct

Oral cavity
Pharynx

Mucous gland
Mucosal lining

Epiglottis
Vocal fold
Thyroid cartilage
Trachea
Apex
Cricoid cartilage

Pulmonary vein
Pulmonary artery   Alveoli
Atrium

Superior lobe
Lobar bronchus:
Right superior
Right middle
Right inferior
Horizontal fissure

Superior lobe
Lingular division bronchus

Carina of trachea
Intermediate bronchus
Main bronchi (right and left)
Lobar bronchus:
Left superior
Left inferior

Oblique fissure
Middle lobe
Inferior lobe

Oblique fissure
Cardiac notch
Lingula of lung
Inferior lobe

Diaphragm

The pharynx leads to the larynx which is covered by the epiglottis. The air then leads into the trachea-which is supported by bands of cartilage tissue which would prevent it from collapsing. The trachea branches into the right and left bronchi these lead to each lung. Where they branch into smaller tubes they are called bronchioles, which end in smaller air sacs, called alveoli.
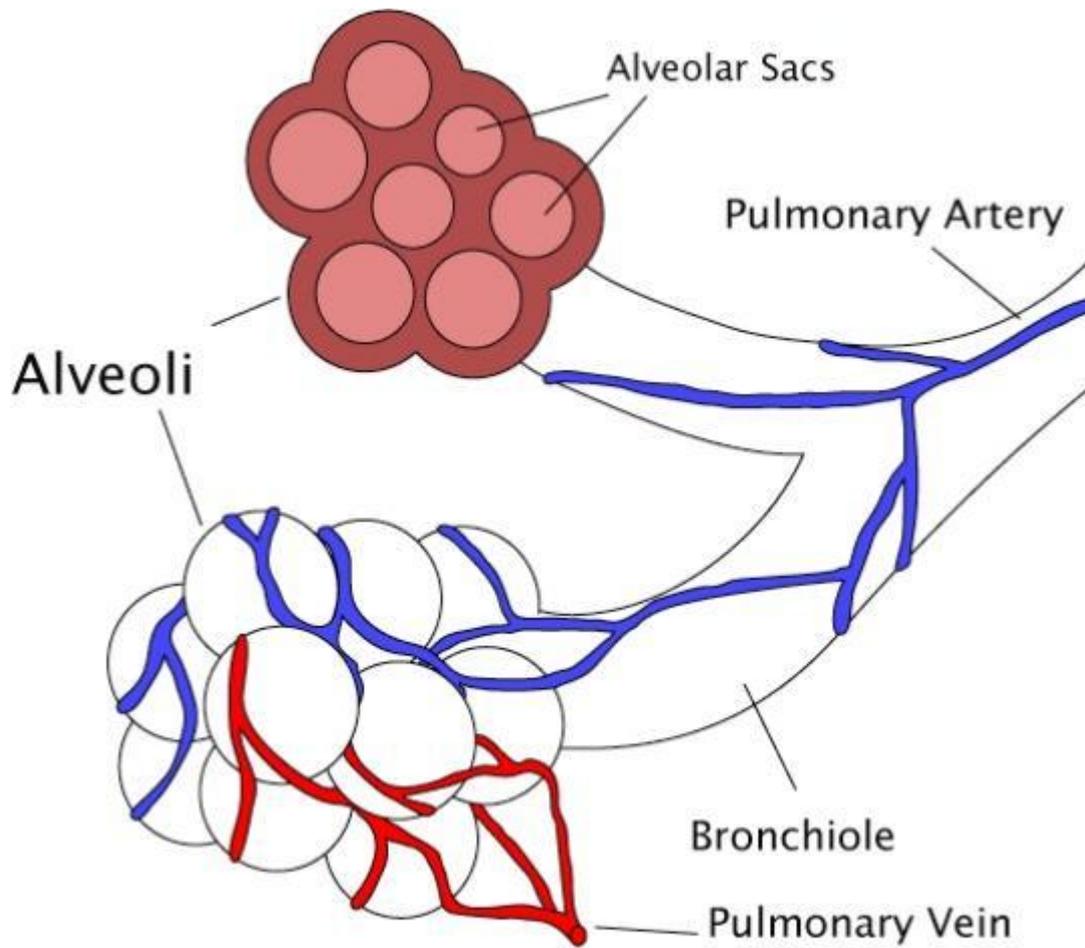
All linings have cilia which would move dust and other particles back up the pharynx where they can be swallowed or sip out. This removal will prevent the blockage of the bronchioles.

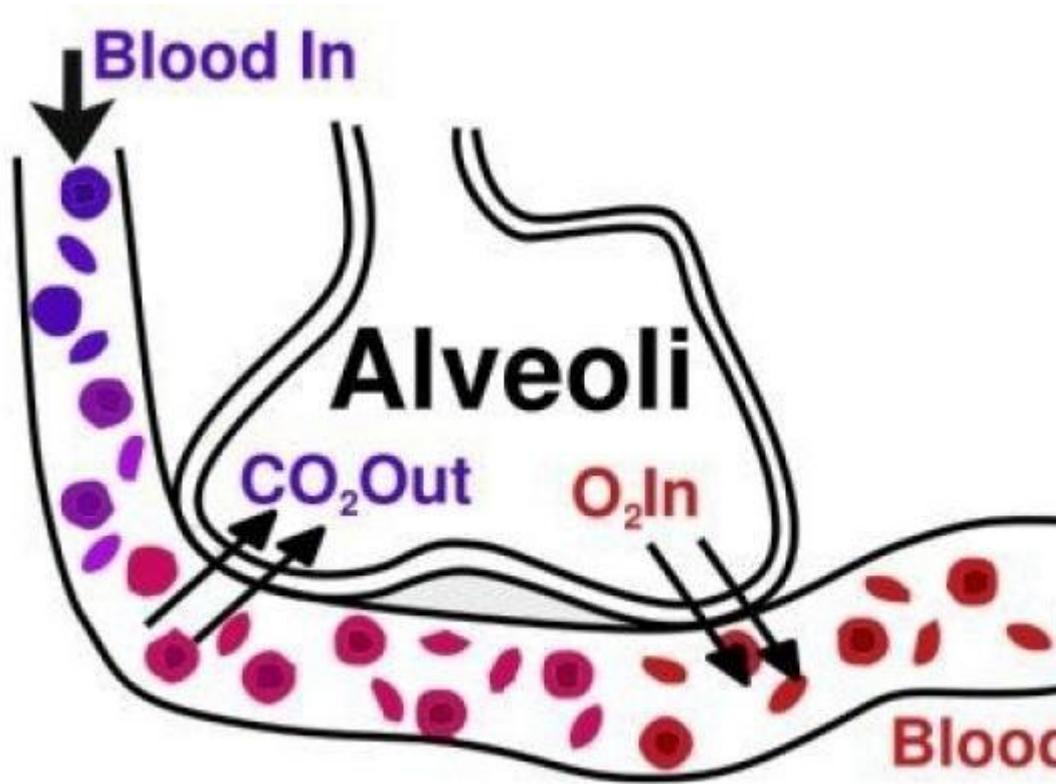**The Structure of the Alveoli and Gas exchange**

Alveoli are air sacs. They are highly vasculated-a network of blood capillaries which brings the blood close to them. The blood in the capillaries come from the body where respiration has already occurred, so the blood has a higher carbon dioxide content than in the lung and so carbon dioxide will move from blood to lungs. Oxygen content in the blood is lower than in the lungs and so oxygen would move from lung to blood. This is gaseous exchange.

This movement of gas is:

1. Very efficient because a large number of alveoli are present to increase surface area for diffusion

2. Alveoli and blood capillaries have thin walls so the distance over which diffusion takes place is very small

3. The respiratory surfaces must be moist so that the gases dissolve allowing rapid diffusion across respiratory surfaces.

ALVEOLI DIAGRAM

Alveolar Sacs

Pulmonary Artery

Alveoli

Bronchiole

Pulmonary Vein

ALVEOLI GAS EXCHANGE DIAGRAM

Blood In

Alveoli

CO_2 Out

O_2 In

Blood