respiratory system

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Lec.8

فسلجه نظري

1ST STAGE

respiratory system

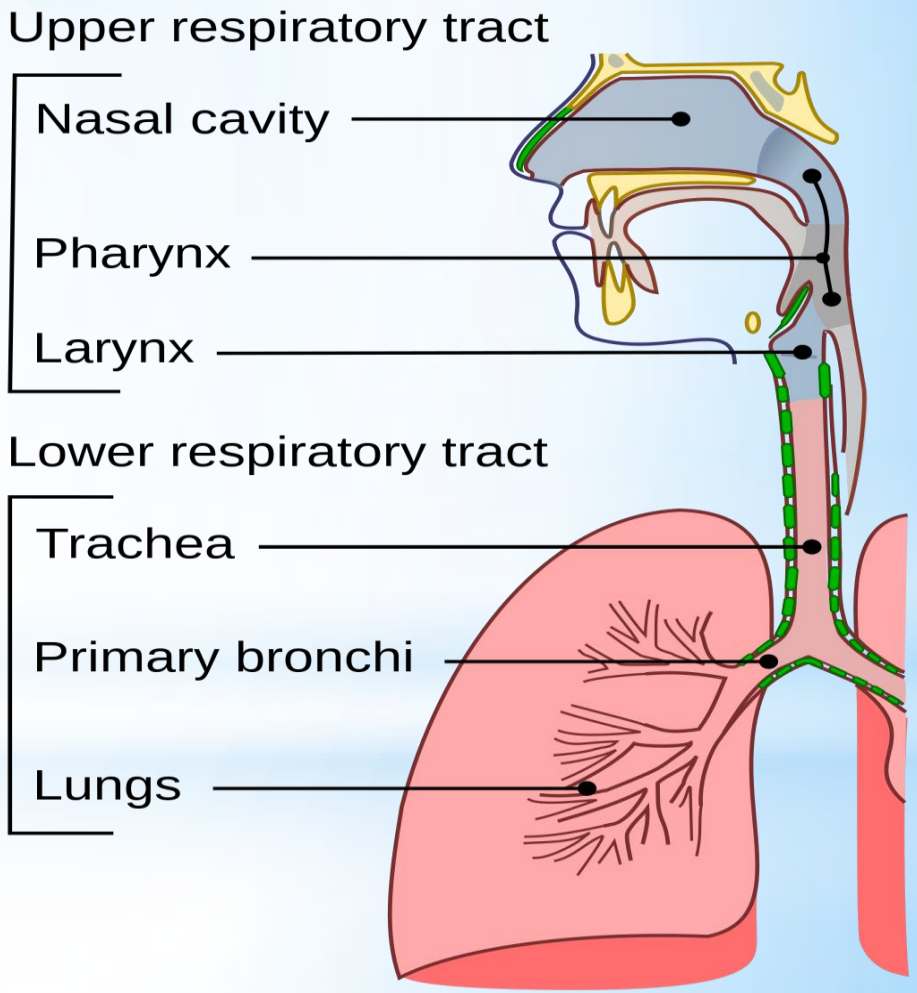
General function of Respiratory System.

- Gas exchange : oxygen enters blood and carbon dioxide levels .
- Regulation of blood pH.
- Voice production : movement of air past vocal folds makes sound and speech.
- Olfaction : smell occurs when airborne molecules draw into nasal cavity.
- Production : against microorganisms by preventing entry and removing them .

Respiratory system

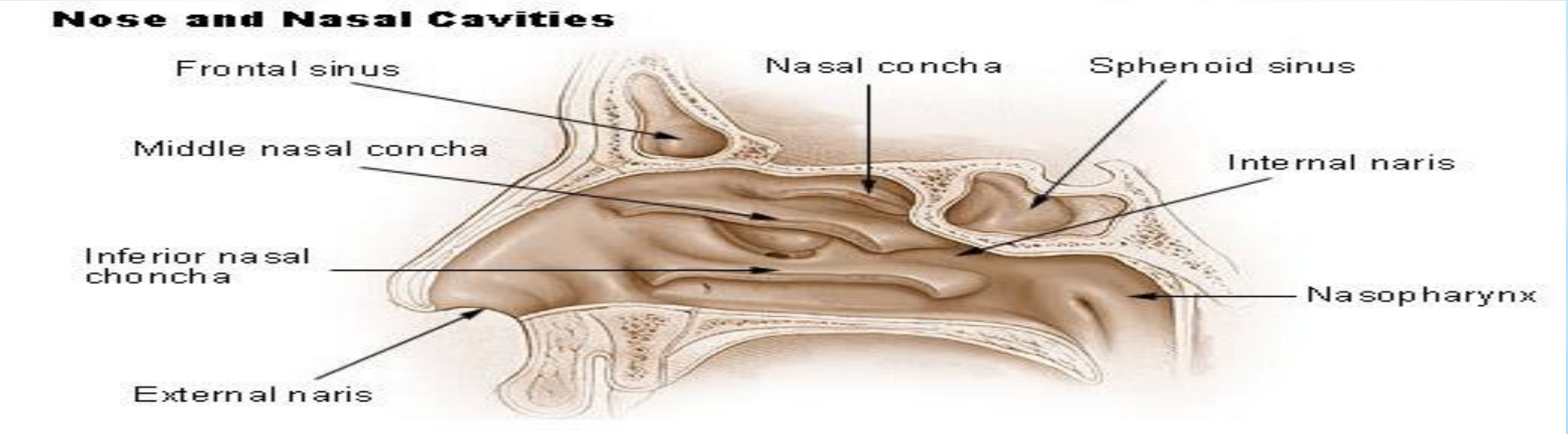
They are classified into:

1) **Upper airway: Nose , pharynx and larynx**
2) **Lower airway**: includes the **trachea, bronchi and lung**



Nose :

External nose of nasal cavity , lined with ciliated mucous membranes containing goblet cells .



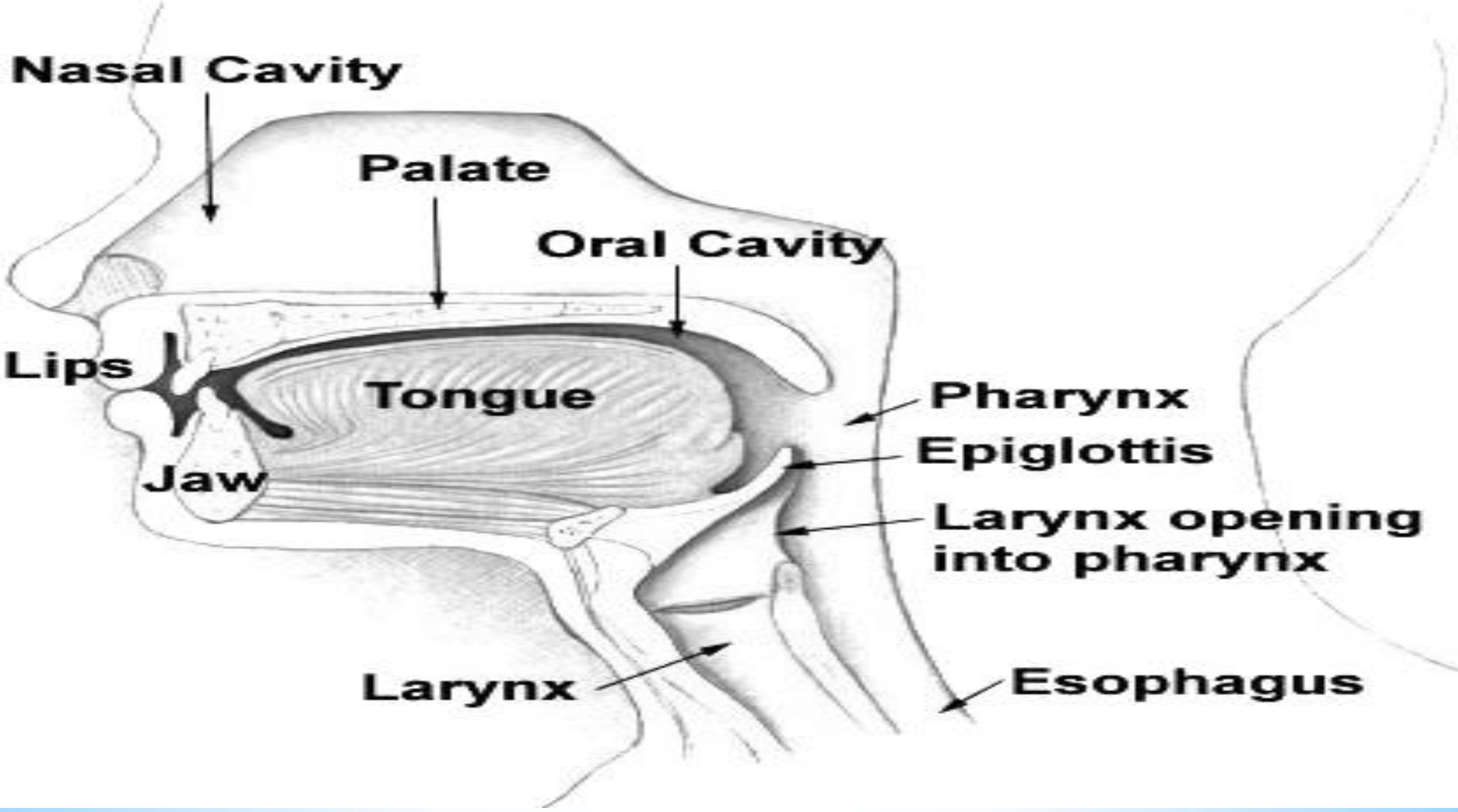
Function of the nose:

1. It serves as an air passageway .
2. It warms and moistens inhaled air .
3. It cilia and mucous membrane trap duct , pollen , bacteria and foreign matter .
4. It contains olfactory receptors , which smell odors .
5. It aids in phonation and the quality of voice .

pharynx:

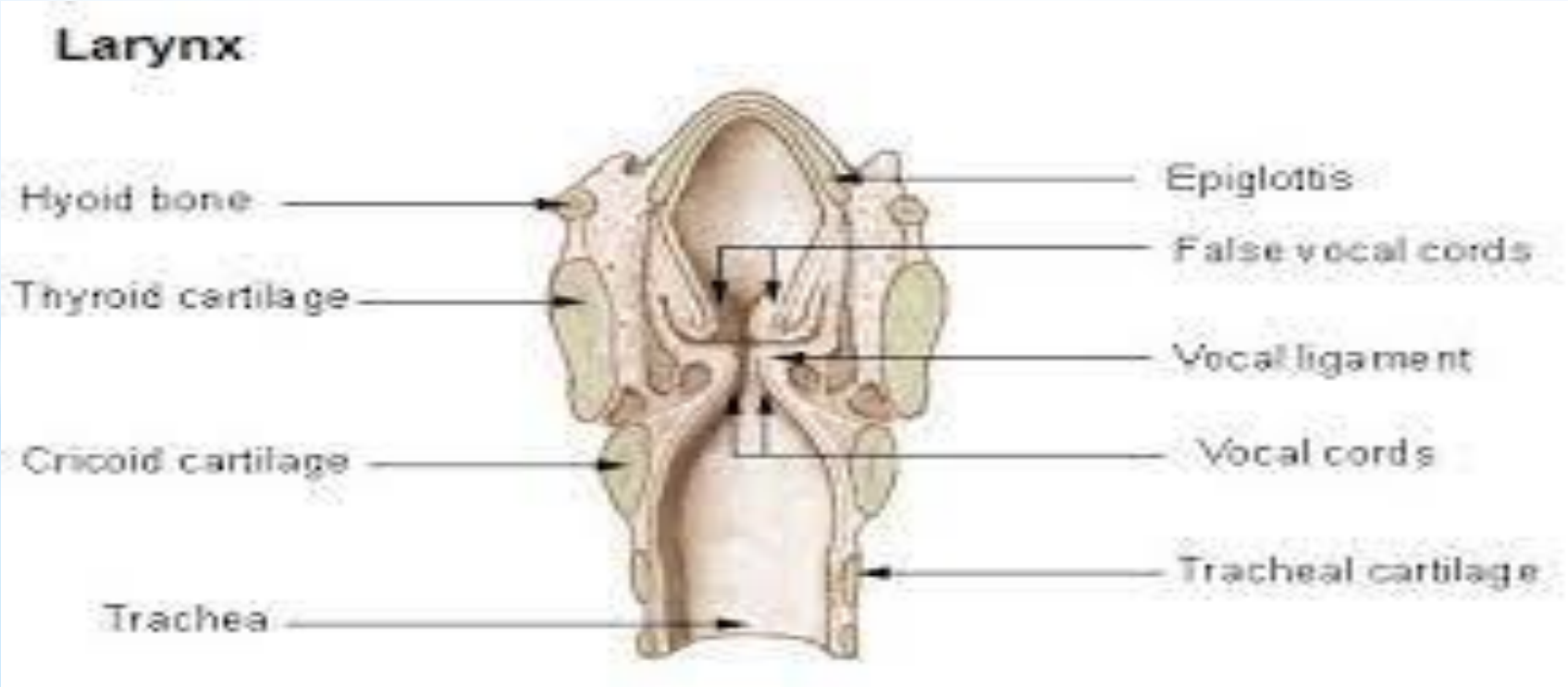
- ❑ Common opening for digestive and respiratory systems
- ❑ 5 cm long
- ❑ Made of musle and lined with mucous membrane .
- ❑ **It is divided into three parts:**

1) Nasopharynx (behind the nose),
2) oropharynx (behind the mouth),
3) laryngopharynx behind the larynx.

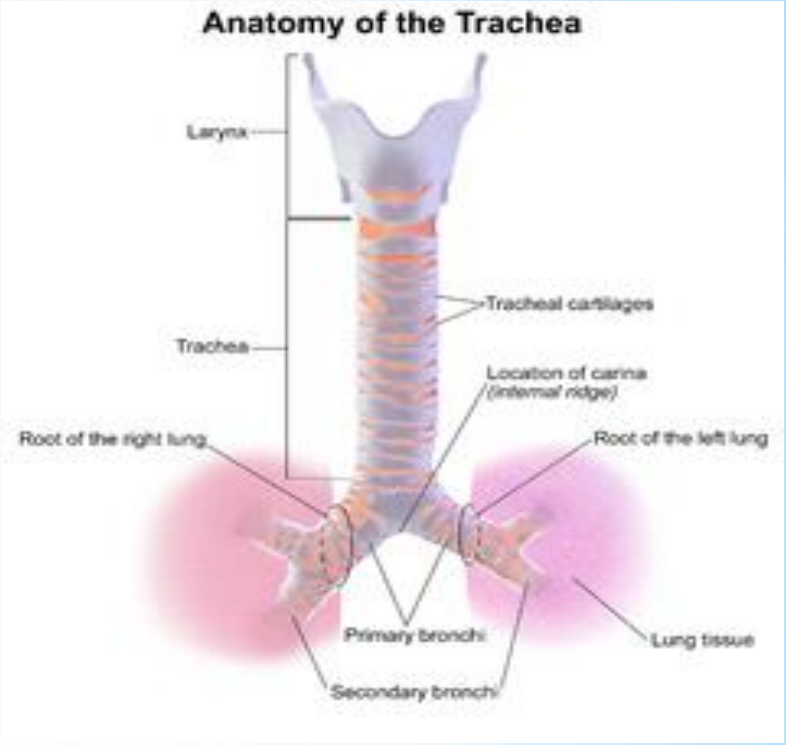

Nasal Cavity
Palate
Oral Cavity
Lips
Tongue
Jaw
Pharynx
Epiglottis
Larynx opening into pharynx
Larynx
Esophagus

Larynx (voice box) :

- ✓ composed of cartilage and muscles .
- ✓ Function : maintain an open passageway for air movement ,
- ✓ Epiglottis and false vocal cord prevent swallowed material from moving into larynx and true vocal folds are primary source of sound production .



Trachea (Windpipe) :



- Is a smooth
- Muscular tube extends from larynx to bronchi .
- Contain cartilage rings prevent crushing

or (collapse) of trachea .

- Function : passageway for air to and from the lungs.
- Lined by pseudo stratified ciliated columnar epithelium
- Which sweep foreign matter out of the pathway .

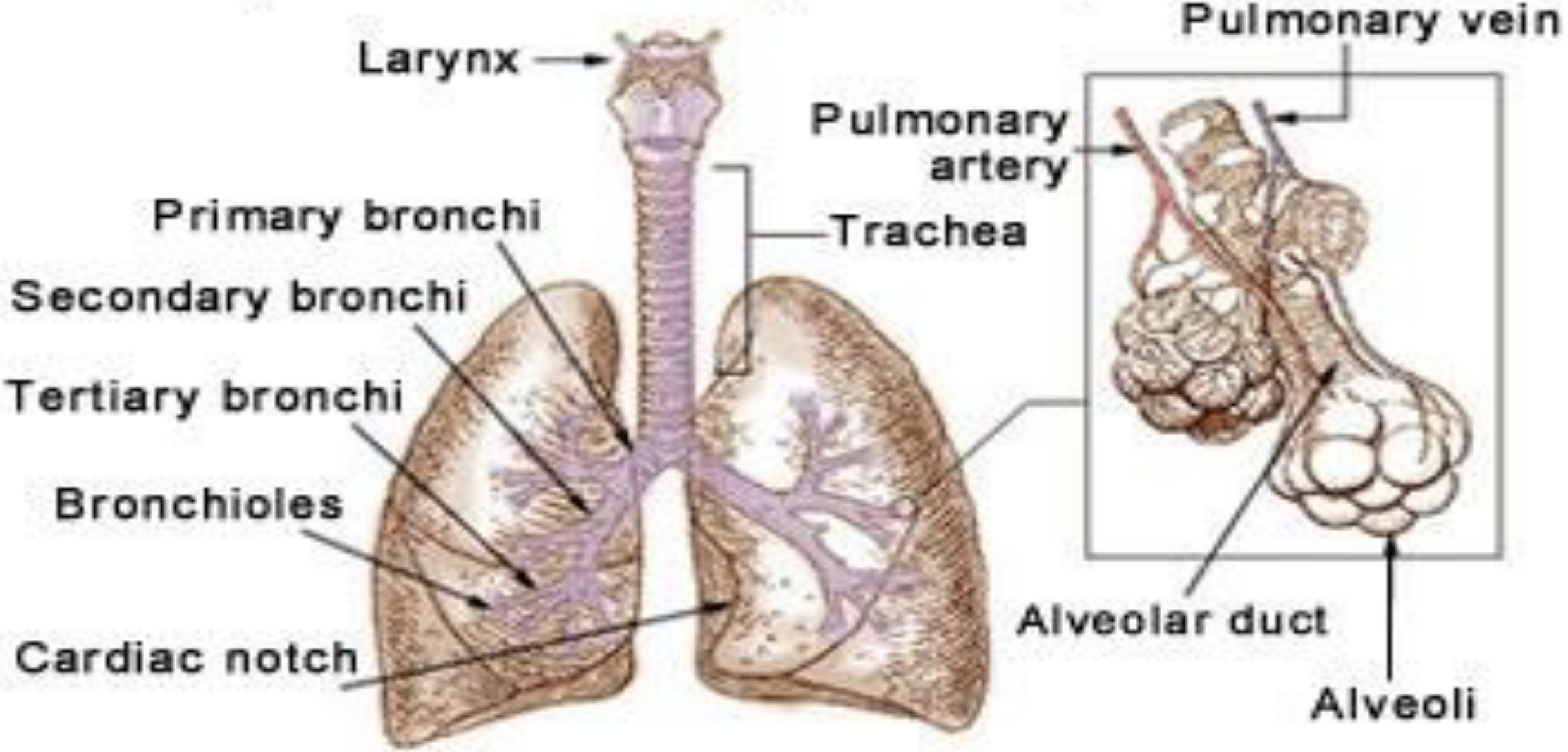
Bronchi :

- Trachea divides into two branches (bronchi) which enter each lung.
- Providing passageway for air to the lung .
- Bronchi resemble trachea un structure also supported by C-shaped cartilage also have lots of elastic connective tissue .
- The two primary bronchi become bronchioles .

Lungs

- There are two lungs, right and left.
- Each lung is pyramidal in shape, having apex, base and side walls.
- The right lung is shorter and broader than the left lung.
- The left lung shows a cardiac notch.
- The right lung is divided into **three lobes**, while the left lung is divided into two lobes

Bronchi, Bronchial Tree, and Lungs



Each lung has a hilum which contains the following structures:

1) a main bronchus

2) a pulmonary artery

3) two pulmonary veins

4) Lymphatics

5) Autonomic nerves. Each lung is covered with a serous membrane called **pleura.**

The pleura is a serous sac which has:

1. a parietal layer lining the thoracic wall.
2. a visceral layer covering the lung surface.
3. a cavity which contain a little amount of serous fluid.

Surface marking of the Pleura and Lungs This is represented by the following points:

The apex of the lung: one inch above the junction of the medial and intermediate one third of the clavicle.

Mechanism of breathing Inspiration:

Inspiration:

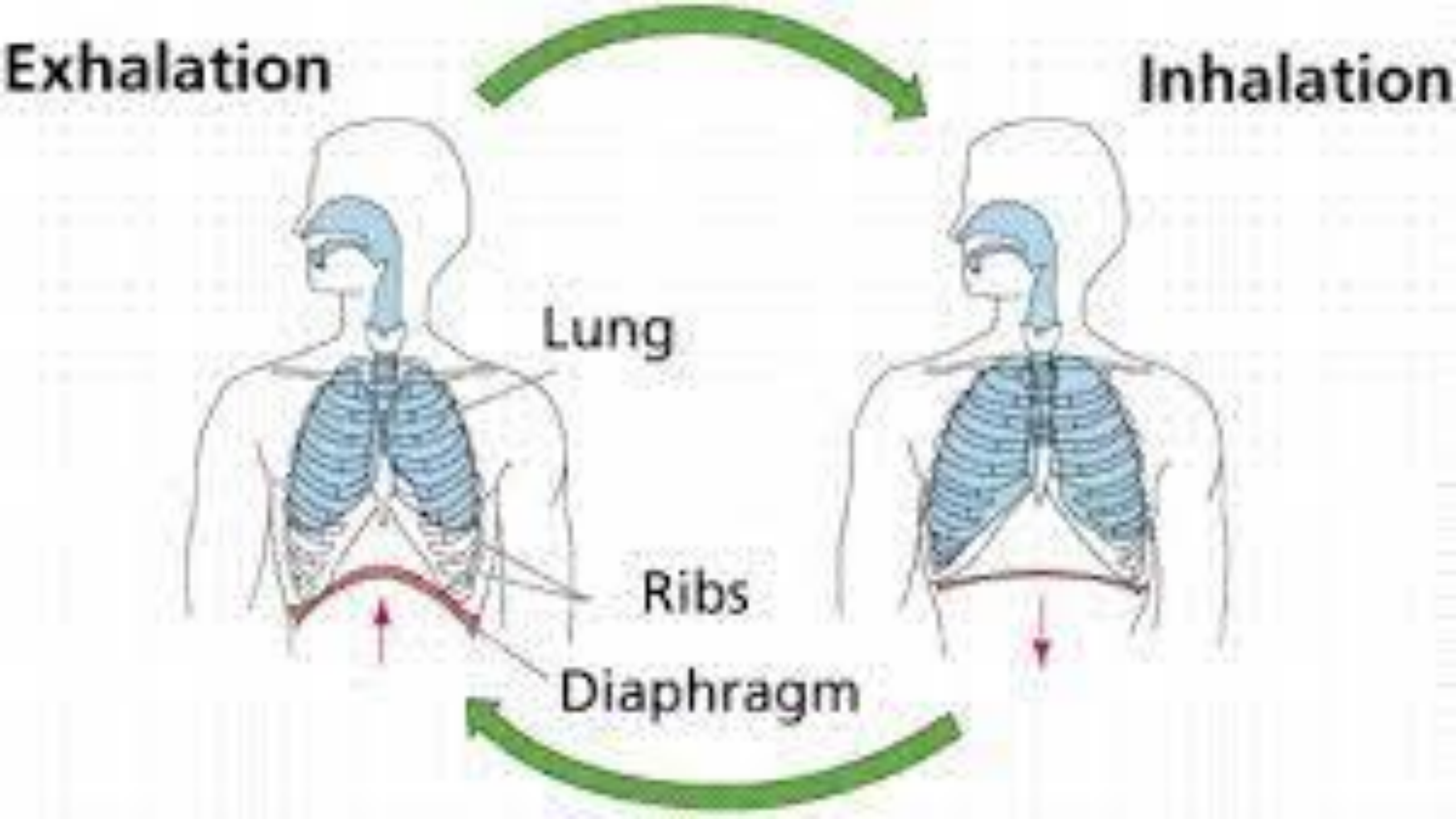
- Inspiration is an active process.
- At the time of inspiration contraction in diaphragm and external intercostal muscles muscles takes place.
- Diaphragm becomes flat and is pushed towards abdominal cavity.
- Sternum moves towards ventral and anterior direction.

Expiration:

- Normal expiration is an passive process.
- During expiration relaxation in diaphragm and external intercostal muscles takes place.
- We have the ability to increase the strength of inspiration and expiration with the help of additional muscles, this is called forceful breathing

Events in inspiration and expiration

Inspiration	Expiration
Respiratory centre initiates the stimuli during inspiration.	Respiratory centre terminates the stimuli during expiration.
The diaphragm and exspiratory muscles contract.	The diaphragm relax but internal intercostal muscles contract.
The thoracic volume increases as the chest wall expands.	The thoracic volume decreases as the chest wall contracts.
The intra pulmonary pressure is reduced.	The intra pulmonary pressure is increased.
The alveolar pressure decreases than the atmospheric pressure	The alveolar pressure increases than the atmospheric pressure.
Air is taken inside due to expansion of alveoli.	Air is sent out due to the contraction of alveoli.
Air flows into the alveoli until the alveolar pressure equalizes the atmospheric pressure and the alveoli get inflated.	Air flows out of the alveoli until the alveolar pressure equalizes the atmospheric pressure and the alveoli get deflated.


Exhalation
Inhalation
Lung
Ribs
Diaphragm

Thank You