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Introduction, Types of respiration, Respiratory system in human beings: Nose, Pharynx, Larynx, Trachea

Period 1

SUBJECT : (Science)
CHAPTER NUMBER: 5
CHAPTER NAME : RESPIRATORY SYSTEM

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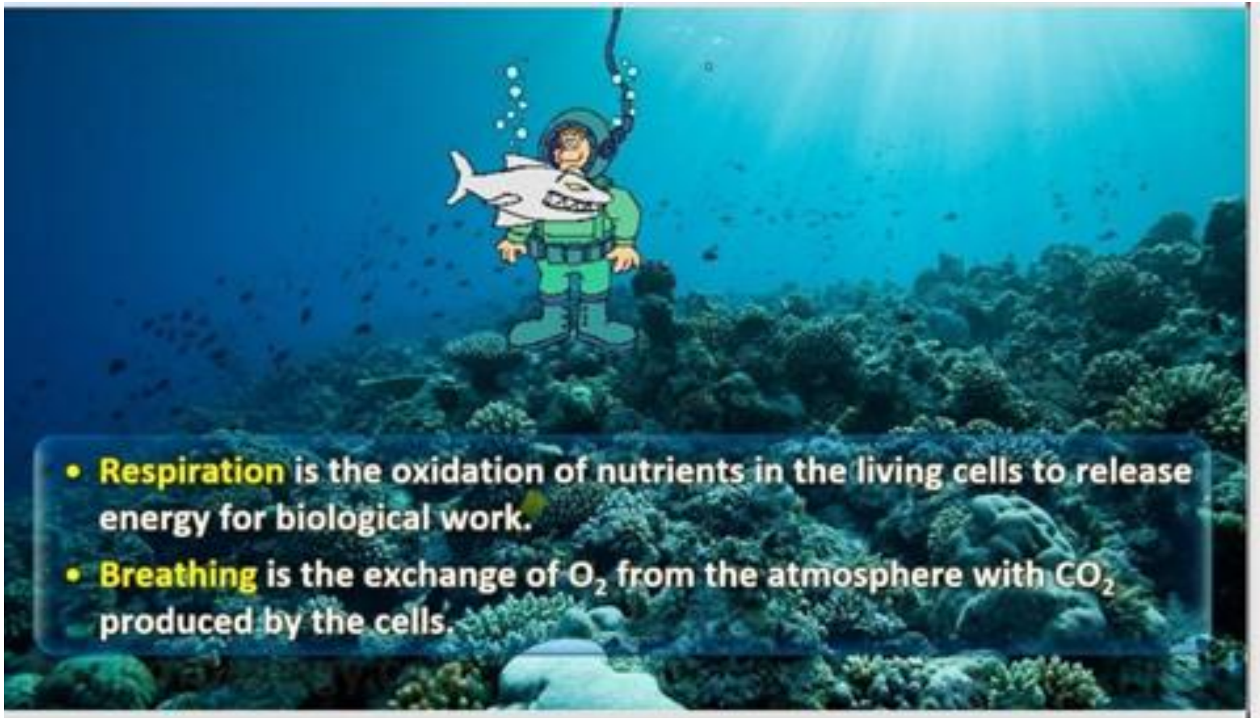
RESPIRATION

- **All living things respire**. Respiration is a process that includes breathing. The movement of air in and out of the body and vice-versa is known as breathing.

For example, animals such as earthworms breathe through their skin; fishes use gills for breathing and plants exchange gases through tiny pores called stomata, which are present mainly on the surface of leaves.

RESPIRATION AND BREATHING



AEROBIC RESPIRATION AND ANAEROBIC RESPIRATION

Aerobic respiration	Anaerobic respiration
It occurs in the presence of O_2.	It occurs in the absence of O_2.
It involves the exchange of gases between an organism and outside environment.	Exchange of gases is absent.
It occurs in the cytoplasm and mitochondria.	It occurs only in the cytoplasm.
It always releases CO_2 and H_2O.	End products may vary.
It yields 36 ATP.	It yields 2 ATP.
Example: Cells in our body	Example: Yeast and muscle cells

Adenosine triphosphate (ATP) is the universal unit of energy used in all living cells.It is the very basic molecule which meets our energy needs and is formed in the later steps of glucose oxidation.

RESPIRATORY ORGANS

General body surface

E.g. lower invertebrates (sponges, coelenterates, flatworms etc).

Gills (Branchial respiration)

E.g. fishes, tadpoles, prawn.

Skin or moist cuticle (cutaneous respiration)

E.g. earthworms, leech, amphibians etc.

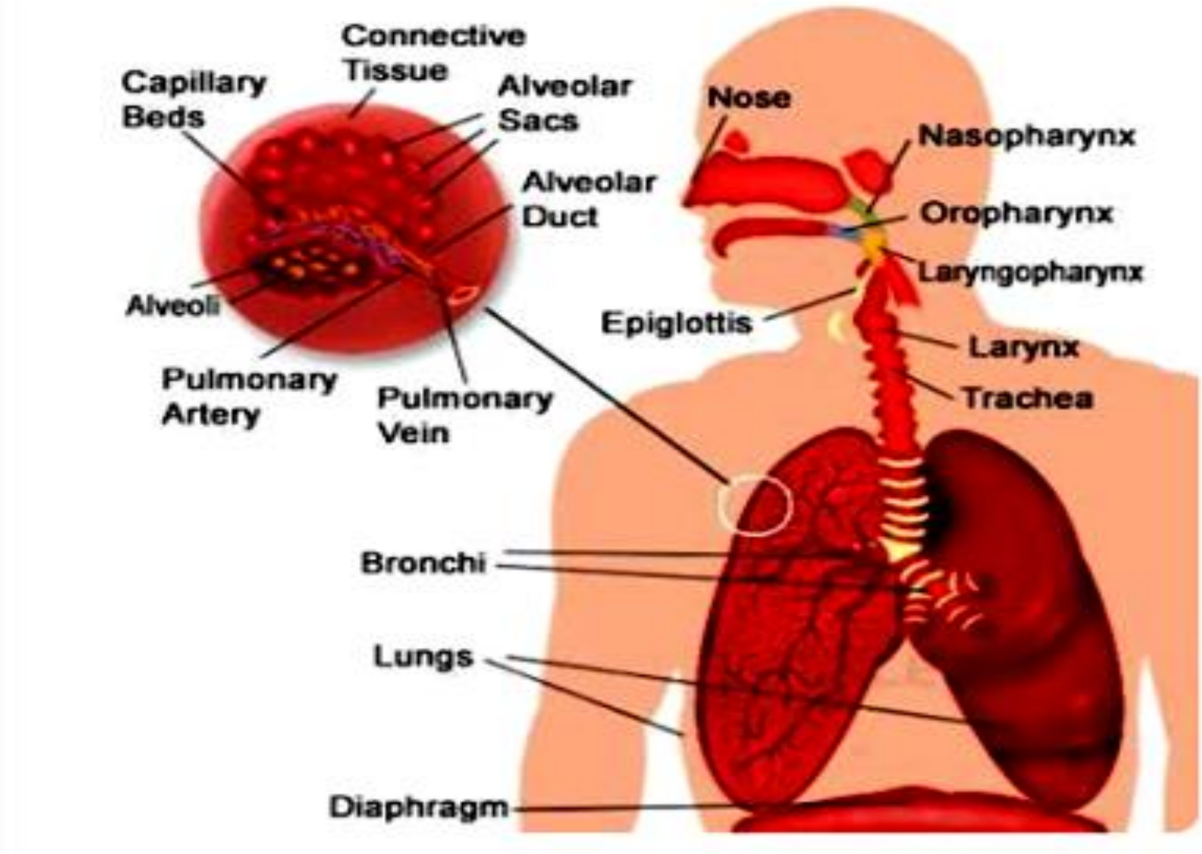
Lungs (Pulmonary respiration)

E.g. most vertebrates.

Tracheal tubes

E.g. Insects, centipede, millipede, spider.

HUMAN RESPIRATORY SYSTEM



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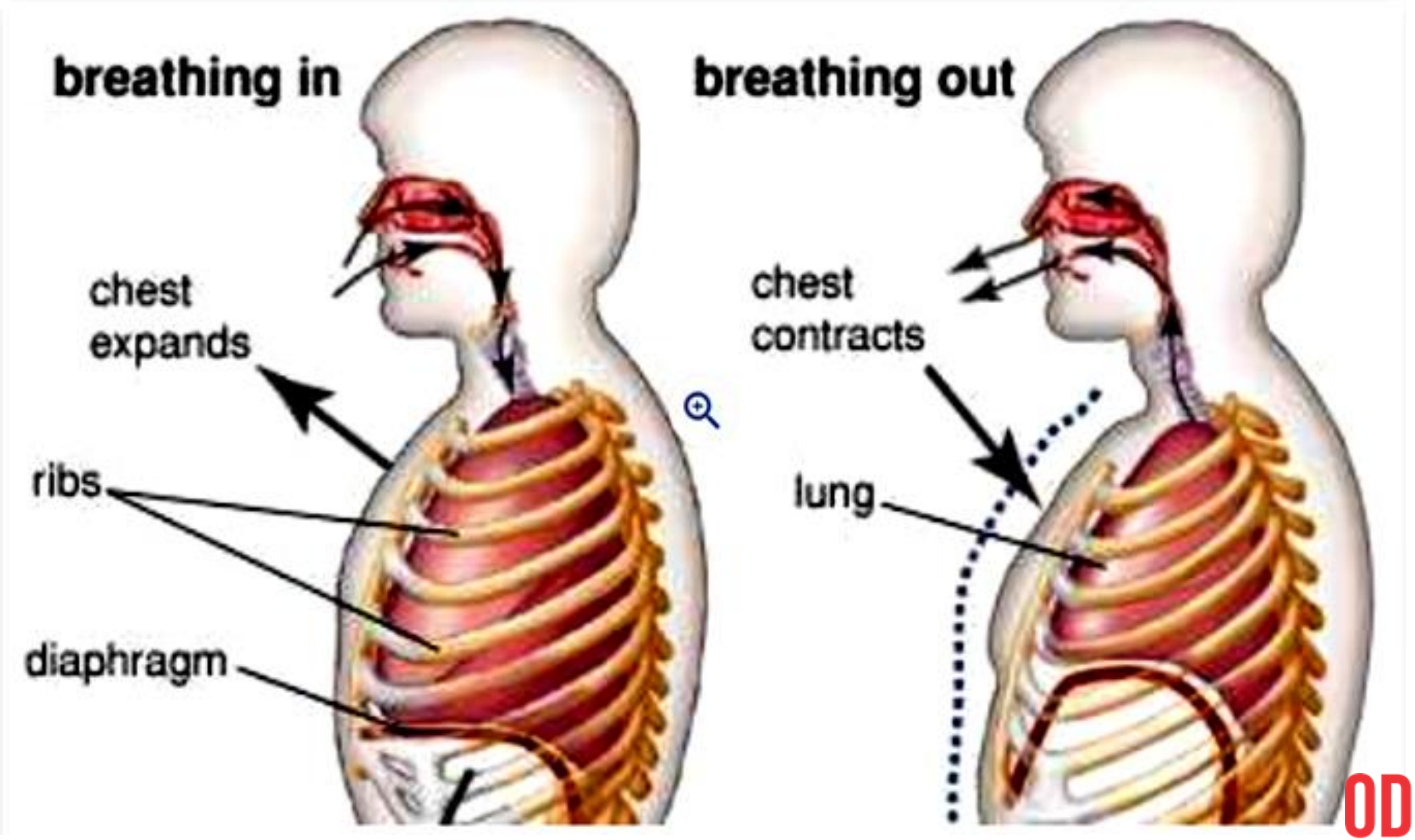
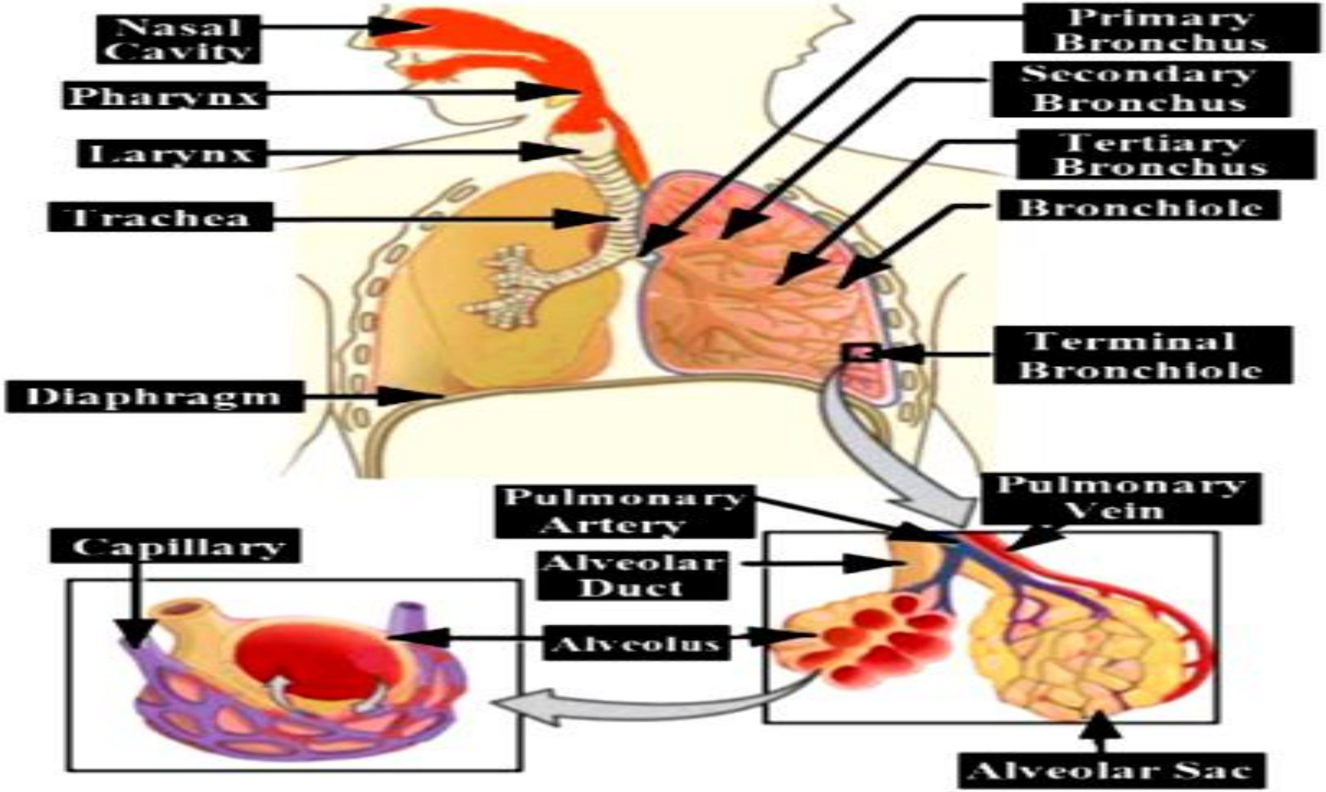
MECHANISM OF BREATHING



NOSE, PHARYNX, LARYNX AND TRACHEA



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NOSE, PHARYNX, LARYNX AND TRACHEA

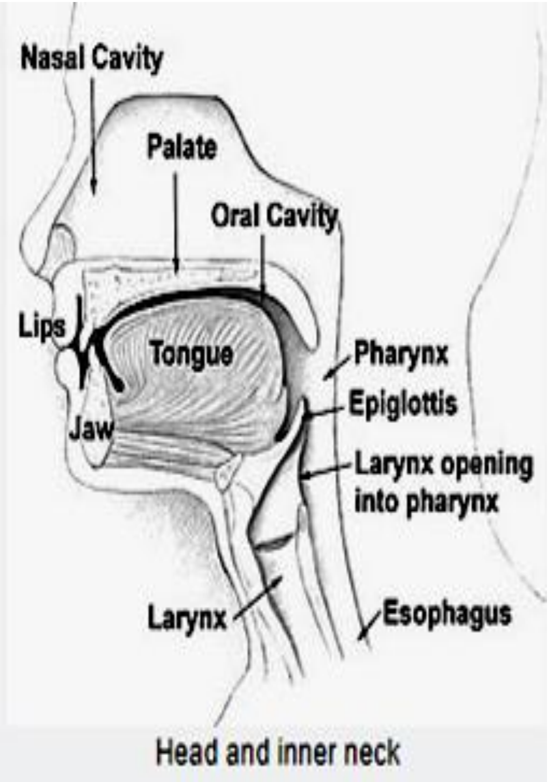
Air is breathed through:

Nostrils — pharynx — larynx — trachea —bronchi — bronchioles — alveoli.

This forms the entire respiratory tract.

* Air can either from nose or mouth and then travel through the throat(pharynx), larynx and finally enters the windpipe known as trachea.

* The trachea further gets divided into two branches(hollow tubes) known as bronchi- the left and right bronchus that leads to the left and right lung respectively.



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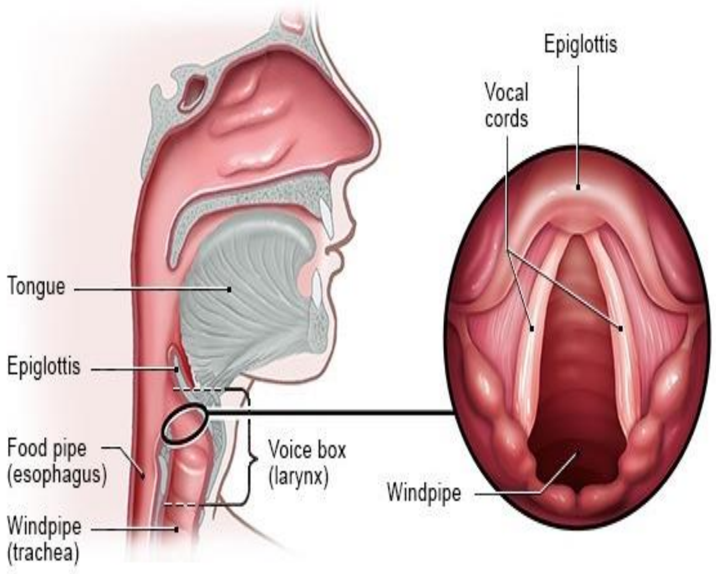
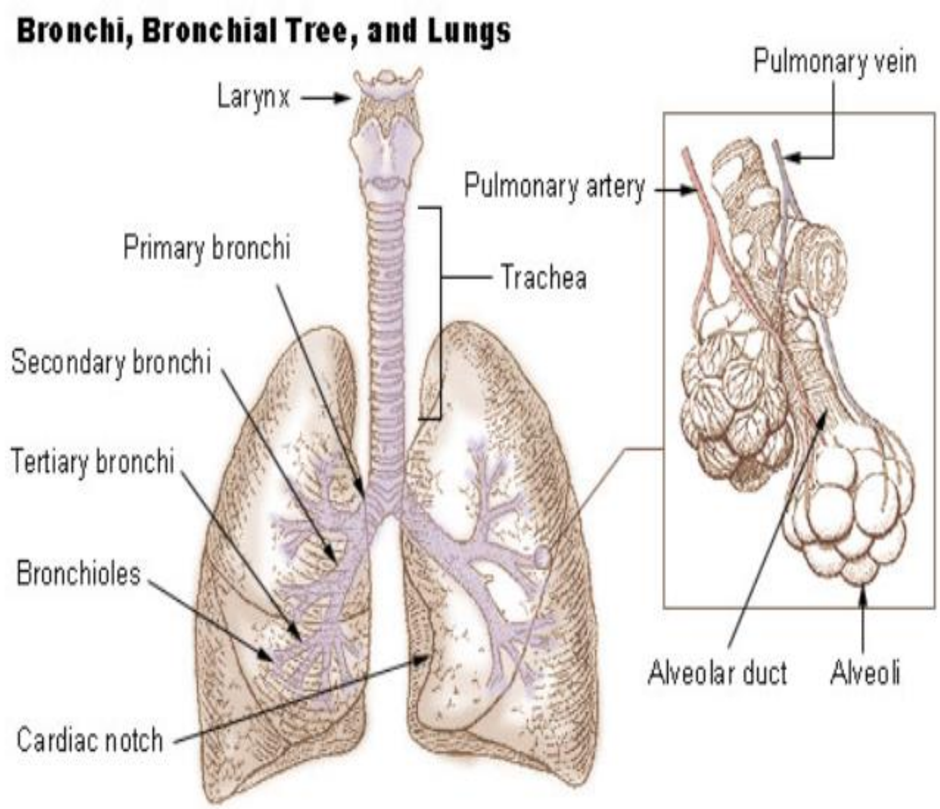
LARYNX

- The larynx has a kind of lid to prevent food from entering the windpipe and lower airways: This lid is called the epiglottis. It is attached to the top part of the larynx, where it can close the entrance to the larynx.
- When we swallow, it moves down to keep any food or liquids out of the windpipe. By using ligaments and muscles, the vocal cords can be opened and closed, tensed and held together closely – which looks like the curtains being closed.
- When we breathe out, air flows through the gap between the vocal cords. Depending on their exact position, this causes them to vibrate in different ways, resulting in different tones.
- Together with the movements of the tongue and mouth, very different sounds can be produced at different volumes, allowing us to speak and sing.



BRONCHI



The trachea divides into the right and left primary bronchi. The bronchi branch into smaller and smaller passageways until they terminate in tiny air sacs called alveoli.
The cartilage and mucous membrane of the primary bronchi are similar to that in the trachea. As the branching continues through the bronchial tree, the amount of hyaline cartilage in the walls decreases until it is absent in the smallest bronchiole.

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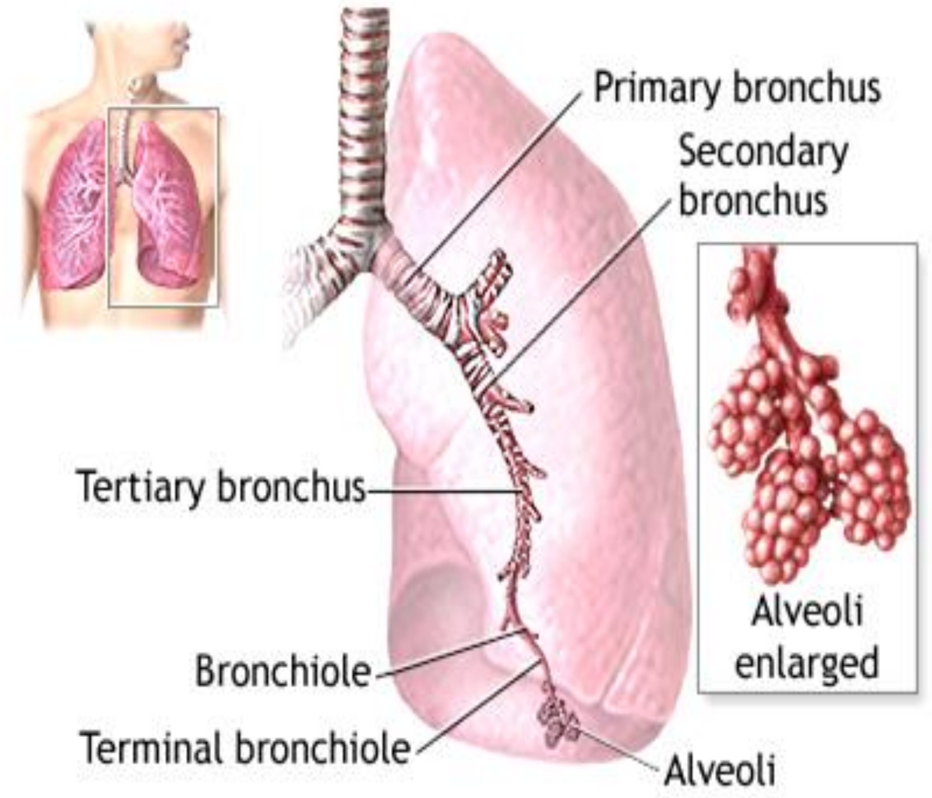
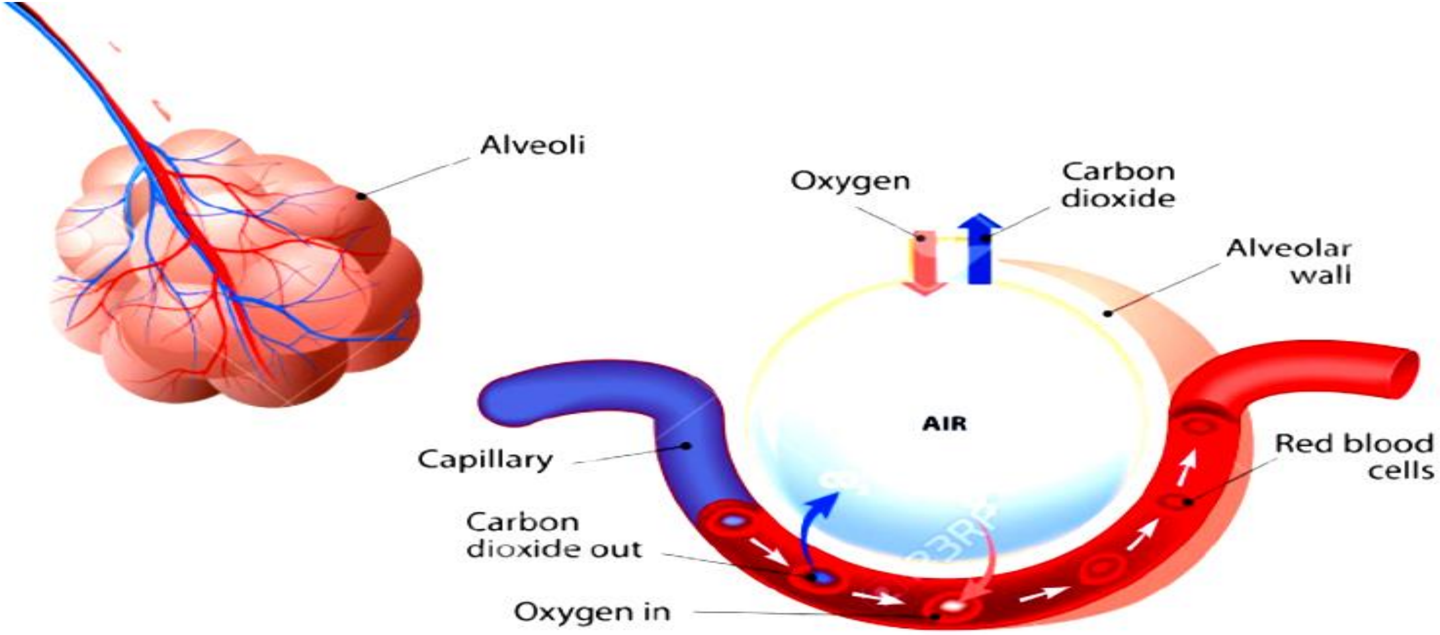
LUNGS



The two lungs, which contain all the components of the bronchial tree beyond the primary bronchi, occupy most of the space in the thoracic cavity. The lungs are soft and spongy because they are mostly air spaces surrounded by the alveolar cells and elastic connective tissue.

ALVEOLUS

The alveolar ducts and alveoli consist primarily of simple squamous epithelium, which permits rapid diffusion of oxygen and carbon dioxide. Exchange of gases between the air in the lungs and the blood in the capillaries occurs across the walls of the alveolar ducts and alveoli.



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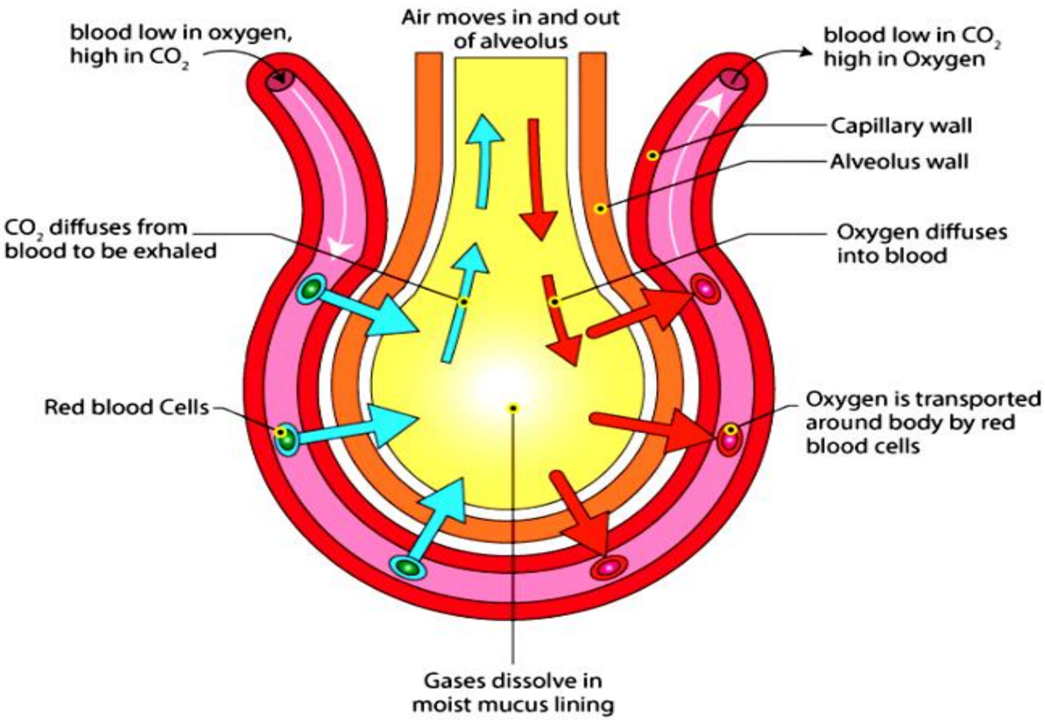
GASEOUS EXCHANGE IN LUNGS

Oxygen gets carried by the haemoglobin of the red blood cells since it has a great affinity for oxygen. Each haemoglobin molecule binds to four molecules of oxygen. This oxygen that is picked up by haemoglobin gets transported by the blood to various tissues. As carbon dioxide is more soluble in water than oxygen, they are transported in the dissolved form in our blood, while some are also transported by haemoglobin. Not all of the carbon dioxide formed is expelled from the body as some of it react with water to form compounds useful for life processes.



THANKING YOU

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