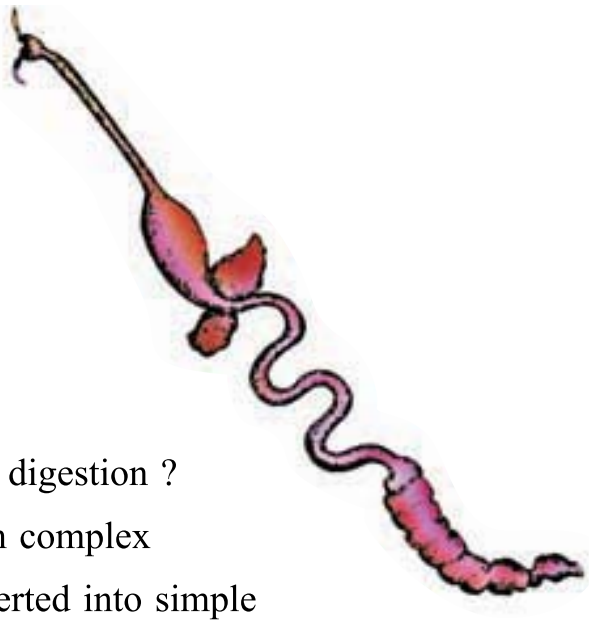
Unit 8

Digestive System, Respiratory System and Circulatory System

Tour of Bolus



Question sir : Where are you going ?

Mr Bolus : I am going to my tour for digestion.

Question sir : Please allow me to join you.

Mr Bolus : You can't come.

Question sir : Then tell me about your tour. First of all tell me that what is digestion ?

Mr Bolus : Digestion is a process in which complex substances of our food is converted into simple form.

Question sir : Which things help you in your digestion ?

Mr Bolus : Mouth, buccal cavity, oesophagous, stomach, small intestine, large intestine, rectum, annus, liver, pancreas, help me in digestion.

Question sir : Now I am very eager to know about that. Tell me about your tour in detail.

Mr Bolus : Look Mr Question... Organs or parts of our body which are helpful in digestion are known as digestive organs. Different organs show different type of reaction over me.

Mr Bolus : From where a person engulfs his food ?

Question sir : From mouth.

Mr Bolus : So you can understand that digestion begins from mouth.

Question sir : It means our teeth and tongue are useful in digestion.

Mr Bolus : Yes of course... My digestion begins at buccal cavity (mouth) with the help of teeth and tongue, chewing of food takes place here, hence food is covered in small particles, salivary gland present in our mouth secretes saliva. Saliva contains an enzyme called ptyaline. Ptyaline digest starch and converts it into simple sugar.

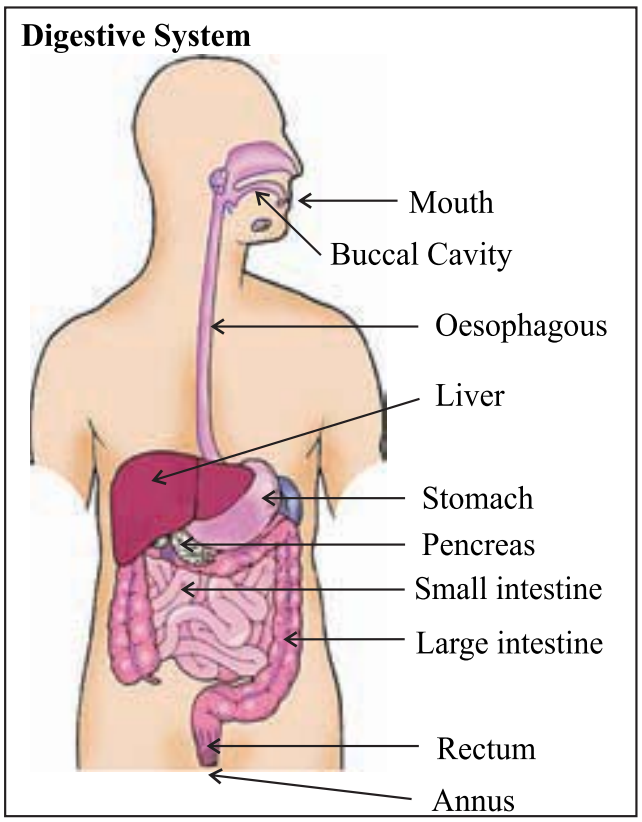
Let us do an activity to understand this.

What is required ? Iodine, Bread (Roti) and Dropper.

What to do ?

- ☞ Put two to three drops of iodine on the bread.
- ☞ Do you observe any colour in the bread ? Yes / No

Now, chew a piece of bread and take it out of your mouth. Put two or three drops of iodine over it. Do you observe any colour change in the colour of the bread ? Note down.



Starch present within me (bolus) is digested in the buccal cavity (mouth). It is better to chew the food. That food is easily digested if we chew it as more as possible. Hence one should chew the food as more as possible. "Drink food and eat liquid."

Question sir : Bolus sir, your structure is completely changed now. Isn't it ? Where will you move now and what will happen to you further ?

Mr Bolus : I will move towards stomach through oesophagous.

Questions sir : Give me the information regarding reactions take place in stomach.

Mr Bolus : After being chewed in mouth I reach to stomach through oesophagous. Gastric juices secreted from the wall of stomach get mixed with me. Gastric juices kill micro organisms present within me and partially digest my proteins. I am converted into semi liquid form.

Question sir : Now, your tour has become interesting.

Mr. Bolus : Actually, important phase of my tour starts now. I move from stomach to intestine. Undigested carbohydrates, proteins and fats are digested here and then absorbed by the wall of intestine. This digested food is given to blood. I pass maximum time in the intestine.

Question sir : I think your tour is going to be completed now. What happens to the undigested food ?

Mr. Bolus : Now, undigested food moves to large intestine. My movement is very slow here. Additional water is absorbed here and it is given to the blood and remaining undigested part is stored in rectum situated at the end of digestive track. That is excreted by annus in the form of stool. Thus, organs related with digestion forms digestive system.

Question sir : Thank you, I am going now.

Initial part of small intestine is known as duodenum. Bile produced in liver and pancreatic juice produced in the pancreas mixed with food in duodenum. It is essential for the digestion of the food. Small intestine is the longest organ of digestive track. Small intestine which is arranged like a coil in our belly is 7 meter long.

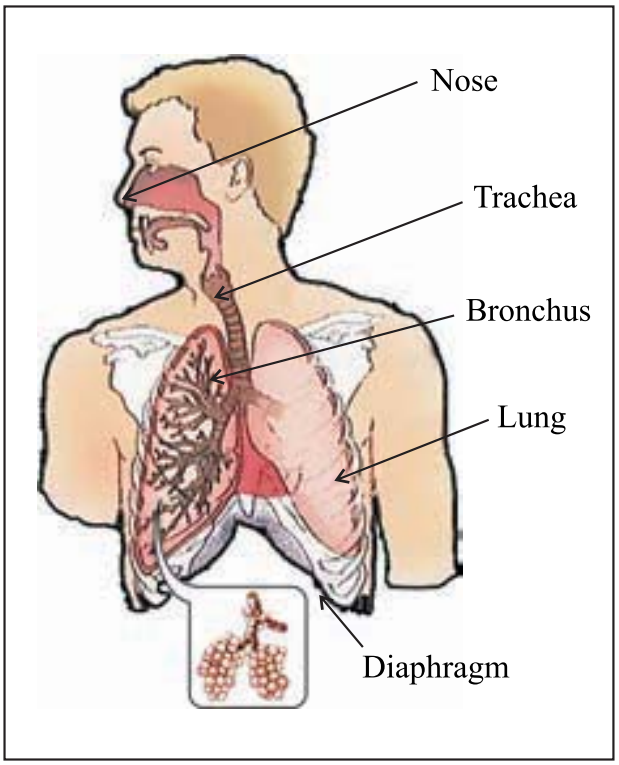
Assessory digestive organs : Liver and pancreas also help in digestion hence they are assessory digestive organs.

Tour of Air :

Question sir : I have just come to know about the tour of Mr Bolus. It is your turn now.

Miss Air : Sir, you are very unique. I will certainty answer you. But let us perform an activity first. Does air come out in equal proportion from both of our nostrils ? Feel the air coming out of your nostrils and tell whether it is coming out from both of nostril or one of nostril only ?

Question sir : Not only I, but all the students sitting in this classroom will perform this and note down the observation.



Question sir : I like that... What will happen now ?

Miss Air : See, I am going to travel through respiratory organs of body. And now I am going to tell you about that tour.

Question sir : I certainly know that your tour begins from the nose. But I want to ask you that can't you start your journey from the mouth ?

Miss Air : No, because nose contains mucus and hairs inside, which filters me (Air) and due to that filtration small particles and micro-organisms can't enter in the body.

Question sir : As Mr Bolus moves further in oesophagous in the same manner, do you have your own tube to move further ?

Miss Air : Yes, my brother yes. I move further through trachea. The wall of trachea is made up of 'C' shape incomplete rings of cartilage. Trachea further divides into two branches. Each branch is known as primary bronchi. With help of these bronchi I enter into the lungs.

Question sir : I want to know about internal structure of lungs. Please tell me about your travelling.

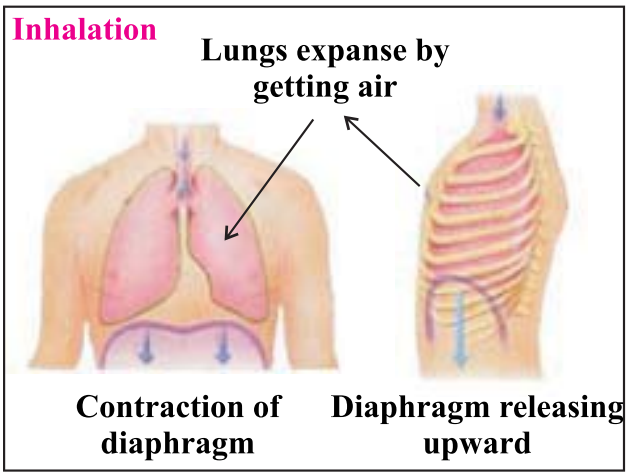
Miss Air : Ok baba let us move further... Lungs are elastic in nature. Within the lungs bronchus divides in small ducts known as alveolar ducts. I reach to alveoli through alveolar ducts. Lungs contain many air sacs or alveoli. Blood absorbs oxygen and release carbon dioxide here.

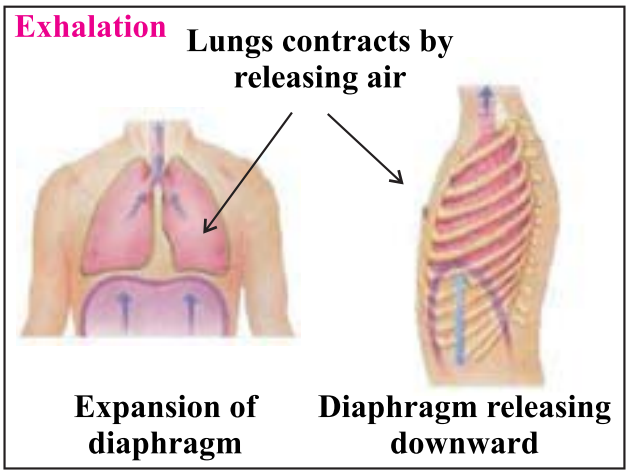
Question sir : Whether chest expands or belly expands when we inhale ?

Miss Air : See the diagram on the next page, you will understand everything.

Question sir : Not only I but all the students sitting in this classroom will perform this activity.

Miss Air : This intake of air from atmosphere is called inhalation and expelling of air from lungs is called exhalation. Inhalation and exhalation takes place alternately and it is called breathing.





Question sir : Ya... Good... Miss Air, I am going to meet Mr Blood now.

Tour of blood :

Question sir : Mr Blood, our body gets useful substances through digestion of food, oxygen and carbon dioxide are being exchanged with atmosphere by breathing. But how do all required nutrients and oxygen reach to all parts of our body.

Mr Blood : Our body has a special system for the transportation of useful and useless things. It is called circulatory system. Circulation of blood in the body is called blood circulation.

Question sir : How do you flow in the body ?

Mr Blood : My conduction is carried out with the help of heart, arteries, veins and capillaries.

Question sir : Oh ! Your family is not small too. Please give me introduction of the members of your family.

Mr Blood : Let us do an activity to understand all these. Are you ready ?

Question sir : I am fond of doing activities. All the students sitting in this classroom will also join me.

What is required ? Thin tube of rubber, funnel, stop-watch

What to do ?

- ☞ Fix a funnel at the end of rubber tube and put this funnel on your heart.
- ☞ Put another end of the tube near your ear and count heart beats per minute.

Put the finger of right hand over the vein towards the thumb of your left wrist and count the pulses per minute.

Now, do some exercise for few time and count it again.

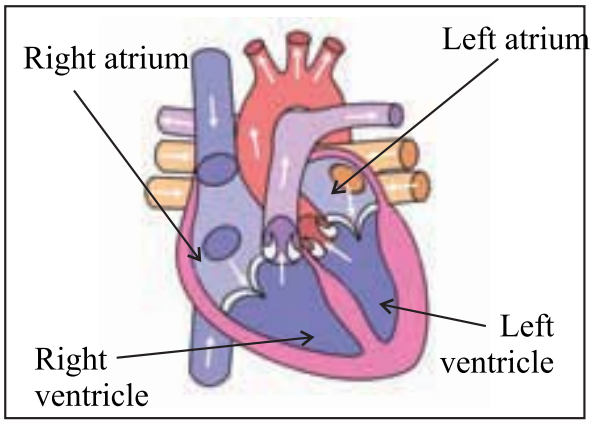
Pulse rate before exercise : _____

Pulse rate after exercise : _____

Note down the reason for the pulse.

Question sir : You are doing wonder...!!! But tell me about the heart.

Mr. Blood : OK... My brother, have some patience. Look at this diagram. This is the most important organ of my family.



Heart is situated slightly on the left side in our rib cage (Thoracic cavity).

Volume of heart is almost equal to the fist of a person. Heart is made up of four chambers. Upper two chambers are called atria and two lower chambers are known as ventricles. Heart continuously keep beating and works like pump. It circulates the blood with the help of arteries and veins.

Question sir : Who are these arteries and veins ?

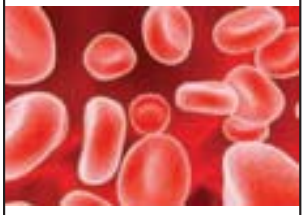
Artery	Vein
	
1. The ducts which carry me with the pressure towards different organs of the body from heart are called arteries. 2. Oxygenated blood moves further with the pressure inside the artery. 3. Due to the presence of oxygen I resemble shiny red. 4. Artery is devoid of valves.	1. The ducts which bring me back towards the heart from different organs of the body is called vein. 2. I (blood) with carbon dioxide moves inside the vein. 3. When I am in vein I do not contain oxygen hence I resemble blackish red. 4. Veins are provided with semi lunar valves.

Mr Blood : These both help me in my circulation in the body.

Question sir : During our talk we came to know about heart, artery and vein but we missed to know about you.

Mr Blood : See the following blocks if you want to know about me.

1



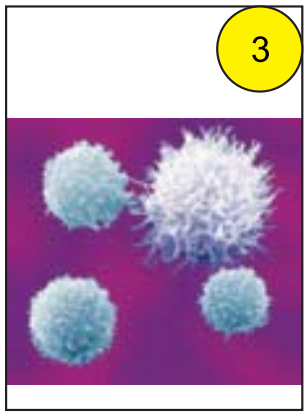
Red Blood Cell :

This red coloured cells are responsible for the transport of oxygen and carbon dioxide.

2

Platelets :

These cells are responsible for the process of blood clotting.



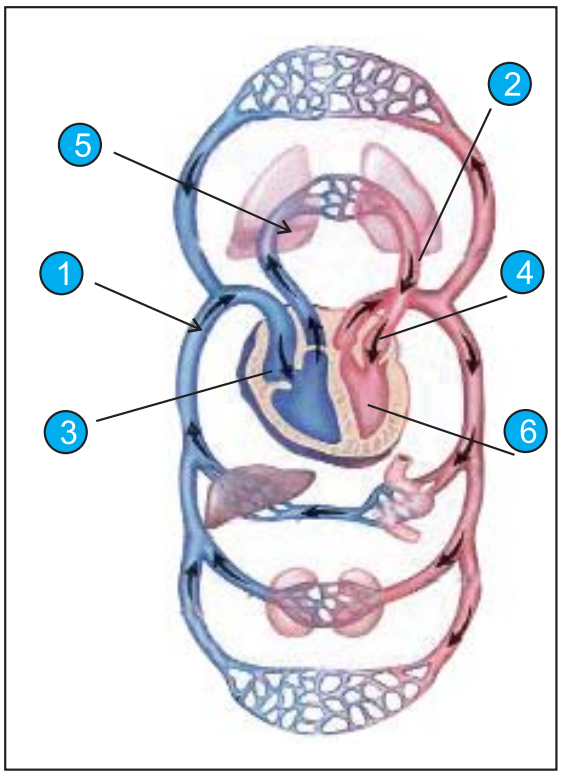
White Blood Cell :

These white coloured blood cells protect our body against different diseases.

The fluid excluding these types of cell is known as plasma.

Question sir : That is all right, but how do you move in the body ?

Mr Blood : Follow me by observing the following diagram and follow my dialogs.



1. Blood containing CO_2 from different parts of body is being poured in the right atrium.
2. At the same time oxygenated blood coming from the lungs is poured in the left atrium.
3. Due to contraction of right atrium, tricuspid valve opens and blood moves to right ventricle.
4. Due to contraction of left atrium, bicuspid valve opens and blood moved to left ventricle.
5. Due to contraction of right ventricle blood moves to lungs.
6. Due to contraction of left ventricle blood moves to different organs of body.

Question sir : Now, I come to know about all the things regarding you and these student also come to know about you.

Q.1 Identify the following organs and write their functions :