

# Life processes



The basic and essential activities performed by a living organism to sustain and maintain life.

## Nutrition

Process of obtaining and utilisation of Food



## Respiration

Process of Breaking down the food to produces energy



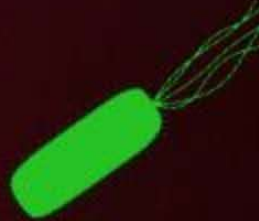
## Transportation

Process of transporting useful and non useful substances from part to another part of the organism



## Excretion

Process of removal of metabolic waste



# Nutrition

## Autotrophic Nutrition

- ✓ **Photo autotrophic Nutrition**
- Ex- Green plants, cyanobacteria
- ✓ **Chemo autotrophic Nutrition**
- Ex- some bacteria

## Heterotrophic Nutrition

- ✓ **Holozoic Nutrition**
- Ex- Human, cow, dog, amoeba, paramecium,
- ✓ **Saprotrophic nutrition**
- Ex- Bread mould, yeast, mushroom
- ✓ **Parasitic Nutrition**
- Ex- Tapeworm, lice, leech, cuscuta ✨

## Photosynthetic Autotrophic Nutrition in plants

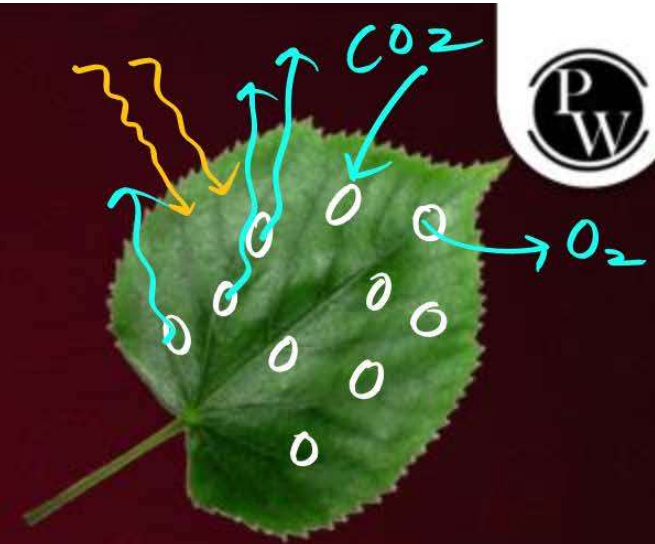


### Mechanism of Photosynthesis

(i) Absorption of light energy by chlorophyll.

(ii) Conversion of light energy to chemical energy and splitting of water molecules into hydrogen and oxygen.

(iii) Reduction of carbon dioxide to carbohydrates.



### Functions of stomata

1. Transpiration ✓
2. Exchanges of gases ✓



## Stomata

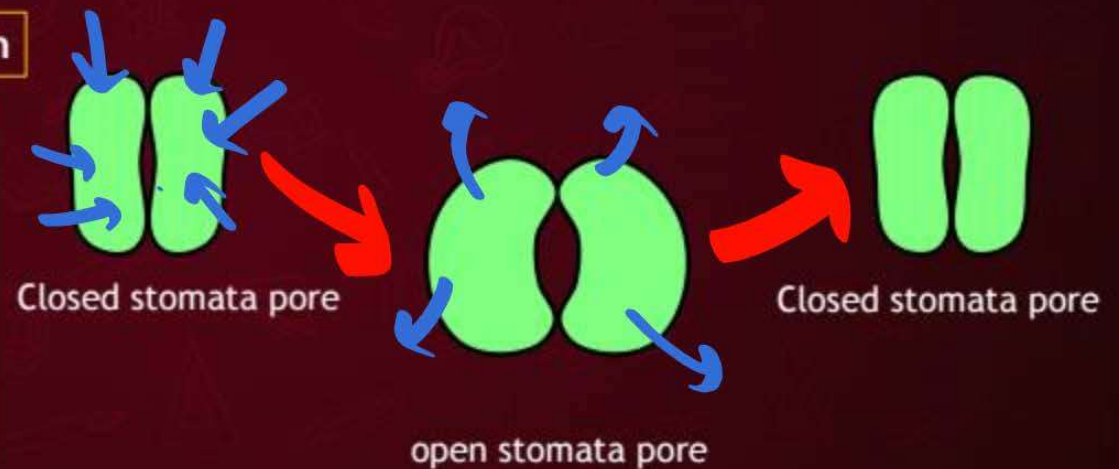
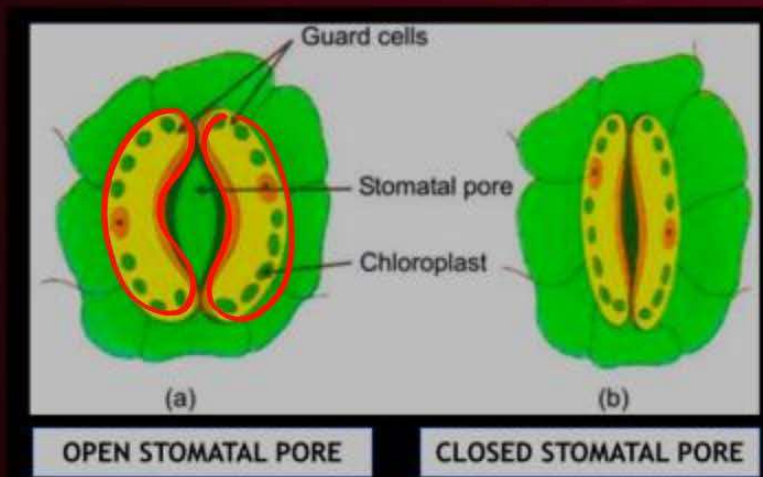
Stomata are are tiny/microscopic pores like structure present on surface of leaves

Role of Stomata

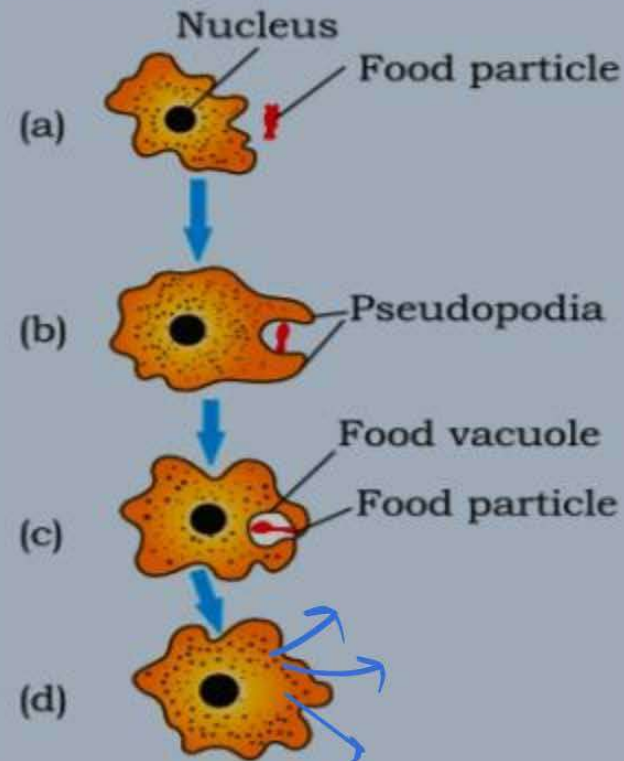
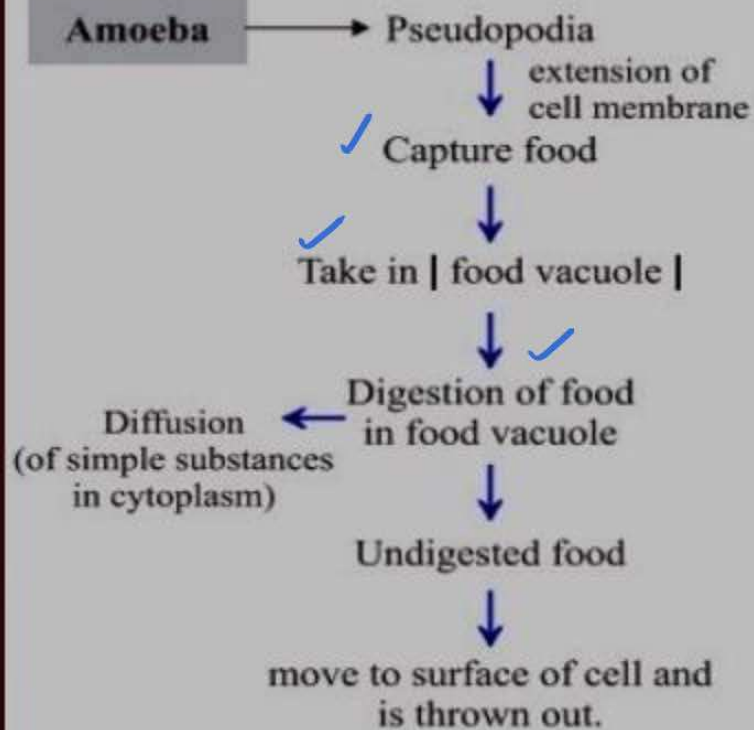
Opening and closing of stomata

Exchange of gases

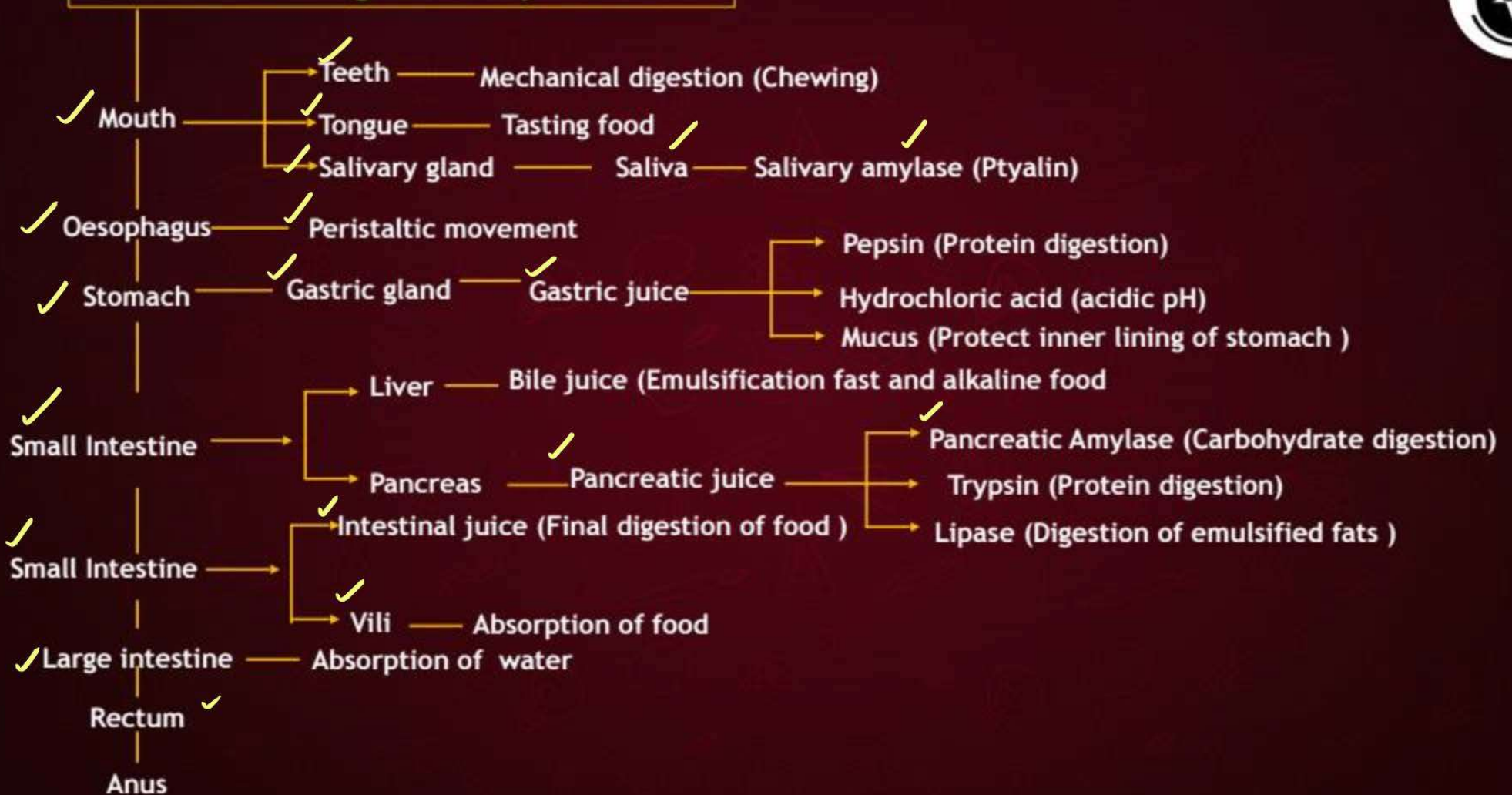
Transpiration



## Nutrition in Amoeba

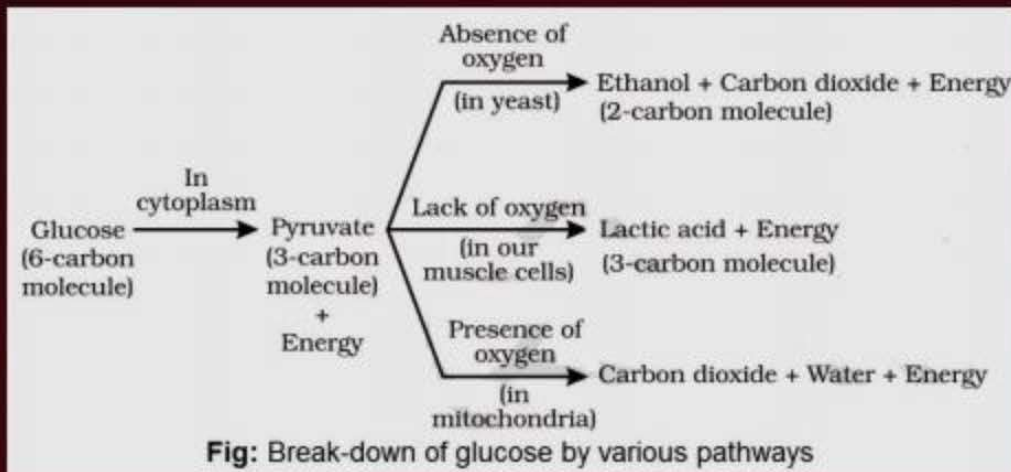


# Human Digestive System



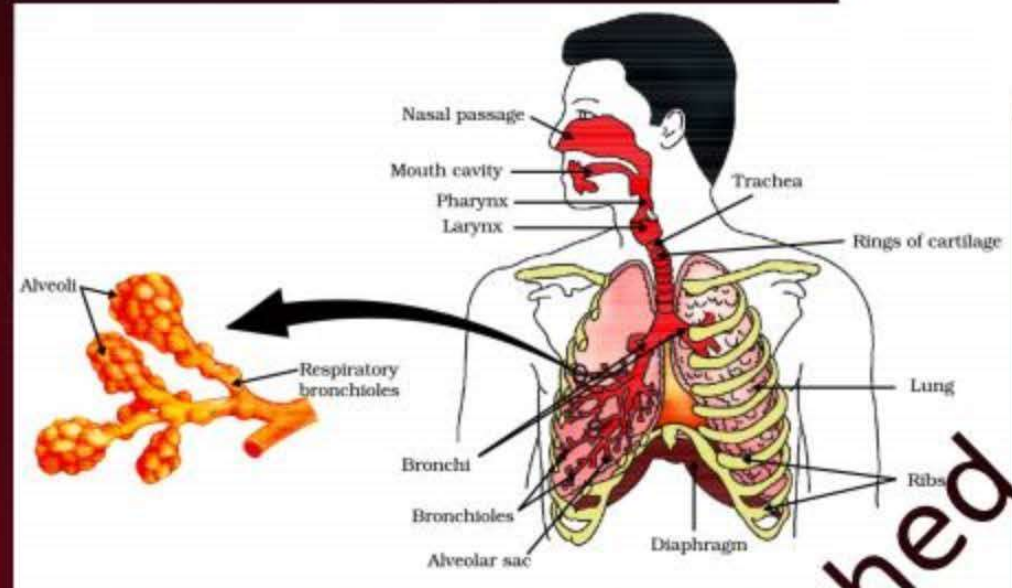
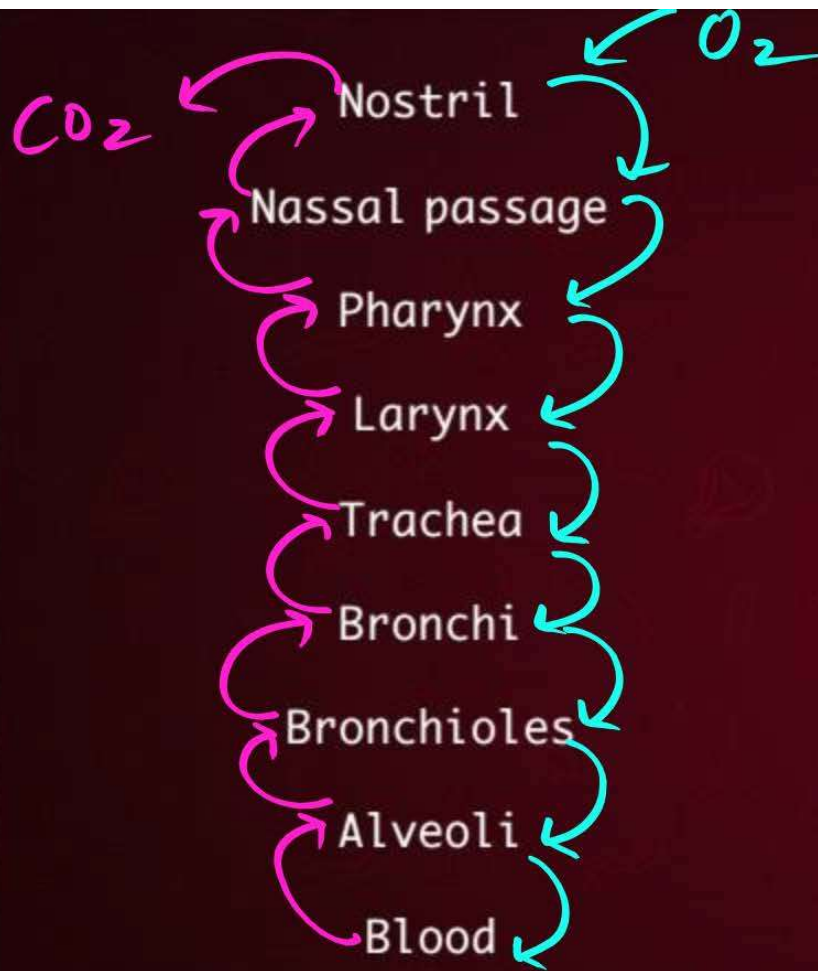


# Breathing and Respiration



✓ Breathing	Respiration
Process of Inhaling and exhaling the air in and out of the lungs	Process of breaking down of glucose to produce energy ✓
It takes place in lungs ✓	It takes place in all cells ✓
It is a physical process ✓	It is a chemical process ✓
Energy is <u>not</u> produced	Energy is produced in the form of ATP

Aerobic Respiration	Anaerobic respiration
O <sub>2</sub> required	O <sub>2</sub> not required
It occurs in cytoplasm and mitochondria	It occurs in Cytoplasm only
Complete breakdown of glucose takes place	Incomplete breakdown of glucose takes place
End products are CO <sub>2</sub> and H <sub>2</sub> O	End products are CO <sub>2</sub> and ethanol or lactic acid



Inhalation / Inspiration	Exhalation / Expiration
The muscles of the diaphragm contract.	The muscles of the diaphragm relax.
The diaphragm goes downward and becomes flat.	The diaphragm goes upward and becomes dome shaped
Air enters the lungs through the nose.	Air goes out the lungs through the nose.



## Transportation



Plasma ✓



Transportation of  
Digested food ✓,  $\text{CO}_2$  ✓  
Waste ✓, Hormones ✓

Red blood cells ✓



Hemoglobin in RBC ✓  
helps in Oxygen  
transport

White blood cells ✓



Produce antibody ✓ to kill  
pathogen

Platelets ✓

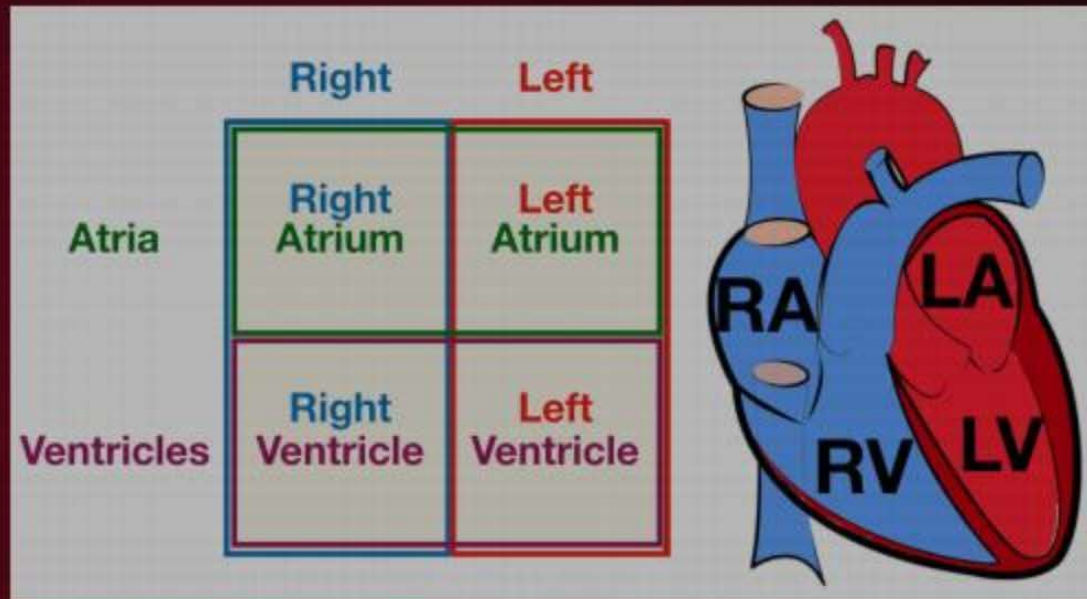
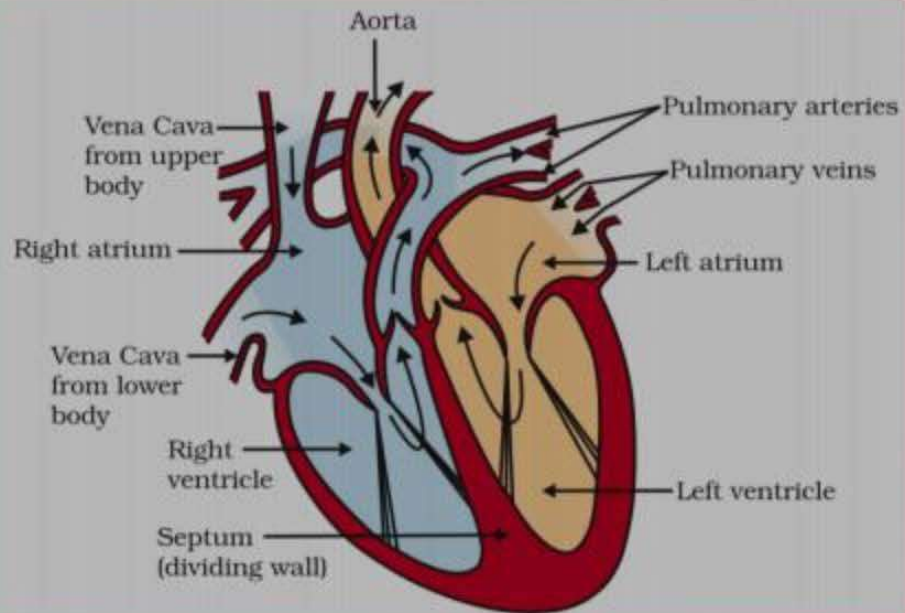


Clotting of  
blood ✓

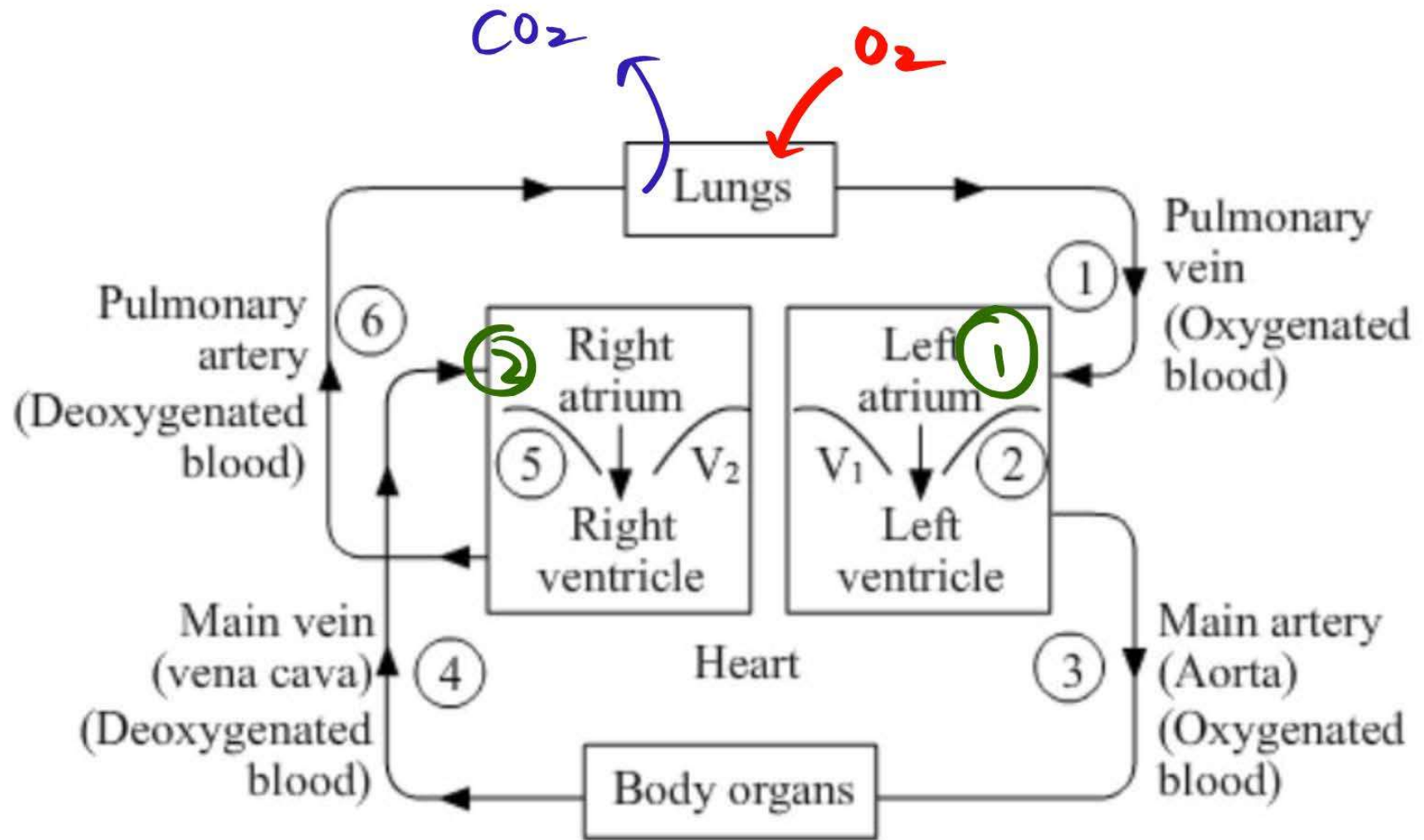


	<u>Arteries</u>	<u>Veins</u>	<u>Capillaries</u>
• Direction of blood flow	<u>Away</u> from the heart	<u>Towards</u> the heart	Helps in exchange of substances ✓
• Oxygen	✓ Oxygenated blood	✓ Deoxygenated blood	Both ✓
• Pressure	✓ High	✓ Low	✓ Medium
• Walls	✓ Thick and ✓ elastic	✓ Thin and ✓ non elastic	✓ Very thin (one cell thickness)
• Valves	✗ Absent	✓ Present	✗ Absent

# Transportation in human beings









## Double circulation

Blood enters TWICE into heart to complete the full circuit/cycle

## Single circulation

Blood enters only ONCE in heart to complete the full circuit/cycle

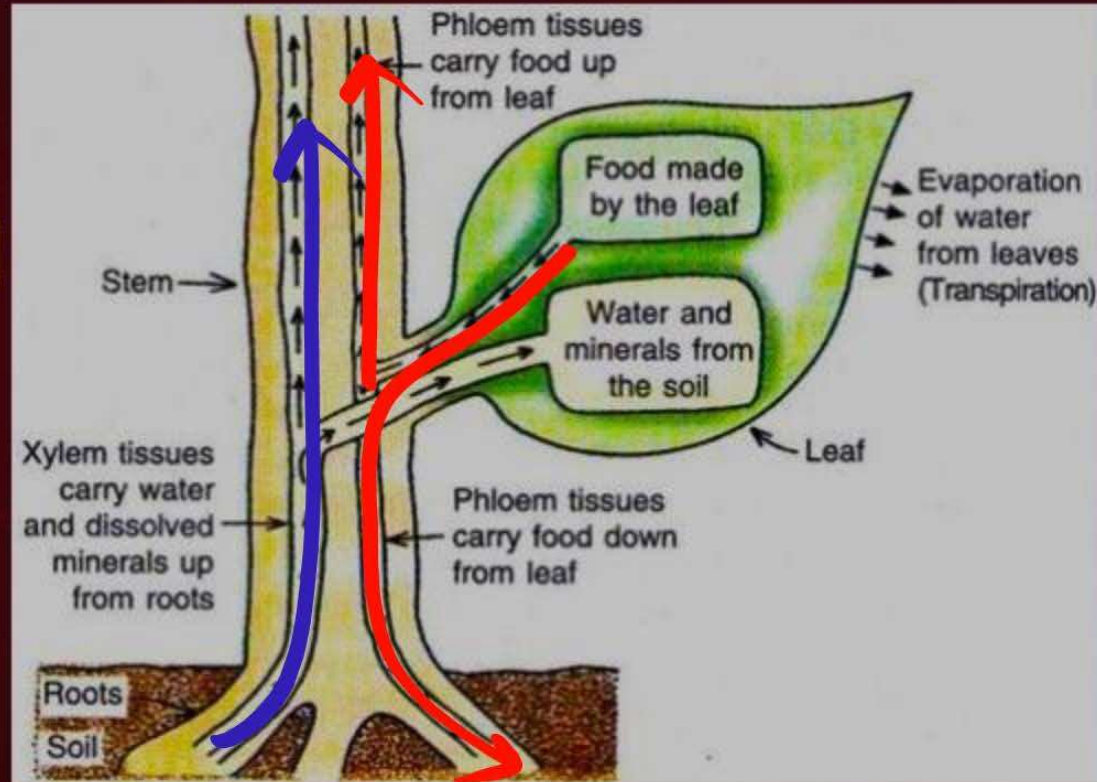
Class	Chambers in heart	Type of circulation	Temperature maintenance
Pisces ✓ (Fishes)	✓ 2	✓ Single circulation	No (Cold blooded)
Amphibians ✓	3	Incomplete Double circulation	No (Cold blooded)
Reptiles ✓	3	Incomplete Double circulation	No (Cold blooded)
Aves ✓ (Birds)	4	✓ Complete double circulation	Yes ✓ (Warm blooded)
Mammals ✓	4	✓ Complete double circulation	Yes ✓ (Warm blooded)

# Transportation in plants

**Xylem**

**Water and mineral salts**

**Ascent of sap**



**Phloem**

**Food**

**Translocation**



## Transportation in plants

Transport of materials in xylem	Transport of materials in phloem
<ul style="list-style-type: none"> <li>Xylem tissue helps in the transport of <u>water</u> and <u>minerals</u>.</li> </ul>	<ul style="list-style-type: none"> <li>Phloem tissue helps in the transport of food. ✓</li> </ul>
<ul style="list-style-type: none"> <li>✓ Water is transported upwards from roots to aerial parts of plants.</li> </ul>	<ul style="list-style-type: none"> <li>Food is transported in ✓ both upward and downward directions.</li> </ul>
<ul style="list-style-type: none"> <li>✚ Transport in xylem requires ✓ physical forces such as transpiration pull and ✓ root pressure.</li> </ul>	<ul style="list-style-type: none"> <li>Transport of food in phloem requires energy in the form of ATP.</li> </ul>

# Excretion

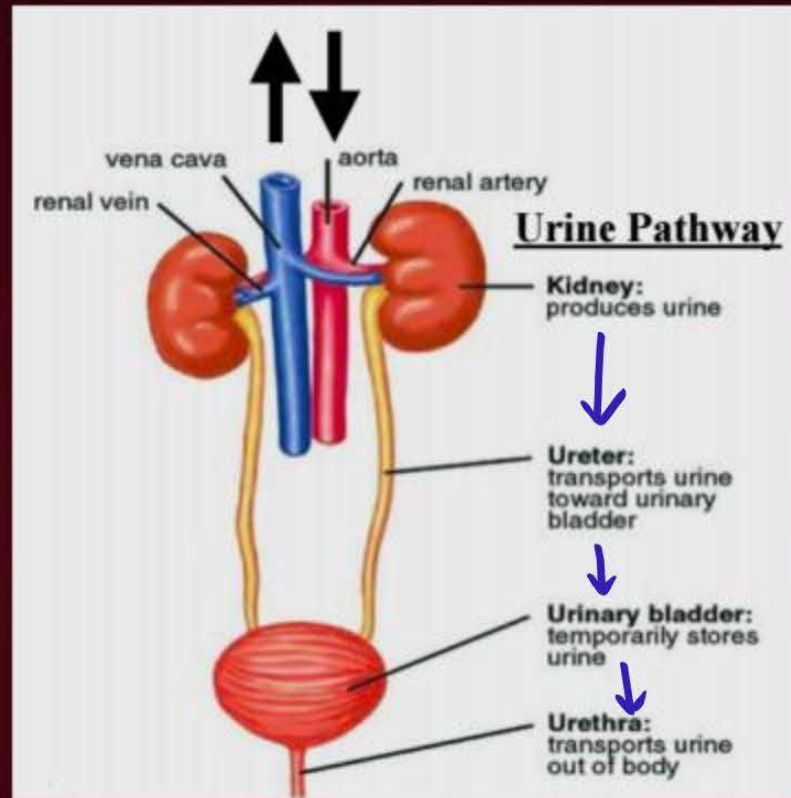
Removal of harmful metabolic wastes from the body

## Waste products

- **Nitrogenous waste products**

Urea, Uric acid, Ammonia

- $\text{CO}_2$  ✓
- Excess Water ✓
- Mineral salts ✓

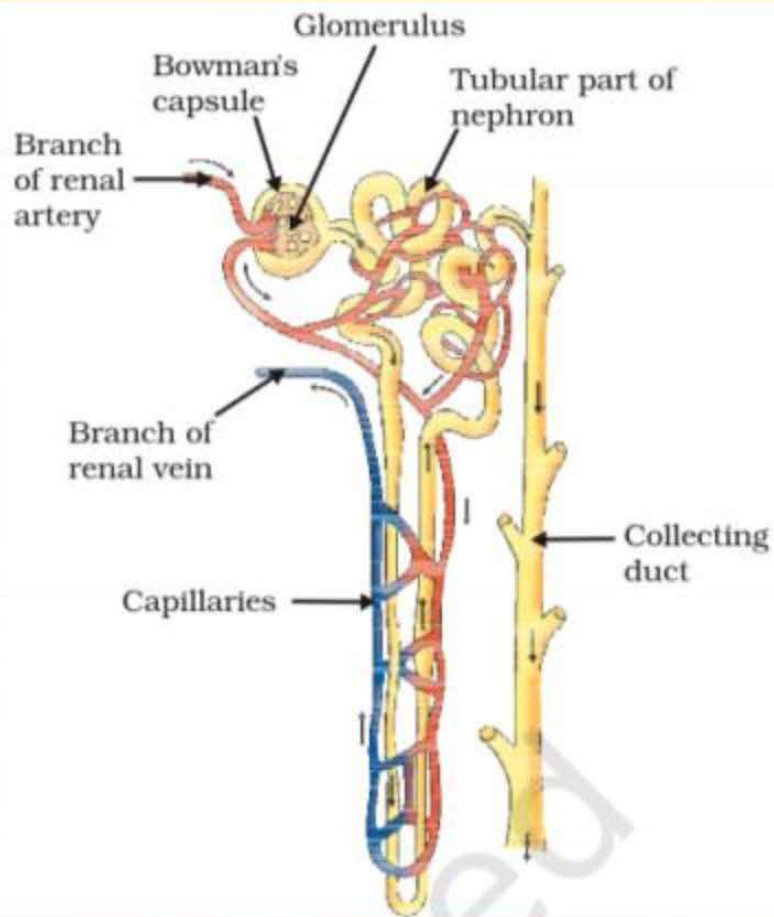


- **Kidney**

- Excretion of nitrogenous and other waste products ✓
- Water balance ✓
- Elimination of toxic chemicals ✓
- Maintenance of pH of body fluids ✓
- Nephron is the structural and functional unit of the kidney.
- Each kidney consists of about one million nephrons.



# Nephron



## Steps of urine formation

### Glomerular filtration

Nitrogenous wastes, glucose, water, amino acid, excessive salts from the blood are filtered and **initial filtrate** enters into Bowman Capsule of the nephron.

### Selective Reabsorption

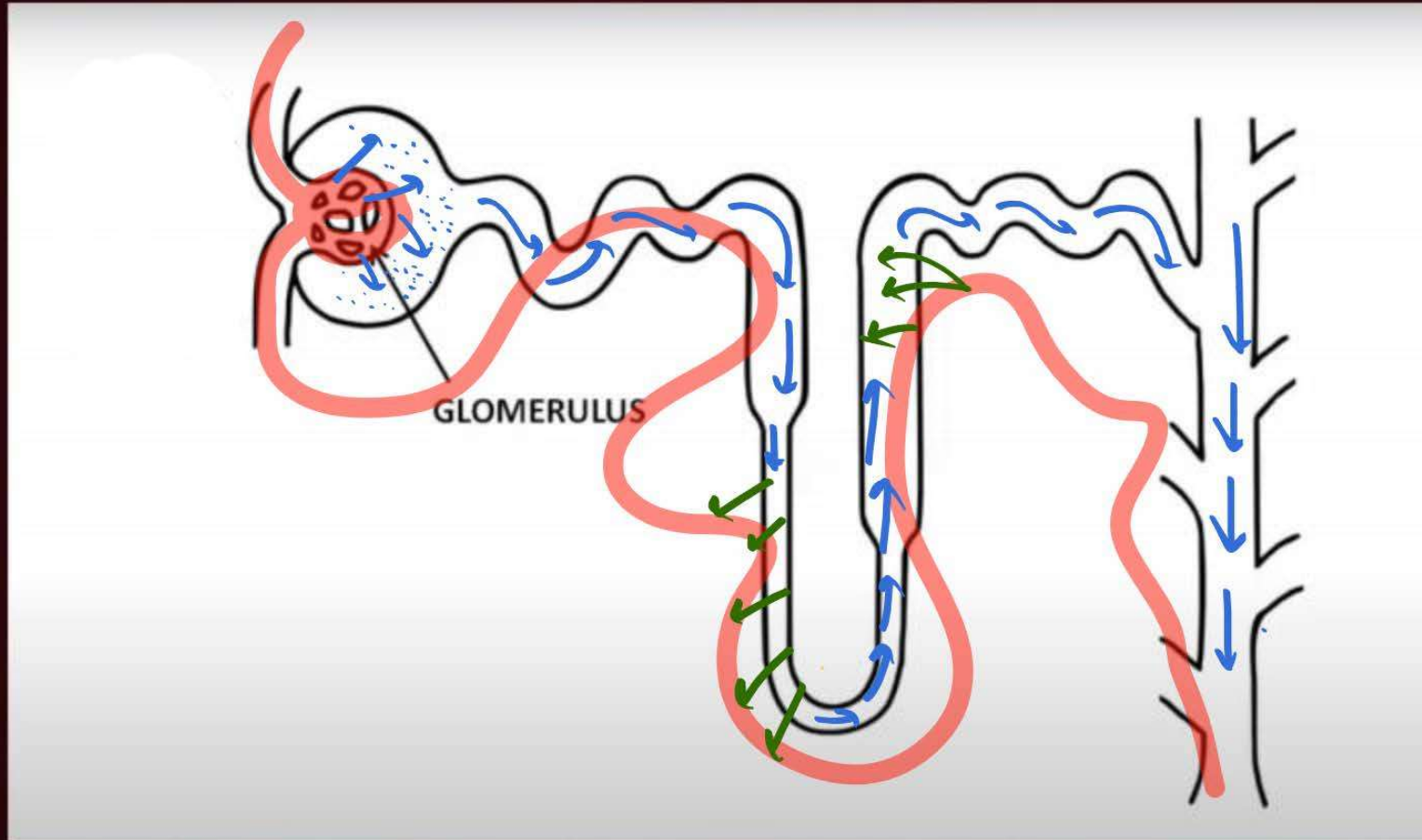
Useful substances like **glucose, amino acids, salts** and a major amount of **water** from the filtrate are reabsorbed back by capillaries surrounding the nephron.

### Tubular Secretion

**Urea, extra water and salts** are secreted into the tubule which open up into the collecting duct & then into the ureter.







## Excretion in plants

- Oxygen and carbon dioxide is diffused through stomata.
- Excess water is removed by transpiration. ✓
- Shedding of old leaves and bark ✓
- Many plant waste products are stored in cellular vacuoles.
- Other waste products like latex, ✓ raisins ✓ and gums ✓ are stored in old xylem cells. ✓
- Plants also secrete some waste substances into the soil around them.

