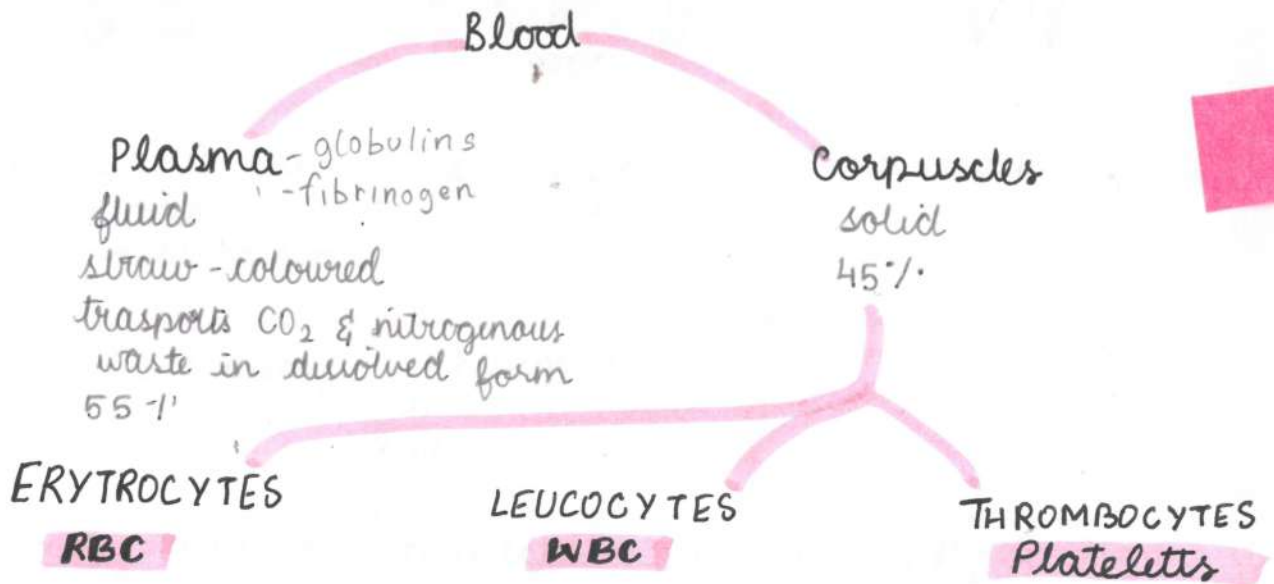
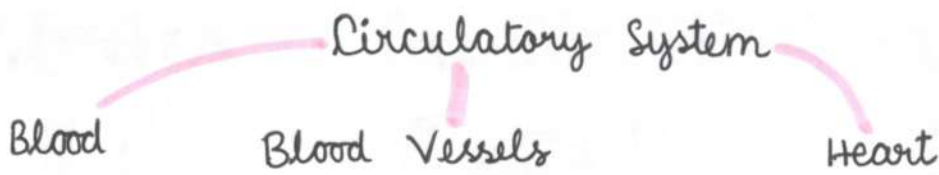


CIRCULATION



- ★ disc / circular
- ★ **Haemoglobin**
↳ red colour
↳ transports O₂

- ★ no shape
- ★ fight against microbes
- ★ produces antibodies

- irregular / spherical
- blood clotting

THROMBIN

leakage - ↓Pa - ↓efficiency of pumping




FUNCTIONS OF BLOOD

- transports (haemostatis)
- ★ nutrients
 - ★ digested food
 - ★ CO₂ & O₂
 - ★ hormones
 - ★ excretory products

- maintains
- ★ pH
 - ★ body temperature
 - ★ H₂O balance

- Protects against diseases
- Platelets - CLOTTING

BLOOD VESSELS :

Arteries	Capillaries	Veins
		
*thick, elastic wall to withstand pressure of blood from heart.	*1 cell thick walls	*thin walls + VALVE
carries blood away from heart	exchange of material b/w blood & surrounding cells.	carries blood towards heart
carries O_2 rich blood except for Pulmonary artery ^{CO_2}	connects arteries and veins	carries CO_2 rich blood except for Pulmonary vein ^{O_2}

BLOOD PRESSURE

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Pressure at which blood is pumped against the wall of a vessel.

arteries $>$ veins
Pressure

AORTA \uparrow B.P

wall of ventricle $>$ wall of auricle
pumps blood against gravitational force = \uparrow Pa Pressure

Hypertension BP $>$ 140
 Hypotension BP $<$ 110
 Normal $\frac{120}{80}$

\rightarrow excess fat accumulates on blood vessels
 $\therefore \uparrow$ Pa of heart

measure Sphygmomanometer

SYSTOLIC PRESSURE

DIASTOLIC PRESSURE

Pressure of blood inside artery during phase of ventricular contraction.

Pressure of blood inside artery during phase of ventricular relaxation.

120 mm of Hg


80 mm of Hg

1 Cardiac cycle

One cycle of contraction & Relaxation

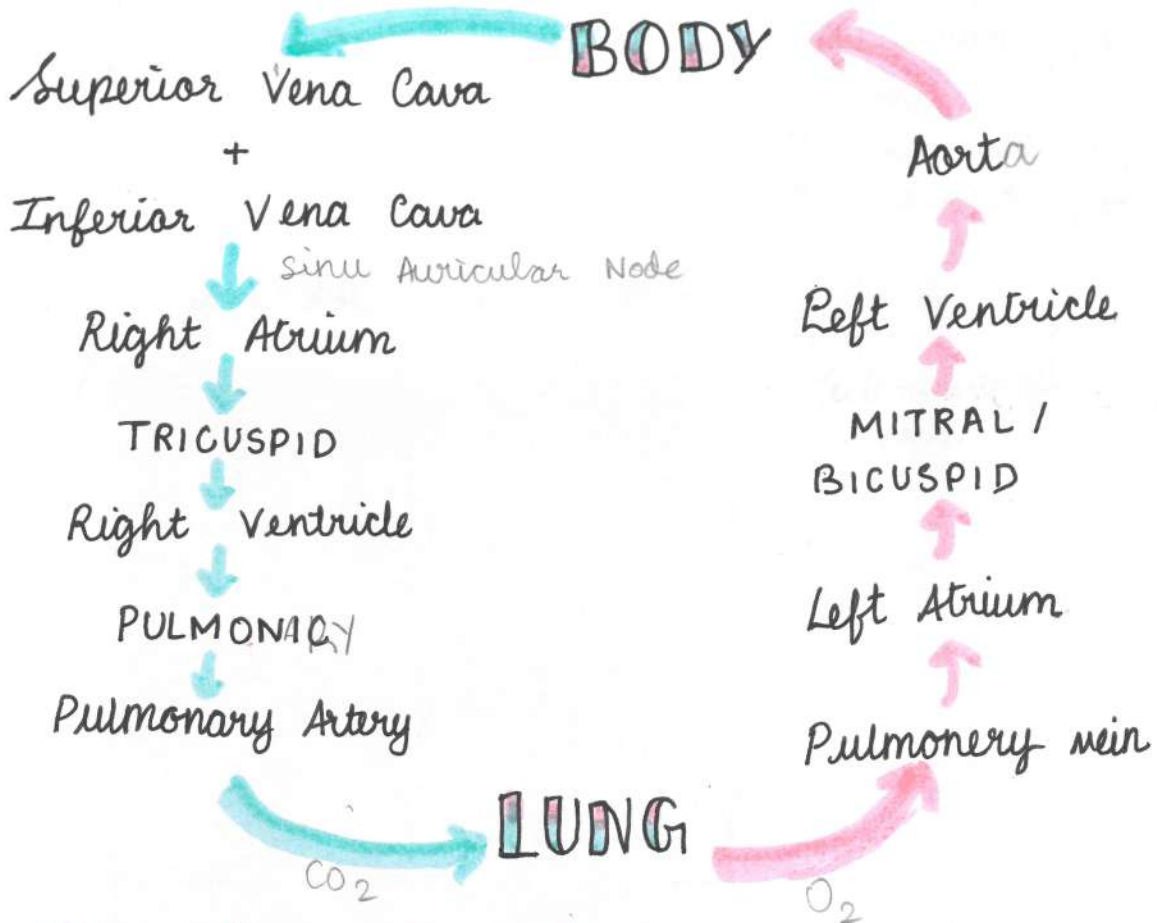
HEART

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- muscular organ
- size of our fist 
- pumping action
- situated between lungs tilted towards left
- Protected by

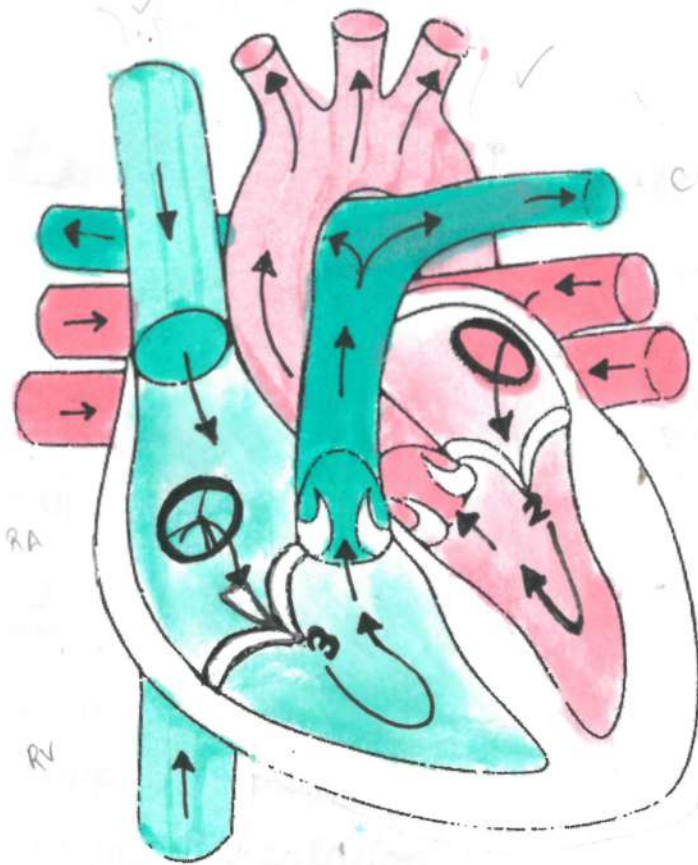


Pericardial fluid
Pericardium - Double layered -
 TISSUE



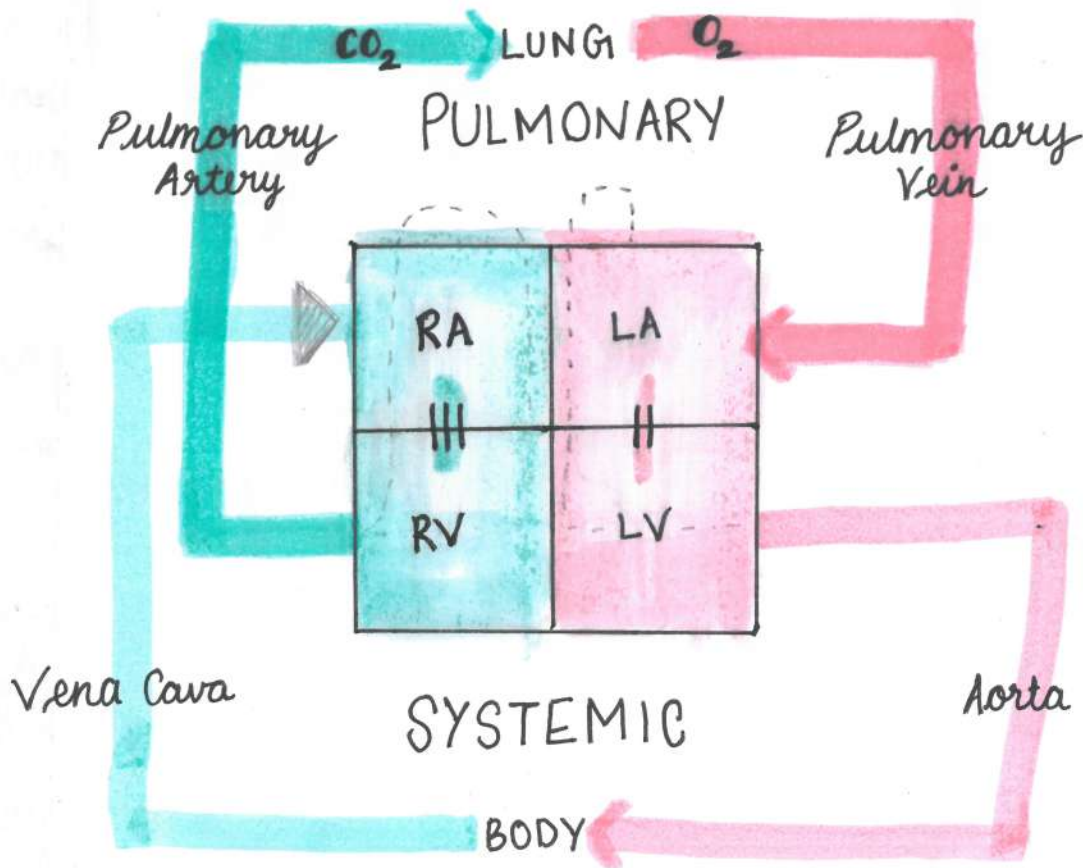
Double Circulation

during a single cardiac cycle, blood enters into the heart twice.



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- █ Pulmonary artery
- █ Vena Cava
- █ Pulmonary vein
- █ Aorta
- 3 Tricuspid valve
- 2 Bicuspid valve



CIRCULATION IN ANIMALS

4 Birds & Mammals

- ★ separation of oxygenated & deoxygenated blood
∴ ↑ efficient O₂ supply.
- ★ ↑ energy needs → maintain body temperature = **Warm blooded**
- ★ DOUBLE circulation

2 fishes

- ★ blood pumped through gills - gets oxygenated &
- ★ supplied directly - rest of body
- ★ SINGLE circulation

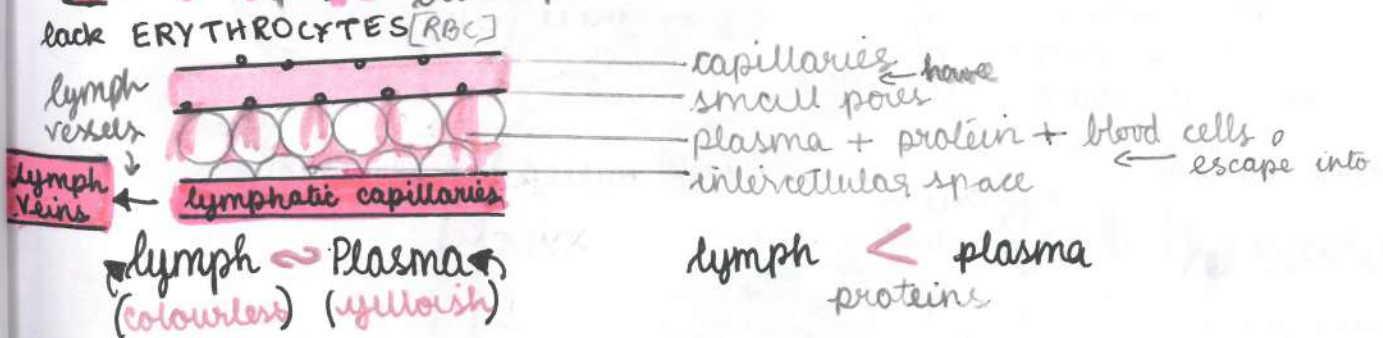
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3 amphibians & reptiles

- ★ tolerates some MIXING of O₂ed & CO₂ed blood
- ★ don't use energy - to maintain temperature
- ★ DOUBLE circulation
- ★ temperature depends on environment = **Cold Blooded**

LYMPH

plasma that leaks out of capillaries due to blood pressure.



Transportation

Blood vessels don't reach

maintains balance b/w tissue fluid & blood

Functions

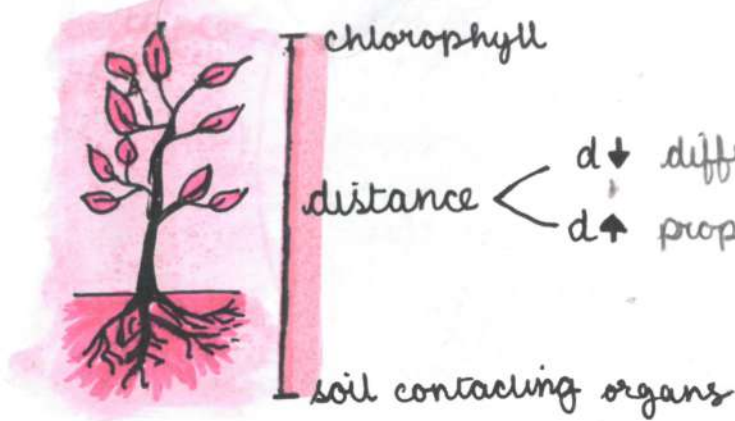
carries digested & absorbed FAT from intestine & drains excess fluid from extracellular space back into blood.

Lymph nodes produce **Immunity WBC**
prevents unwanted stuff from entering

PLANTS

- vascular tissue
 { xylem [H_2O + minerals]
 { phloem [food]

- ★ soil - nearest, richest source of Nitrogen, Phosphorous
- ★ absorption - parts with contact with soil [ROOTS]



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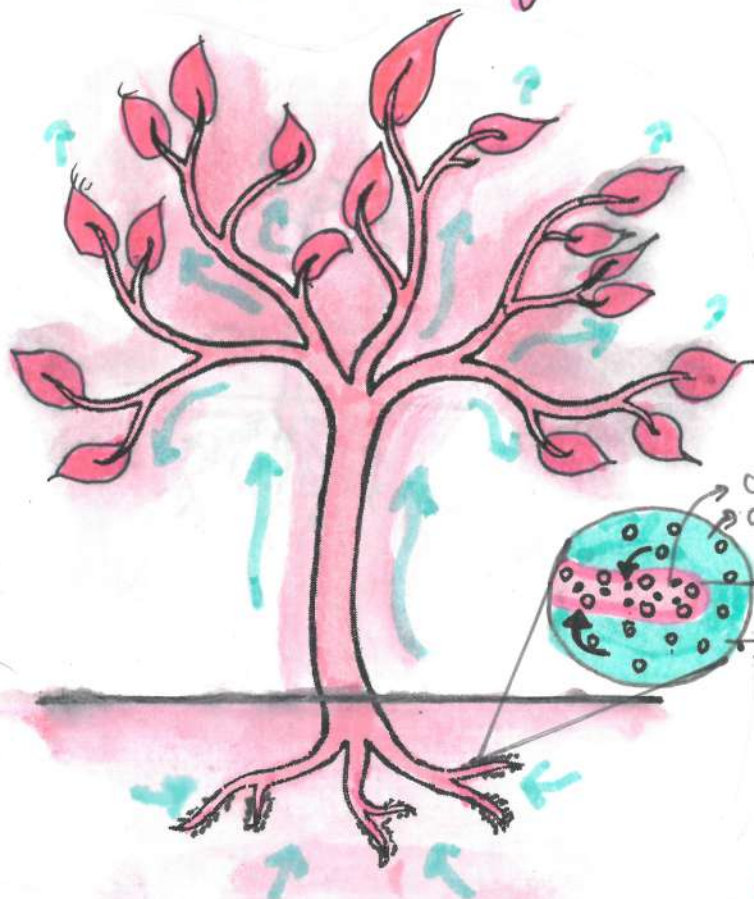
plants < animals

- ENERGY NEEDS + SLOW TRANSPORT
- don't move
 - ↑ DEAD cells

- ★ parenchyma
 - ★ fiber
 - ★ tracheids
 - ★ vessels
- dead

Transport of Water

supports STEM
 interconnected network of vessels
 xylem → tracheids in root / stem / leaf



Transpiration

Loss of water in form of vapour in aerial parts

Pull
 STOMATA
 Pa exerted by T on walls of XYLEM

- Advantages
- ★ removes excess water
 - ★ maintain TEMPERATURE
 - ★ ensure - regular supply of IONS to leaf
 - ★ ensure - ABSORPTION UPWARD MOVEMENT

Root Pressure

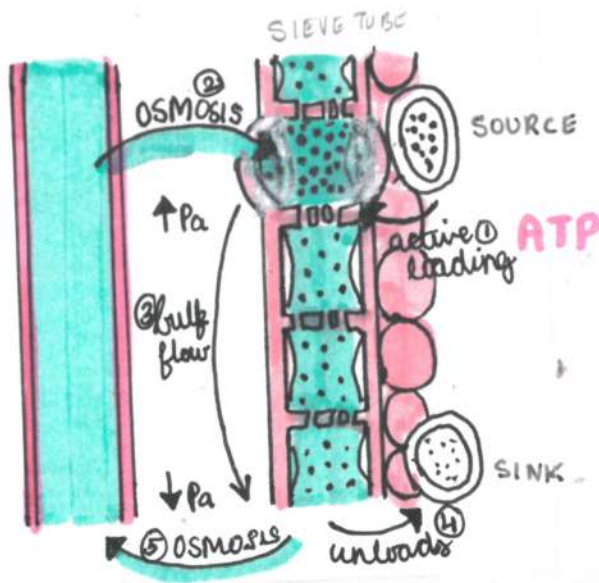
concentrated dilute
 ROOT CELLS in contact with SOIL } actively take up ions
 ↓ difference
 OSMOSIS
 ↓ conc H_2O → ↑ conc

DAY • Root Pa < Transpiration
 NIGHT • Root Pa > Transpiration

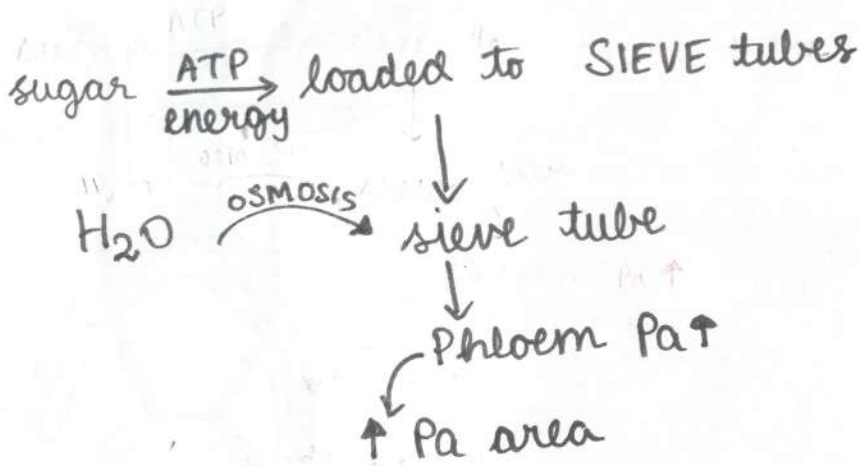
Transport of food

Phloem - sieve tubes
- companion cells

transport / movement of soluble products (sugar) of photosynthesis from leaf to other parts.
+ amino acids
+ plant hormones



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If a young plant is dug up & replanted in another place?

S.A of root ↓
 ∴ affects mineral uptake
 ∴ stem cant transport H₂O