INDIAN SCHOOL MUSCAT

CLASS X

BIOLOGY- TRANSPORTATION- REFERENCE MATERIALS

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❖ Transportation

○ Transportation in human beings-

▪ Blood- (i) It is a fluid connective tissue.

(ii) Components- (1) Fluid medium- Plasma

(2) Red blood corpuscles

(3) White blood corpuscles

(4) Platelets suspended in plasma

(iii) Plasma transports food, Oxygen, Carbon dioxide, Nitrogenous wastes, etc.

▪ Functions of blood- (i) Transport of respiratory gases.

(ii) Transport of nutrients.

(iii) Transport of waste products.

(iv) Defence against infection

▪ Blood vessels- (i) Arteries (ii) Veins (iii) Capillaries

Arteries	Veins
1. Thick walled.	1. Thin walled.
2. Deep seated.	2. Superficial.
3. Carry blood away from the heart.	3. Carry blood to the heart.
4. Carry Oxygenated blood.	4. Carry Deoxygenated blood.
5. Valves absent.	5. Valves present

▪ Heart- (Refer to figure 6.10 page no. 106 of N.C.E.R.T Text book)

(i) It is a muscular organ, which works as a pump in the circulatory system.

(ii) It is the size of our fist.

(iii) It has two sides, which are separated by a partition (SEPTUM) so that the oxygenated and deoxygenated blood do not get mixed up.

(iv) It has four chambers-

Two upper chambers called Atria.

Two lower chambers called Ventricles.

▪ Working of heart-

Left side- (i) Left atrium relaxes & the Oxygenated blood enters it from the lungs through the pulmonary vein.

(ii) Left atrium contracts & the blood enters the left ventricle

through the valve.
(iii) Left Ventricle contracts and the blood is pumped into thel argest artery _Aorta‘ and is carried to all parts of the body.
Right side- (i) Right atrium relaxes & the deoxygenated blood from the body enters it through superior and inferior Vena cava.
(ii) Right atrium contracts & the blood enters the right Ventricle through the valve.
(iii) Right Ventricle contracts and the blood is pumped into the Pulmonary artery and is carried to lungs.

- Valves- Unidirectional to prevent the backward flow of blood.
- Pulmonary vein is the only vein that carries Oxygenated blood.
- Aorta is the only artery that carries Deoxygenated blood.
- Double circulation in man- because the blood passes through the heart twice in one complete cycle of the circulation.
- Capillaries- (i) Form the connection between arteries & veins.

(ii) Walls are one cell thick only for easy exchange of blood.

- Platelets- Plug the leaks of arteries and veins by clotting the blood.
- Lymph- Extracellular fluid similar to plasma but colourless with lesser protein.
- Function of lymph- (i) Transportation of digested & absorbed fats from the small intestine.

(ii) Drains excess fluid from the intercellular spaces back in the blood.

- Higher animals- E.g., birds, mammals.

(i) Oxygenated blood & Deoxygenated blood are completely separate for efficient Oxygen supply.
(ii) This is to fulfil higher energy needs and to maintain body temperature (warm blooded animals).

- Amphibians & reptiles- have 3 chambered heat where little mixing of Oxygenated blood & Deoxygenated blood takes place. Therefore their body temperature varies with the temperature of the environment. (cold blooded animals)

- **Transportation in plants-**

- Plants need less energy needs- because they do not move and therefore have a slow transport system
- Transport of water-

(i) Takes place by xylem tissue present in roots, stem, leaves and is therefore interconnected.
(ii) Root cells take up ions from the soil, which creates a concentration difference between root and soil. Column of water therefore rises upwards.

- In very tall plants- transpiration creates a suction pressure, which pulls the water upwards.
- Importance of transpiration-

(i) Helps in upward movement of water in plants.
(ii) It regulates the temperature in plants.

- Transport of food-

(i) Takes place by phloem tissue.
(ii) Movement of prepared food in plants is called translocation.

- The translocation in phloem is achieved by utilizing energy.
- Sucrose is transferred into phloem tissue using energy from ATP.
- This increases the osmotic pressure of the tissue causing water to move into phloem.

- This pressure moves the material in the phloem to tissues which have less pressure. according to the plant’s needs)