

Chapter 3

TRANSPORTATION

Transportation is the process by which food, oxygen, water, waste products are carried from one part of the body to the other.

a) **Transportation in Human beings:**

The main transport system in human beings is the circulatory system.

i) **Blood:** transports food, oxygen and waste products.

Contains: Plasma, RBC, WBC and Platelets.

ii) **Arteries:** carry pure blood from the heart to all parts of the body.

iii) **Veins:** carry impure blood from all parts of the body to the heart. They are thin walled and have valves.

iv) **Capillaries:** are very narrow blood vessels which connects arteries and veins together.

v) **Heart:** is a muscular organ which pumps blood to all parts of the body. It has four chambers.

1. The upper chambers are called atria and the lower chambers are called ventricles.
2. The right and left chambers are separated by a septum.
3. It prevents the mixing of oxygenated and deoxygenated blood. The atria and ventricles have valves between them to prevent blood flowing backward.

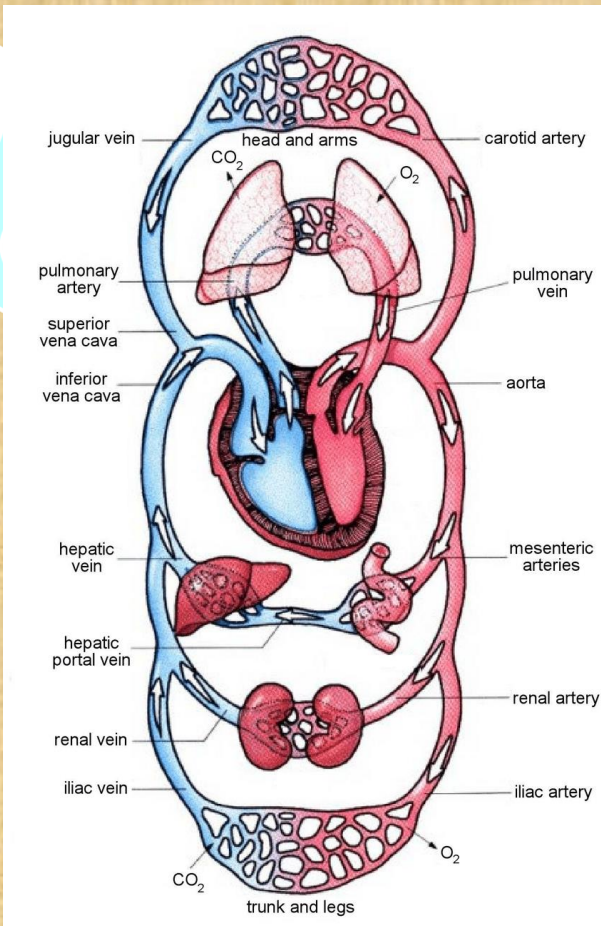
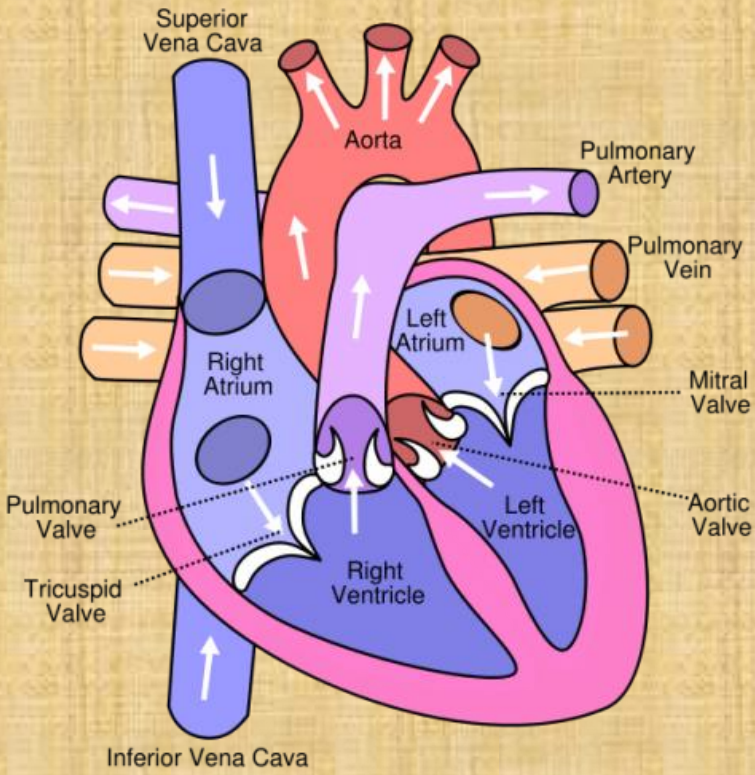
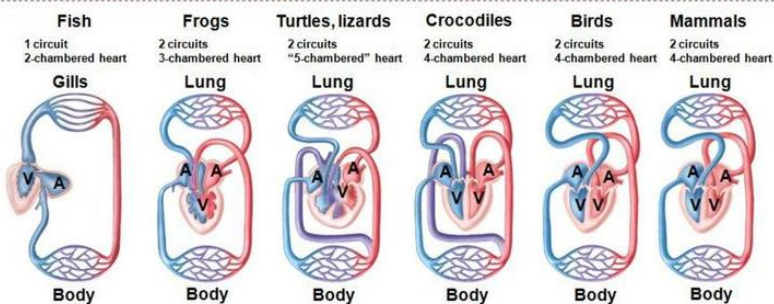


Fig. Circulatory system

Working of the heart (Circulation of blood):

- When the left atrium relaxes oxygenated blood from the lungs flows into it through the pulmonary vein. When it contracts, the left ventricle expands and the blood flows into it. Then the left ventricle contracts and the oxygenated blood is pumped out through the aorta to all parts of the body. After circulating through all parts of the body the deoxygenated blood enters the right atrium through the vena cava. When the right atrium contracts, the right ventricle expands and the blood flows into it. Then the right ventricle contracts and the blood is pumped to the lungs through the pulmonary artery. In the lungs carbon dioxide is removed and oxygen is absorbed and the oxygenated blood again enters the left atrium and the process repeats.
- Since blood flows through the heart twice in one cycle, it is called double circulation.
- **Lymph:** is a colourless fluid present in intercellular spaces. It is formed from the plasma, which escapes from the capillaries. Lymph drains into lymphatic capillaries, which forms lymph vessels and joins into large veins.
- Lymph transports digested fats and drains excess fluids from intercellular spaces back into the blood.
It contains lymphocytes, which kills germs and protects the body.

Comparative Anatomy of Vertebrate Hearts



Hearts of mammals, birds, amphibians, reptiles, and fishes:

- i) The heart in mammals and birds have four chambers and the right and left sides of the heart is separated by a septum.
- ii) The heart in amphibians and reptiles: have three chambers and allows some mixing of oxygenated and deoxygenated blood because they do not use energy to maintain their body temperature. Their body temperature is the same as the temperature of the surroundings.
- iii) The heart in fishes: have only two chambers and blood is oxygenated in the gills.

