



**CLASS X SUBJECT- BIOLOGY**

**CHAPTER: LIFE PROCESSES**

**TOPIC: TRANSPORTATION IN HUMAN BEINGS**

**Guidelines:**

**Dear Students,**

- Refer to the following content of the chapter.
- These notes will help you understand the concept of the lesson and complete the assignment that follows which will be graded on submission.
- Do the assignment in the Biology notebook.
- Link for the book: [http://ncertbooks.prashanthellina.com/10\\_Science.html](http://ncertbooks.prashanthellina.com/10_Science.html)

**Human Heart:**

The heart is a muscular organ.

Location: The heart is located under the **rib cage** -- 2/3 of it is to the left of your breastbone (sternum) -- and between your lungs and above the **diaphragm**.

- It is about the size of a closed fist, weighs about 10.5 ounces and is cone-shaped. It is covered by a membrane termed the **pericardium**.
- The normal heart anatomy is a hollow organ that is **four-chambered**. It is divided into the left and right chambers by a muscular wall called the **septum**.
- The right and left sides of the heart are further divided into two top chambers called the **atria** (also termed the right and left atrium), which receive blood and then pump it into the two bottom chambers called **ventricles**, which pump blood to the lungs and to the body.

**NOTE: RIGHT CHAMBERS OF THE HEART TRANSPORT DEOXYGENATED BLOOD (from body parts to the lungs) WHILE THE LEFT CHAMBERS TRANSPORT OXYGENATED BLOOD (from the lungs to the body parts)**

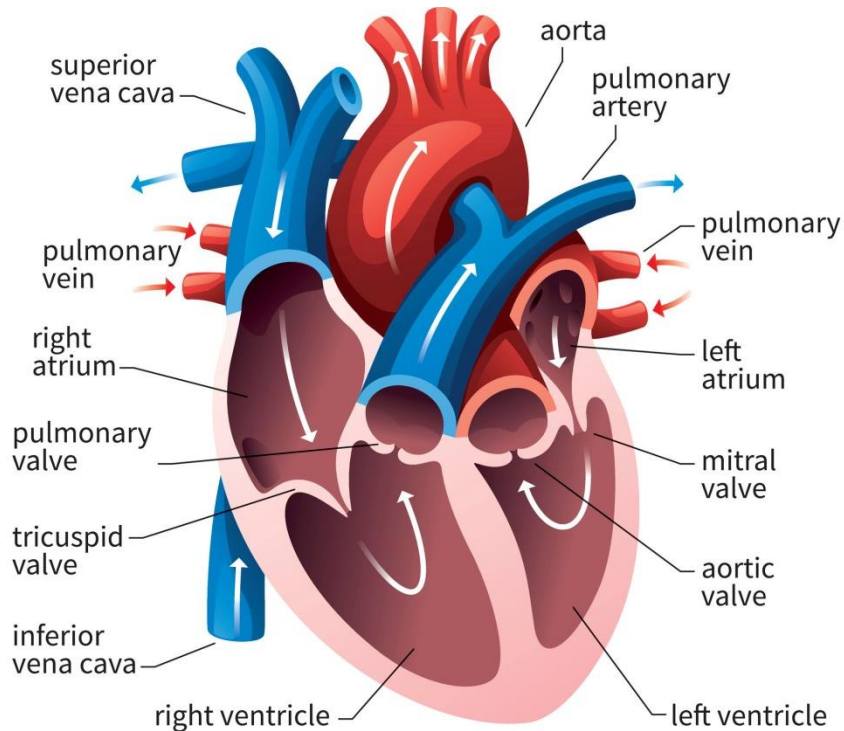
**Kindly refer to the link shared below for better understanding of the Human Heart and its functioning. It will enable you to experience the process visually.**

<https://www.youtube.com/watch?v=GMBSU-2GK3E>

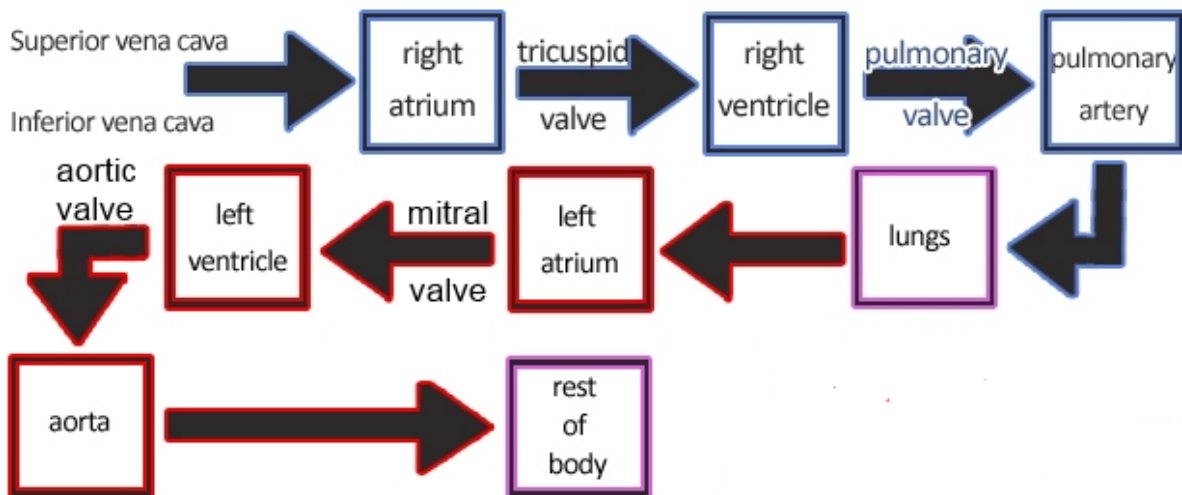
**Circulation of Blood:**

- The **right atrium** receives blood from the **Superior and Inferior Vena Cava** and then pumps it to the **right ventricle**.
- The **right ventricle** receives blood from the **right atrium** (through the **tricuspid valve**) and pumps it **to the lungs**, where it is loaded with oxygen.
- The **left atrium** receives oxygenated blood **from the lungs** and pumps it to the **left ventricle**.

- The **left ventricle** (the strongest chamber) pumps oxygen-rich blood to the **rest of the body** through the main artery called **AORTA**. The vigorous contractions of the left ventricle create our blood pressure.



**Human Heart**



**Flow Chart showing Double Circulation of Blood**

**Double Circulation:**

It is a unique feature of human beings as blood flows twice through the heart, once through the right chambers as deoxygenated blood and then as oxygenated blood through the left chambers of the heart . It involves systemic and pulmonary circulation.

**Systemic Circulation**

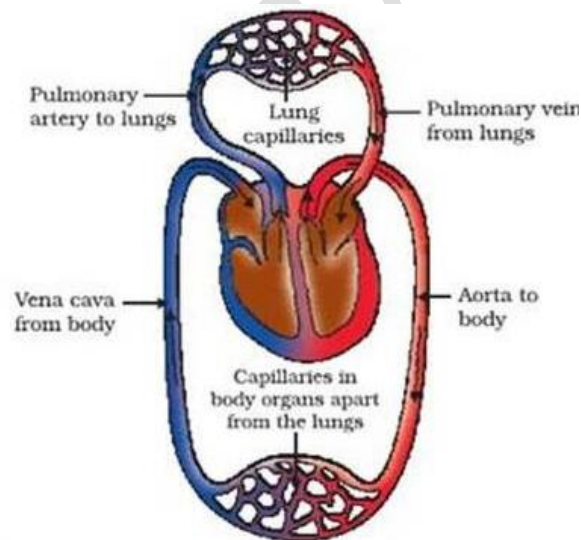
Systemic circulation carries oxygenated blood from the left ventricle to the tissue capillaries present in our different body parts.

- The oxygen-rich blood is transferred to the aorta for circulating into various parts of the body.
- Later, the veins and venules collect the deoxygenated blood – which is rich in carbon dioxide from various parts of the body.
- The deoxygenated blood is pumped back into the superior vena cava and then to the right atrium.
- Once after receiving the deoxygenated blood, the right atrium carries blood to the right ventricle for pulmonary circulation.

### Pulmonary Circulation

In the pulmonary circulation, the circulation of deoxygenated blood starts from the heart to the lungs and back. In this pathway:

- The pulmonary artery collects blood from the right ventricle and carries to lungs for oxygenation.
- Once after the purification process, the oxygenated blood is pumped back to the left atrium through the pulmonary vein which is carried to the left ventricles.
- The left ventricles pump the oxygenated blood to the aorta for systemic circulation.



### Schematic Representation of Double Circulation in Human Beings.

#### Advantages of Double Circulation:

Double circulation supports a strict separation of both oxygenated and deoxygenated blood. Therefore, this circulation ensures that the body always has a dedicated supply of oxygen and also, it improves body efficiency. This is also one of the reasons why mammals can **maintain their body temperatures** and are said to be **warm blooded**. All **birds and mammals** are warm blooded while all **fishes, amphibians and reptiles** are **cold blooded** as they change their body temperature according to the surroundings.

Kindly refer to the link shared below for better understanding of double circulation in Human Heart. It will enable you to experience the process visually.

<https://www.youtube.com/watch?v=AWsppqBQpLY>

## Blood Pressure

Blood pressure is the force created by blood circulation through the circulatory system. It is measured with the help of an instrument called **SPHYGMANOMETER**. The average blood pressure of an adult human is **120/80 mm of Hg**.

## Pulse

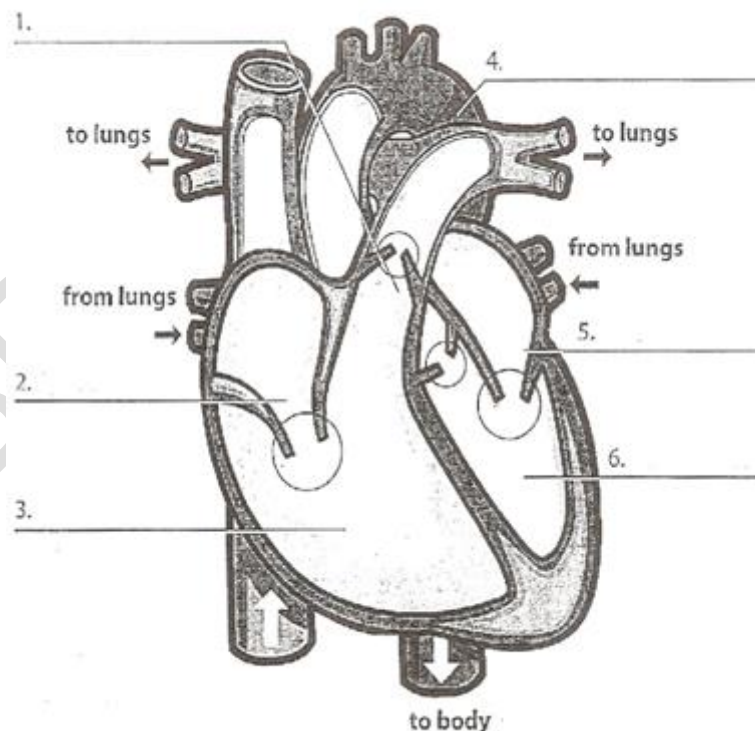
It is the throbbing that we feel at our wrists due to the pumping action of the heart. The number of times we feel our pulse in a minute is called **Pulse Rate**. The average pulse rate of an adult human is 72 times / minute.

**Key Words:**

<b>Heart</b>	<b>Atrium</b>	<b>Ventricle</b>	<b>Double Circulation</b>
<b>Aorta</b>	<b>Vena Cava</b>	<b>Pulse</b>	<b>Blood pressure</b>

**ASSIGNMENT:**

Q1. Label the parts of human heart in the given diagram:



Q2. With the help of a flow diagram show the process of double circulation in human beings.

Q3. Why is it necessary to separate oxygenated and deoxygenated blood in human beings and birds?

Q4. Write any 5 facts related to human heart.

Q5. Search and mention any two common diseases of heart.