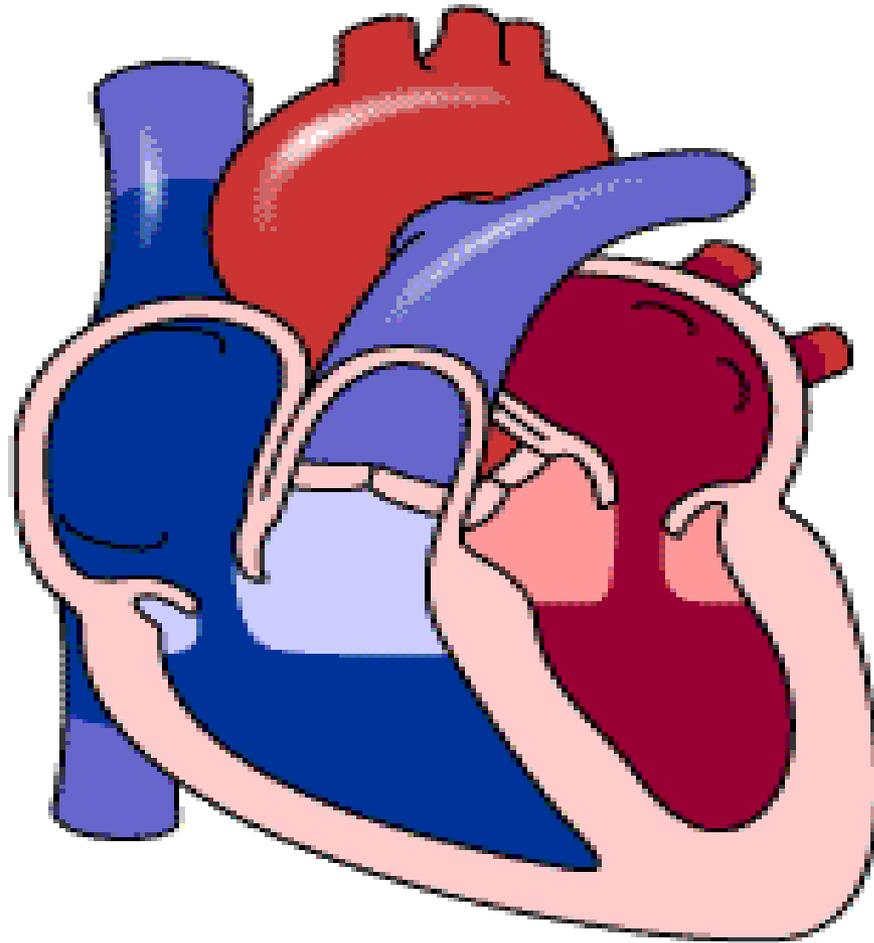


# The Heart and The Pathway of Blood



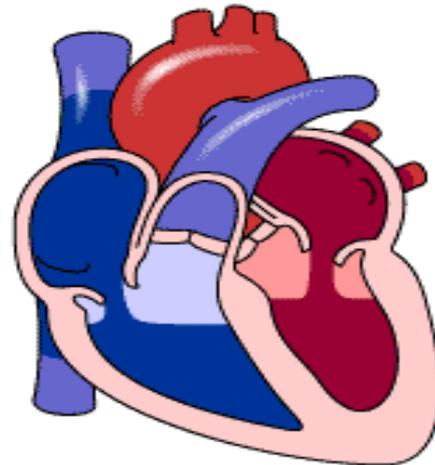
# Learning Objective and Learning Outcomes:

To develop our understanding of the heart and the pathway of blood through **perseverance**

- ▶ 5-1 can list the key facts of the heart and identify the two separate pumps involved (Oxygenated and Deoxygenated) .
- ▶ 6-7- All of the above, and I can remember most of the structure and vessels associated with the heart. I am starting to understand the pathway of blood through the heart.
- ▶ 8-9-As above-I can remember all of the structure and vessels associated with the heart. I can explain the role valves have in the pathway of blood and can explain this process.

# Task One-The Heart:

- ▶ Write as much as you know about the heart including names for certain parts of the heart you may already know and facts you may know about the heart already. Use the images below to help you:



# Green Pens:



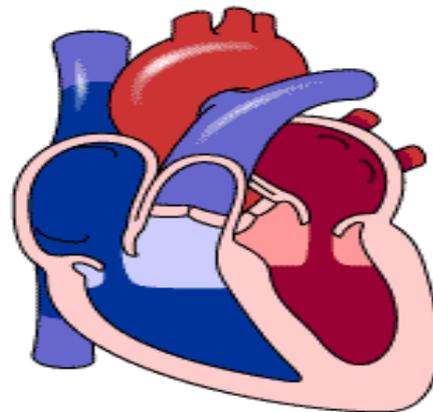
The heart is about the size of a closed fist



The heart is part of the cardiovascular system



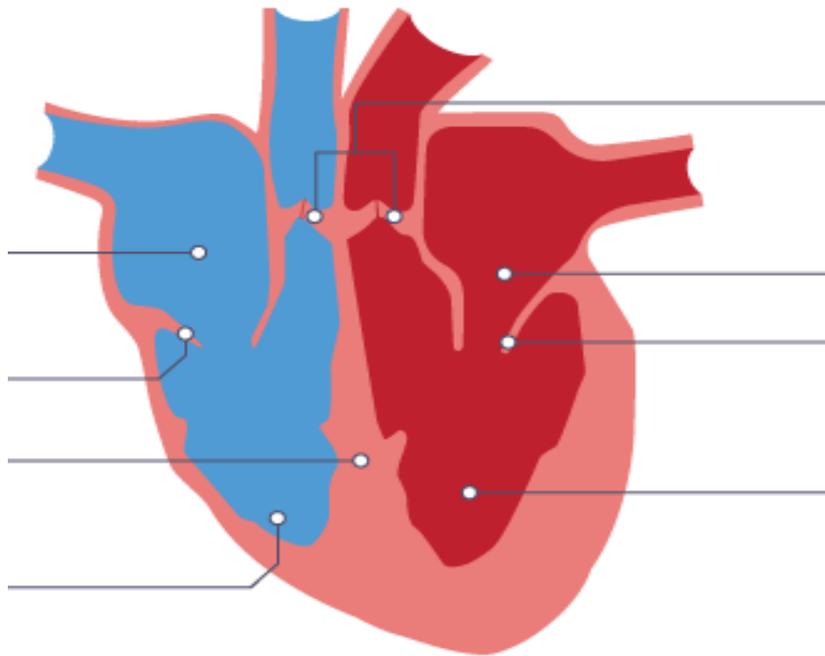
Consists of 4 chambers is made up of cardiac muscle-The top half two being the atria and the bottom half two being the ventricles



Main function of the heart is to pump blood around the body

# The Structure of the Heart

- ▶ It is divided into 2 halves.
- ▶ The right hand side and the left hand side
- ▶ This sides are separated by a muscular wall.



**Left Hand Side=Pumps oxygenated blood around the body**

**What is Oxygenatd Blood?**  
Oxygenated blood=Blood rich in oxygen that is carried away from the heart to the muscles and organs that require it in order to contract

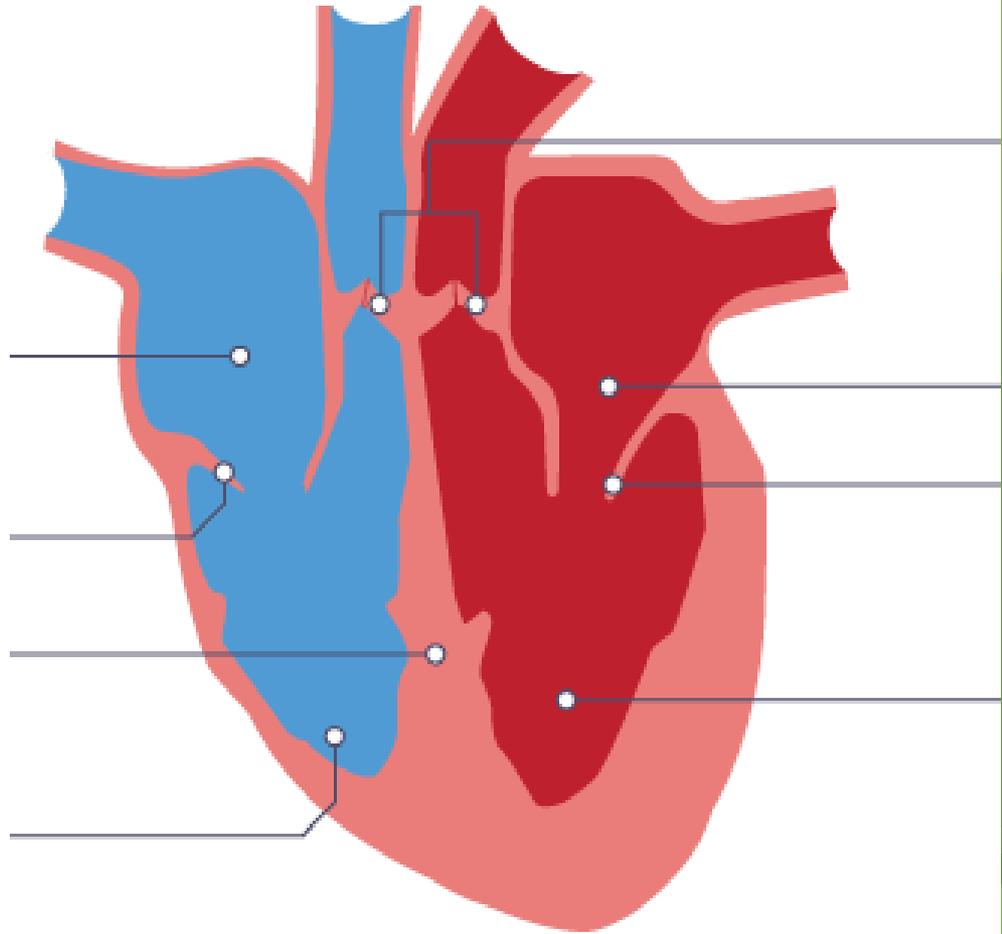
**Extension: What is the name of the muscular wall that divides the heart into 2 halves?**

**Muscular Wall=Septum**

Right Hand Side=Pumps  
deoxygenated blood to the  
lungs

What is deoxygenated  
blood?

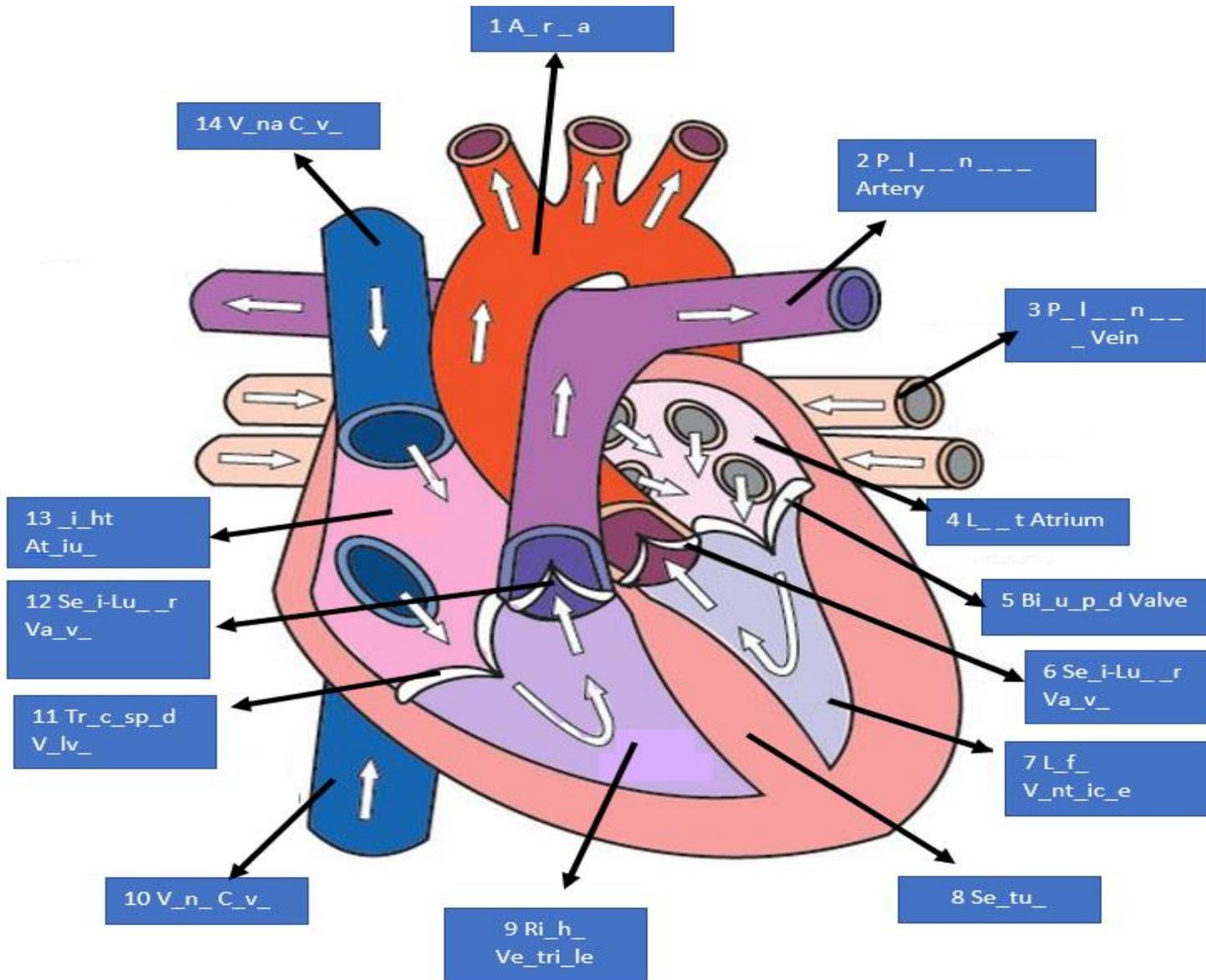
Deoxygenated blood=Blood  
that does not contain oxygen  
as it has been used by the  
muscles and is on its way  
back to the heart

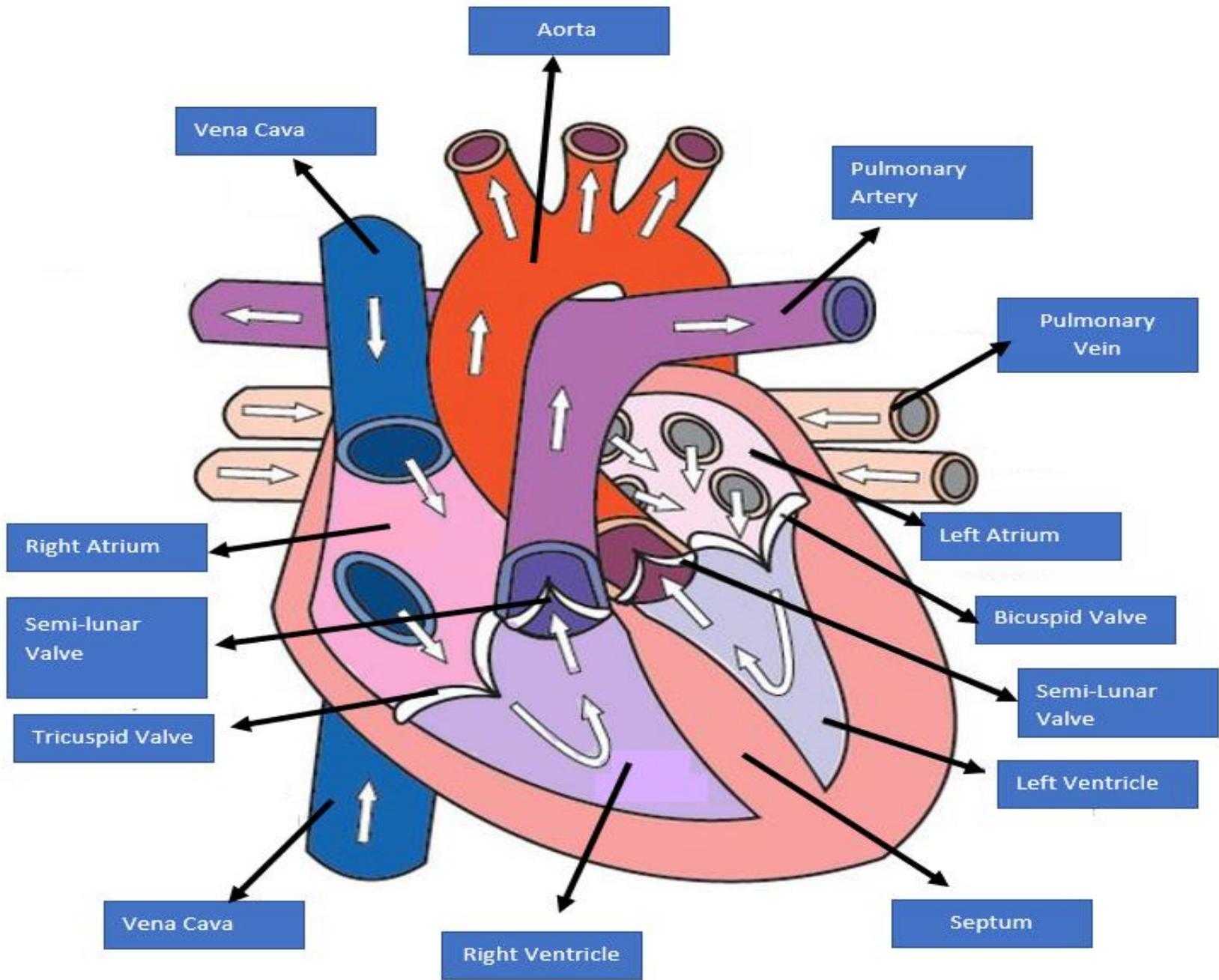


- ▶ Using the key words below-Label your heart worksheet
- ▶ If this is too difficult-Turn your planner to red to receive a help sheet

Key Words:

- Right Atrium
- Left Atrium
- Pulmonary Artery
- Septum
- Pulmonary Vein
- Semi-lunar Valve
- Bicuspid Valve
- Semi-Lunar Valve
- Left Ventricle
- Right Ventricle
- Aorta
- Vena Cava
- Tricuspid Valve
- Vena Cava





# Where are you now?

To develop our understanding of the heart and the pathway of blood through **perserverance**

- ▶ 5-I can list the key facts of the heart and identify the two separate pumps involved (Oxygenated and Deoxygenated) .
- ▶ 6-7- All of the above, and I can remember most of the structure and vessels associated with the heart. I am starting to understand the pathway of blood through the heart.
- ▶ 8-9-As above-I can remember all of the structure and vessels associated with the heart. I can explain the role valves have in the pathway of blood and can explain this process.

# Key Parts of the Heart:

- ▶ The **atria** (plural of atrium) are where the blood collects when it enters the heart.
- ▶ The **ventricles** pump the blood out of the heart to the lungs or around the body.

# Valves

- ▶ Valves= Ensure that blood can only flow in one direction around the body as they work one way themselves.
- ▶ There are four valves in the heart
- ▶ Using your diagram of the heart-Can you list the 4 we have?
  1. Tricuspid Valve
  2. Bicuspid Valve
  3. Aortic Valve
  4. Pulmonary Valve
  5. Semilunar Valve

Extension: What ways can you think of to make the above easy for you to remember?

# Valves:

- ▶ Looking at your labelled diagram of the heart-Can you fill in these gaps and write the descriptions out?
- ▶ **Atrioventricular Valves:** all valves between ..... and .....
- ▶ **Tricuspid valve:** between ..... ventricle and ..... atrium
- ▶ **Bicuspid Valve:** between ..... atrium and ..... V.....
- ▶ **Aortic Valve:** between right ventricle and pulmonary .....
- ▶ **Pulmonary Valve:** between ..... ventricle and .....artery.
- ▶ **Semilunar Valves:** collective term for aortic and Pulmonary Valves

# Green Pens:

- ▶ Atrioventricular Valves: all valves between the ..... **Atria** .....  
and ..... **Ventricles** .....
- ▶ Tricuspid valve: between ..... **Right** ..... ventricle and  
..... **Right** ..... atrium
- ▶ Bicuspid Valve: between ..... **Left** ..... atrium and  
..... **Left** ..... V.entricle .....
- ▶ Aortic Valve: between right ventricle and pulmonary  
..... **Artery** .....
- ▶ Pulmonary Valve: between ..... **Right** .....  
ventricle and ..... **Pulmonary** ..... artery.
- ▶ Semilunar Valves: collective term for aortic and  
Pulmonary Valves

# 4 Major Blood Vessels

1. Aorta-The largest artery in the body carrying oxygenated blood away from the left ventricle of the body
2. Pulmonary Artery-Carries deoxygenated blood away from the right ventricle to the lungs
3. Vena Cava-The largest vein in the body carrying deoxygenated blood from the muscles and organs to the right atrium
4. Pulmonary Vein- Returns oxygenated blood from the lungs to the heart

# The Pathway Of Blood Through The Right Side of the Heart:

- ▶ The pathway of blood through the right hand side of the heart
- ▶ Blood returns from the body through the vena cava where deoxygenated blood enters the right atrium. The deoxygenated blood passes through the tricuspid valve into the right ventricle. The semilunar valve prevents blood from re-entering the heart and so deoxygenated blood is pumped through the pulmonary artery where then the blood is oxygenated at the lungs.

1)Vena Cava

2)Right Atrium

3)Tricuspid  
Valve

4)Right  
Ventricle

5)Semilunar  
Valve

6)Pulmonary  
Artery

7)Lungs

# The Pathway Of Blood Through The Left Side of the Heart:

- ▶ The pathway of blood through the left hand side of the heart
- ▶ Oxygenated blood returns to the heart from the lungs through the pulmonary veins and enters the left atrium of the heart. The blood then passes through bicuspid valve and into the left ventricle. The semilunar valve prevents blood from re-entering the heart whereby then the oxygenated blood is pumped into the aorta and round the body.

1) Pulmonary Vein

2) Left Atrium

3) Bicuspid Valve

4) Left Ventricle

5) Semilunar Valve

6) Aorta

7) Body

# Learning Objective and Learning Outcomes:

- ▶ To develop our understanding of the structure and function of the cardiovascular system through **perseverance**
- ▶ 5-1 can name the 2 types of systems that make up the double circulatory system. I can name the major organs and vessels involved.
- ▶ 6-7- All of the above, and I can remember most of the pathway of blood through the double circulatory system, the role of the different vessels and define Heart Rate, Stroke volume and Cardiac Output
- ▶ 8-9-As above-I remember the full pathway of blood through the double circulatory system. I understand the relationship between Heart rate, stroke volume and cardiac output and how it can be affected during sport.

# Heart rate

- ▶ Heart rate: beats per minute (bpm)
- ▶ The average resting heart rate is 75bpm.
- ▶ **How is your maximum heart rate calculated?**
- ▶ Max Heart rate=  $120 - \text{AGE}$
- ▶ Find your pulse and we will all now take our heart rates.
  
- ▶ **Extension: What will happen to your heart rate when you exercise and why ?**

Definition of HR (amount of times the heart beats per minute). It will increase due to the working muscles needing more oxygen which is carried around by the blood.

# Stroke volume

- ▶ The volume of blood pumped out by the heart by each ventricle during one contraction (one beat)

# Cardiac output

- ▶ Blood ejected from the left ventricle in one minute.
- ▶ Cardiac output (q)= Stroke Volume (SV) x Heart Rate (HR)
- ▶ Measurement is litres/min

# Plenary-where are you now?

- ▶ 5-I can name the 2 types of systems that make up the double circulatory system. I can name the major organs and vessels involved.
- ▶ 6-7- All of the above, and I can remember most of the pathway of blood through the double circulatory system, the role of the different vessels and define Heart Rate, Stroke volume and Cardiac Output
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