

Name: KEY

Circulatory System

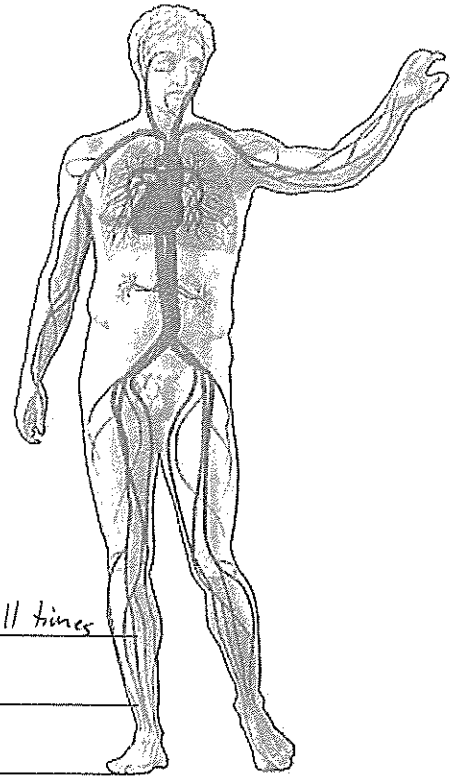
Period: _____

SWUT

- The cardiovascular system transports all materials around the body
- The cardiovascular system has 3 parts
 - Heart, blood and vessels

SWBAT

- Describe the path blood takes through the body



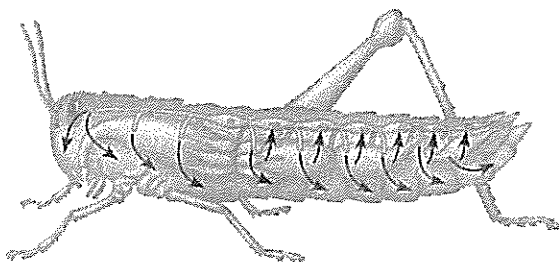
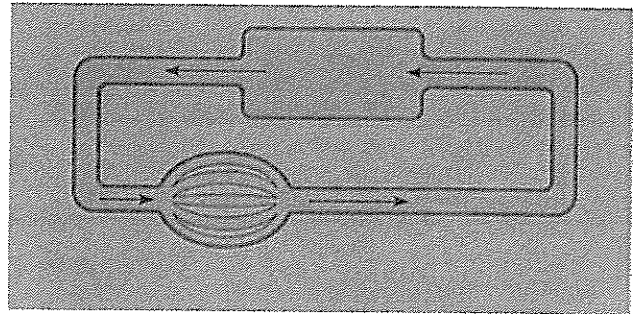
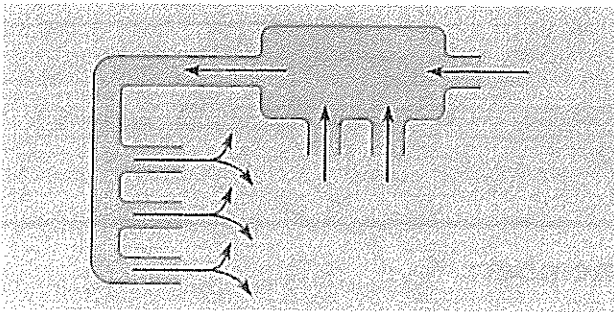
A. Types of Circulatory systems:

1. Open Circulatory system :

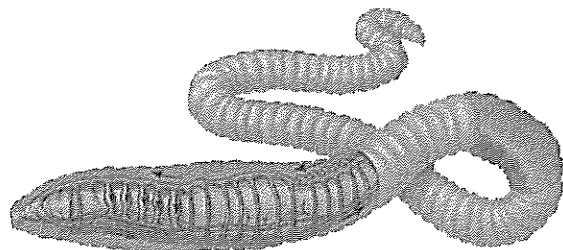
- The fluid is **NOT** contained within vessels at all times
- Slow movement
- Low pressure
- found in insects, crustaceans, arachnids

2. Closed Circulatory system

- fluid is contained within vessels at all times
- fast movement
- High pressure
- found in larger animals



Open Circulatory System



Closed circulatory System

B. All circulatory systems have 3 parts:

1. A fluid Medium - carries materials
2. Vessels - for the fluids to move through
3. A Pump - to push the fluid through the vessels

C. What is the purpose of the circulatory system?

1. Delivers needed substances to cells (O_2)
2. Carries away wastes from cells (CO_2)
3. Regulates the body temperature
4. Fights disease

TRANSPORT

TRANSPORT

D. Main parts of the Human Circulatory system:

1. Heart
 - a. A 4 chambered muscular pump that contracts to push blood through vessels.
2. Blood vessels (vascular tissue)
 - a. Arteries: bring blood away from the heart.
 - b. Veins: bring blood back to the heart.
 - c. Capillaries: connect arteries to veins, where gas exchange takes place.
3. Blood
 - a. Red blood cells
 - b. White blood cells
 - c. Plasma
 - d. Platelets

Things to remember:

The cells that make up your heart need oxygen for cellular respiration.

Blood is NEVER blue!

When you look at a diagram of the heart, the left side of the heart will be on the right side of the page and the right side of the heart will be on the left side of the page.

OVERHEAD TRANSPARENCY MASTER

CHAPTER

9

Structure of the Human Heart

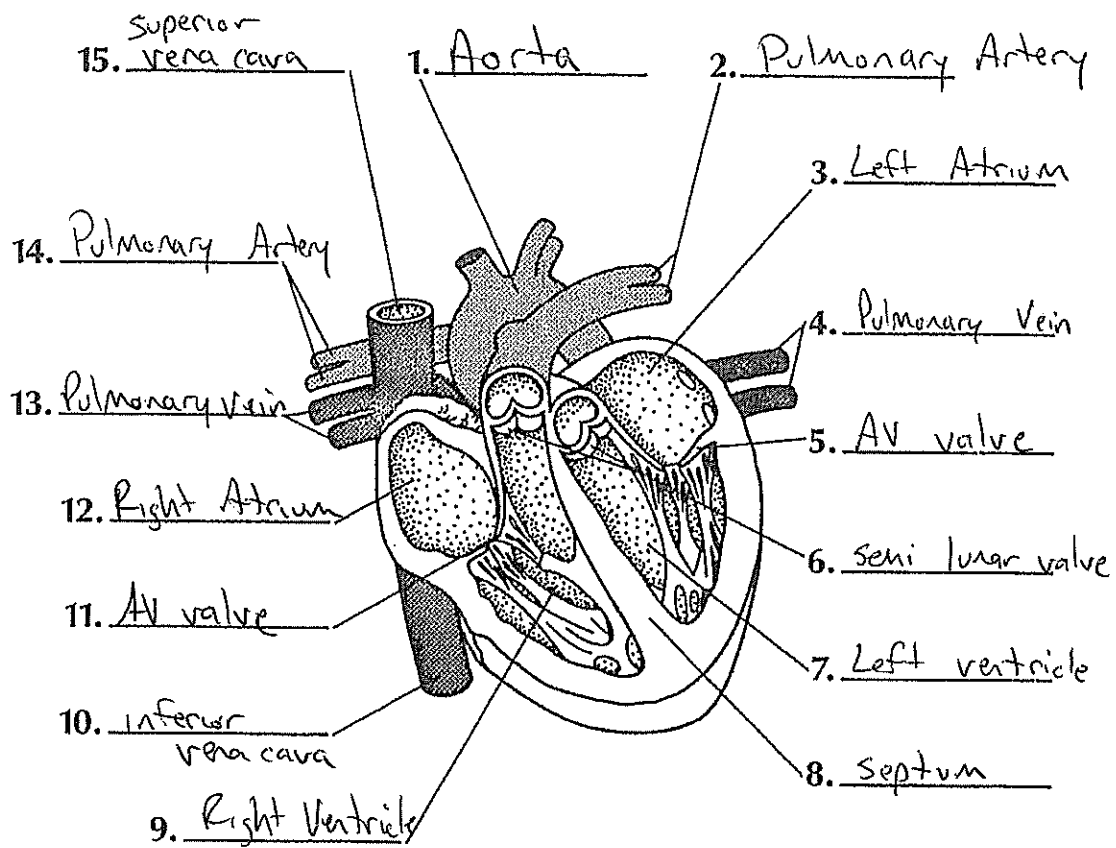
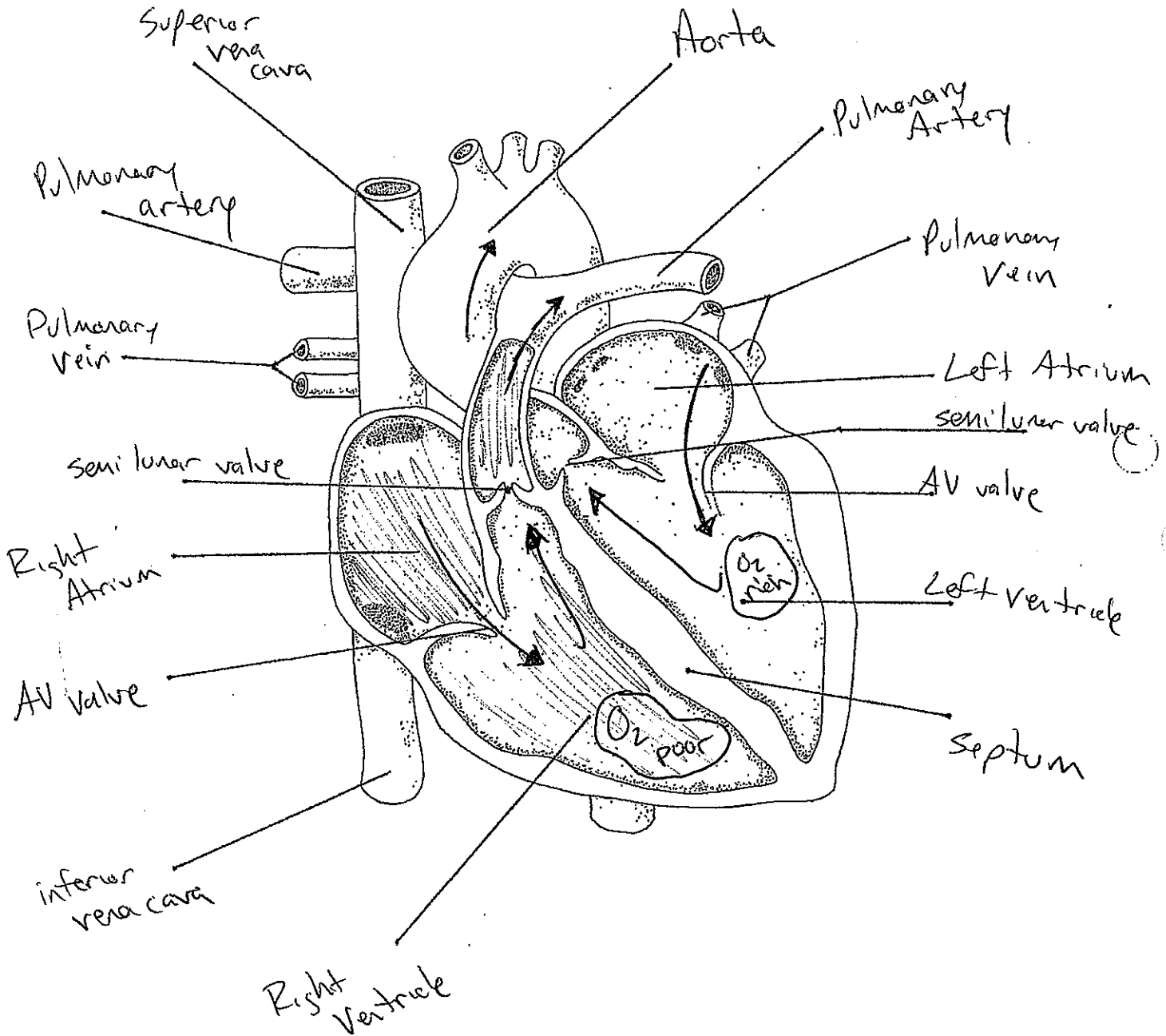


Diagram 8 The Heart



2. In the human body, the heart is located in the chest cavity.
3. The human heart is protected by a membrane called the pericardium
4. The structure that separates the right and left sides of the heart is the septum
5. What prevents the backflow of blood from the ventricles to the atria? AV valve

E. The Heart

1. Right Heart

a. Pulmonary Circulation

- i. Leads to lungs
- ii. The blood picks up Oxygen and drops off Carbon dioxide.
- iii. Oxygen rich blood returns to the _____ atrium.

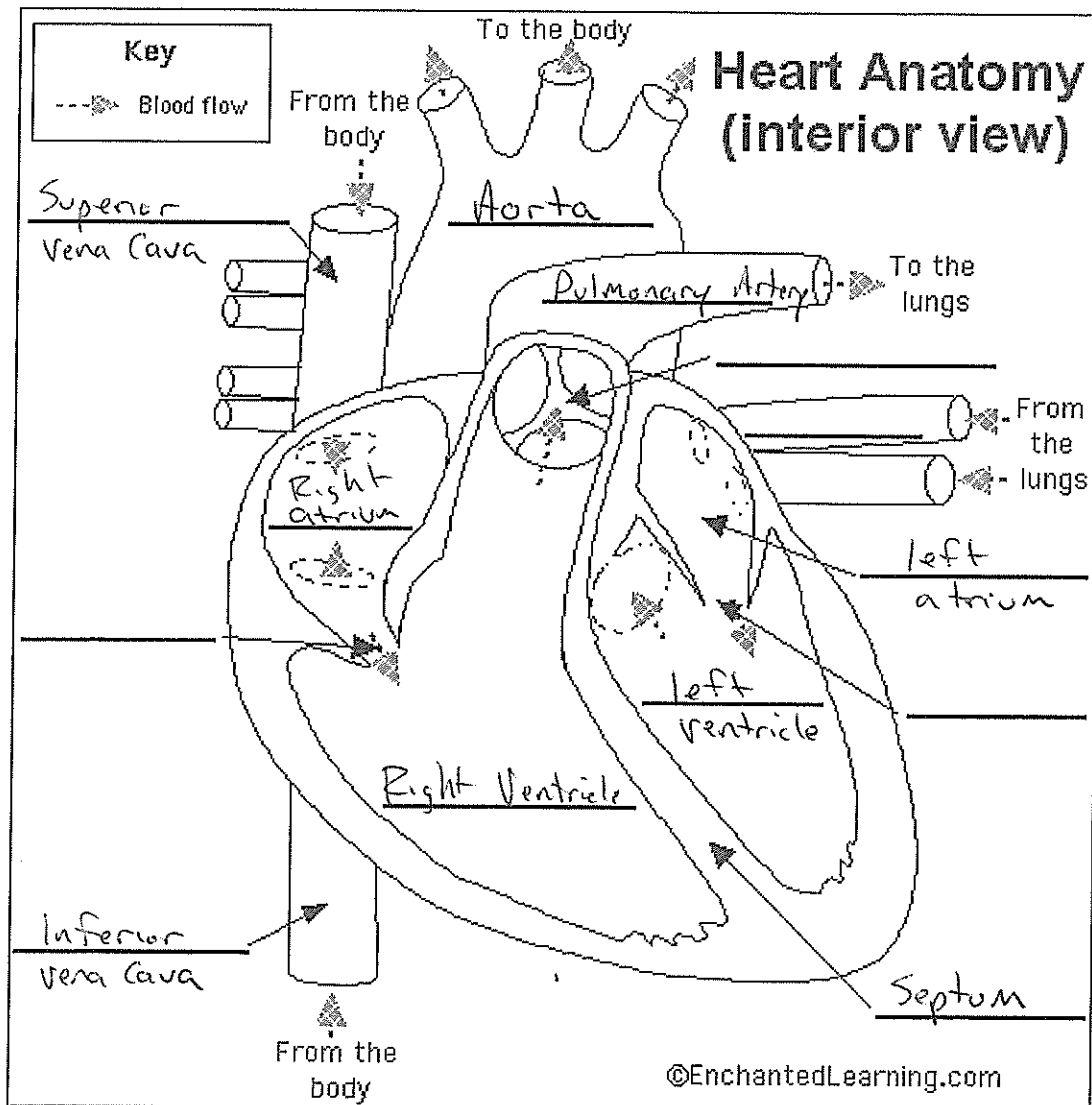
2. Left Heart

a. Systemic Circulation

- i. Blood goes to all your organs
- ii. Returns to the right atrium.

b. Coronary / Cardiac Circulation

- Blood flow to the heart.



F. Blood Vessels:

1. Arteries

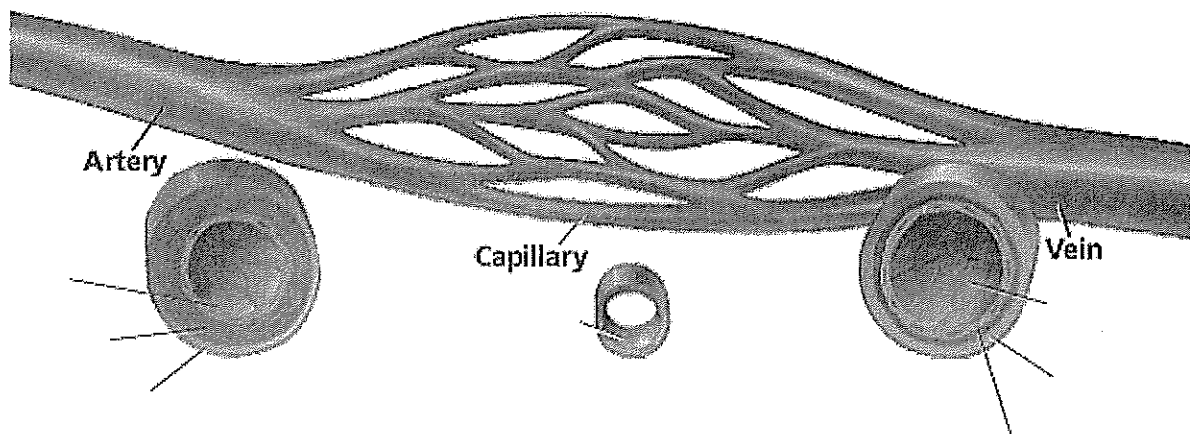
- Move blood away from the heart
- Have thick elastic walls
- Each time the heart beats, blood is forced out of the heart at high pressure.
- You feel your pulse where an artery comes close to your skin.

2. Capillaries

- Smallest blood vessels in your body.
- Only ONE cell layer thick
- Exchange of material takes place here by diffusion.
 - Needed materials dropped off to the cells
 - Waste materials picked up from the cells

3. Veins

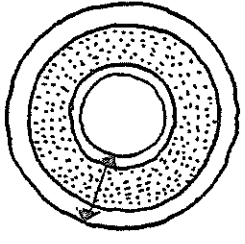
- Bring blood back to the heart
- thin walls
- Have valves to stop the backflow of blood
- When skeletal muscles contract, they squeeze nearby veins and help push the blood towards the heart.



Your Blood Vessels

Arteries

- thick walls
- elastic
- smooth muscle



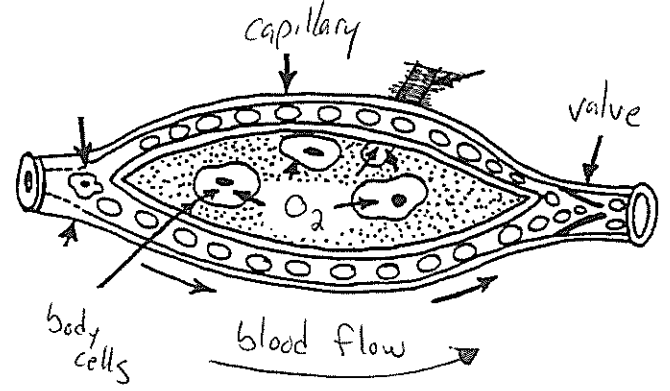
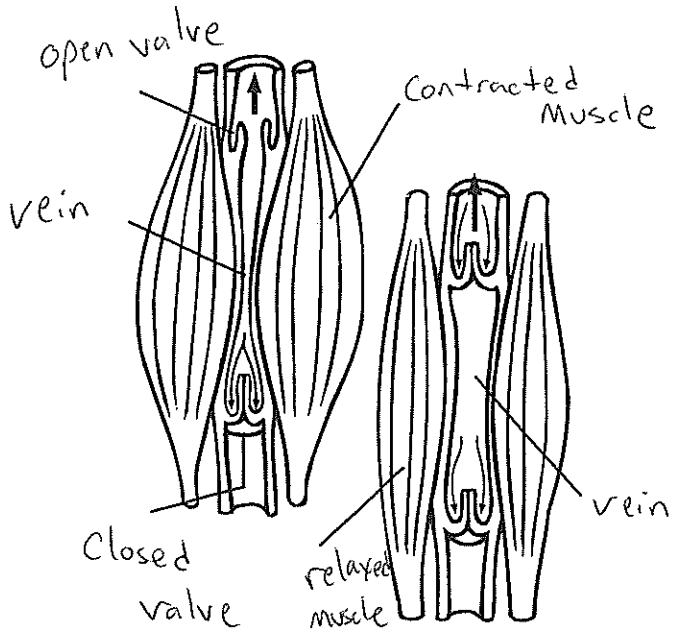
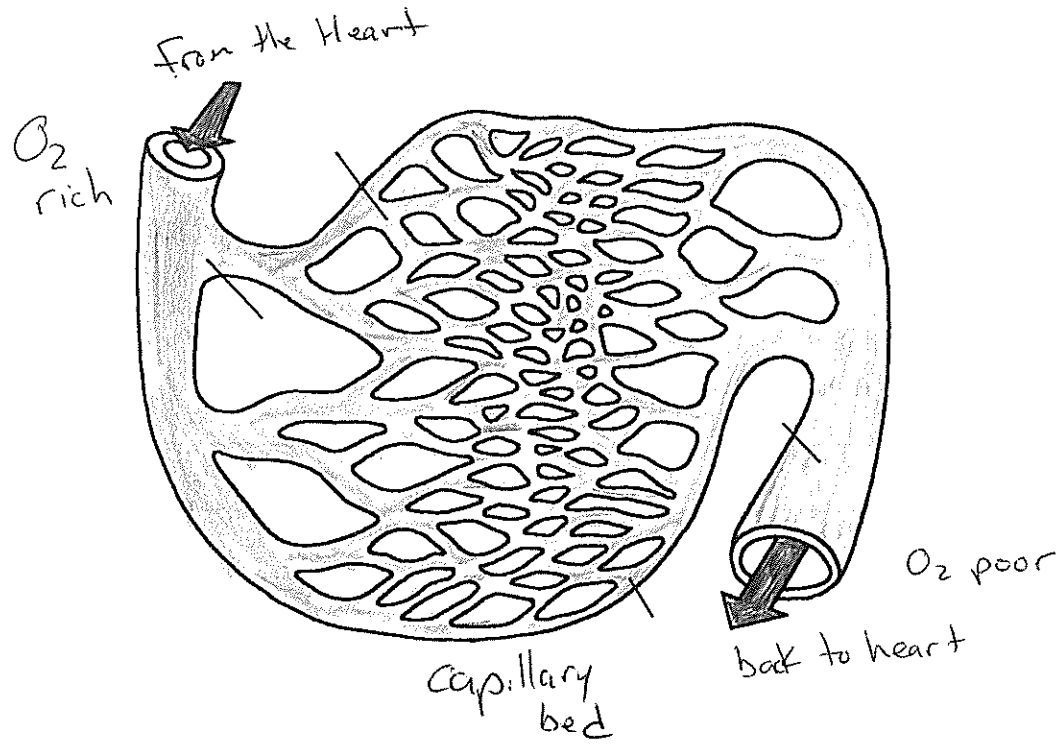
Capillary

- one cell thick wall



Vein

- thin wall
- little smooth muscle
- has valves



1. Describe the structure and function of arteries.

Thick & elastic made of smooth muscle
brings blood away from heart

2. In the top illustration, why is the color of the blood shown in the veins much darker than the blood shown in the arteries?

Blood in veins is oxygen poor
Blood in arteries is oxygen rich

3. Compare the structure of arteries, veins, and capillaries.

Artery - Thick / elastic

Vein - thinner - has valves

Capillary - walls are 1 cell thick - gas exchange

4. How does the pressure of blood in the arteries affect the flow of blood from the heart to the tissues?

Higher the pressure the faster
the flow of blood

5. How does the pressure of blood in the veins compare with the pressure in the arteries? How does this difference in pressure relate to the fact that some veins are equipped with valves?

Pressure in arteries is much greater.
Valves prevent back flow.

6. Study the drawing of skeletal muscles in the bottom illustration. Describe what happens to the valves in the veins when the skeletal muscles relax or contract.

The valves open & close based
on the muscles contracting/expanding to
allow blood to be pushed back to the
heart

G. Major Blood Vessels to and from the Heart

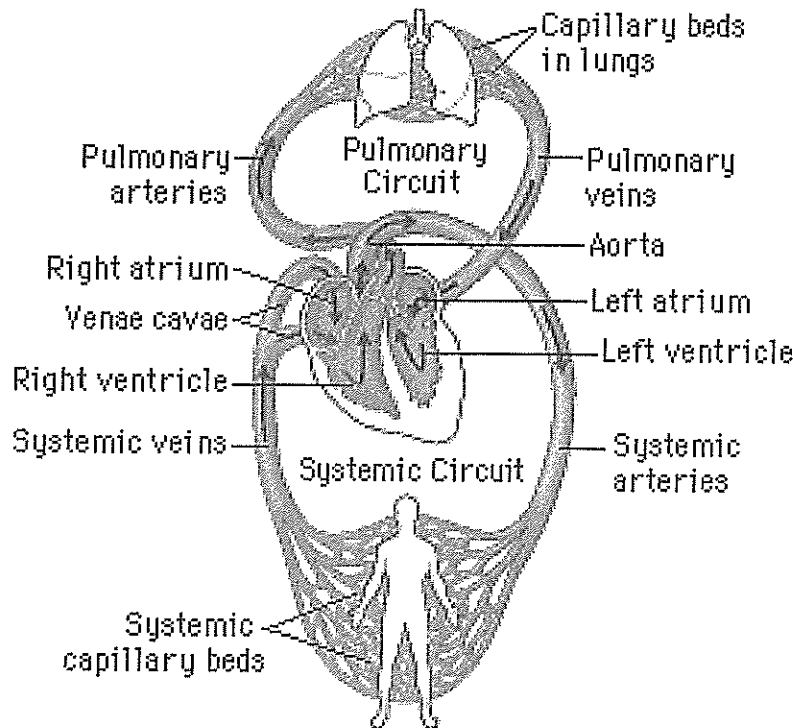
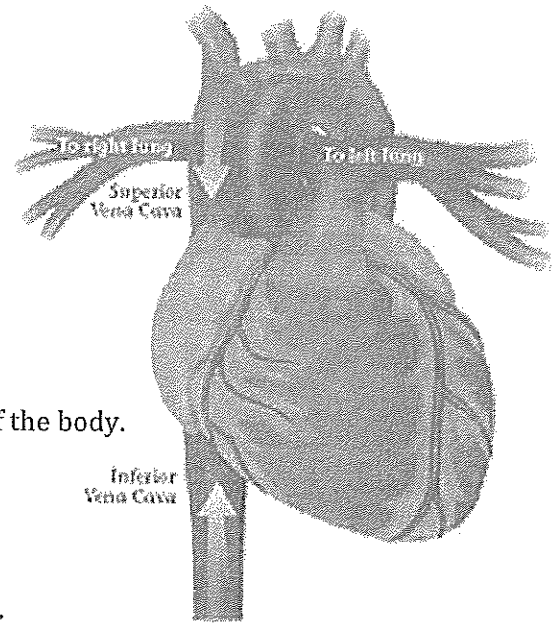
1. Superior Vena Cava
 - a. Large Vein
 - b. Collects blood from upper part of the body (head)
 - c. Blood returns to the right atrium

2. Inferior Vena Cava
 - a. Large vein that collects blood from the lower part of the body.
 - b. Blood returns to the right atrium.

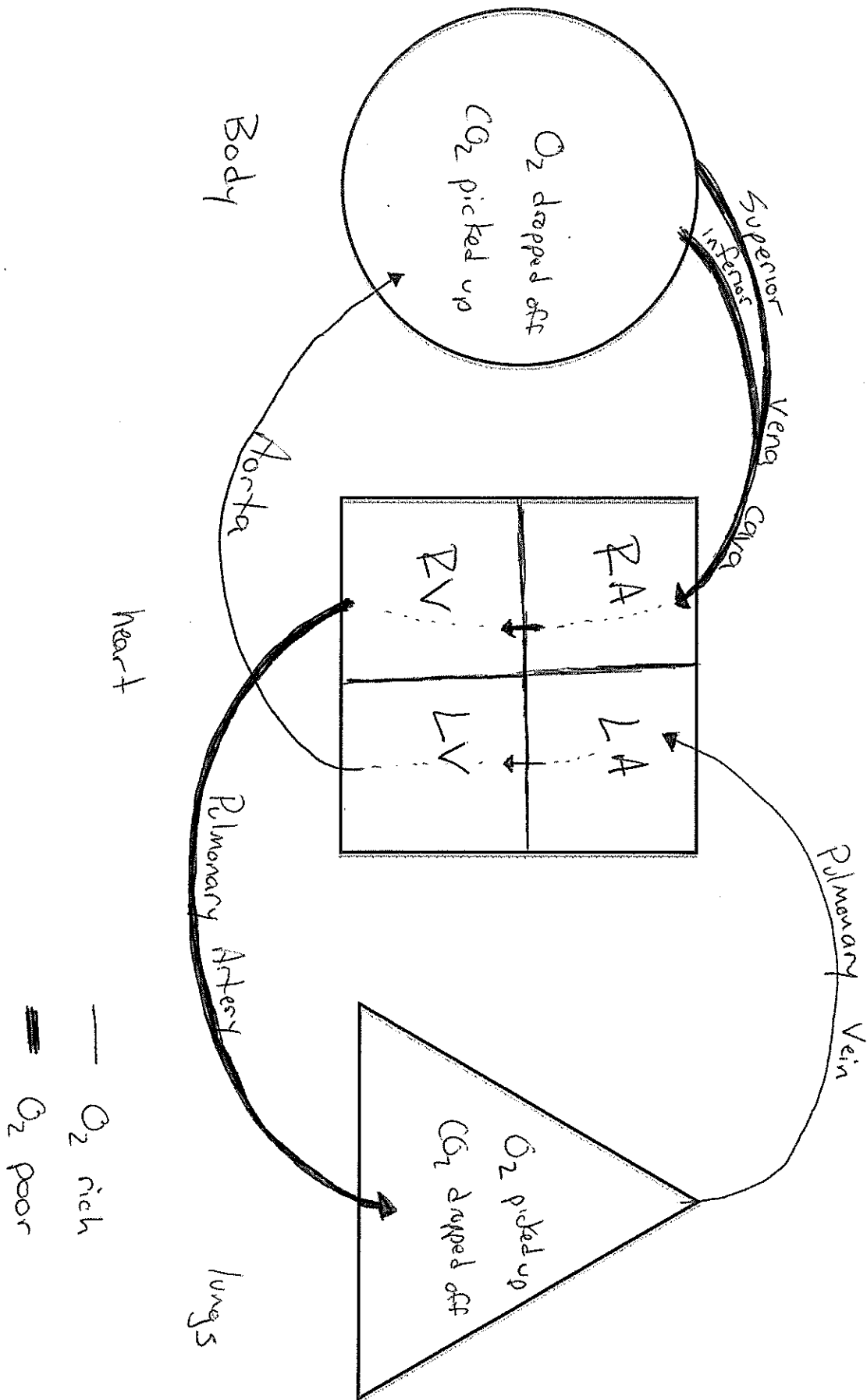
3. Pulmonary Artery
 - a. Blood leaves the Right ventricle and travels to the lungs.
 - b. In lungs blood picks up O₂ and drop off Carbon dioxide.

4. Pulmonary Vein
 - a. Blood is returning from lungs and enters the left Atrium.

5. Aorta
 - a. Largest artery in the body.
 - b. Blood leaves the heart from the Left ventricle.
 - c. Pumps blood all over the body.



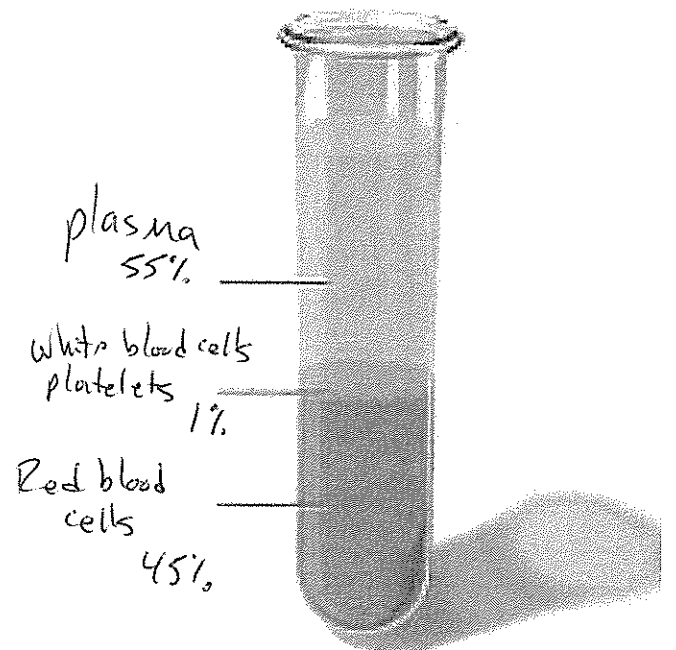
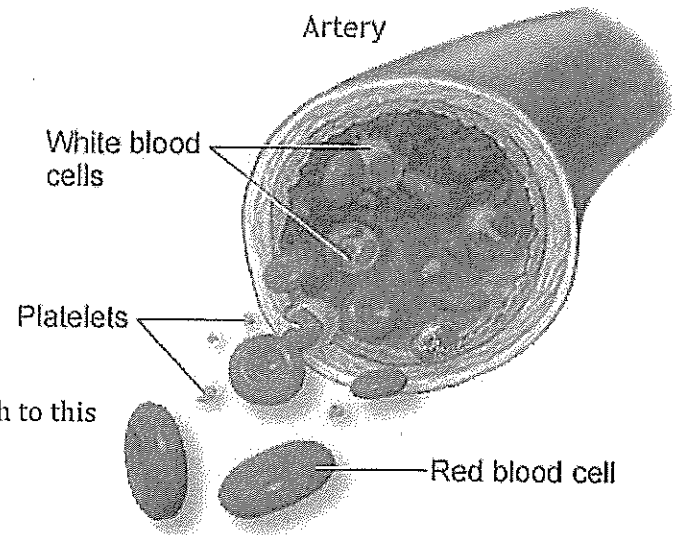
H. Pathway of blood through the body:



H. Pathway of blood through the body:

I. Components of blood:

1. Red blood cells
 - a. Erythrocytes
 - b. Carry oxygen
 - c. Made in bone marrow
 - d. Hemoglobin makes blood red, O₂ and CO₂ attach to this
2. White blood cells
 - a. Leukocytes
 - b. Fight Infection
3. Plasma
 - a. liquid part of your blood.
 - b. They transport blood cells, the end products of digestion, hormone, antibodies, etc...
4. Platelets
 - a. Help your blood to clot



* Not all organisms have red blood.

For example: Some insects have colorless blood. It does not contain hemoglobin and does not carry Respiratory gases. Oxygen gets to the cells via a different route.

J. Blood types:








1. There are 4 main blood groups:

- a. A
- b. B
- c. AB
- d. O

2. Blood type is based on the presence or absence of two proteins

- a. (A and B) on the surface of the red blood cells.

The ABO Blood System

Blood Type (genotype)	Type A (AA, AO)	Type B (BB, BO)	Type AB (AB)	Type O (OO)
Red Blood Cell Surface Proteins (phenotype)	 A agglutinogens only	 B agglutinogens only	 A and B agglutinogens	 No agglutinogens
Plasma Antibodies (phenotype)	 b agglutinin only	 a agglutinin only	NONE No agglutinin	 a and b agglutinin

Universal Donor:

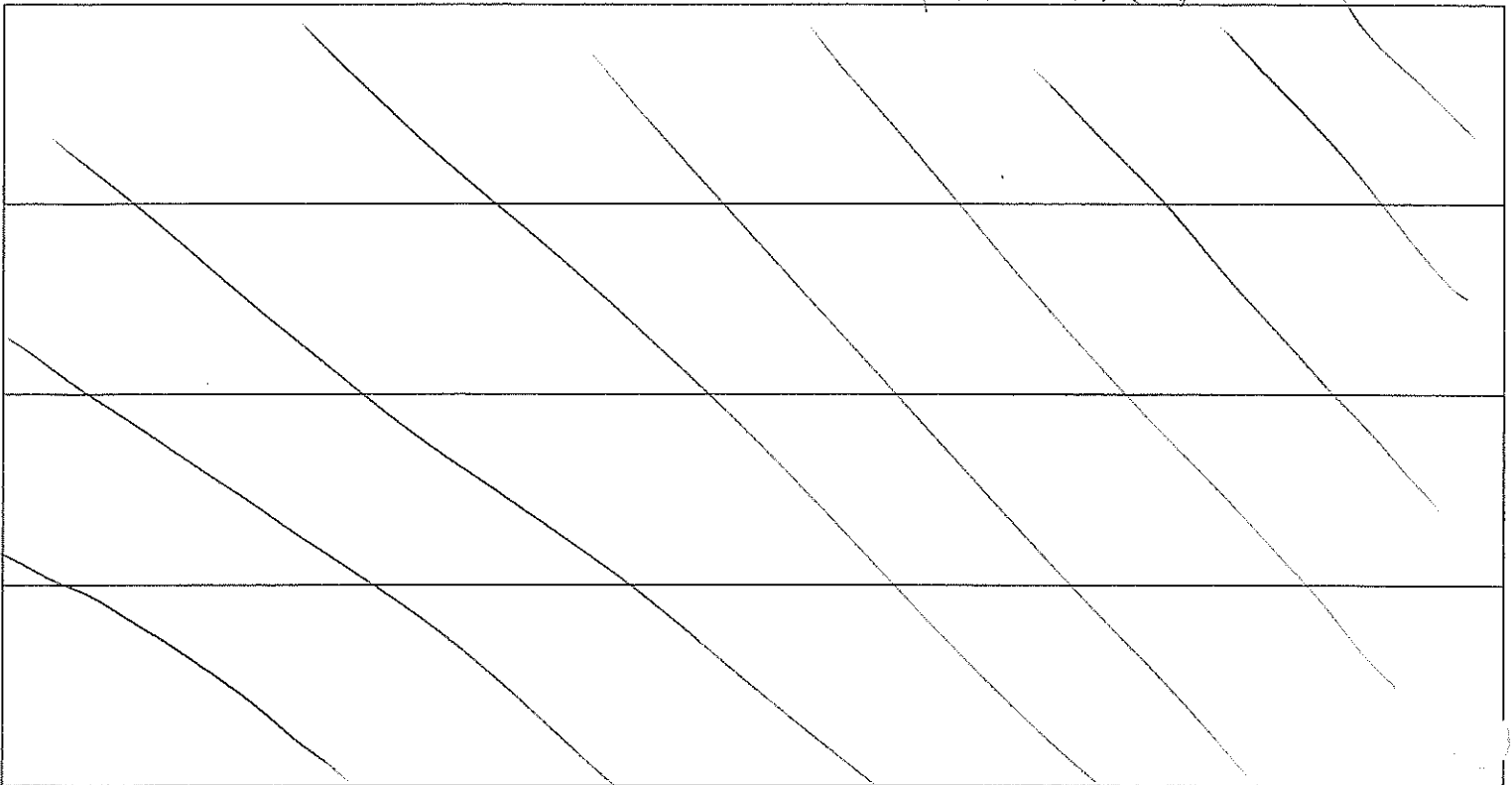
O

Universal Recipient:

AB

ABO Blood test

NEXT CHAPTER



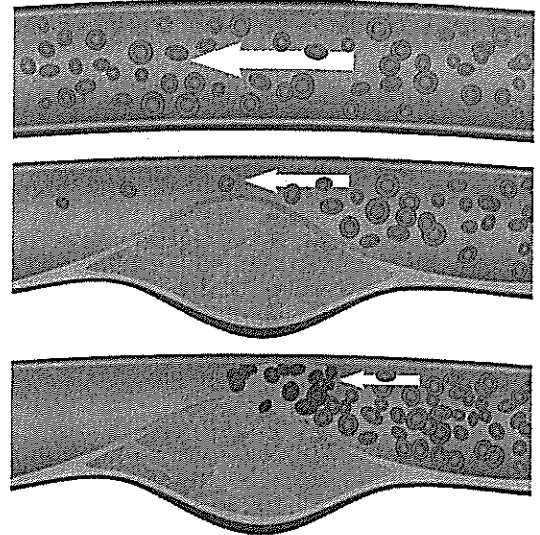
1. Malfunctions of the circulatory system

- Stroke
- Brain Aneurysm
- Heart Attack
- Hypertension

2. Cardiovascular Diseases (any disease that affects the cardiovascular system)

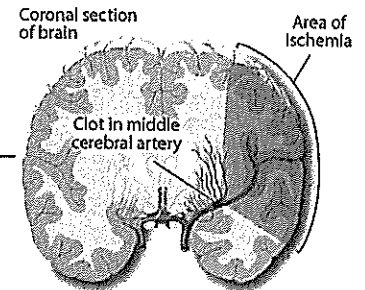
3. Atherosclerosis

An inflammation of the walls of arteries that causes a buildup of a material called plaque



4. Stroke:

- Results from a blockage of artery (Carotid artery) towards the head
- As a result, Brain tissue dies
- Can be fatal



5. Brain Aneurysm

- bulging weak area in an artery - fills up like a balloon
- Can burst and cause internal bleeding or a stroke

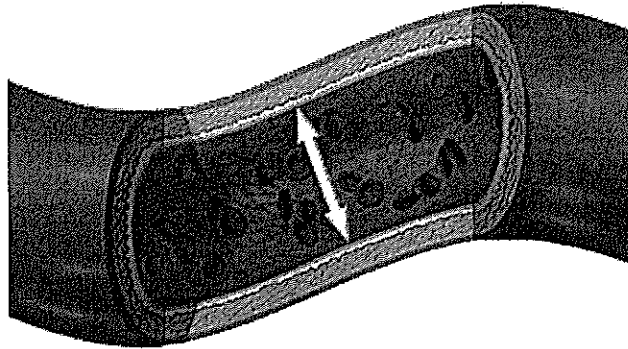


6. Heart Attack

- A heart attack is when part of the heart muscle is damaged or dies b/c it doesn't receive O₂
- Oxygen is carried to the heart by the arteries
- Most heart attacks are caused by a Blockage in these arteries.

7. Hypertension

- a. Is the term used to describe high blood pressure.
- b. Blood pressure is a measurement of the force against the walls of your arteries as your heart pumps blood through your body.
- c. Blood pressure is summarized by two measurements:
 - i. Systolic pressure when the heart muscle is contracting
 - ii. diastolic pressure when the heart is relaxed between beats
- d. Normal blood pressure at rest is within the range of 100-140mmHg systolic (top reading) and 60-90mmHg diastolic (bottom reading).
- e. High blood pressure is said to be present if it is persistently at or above 140/90 mmHg.



8. How does circulation maintain homeostasis

- a. The heart keeps blood flowing through the body which regulates body temperature and delivers the nutrients the body needs

Circulation in Protista:

- diffusion
- osmosis
- active transport

