Developmental Physiology and School Hygiene

Lecture 3.

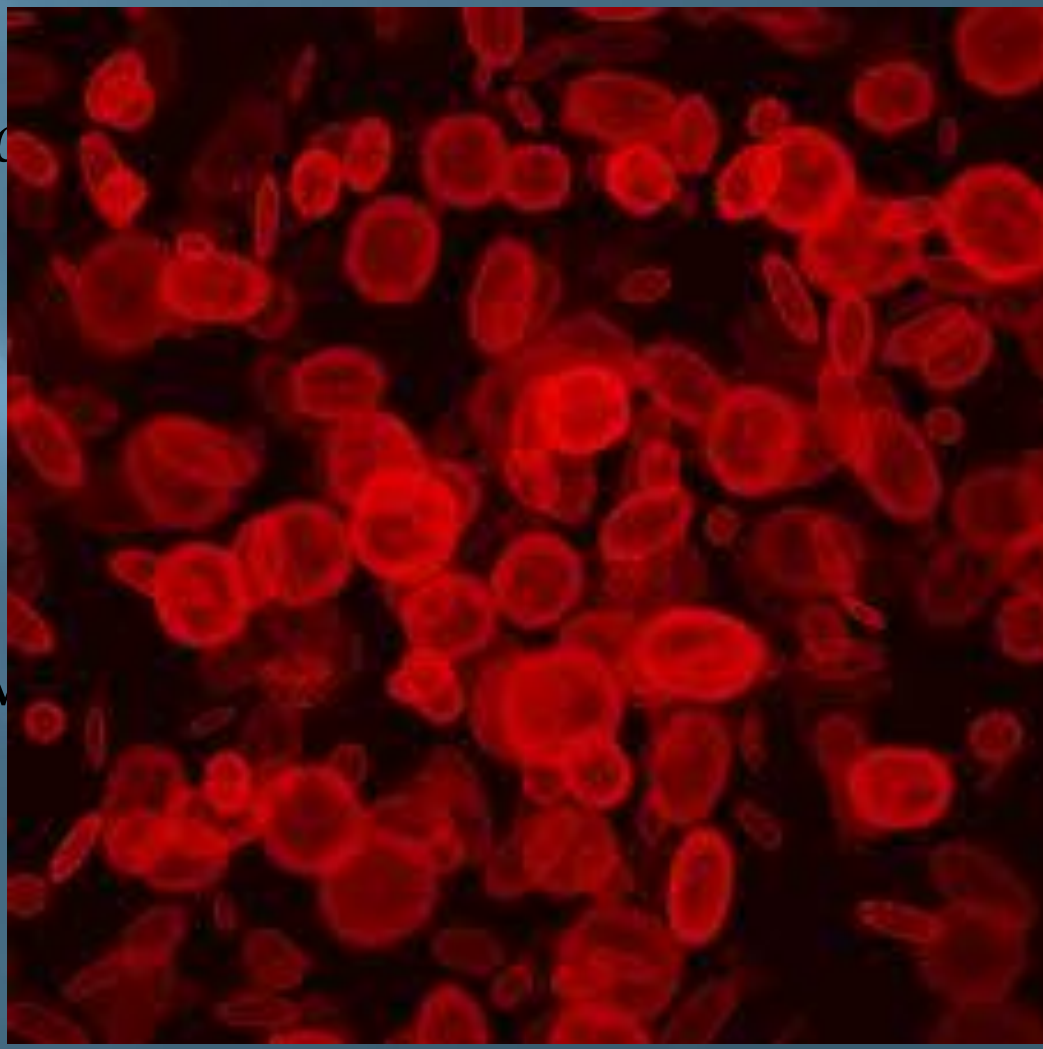
The Blood.

1. *Physical properties and composition of the blood.*
2. *Coagulation of the blood.*
3. *Quantity, functions, and changes of the blood.*
4. *Hygiene of the blood.*

Physical Properties of the Blood:

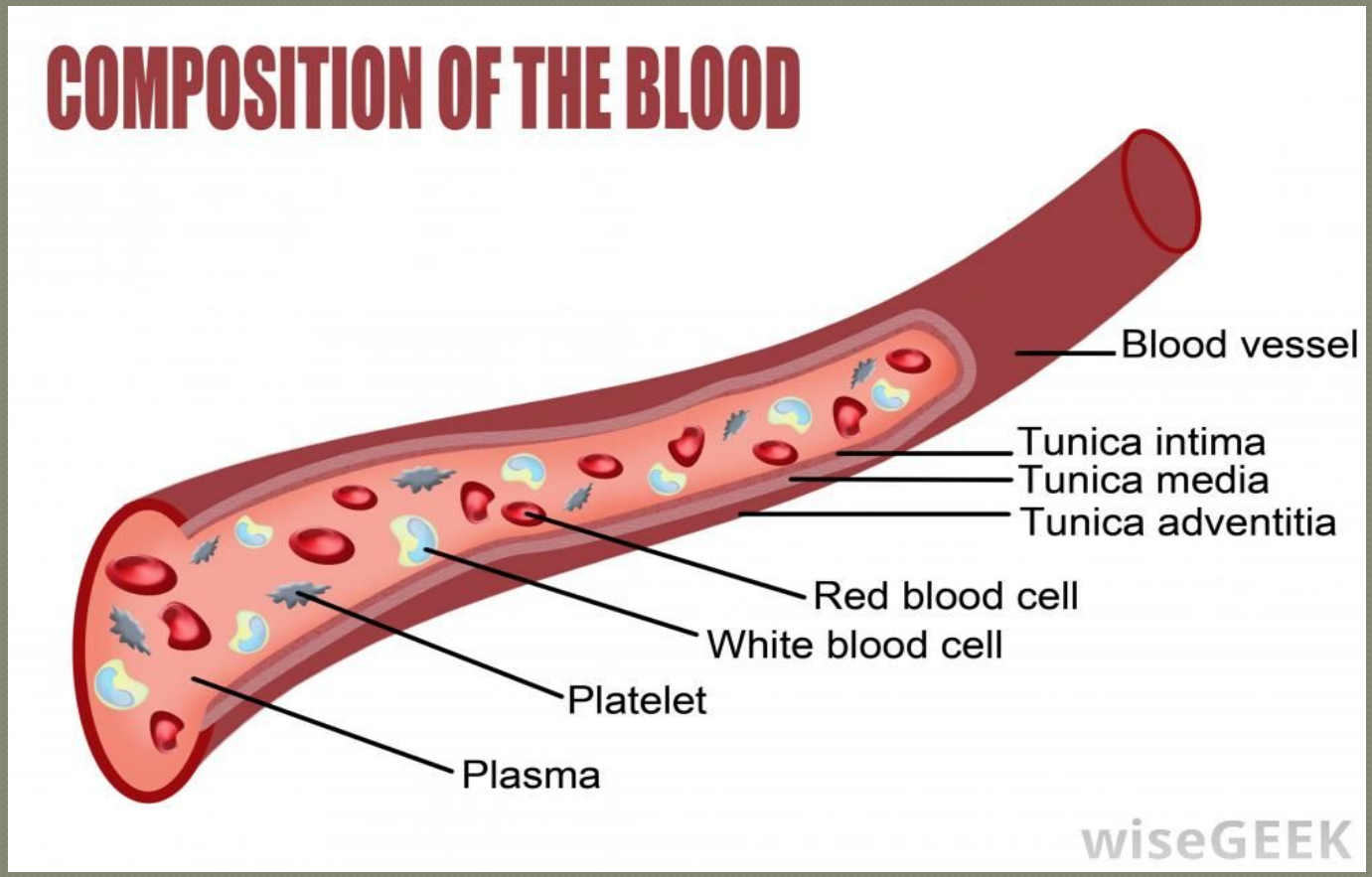
The blood occupies and moves through the bloo vessels.

- Heavier and denser than water
- A faint odor
- A slightly salty taste
- A bright red color (w oxygen)
- A dark red color (no oxygen)



Composition of the blood:

plasma **red blood cells** **white blood cells** **platelets**



RED BLOOD CELLS PROPERTIES

a) Cells called Erythrocytes with no nuclei ;
b) Hemoglobin makes th red ;
c) Numerous (5 mln in a
d) Shortlived (app. 2 m and then replaced by cells);

Function: oxygen carrier the cells (from lungs in the different tissues)

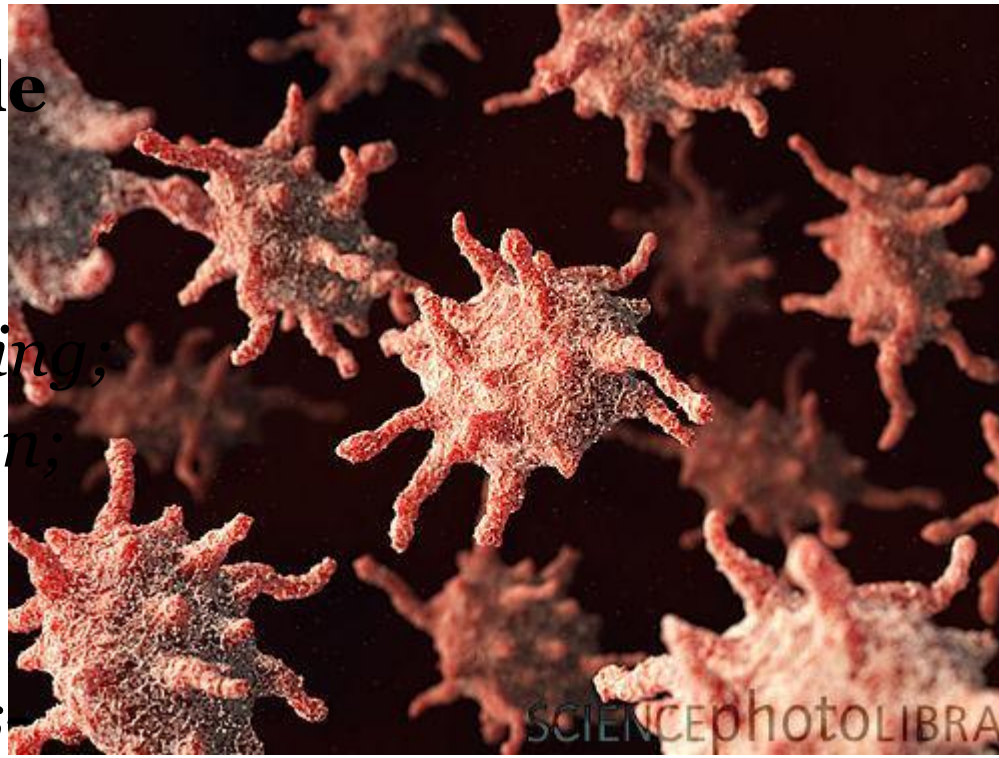
WHITE BLOOD CELLS PROPERTIES.

1) Cells called leucocytes;
2) 1,2 more nuclei;
3) Less numerous (1/50 of the red ones)
4) Larger (1/3 of the red ones)

Functions: destroy the disease germs, healing wounds, aiding coagulation.

Platelets (Thrombocytes)

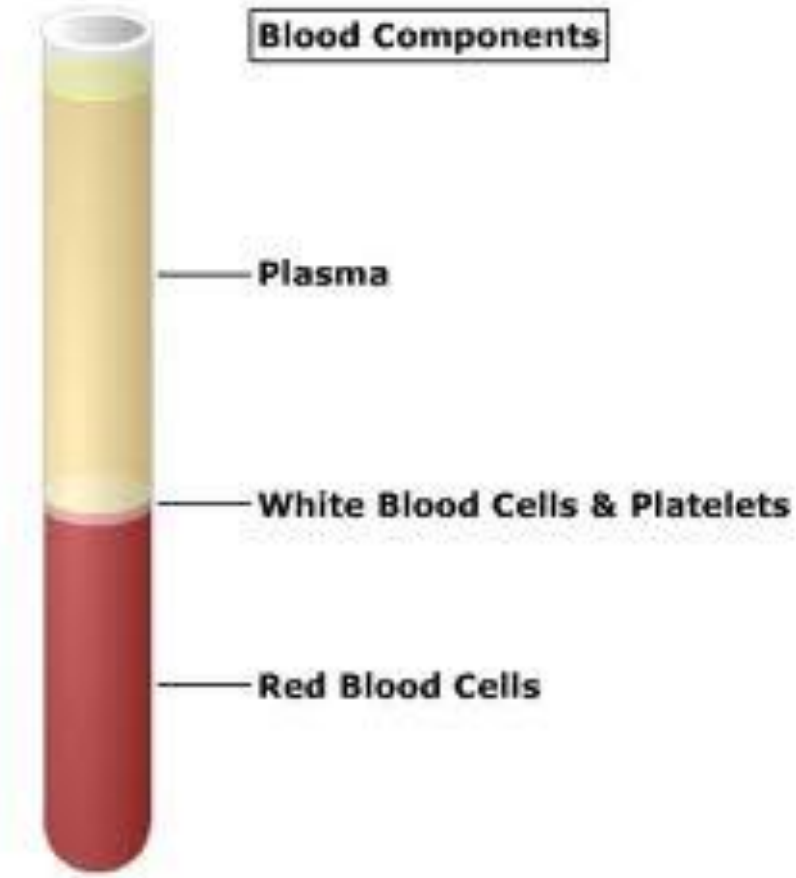
- **-irregularly shaped**
- **-have no nucleus**
- **- Less than 1% of whole blood**



Functions:

- *1. Natural source of healing;*
- *2. Involved in coagulation;*
- *3.too low in number – excessive bleeding;*
- *4. Too high – thrombosis blood clots*

Plasma Properties



- Water
- Dissolved substances: foods and wastes from cells;
- Foods: proteins, carbohydrates, fats, salts
- Wastes: carbon dioxide and urea.

Purposes of Water in the Blood.

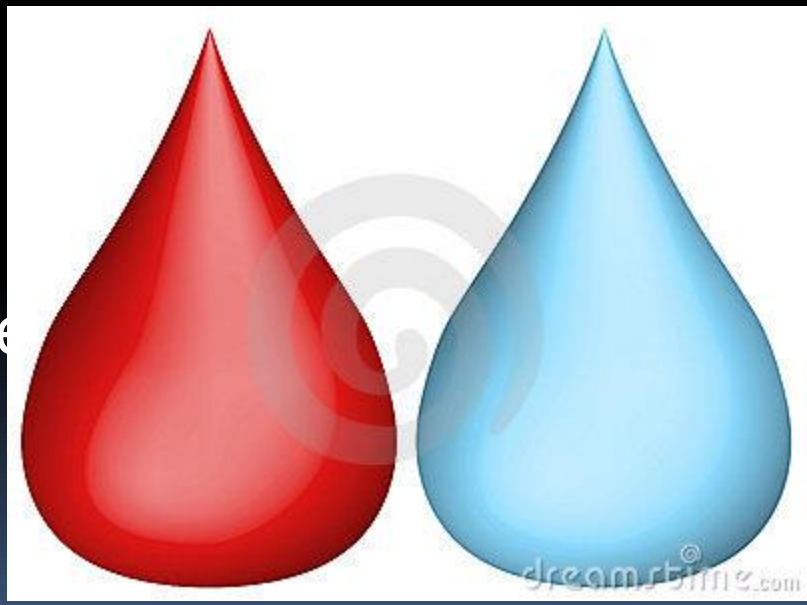
1. Most abundant (80%)

2. Most important

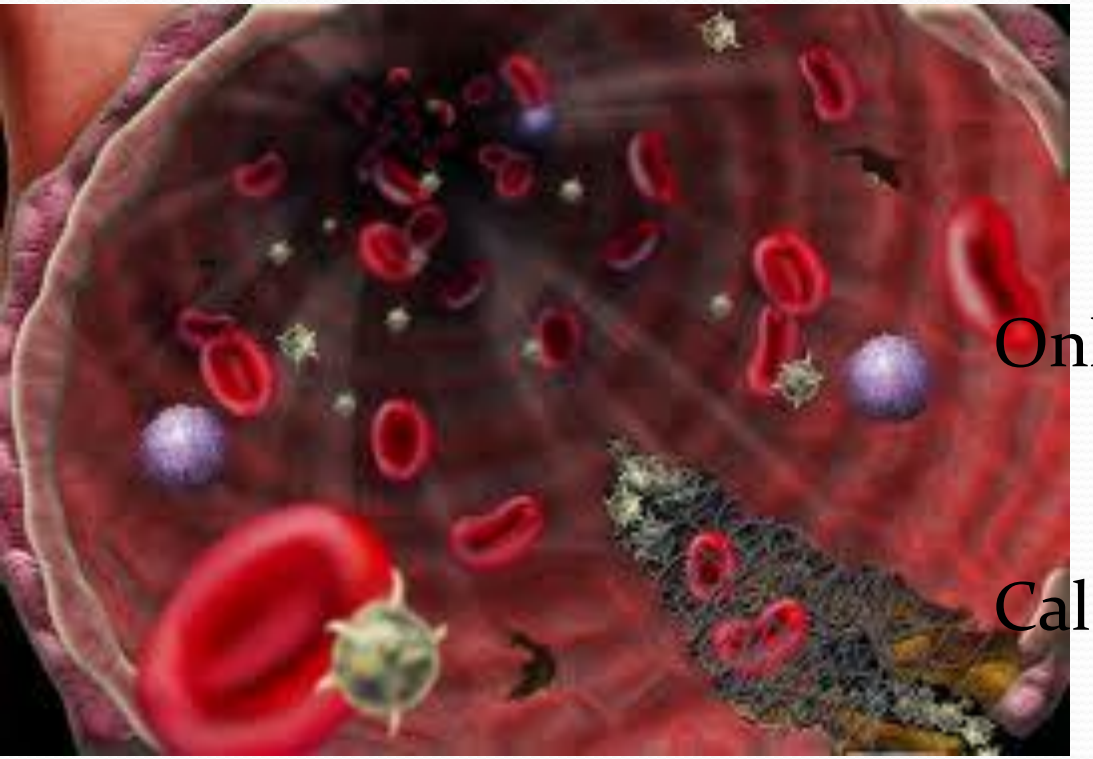
constituent of the blood

Why? 1) The cells of the body Require water blood

2) Water is present in the red/white blood cells and in the plasma.



Coagulation of the blood



When blood escapes from the blood vessels, it undergoes peculiar change known as coagulation

Only one constituent participates in coagulation
- fibrinogen;

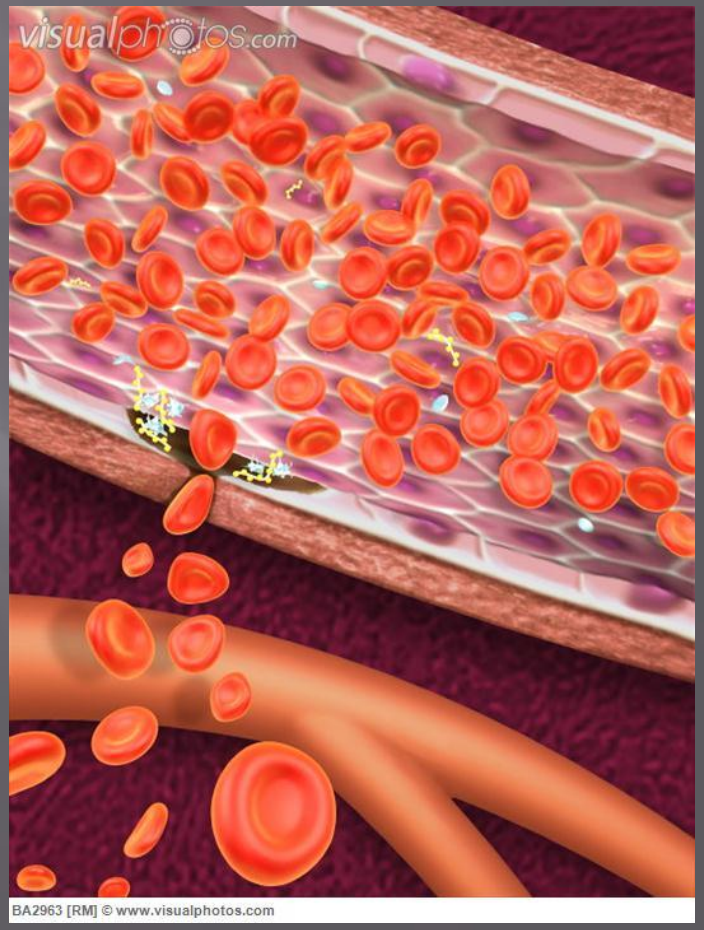
Calcium is really necessary!

Purposes of coagulation

1 purpose to check the flow of blood wounds

2 purpose depends on the t °

Heat hastens cold retards the process



Quantity and change in the Blood.

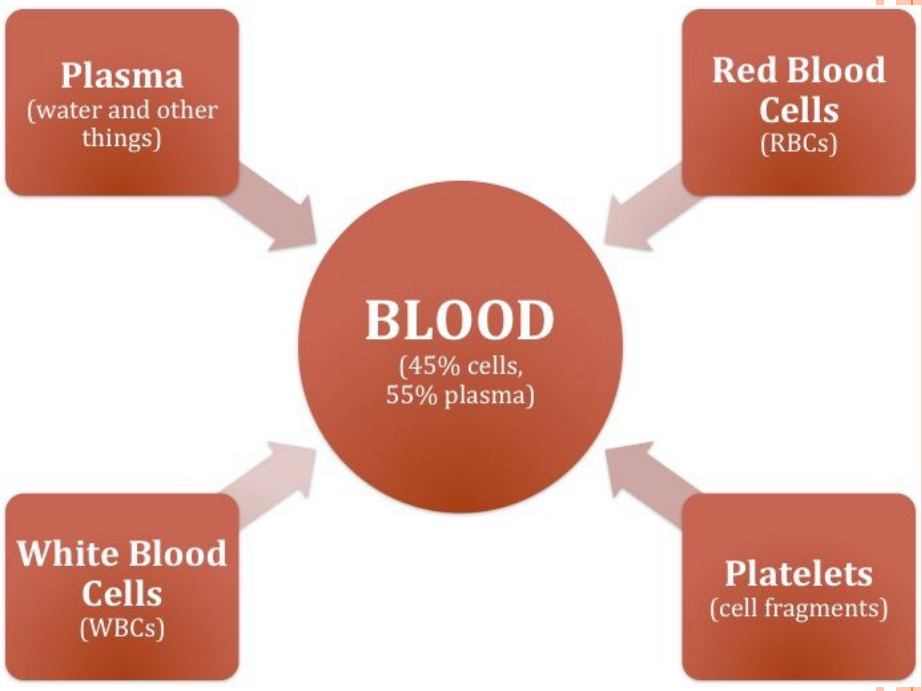
45% made up of cells

55% plasma

app. 1/13 of the entire weight of the body

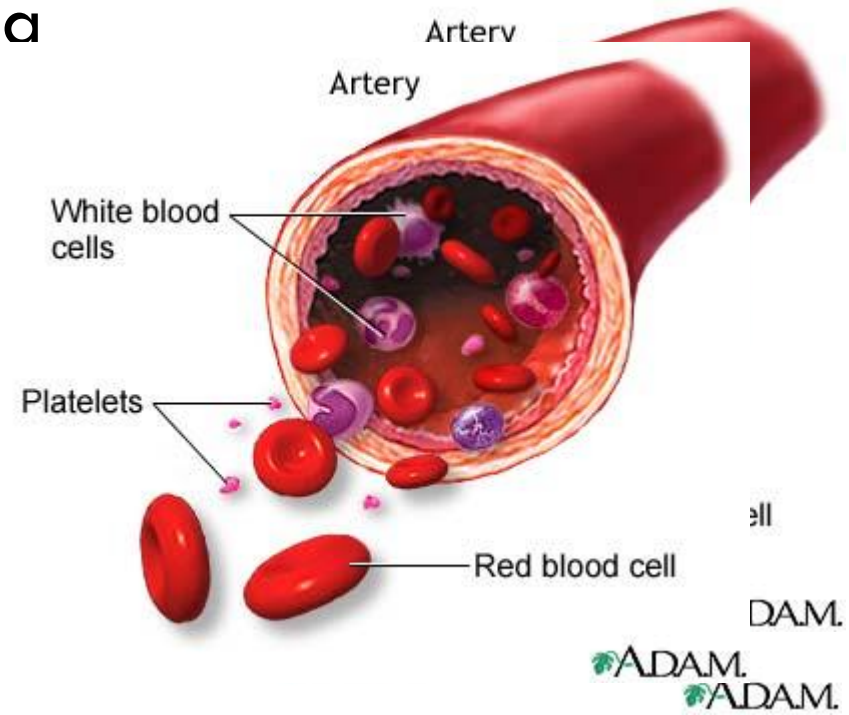
Quantity and character of the blood remain practically constant .

A fair balance of the intake ar
outgo of the blood keeps its composition about the same level.



Functions of the blood.

- Carries food and oxygen to the cells
- Carries waste materials from the cells
- Distributes heat, keeping the same t
- Antiseptic: destroys disease a
- Coagulation: closes leaks i



Hygiene of the blood

- Cultivates those habits that are beneficial and avoid those that are harmful to the blood;
- Blood cells are sufficient in number and vigor in the blood of those who :

a) **Take plenty exercise**
b) **Have outdoor air and sunlight**
c) **Sufficient sleep**
d) **Avoid use of injurious drugs.**

Take care of the organs of excretion: they are natural purifies of the blood!
Impurities come through digestive organs.

Effect of Drugs.

- Medicine (certain types)and alcohol destroy white blood cells

Result: less able to withstand attacks of disease.

Keep the blood in good condition: use natural remedies instead of taking drugs and patent medicines for purifying the blood.

SEMINAR QUESTIONS:

1. Compare blood and water with reference to weight, density, color, odor, and complexity of composition.
2. Show by an outline the different constituents of the blood.
3. Compare the red and white corpuscles with reference to size, shape, number, origin, and function.
4. Name some use or purpose for each constituent of the blood.
5. Define coagulation and its purposes.
6. What purposes are served by water in the blood?
7. Show how the blood, though constantly changing, is kept about the same in quantity, density, and composition.
8. If the oxygen and hemoglobin formed a strong instead of a weak chemical union, could the hemoglobin then act as an oxygen carrier? Why?
9. What habits of living favor the development of corpuscles in the blood?
10. Why will keeping the skin clean and active improve the quality of one's blood?