CHAPTER TWENTY TWO

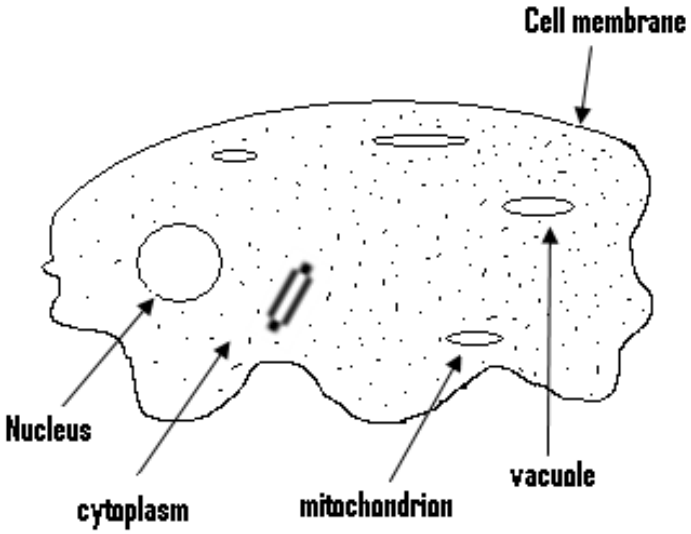
CELLS AND BLOOD

Cell:

- This is the smallest unit of a living organism, which is capable of basic life processes such as excretion and reproduction. All living things are composed of cells, and certain microscopic organisms such as the bacteria, protozoa, euglena as well as amoeba consist of a single cell.For this reason, they are said to be unicellular.On the other hand, plants, animals, humans and fungi are composed of many cells and are therefore said to be multicellular. The cell consists mainly of the cytoplasm and the nucleus, which are collectively referred to as the protoplasm.The cytoplasm is a jelly-like fluid within the cell, which consist of about 90% water with salt and sugar dissolved in it.Fats and proteins are suspended in the cytoplasm**.**The function of the cytoplasm is that it contains all the organelles, starch granules and oil globules.At the centre of the cytoplasm is a dense structure called the nucleus, which is surrounded by the nuclear membrane.The functions or importance of the nucleus are that, it controls all the chemical processes or reactions within the cell, and it is also responsible for the division of the cell.Apart from that the nucleus also contains the chromosomes, which carry the genetic information of the cell.

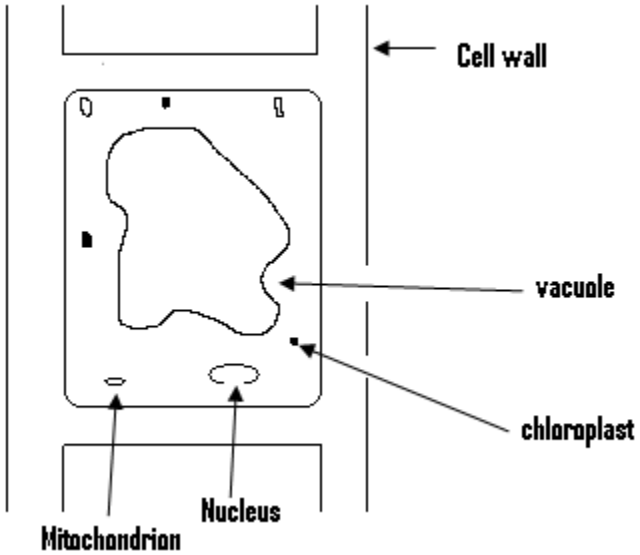
There are two types of cells and these are the plant and the animal cells.The outer cover of the animal cell is referred to as the cell membrane or the plasma membrane.It is very thin and semi-permeable, made up of layers of lipids and protein**.**Cell wall is the name given to the outer covering of a plant cell, and it is made up of carbohydrate called cellulose.Found also within the cell are the vacuoles and the mitochondrion.

The animal cell



- Animals cells are of different shapes and sizes and may be spherical, irregular or spiral in shape.They are flexible and consist of the cell membrane, which is the outermost wall.Within the cell membrane can be found the cytoplasm and nucleus, which are referred together or collectively as the protoplasm, which is the living part of the cell.Found also within the animal cell are the mitochondrion, and open spaces called the vacuoles which accumulate food and waste materials from the cells.The nucleus directs all the living processes within the protoplasm, while all the chemical processes take place in the cytoplasm.

The plant cell



The plant cell has a rectangular outline and a fixed shape. It consists mainly of the cell wall, chloroplast, mitochondrion, cytoplasm, nucleus and the vacuole.The cell wall protects the inner part of the cell which is known as the protoplasm.The chloroplast found within the plant cell gives the green colour to most leaves and stems, and apart from that it also absorbs sunlight for photosynthesis.The vacuole accumulates the food and waste found within the cell.

Differences between plant and animal cells;

(1)Plant cell has cell wall, while animal cell has cell membrane.

(2) Plants cells have chloroplast but animals do not.

(3) Plant cell has a large vacuole and a small cytoplasm, but animal cell has a small vacuole and a large cytoplasm.

(4) Plant cells are bigger than animal cells.

Tissue:

- This is formed when a group of cells comes together to perform the same duty.- Examples of tissues found in animals are the bones, the nerves and the muscles.- Also examples of tissue found in plants are the phleom and the xylem.

Organs:

- This is formed when a group of tissues come together to perform the same function.- Examples of organs found in animals are the heart and the kidney, and that of those found in plants are the roots, the stem and the leaves.

System:

- This is formed by the coming together of a group of organs to perform the same function.- An example is the circulation system, which consists of the heart, the blood, the veins, the arteries and the capillaries.The excretory system consists of the kidney, the bladder, and the urethra.

Organism:

- This is formed from the efficient co-ordination of organs and systems, to produce an individual capable of separate existence.

Blood:

- This is a living tissue and is the life stream of the human body.

- This red fluid performs many tasks, and no part of the body can live without it.

- Blood supplies the cells of the body with the food and oxygen they need for work and growth.

- It carries waste products from the cells to special organs that remove them from the body, or break them down into harmless substances.

- It is the heart which pumps the blood through the body.

- Eventhough blood flows from the heart through the arteries, it is returned to the heart through the veins.

- The large arteries which leave the heart carry blood into smaller and smaller vessels, with the smallest of these being the capillaries.

- Oxygen, food and waste pass between the blood and the body cells through the walls of the capillaries.

- Blood flows from the capillaries into larger and larger veins, until it reaches the great veins that enter the heart.

- Many other organs work to keep the blood functioning.

- For example, the lungs supply it with oxygen and remove carbon dioxide from it.

- While the kidney keeps it free of poison, the liver and the intestines supply the blood with food.

The components or the composition of blood:

Blood has four main parts and these are:

(1) Plasma. (2) Red blood cells.

(3) White blood cells. (4) Platelets.

Plasma:

--This is the liquid part of the blood.

-- The red and white blood cells as well as the platelets are solid substances that are

suspended in it.

-- Eventhough it consists mostly of water, it also contains other substances such as protein, digested food, waste products and minerals.

-- Digested food enters the plasma from the intestines, and the blood carries it to the body cells, which use it to produce energy and new tissue.

-- Waste products are picked up from the cells by the blood, and the plasma carries many of these wastes.

-- The kidney and the liver remove waste from the plasma.

-- Plasma also carries various minerals and dissolved gases,and also carries homones from one part of the body to anther.