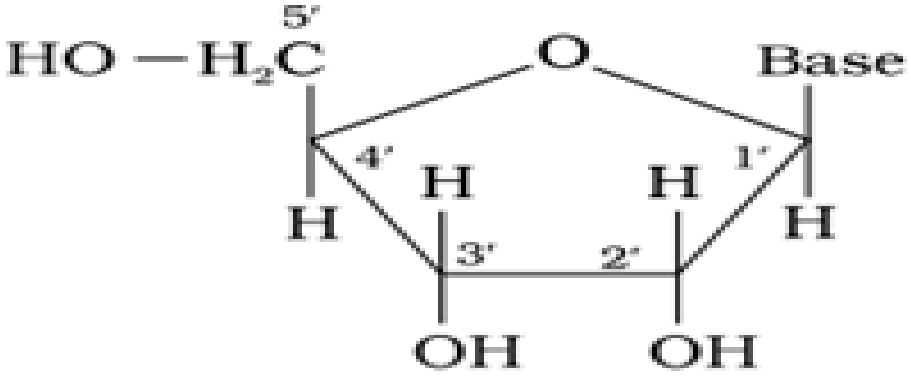
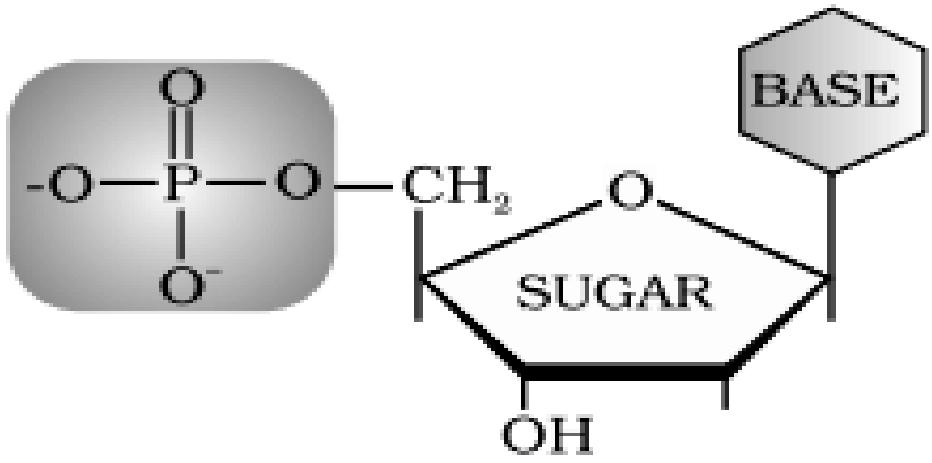
Nucleic Acids
Nucleic acids are chain like polymers of thousands of nucleotide units, hence they are also called polynucleotides.

Nucleoside
A unit formed by the attachment of a base to 1' position of sugar is known as nucleoside.



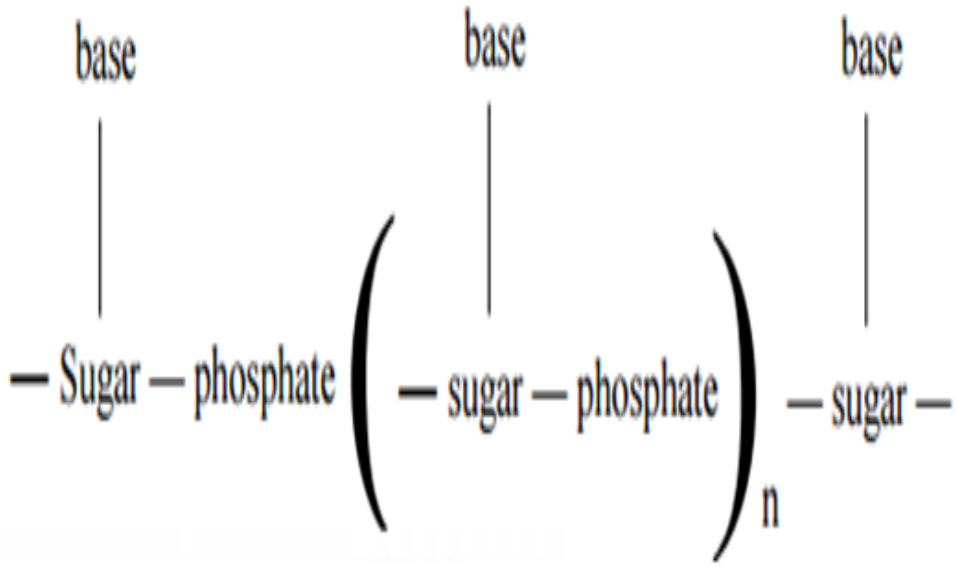
Structure of nucleoside

Nucleotide
A nucleotide consists of three subunits: a nitrogen containing heterocyclic aromatic compound which is called base, a pentose sugar and a molecule of phosphoric acid.



Structutre of a nucleotide

Structure of Nucleic Acid
Thus, a nucleic acid chain is represented as shown below.



Types of Nucleic Acids
The nucleic acids are of two types:

(i) Deoxyribonucleic acid (DNA)

(ii) Ribonucleic acid (RNA)

- DNA is mainly localised in the nucleus, within the chromosome. While small amount is present in cytoplasm. RNA is also present in the nucleus as well as cytoplasm.

- DNA is mainly used in protein synthesis involving RNA and also a major source of genetic information.

- DNA contains doxy-ribose while RNA contains ribose.

Structure of DNA
- DNA has a double helix structure in which the two strands are anti-parallel and are held together by hydrogen bonds.

- In DNA molecule, adenine (A) pairs up with thymine (T) via two hydrogen bonds and guanine (G) pairs up with cytosine (C) via three hydrogen bonds. Therefore, CG base pair has more stability than AT base pair.

Structural difference between DNA and RNA
There are mainly two structural differences Between DNA and RNA

- Sugar part: DNA contains deoxyribose while RNA contain riboses.

• Base part: In DNA, four bases have been found. They are adenine (A), guanine (G), cytosine (C) and thymine (T). The first three of these bases are found in RNA but thymine (T) is replaced by uracil (U) in place of Thymine.

Importance of DNA

• DNA is the store house of the hereditary information of the organism.

• DNA is involed in protein synthesis.

Vitamins

• Vitamins are a group of organic compounds which are essential for normal growth and nutrition and are required in very small amounts for maintaining optimum growth and a good health.

• Their absence causes specific deficiency diseases.

• Most of the vitamins cannot be synthesised in our body but plants can synthesise almost all of them.

• Vitamin D is an exception because it can be made in the skin from exposure to sunlight.

Classification of Vitamins

On the basis of solubility in water, vitamins are classified into the following two types:

• Fat soluble vitamins: Vitamins A, D, E and K are oil soluble.

• Water soluble vitamins: The group includes Vitamins B and C. These are stored in much lesser amounts in the cells.

Note: Vitamin H (Biotin) is an exception, since it is neither soluble in water nor in fat.

Some important Vitamins, their Sources and their Deficiency Diseases are dictated in the table given below

Name of Vitamin	Important Sources	Deficiency Diseases
Vitamin A	Fish liver oil, Milk, butter, egg yolk, green and yellow vegetables.	Night blindness, Xerophthalmia (hardening of cornea of eye).
Vitamin B_1	Yeast, milk, green vegetables, cereals, fruits, egg yolk.	Beriberi (loss of appetite, retarded growth)
Vitamin B_2	Egg yolk, liver, milk, green leafy vegetables.	Cracked lips, sore tongue, digestive disorders and burning sensation of the skin.

Vitamin B_6	Milk, egg yolk, cereals, yeast, legumes.	Nervous disturbances and convulsions.
Vitamin B_{12}	Meat, fish, kidney, eggs.	Pernicious anaemia (RBC deficient in haemoglobin)
Vitamin C	Citrus fruits, amla and green leafy vegetables.	Scurvy (bleeding gums)
Vitamin D	Exposure to sunlight, fish and egg yolk	Rickets (bone deformities in children) and osteomalacia (soft bones and joint pain in adults)
Vitamin E	Milk, ghee, vegetable oils like wheat germ oil, sunflower oil, cotton seed oil.	Increased fragility of RBCs and muscular weakness
Vitamin H	Milk, yeast, liver, kidney.	Loss of hair, dermatitis.
Vitamin K	Green leafy vegetables, fish, meat, cereals.	Increased blood clotting time