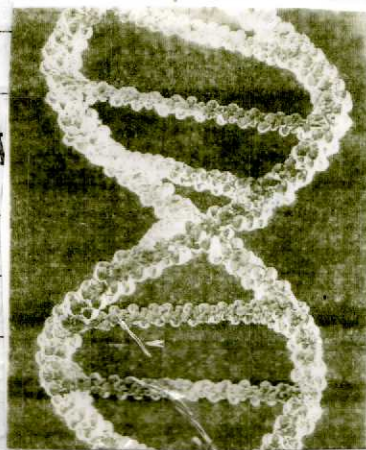




Molecular Genetics

State the structure of DNA in terms of bases, sugar and phosphate groups found in each nucleotide.

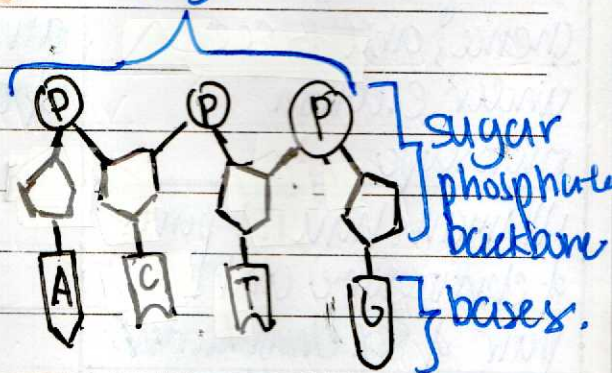
• DNA (Deoxyribose nucleic Acid) consists of 2 strands of polynucleotide which are antiparallel and coiled together in a double helix shape



• Each polynucleotide strand is made up of smaller basic unit called nucleotide joined together, sharing a sugar phosphate backbone.

polynucleotide

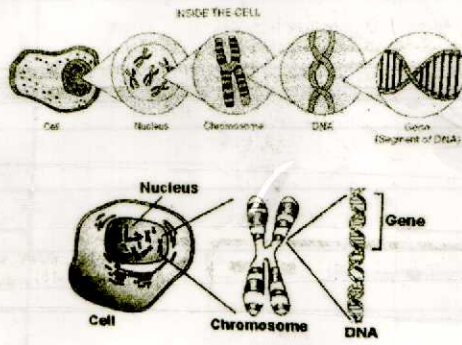
• Each nucleotide is made up of 3 parts: A deoxyribose pentose sugar, a phosphate group and a nitrogenous base

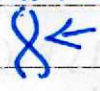


• There are 4 types of nitrogenous base: Adenine (A), Thymine (T), Guanine (G), Cytosine (C).

• A pairs with T, G always pairs to C. This is according to the rule of complementary base pairing.

• half of chromosome is chromatid!



Chromosomes	DNA	Gene
• The form of DNA found in nucleus of the cell	• The basic, uncoiled condensed form	• A segment of DNA, which contains genetic information coding for a specific polypeptide for a specific trait.
• DNA that has been wrapped around proteins (histones), coiled and condensed many times hence, able to see under electron microscope	• Double strand helix structure. 	• The sequence of nucleotide bases in the gene determines what polypeptide is produced. Hence, expressed phenotype of the trait is coded by the gene.
• Humans have 22 pairs of chromosome and 1 pair of sex chromosomes.		
• Function: contain all genetic information of an organism		

Outline the relationship between genes, chromosome and DNA

A chromosome is DNA in a form that is wrapped around proteins, coiled and condensed.

A gene is only a segment of entire DNA molecule.

While the chromosome and DNA contain genetic information for the entire organism,

each gene only codes for 1 specific polypeptide for 1 specific function, according to the specific sequence of nucleotide of the gene.

