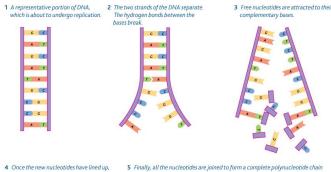
## **Nucleic Acids**

## Structure of DNA and RNA:

- Deoxyribonucleic acid and ribonucleic acid are important information-carrying molecules. DNA holds genetic information and RNA transfers genetic information from DNA to ribosomes.
- DNA and RNA are both polymers of nucleotides:
- Phosphate group Phosphoric acid joins the nucleoside (sugar and NITROGENOUS base) forming a Phosphoester bond in a BASE (eg. Adenine) condensation reaction. Purine bases: adenine and guanine (double ring • structures). **Phosphoester Bond** Pyrimidine bases: thymine/uracil, SUGAR cytosine (single ring structure). (Deoxyribose or Ribose) A & T/U join by 2 hydrogen bonds. C & G join by 3 hydrogen bonds. The strands need a '3 ring gap' to keep parallel. Sugar phosphate backbond A condensation reaction between 2 nucleotides forms a phosphodiester bond, join between sugar of one and phosphate of another. Phosphate -Many nucleotides form a chain = sugar-phosphate ne. • Base suga Double helix = antiparallel chains twisted RNA is a much shorter polymers t de chain than DNA. The simplisition I Mitstucture = doubt that it carries the genetic code. Base to tf DNA: Phosphodiester Has to be tabe opass genetic information on to the next bond Urogen bonds are easily broken = easy replication. nucleotide added to the There is a lot of information in a very small space. 0 Sugar-phosphate backbone acts as protection to the bases. 0 Base

## DNA Replication:

- The semi-conservative replication of DNA ensures genetic continuity between generations of cells.
- Meselson-Stahl experiment is evidence (E.coli and N14 and N15 mediums).
- The 2 strands of DNA unwind, leaving what will be 2 template strands.
- The hydrogen bonds are then broken by DNA helicase.
- Complementary nucleotides join by DNA polymerase.
- Daughter strand is half of the original DNA and half newly synthesised nucleotide.







5 Finally, all the nucleotides are joined to form a complete polynucleotide chain using DNA polymerase. In this way, two identical strands of DNA are formed. As each strand retains half of the original DNA material, this method of replication is called the semi-conservative method.

