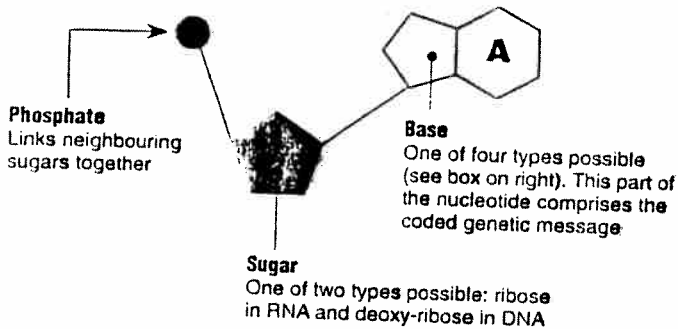


Nucleic Acids

Nucleic acids are a special group of chemicals in cells concerned with the transmission of inherited information. They have the capacity to store the information that controls cellular activity. The central nucleic acid is called **deoxyribonucleic acid (DNA)**. DNA is a major component of chromosomes and is found primarily in the nucleus, although a small amount is found in mitochondria and chloroplasts. Other nucleic acids are involved in the 'reading' of the information in DNA. These are called **ribonucleic acids (RNA)** and make up structures such as messenger RNA

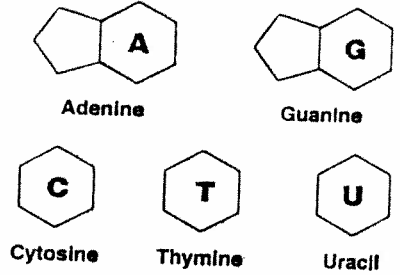
(mRNA), transfer RNA (tRNA), and (with protein) ribosomes. Nucleic acids are made up of simple repeating units called **nucleotides**, linked together to form chains or strands, often of great length. The strands vary in the sequence of the bases found on each nucleotide. It is this sequence which provides the 'genetic code' for the cell. In addition to nucleic acids, certain nucleotides and their derivatives are also important as suppliers of energy (ATP) or as hydrogen ion and electron carriers in respiration and photosynthesis (NAD, NADP, and FAD).

Nucleotide Structure



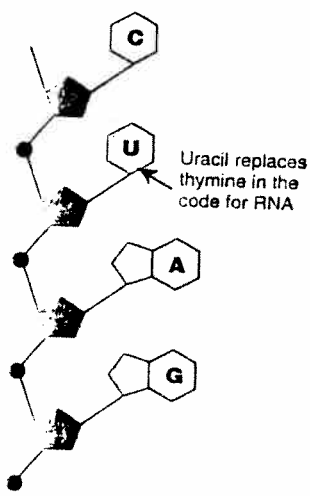
Nucleotides are the building blocks of DNA. Their precise sequence in a DNA molecule provides the genetic instructions for the organism to which it governs. Changes in nucleotide sequences are a cause of mutations.

Bases



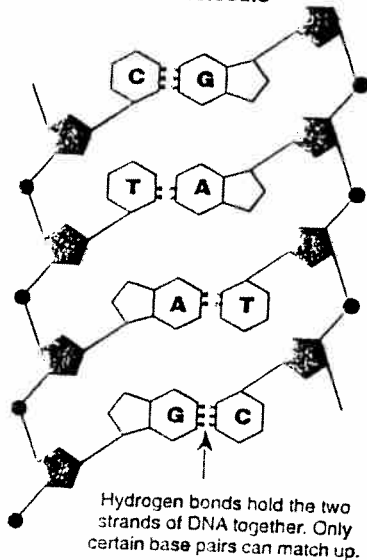
Nucleotides have four kinds of base making up part of their structure. Both DNA and RNA use the same bases with the exception of uracil which is found only in RNA. Uracil replaces the equivalent base thymine, found in DNA.

RNA Molecule



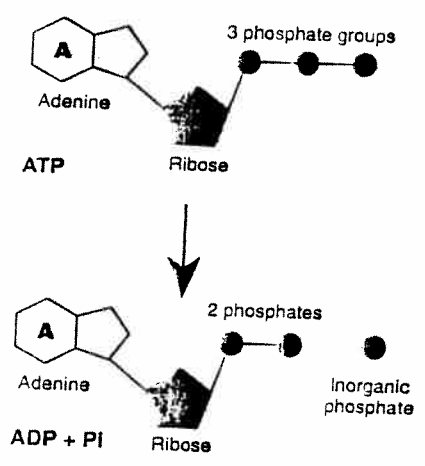
Ribonucleic acid (RNA) consists of a single strand of nucleotides linked together.

DNA Molecule



Deoxy-ribonucleic acid (DNA) consists of a double strand of nucleotides linked together, forming a twisted double helix.

Adenosine Triphosphate (ATP)



ATP consists of an adenine linked to a ribose sugar and 3 phosphate groups. It supplies the energy to power cellular reactions. When releasing its energy, it loses a phosphate group to become ADP.

- (a) Name the repeating unit that makes up DNA and RNA molecules: _____

(b) Name the three components that make up these repeating units: _____
- The base of each type of nucleic acid will pair up with only one other type of base. Study the diagram of the DNA Molecule (above right) and determine the Base Pairing Rule for complementary (double) DNA strands:

(a) Cytosine only pairs with: _____

(c) Adenine only pairs with: _____

Biology 12 – Nucleic Acids

Compare DNA and RNA:

	DNA (deoxyribonucleic acid)	RNA (ribonucleic acid)
Sugar		
Types of Bases		
# of Strands		
Function		