

PART I. KNOW YOUR NUCLEOTIDES: Nucleic Acid Structure

A. PREPARATION

1. Before you begin, read the section in your text which introduces DNA and its nucleotide structure. Indicate under "A. Examples" on the Nucleic Acids outline sheet (pink) where in a cell most of the RNA and most of the DNA are found.
2. Now, read over all the steps below before proceeding. (The sub-unit cut-outs are simplified models of their respective molecular structures).

B. BUILDING NUCLEOTIDES

1. INFORMATION: Nucleic acids (DNA and RNA) are all long chains, each link of which is a main building block called a NUCLEOTIDE. Each nucleotide is, in turn, made up of 3 sub-units: a) a PHOSPHATE group; b) a PENTOSE sugar (ribose in RNA, or deoxyribose in DNA); and c) one of 5 possible nitrogenous BASES (adenine, guanine, cytosine, or thymine in DNA; adenine, guanine, cytosine, or uracil in RNA).
2. Cut out one of each of the different model sub-units (next page) involved in the sub-structures of different nucleotides, and paste or glue each one in its proper space provided on the pink outline sheet (part B-1).
3. Now, cut out the remaining sub-unit models, and arrange the appropriate units together to build each of the nucleotides named under "Examples of Nucleotides" in the outline (part B-2). Follow the example shown for the first one: Adenine ribonucleotide. Of course, for ribonucleotides, use ribose sugars, and for deoxyribonucleotides, use deoxyribose sugars.
4. As you work with each sub-unit and each nucleotide, repeat its name over and over. By doing this, you will be learning the names for these vital parts of the "thread of life".
5. Place each set of sub-units (each nucleotide assembled as above) in the appropriate space (beneath its name) in the outline. When you are certain it is correctly done paste or glue each piece in place.
6. Connect the sub-units of each nucleotide to each other by bond lines at the proper positions (marked by short marks in the sub-units). When high energy bonds exist, show each by a wavy line (as in ATP).
7. When you finish, all cut-out pieces will have been used. Have your completed Nucleic Acid outline sheet ready to be checked tomorrow.
8. Review the text material which deals with these basic structures. Especially fascinating is to read the detective story about how the structure of DNA was discovered by James Watson, Francis Crick, and their associates back in 1952. What were the clues, and how did they lead to that momentous discovery? Read "The Double Helix" by James Watson, 1980, and earn extra credit, too!.