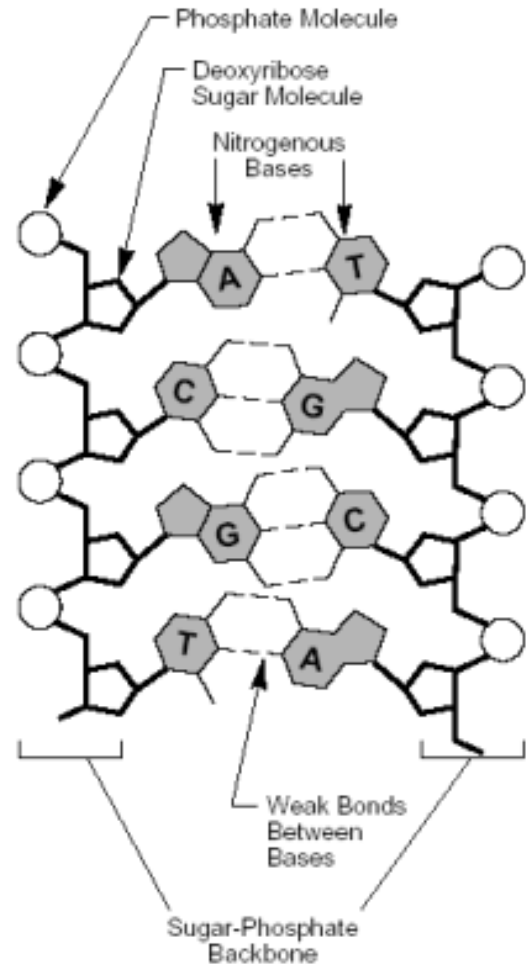


DNA Fact Sheet

- **DNA** stands for the chemical deoxyribonucleic acid.
- DNA is the chemical which stores genetic information in all living cells.
DNA from all organisms is made up of the same chemical and physical components.
- **Double helix structure**: DNA can be pictured as an extremely long ladder that has been twisted into the double helix shape or spiral staircase.
- The **sides** of the ladder or double helix are a linked chain of alternating **sugar and phosphate** molecules.
- The **rungs** of the ladder are made of a pair of molecules called **bases** that are weakly attracted to each other.
- There are 4 different bases- **adenine**, **thymine**, **cytosine**, and **guanine** (A,C,T, G for short).
- The 4 DNA bases can pair with each other, but only in certain combinations. A pairs with T. C pairs with G.
- A:T and C:G are said to be **complementary base pairs**
- The 2 DNA strands in a helix are **complementary strands**
- The sequence of the bases determines the genetic information. The **DNA sequence** is the particular side-by-side arrangement of bases along the DNA strand (e.g., ATTCCGGA). This order spells out the exact instructions required to create a particular organism with its own unique traits.



- DNA in the human genome is arranged into 23 pairs of **chromosomes**-- physically separate molecules that range in length from about 50 million to 250 million base pairs.
- **Genes** are the basic physical and functional units of heredity. A gene is a specific sequence of bases that encode instructions on how to make a protein. The human genome is estimated to contain 20,000-25,000 genes.
- **Proteins** are the workhorses in a cell. **Proteins** perform most life functions and make up the majority of cellular structures. Proteins are large, complex molecules made up of smaller subunits called amino acids. There are 20 different **amino acids**, each with unique chemical properties. Just as the sequence of DNA bases in a gene determines the gene's function, the sequence of amino acids in a protein determines its chemical properties. Linear protein chains fold up into specific three-dimensional structures that define their particular functions in the cell.
- The **genome** is an organism's complete set of DNA. Genomes vary widely in size. The smallest known genome for a free-living organism (a bacterium) contains about 600,000 DNA base pairs, while human and mouse genomes have some 3 billion.
- **Cells** are the fundamental working units of every living system. All the instructions needed to direct a cell's activities are contained within the chemical DNA (deoxyribonucleic acid).
- There are 3 billion bases (A,C,T,G) in the DNA code of a human.
- A person has about 9 million kilometers of DNA in her body.