

634-7010 DNA Model

Introduction: DNA, or deoxyribonucleic acid, is the foundation of all known life. Even the most primitive bacteria share a large number of genes with us. The DNA molecule is often likened to “blueprints” that determine how a cell is supposed to form.

Chemically, DNA is an extraordinary molecule. It is an incredibly complex polymer chain, usually 2.2-2.6 nanometers wide. Each unit, called a *nucleotide*, is very small, only about 3 nanometers long. However, many millions of nucleotides make up one DNA strand. Chromosome 1 in humans contain 220 million base pairs!

What is a base pair? In nature, DNA is very rarely found as a singleton molecule. Most often, it is coupled with another DNA molecule. These two strands lock together in a three dimensional structure known as a *double helix*. The molecule is composed of alternating layers of phosphates and sugars.

There are four bases in DNA, known as Adenine, Cytosine, Guanine, and Thymine. They are abbreviated as A, C, G, T. These bases repeat themselves over and over again, in a nearly infinite number of possible patterns.

DNA was first accurately modeled in 1952 by Watson and Crick in Cambridge, England. It was isolated for the first time in 1869 by the Swiss physician Friedrich Miescher.

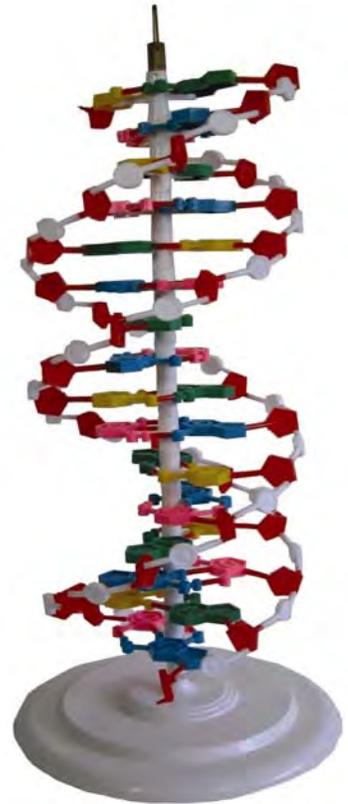
Description: Your DNA model, constructed from plastic, is designed to be easily dismantled and rearranged. Do not be alarmed if you receive the unit and some of the pieces are loose, this occasionally occurs during shipping. The free pieces can easily be put back together by simply snapping them in place.

The four bases are represented by four different colored structures. These structures are also labeled with a letter representing the name of the base unit. The base units and their corresponding colors are listed below:

A	Green
C	Pink
G	Blue
T	Red

You will also notice red pentagon structures along the outside of the model, alternating with white circles. The red “D” units represent deoxyribose, which is a pentose, or 5-carbon sugar. The white “P” items are phosphates.

Inside the double helix, the different bases have representations of atoms bonding them together. These atoms are: nitrogen, hydrogen, and oxygen. All of these atoms are highly reactive, and the hydrogen atoms form tight



bonds with other atoms. You can observe that between any bonding of the bases, hydrogen is either bonded to oxygen, or shared equally by two bases.

These enormously strong hydrogen bonds give the DNA molecule its stability. To remain whole over a huge length and millions of units, any molecule needs to be very well structured. This is one of the reasons for the double helix shape.

Your unit can be fully disassembled if you wish. The plastic components snap together, and can be pulled apart with a gentle tug. On the top of the center shaft is a nut. If this is removed, the segments of the shaft can be slid off one another.

In addition, the model comes with some replacement parts. You will find three red sugars, two white phosphates, and one each of the bases.

Warranty and Parts:

We replace all defective or missing parts free of charge. Additional replacement parts may be ordered toll-free. We accept MasterCard, Visa, checks and School P.O.s. All products warranted to be free from defect for 90 days. Does not apply to accident, misuse or normal wear and tear. Intended for children 13 years of age and up. This item is not a toy. It may contain lead or small parts that can be choking hazards. Adult supervision is required