

What is the structure of DNA?

The DNA molecule is in the shape of a double helix. A helix is a spiral shape. The double helix forms the sides of the molecule or "twisted ladder." The sides are composed of alternating units of deoxyribose sugar and phosphate. The internal building blocks of the molecule or rungs of the ladder are composed of nitrogen-containing bases that are joined to the sides. The basic unit of DNA is called a *nucleotide* and consists of a deoxyribose molecule, a phosphate, and a base.

There are four types of bases in DNA. Two of the bases are *purines*. The purines are *adenine* and *guanine*. The other two bases are *pyrimidines*, called *thymine* and *cytosine*. The bases are known by their code letters A, G, T, and C. These bases always bond in a certain way. Adenine only bonds to thymine and guanine only bonds to cytosine.

1. Given the following code letters, predict to which base each would be bonded.

A _____ T _____

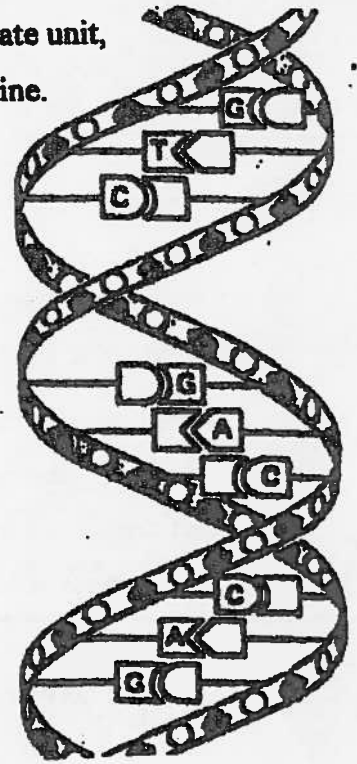
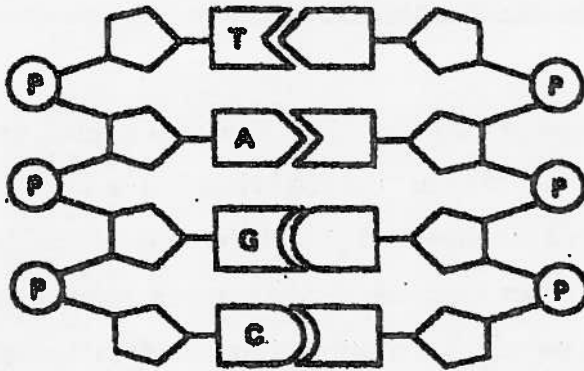
G _____ C _____

2. Consider a base sequence in one DNA chain. How would you fill in the corresponding portion of the other chain?

A G T C T T C G A G T A C G G

3. What is the general structure of the DNA molecule?
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4. In the diagrams below, label each part of the helix and fill in the base code letters that correspond to the correct nucleotide. Be sure to label: phosphate unit, deoxyribose, hydrogen bond, guanine, cytosine, thymine, and adenine.



5. What composes the backbone or sidepiece of the DNA molecule?

6. Of what is each three-part unit of DNA composed?

7. What is this three-part unit called? _____

8. What are the purine bases of DNA? _____

9. What are the pyrimidine bases of DNA? _____

10. What are the code letters of the bases? _____

11. In what sequence do these bases bond together?

12. How are the strands of the DNA molecule held together? _____