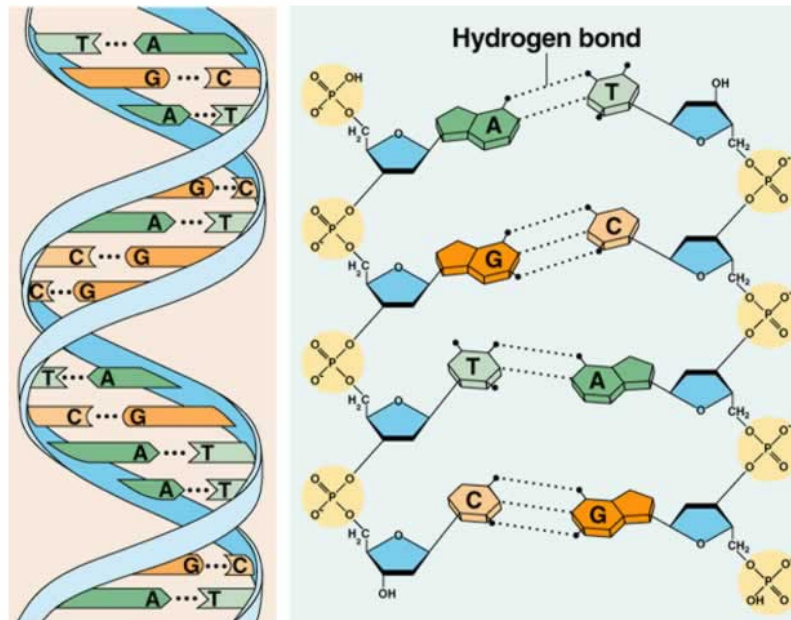


DNA

Nucleic acids store information in cells in the form of a code. **Deoxyribonucleic acid (DNA)** is the master copy of an organism's genetic information. The information in DNA contains instructions used to form nearly all of an organism's proteins. **DNA is the blueprint for how an organism works and how it looks.** For example, DNA determines eye color, body structure, and enzyme production. DNA is passed on every time a cell divides. (The DNA in all of your cells is the same.) DNA is also passed from one generation of an organism to the next.

Nucleic acids are made of smaller subunits called **nucleotides**. A nucleotide is made of a **sugar, a phosphate, and a nitrogen base**. The sugar in DNA is called **deoxyribose**- this is what the "D" in DNA stands for. DNA has four possible nucleotides- adenine (A), thymine (T), cytosine (C), and guanine (G). In DNA, nucleotides form two long chains that form a **double helix** (like a winding staircase). The backbone of the double helix is made up of sugar molecules and phosphate groups, and the two chains are joined together by hydrogen bonds between the nitrogen bases. The two bases that form each rung of the ladder are called a base pair. In DNA, cytosine and guanine form one base pair; thymine and adenine form the other base pair.



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If the sequence of one strand on DNA is... **ATC CGT GAT**
its complementary strand will be... **TAG GCA CTA**

DNA forms the genetic code of an organism. **The order of the nitrogen bases (A's, T's, C's, and G's) determines everything about every organism because it tells our cells how to make proteins.** A protein is made up of **amino acids**. There are 20 different amino acids, and how your body puts amino acids together determines how you look and how you work. DNA controls eye color and eye shape, hair color and texture, and your other traits by controlling how your proteins are put together.

PRACTICE

1. If the sequence of one strand on DNA is... **CTA GCT CCA**
its complementary strand will be... _____
2. If the sequence of one strand on DNA is... **TCG CCG ATC**
its complementary strand will be... _____
3. What does the "D" in DNA stand for?
4. Name the three parts of a nucleotide:
5. What molecule determines your eye color, enzyme production, and body structure?
 - A. Carbohydrates
 - B. Starch
 - C. Fatty acids
 - D. DNA
6. You look the way you look because of _____.
 - A. The amount of guanine in your cells
 - B. The number of sugars in your cells
 - C. The sequence of nitrogen bases
 - D. The strength of your hydrogen bonds
7. The backbone of the double helix is made up of _____ molecules and _____ groups, and the two chains are joined together by hydrogen bonds between the _____.
8. If the DNA of an organism contains 20% adenine, what is its percentage of guanine?
 - A. 20%
 - B. 30%
 - C. 60%
 - D. 80%
9. Which of the following represents the building block of a DNA molecule?
 - A. Nitrogen-containing base
 - B. Phosphate group
 - C. Deoxyribose sugar
 - D. Nucleotide
10. What would you expect to find in all organisms?
 - A. The same genetic information
 - B. The same sequence of DNA nucleotides in the DNA molecules
 - C. The same percentages of DNA base pairs
 - D. The same four DNA nucleotides
11. In which organelle must DNA replication occur?
 - A. Cell membrane
 - B. Cell wall
 - C. Ribosome
 - D. Nucleus