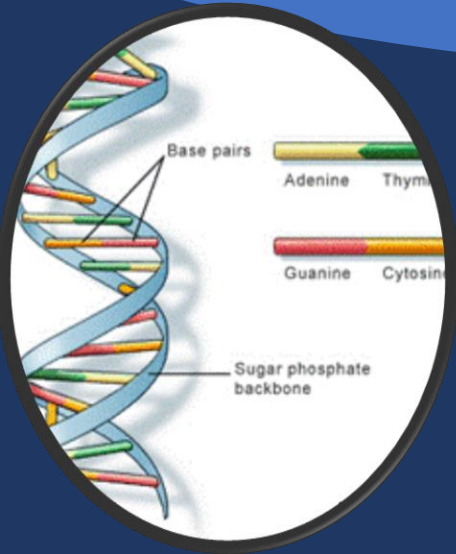


Science Heads

What is DNA?



DNA is an essential molecule for life. It acts like a recipe telling our bodies how to develop and function.

What does DNA stand for?

DNA is short for deoxyribonucleic acid.

What is DNA made of?

DNA is a long thin molecule made up of molecules called nucleotides. There are four different types of nucleotides: adenine, thymine, cytosine, and guanine. They are typically represented by their first letter:

A for Adenine T for Thymine
C for Cytosine G for Guanine

Holding the nucleotides together is a backbone made of phosphate and deoxyribose. The nucleotides are referred to as "bases".



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How cells know what to do?

Cells get their instructions from DNA. DNA acts sort of like a computer program. You can think of the cell as the “computer” or the “hardware” and the DNA as the “program” or “code.”

The DNA Code

The DNA Code is made up of the four different nucleotides and the combination of these nucleotides provide instructions to the cell. Every three letters make up a word called a codon. A string of codons may look like this:

ATC TGA GGA AAT GAC CAG

Even though there are only four different letters, DNA molecules are thousands of letters long. This allows for billions and billions of different combinations.

Genes

Within each string of DNA are sets of instructions called genes. A gene tells a cell how to make a specific protein. Proteins are used by the cell to perform certain functions, to grow, and to survive.

The Shape of the DNA Molecule

Although DNA looks like very thin long strings under a microscope, it turns out that DNA has a specific shape. This shape is called a double helix. On the outside of the double helix is the backbone which holds the DNA together. There are two sets of backbones that twist together. Between the backbones are the nucleotides represented by the letters A, T, C, and G. A different nucleotide connects to each backbone and then connects to another nucleotide in the center.

Only certain sets of nucleotides can fit together. You can think of them like puzzle pieces where A (Adenine) only connects with T (Thymine) and G (Guanine) only connects with C (Cytosine).

Interesting Facts about DNA

- About 99.9 percent of the DNA of every person on the planet is exactly the same. It's that 0.1 percent that is different that makes us all unique.
- The double helix structure of DNA was discovered by Dr. James Watson and Francis Crick in 1953.
- If you unraveled all the DNA molecules in your body and placed them end to end, it would stretch to the Sun and back several times.
- DNA is organized into structures called chromosomes within the cell.
- DNA was first isolated and identified by Swiss biologist Friedrich Meischer in 1869.