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DNA The Foundation of Life

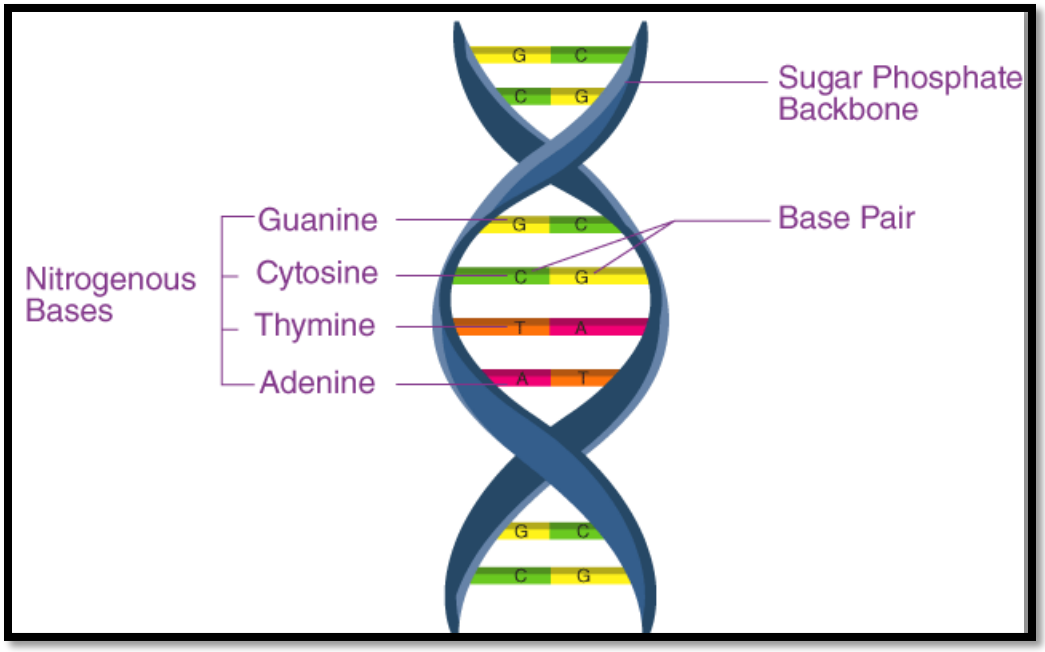
What is DNA?

DNA, or deoxyribonucleic acid, **is the hereditary material in humans and almost all other organisms**. Nearly every cell in a person's body has the same DNA. Most DNA is located in the cell nucleus (where it is called nuclear DNA), but a small amount of DNA can also be found **in the mitochondria** (where it is called **mitochondrial DNA or mtDNA**). Mitochondria are structures within cells that convert the energy from food into a form that cells can use.
DNA is a vitally important molecule for not only humans but also most other organisms. DNA contains our hereditary material and our genes, the things that make us unique.
DNA is a double helix formed by base pairs attached to a sugar-phosphate backbone

What is the structure of DNA?

A collection of nucleotides makes a DNA molecule. Each nucleotide contains three components:
- a sugar
- a phosphate group
- a nitrogen base

The sugar in DNA is called 2-deoxyribose. These sugar molecules alternate with the phosphate groups, making up the "backbone" of the DNA strand.
Each sugar in a nucleotide has a nitrogen base attached to it. There are four different types of nitrogen bases in DNA. They include:
adenine (A)
cytosine (C)
guanine (G)
thymine (T)



Why is DNA so important?

Put simply, DNA contains the instructions necessary for life.

The code within our DNA provides directions on how to make proteins that are vital for our growth, development, and overall health.

The DNA sequence that houses the information to make a protein is called a gene.

The two strands of DNA form a 3-D structure called a double helix. When illustrated, DNA looks like a spiral ladder in which the base pairs are the rungs, and the sugar-phosphate backbones are the legs.

Additionally, it's worth noting that the DNA in the nucleus of eukaryotic cells is linear, meaning that the ends of each strand are free. In a prokaryotic cell, the DNA forms a circular structure.