

DNA & Protein Synthesis

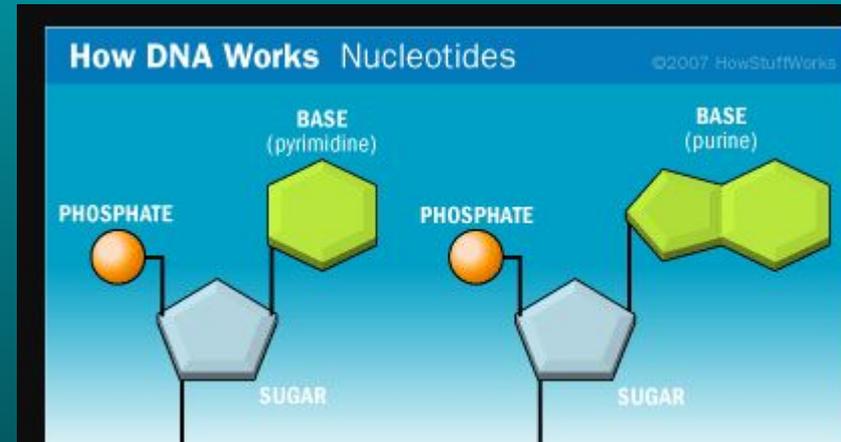
Structure and Function of the DNA

DNA- Deoxyribo Nucleic Acid

DNA is a Double Helix structure

The twisted ladder is made up of Nucleotides

The Nucleotides comprise of a phosphate, a sugar and a base.



- The bases in the DNA are Adenine, Guanine, Thymine and Cytosine.
- In the double helix structure, Adenine pairs with Thymine and Guanine with Cytosine.
- A-T, G-C
- In RNA (Ribo Nucleic acid)
- In RNA Thymine is replaced with Uracil.

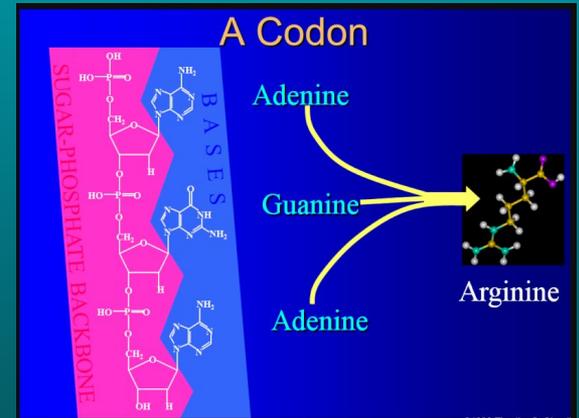
Function of DNA

- One of the functions of the DNA is to direct the cells to make proteins.
- Proteins are long chains of Amino acids.
- The process by which the DNA directs the cell to make protein is called **Protein synthesis**.
- 3 sets of bases from the DNA and mRNA code for an amino acid each.

Eg: CAG- code for Glutamine

CGA - Code for Arginine

- 3 sets of bases are called **codon** or **triplet code**



Protein Synthesis

Protein synthesis has two steps

- Transcription- The cell copies information from DNA to mRNA
- Translation- Protein is synthesised at the ribosomes from the codes in mRNA

Transcription

- The DNA is unzipped
- The RNA which is a single strand links in between the unzipped DNA. Thus the **Triplet code** is created.
- The mRNA leaves the nucleus and attaches to the ribosome in the cytoplasm.

Translation

- Ribosome reads the code from mRNA and the tRNA brings the related amino acid.
- These amino acids link together to form a chain of protein.
- The stop codon gives the ribosome the signal to stop synthesizing protein.
- This process continues.

Mutation

The sequence of bases determines the order of the amino acid in protein. Any error or change in the DNA sequence can affect protein synthesis. This is called **Mutation**