

# DNA & Protein Synthesis

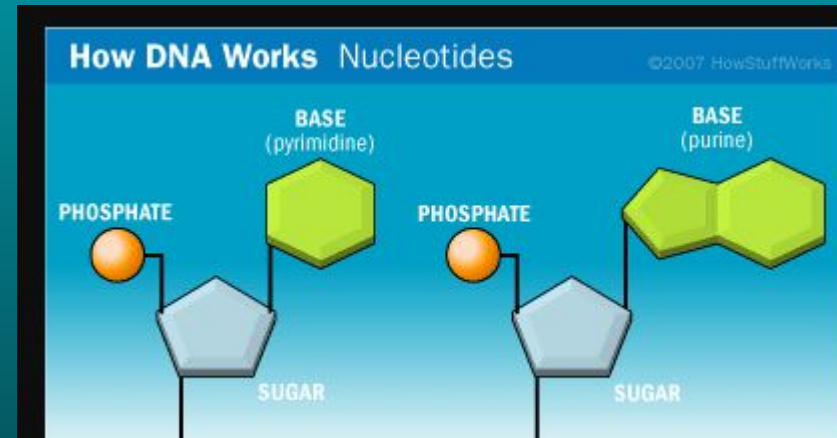
# Structure and Function of the DNA

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.

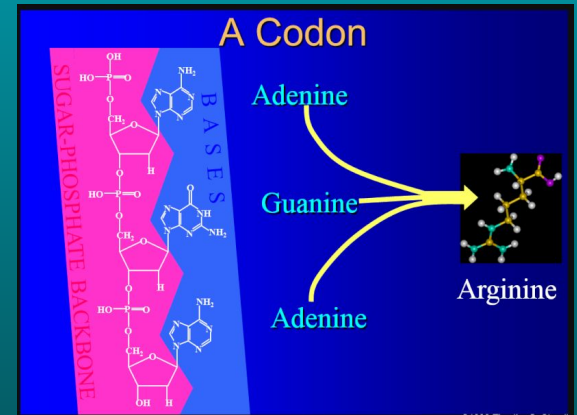
# Function of DNA

- 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**