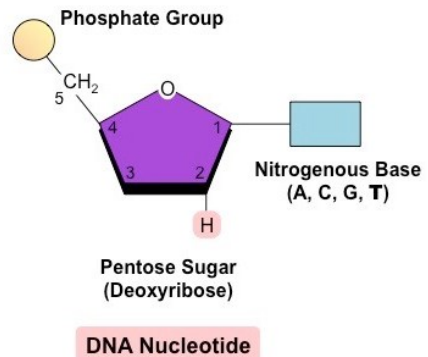


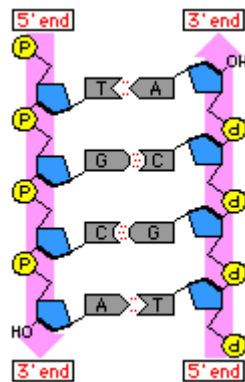
## Unit 1 DNA & the Genome

### Key Area 1 : Structure of DNA

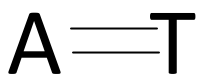
- DNA is a double-helix consisting of repeating units of **DNA nucleotides**.
- A DNA nucleotide consists of 3 components:
  - Deoxyribose sugar
  - Organic Base
  - Phosphate group



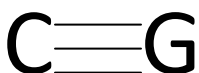
- The 2 DNA strands in the double helix are **anti-parallel**.
- There is a **Deoxyribose sugar at the 3' end** and a **Phosphate group at the 5' end**.



- The DNA nucleotides in a strand of DNA are joined together by **strong chemical bonds** between the phosphate group of one nucleotide and the deoxyribose sugar of another nucleotide. This creates a **sugar-phosphate backbone**.
- There is complimentary base-pairing between the 2 strands in the double helix.



There are 2 **weak Hydrogen bonds** between Adenine and Thymine



There are 3 weak hydrogen bonds between Cytosine and Guanine.

## Organisation of DNA

DNA is found in **LINEAR CHROMOSOMES** in the **nucleus** of **EUKARYOTES**. Eukaryotes have a nucleus present in their cells ( e.g. plant, animal & fungal cells). Prokaryotes do not have a nucleus (e.g. Bacteria).

DNA is found in **CIRCULAR CHROMOSOMES** in the **cytoplasm of PROKARYOTES** and in **Mitochondria and Chloroplasts of Eukaryotes**.

DNA is found in **PLASMIDS** in the cytoplasm of **PROKARYOTES** and **YEAST** cells.

| Type of Cell | Linear Chromosomes | Circular Chromosomes | Plasmids    |
|--------------|--------------------|----------------------|-------------|
| Animal       | ✓                  | ✓                    |             |
| Plant        | ✓                  | ✓                    |             |
| Bacterial    |                    | ✓                    | ✓           |
| Fungal       | ✓                  | ✓                    | ✓Yeast only |

DNA is **tightly coiled & packaged** with associated **Histone Proteins**.

