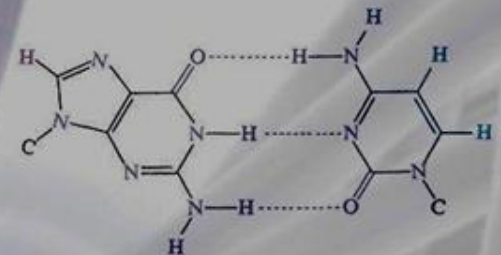
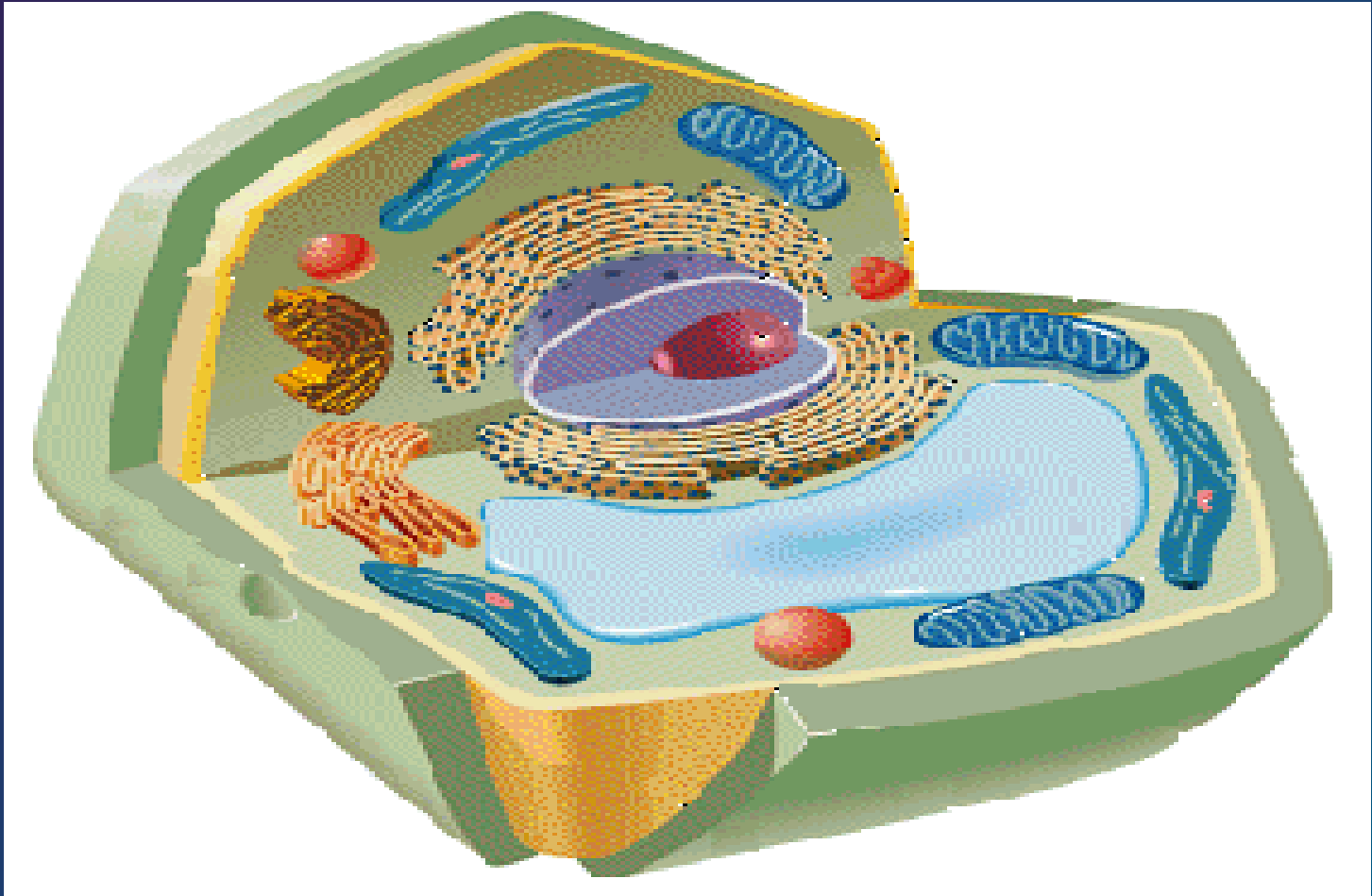


DNA Structure



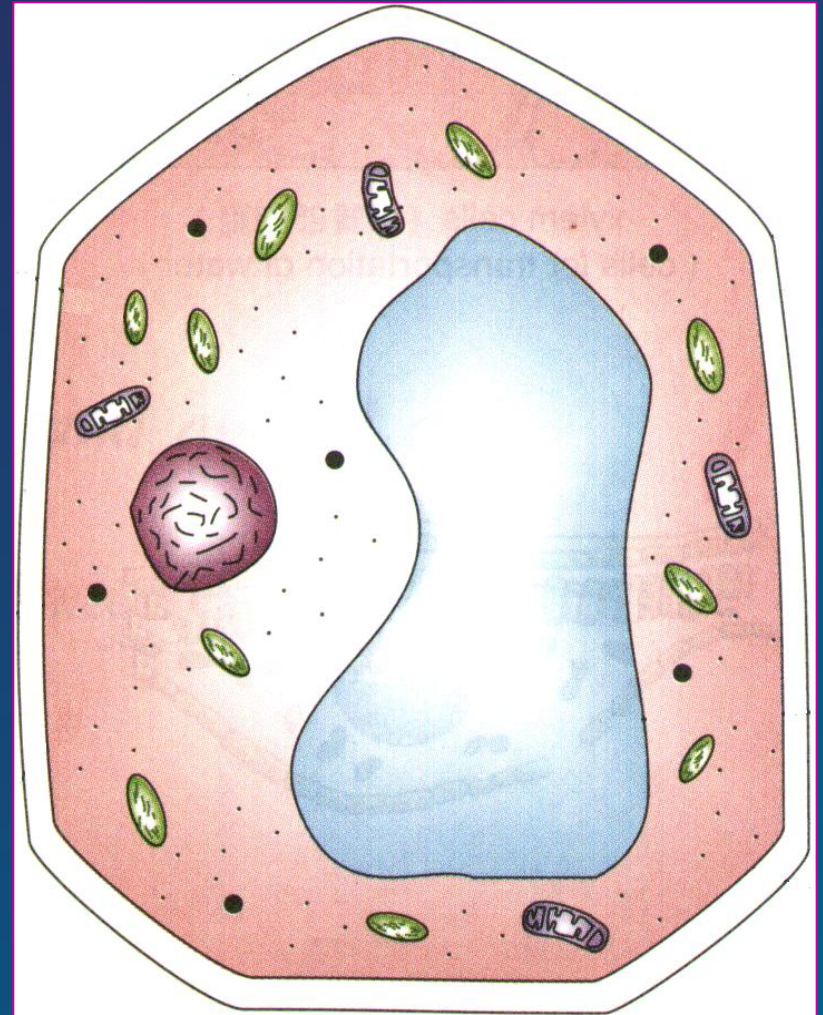
deoxyribonucleic acid

Basic Structure of a Cell



Cell Wall

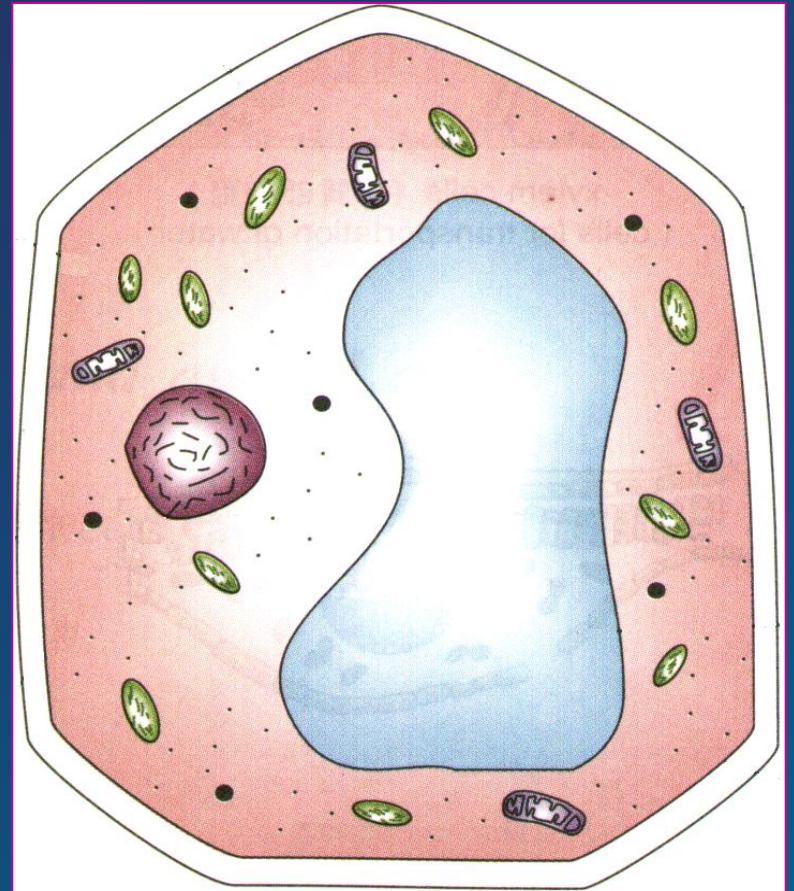
- Nonliving layer
- Gives structure and shape to plant



Cell or Plasma Membrane

Cell membrane

- Living layer
- Controls the movement of materials into and out of the cell
- Selectively permeable



Vacuole

- Have a large central vacuole
- Surrounded by *tonoplast*
- Contains cell sap
- Sugars, proteins, minerals, wastes, & pigments

Chloroplast

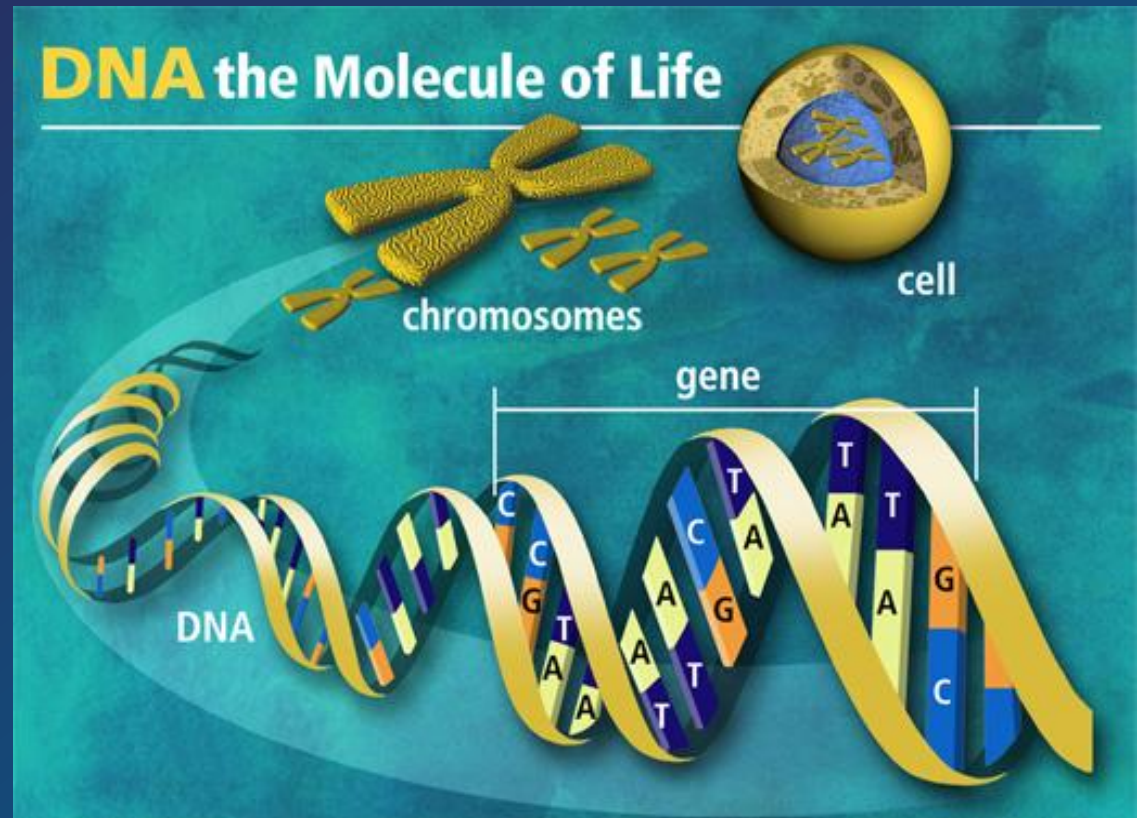
- Contain the green pigment chlorophyll
- Traps sunlight to make sugars (food)
- Process called photosynthesis

Nucleus

- Controls the normal activities of the cell
- Contain the DNA
- Bounded by a nuclear membrane
- Contains chromosomes
- Each cell has fixed number of chromosomes that carry genes
- Genes control cell characteristics

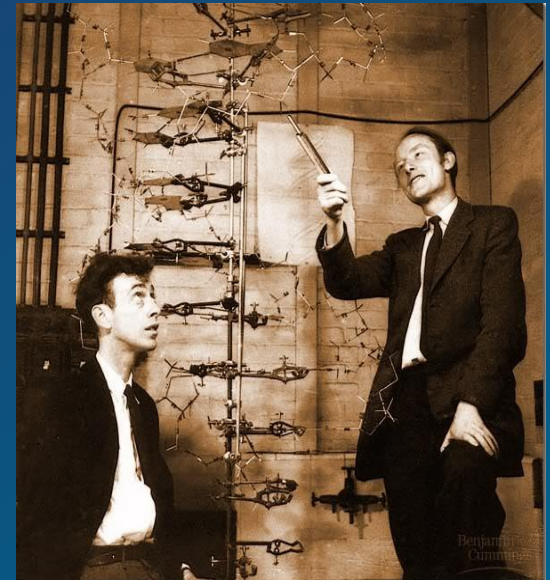
DNA stands for

- Deoxyribonucleic acid

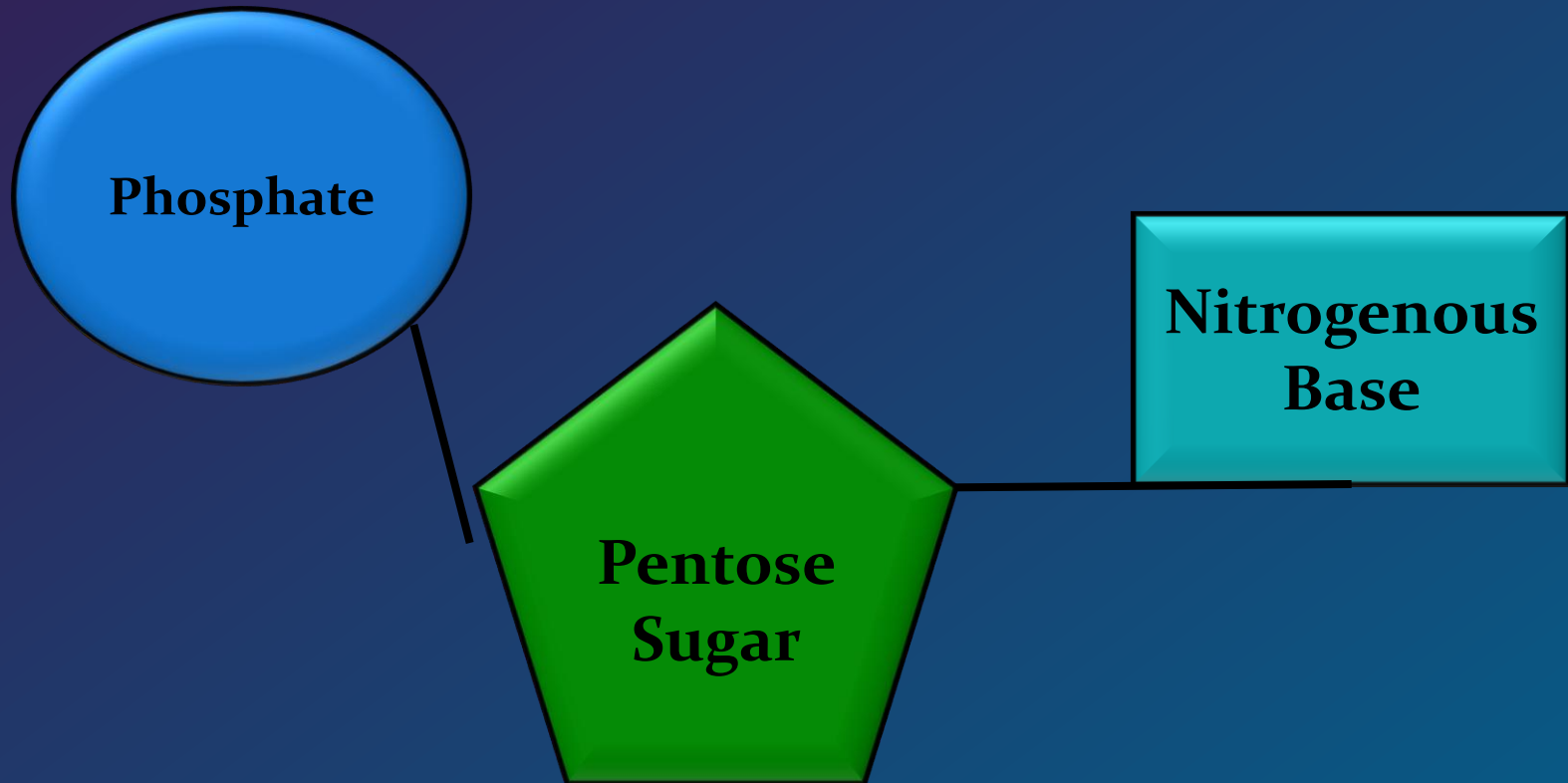


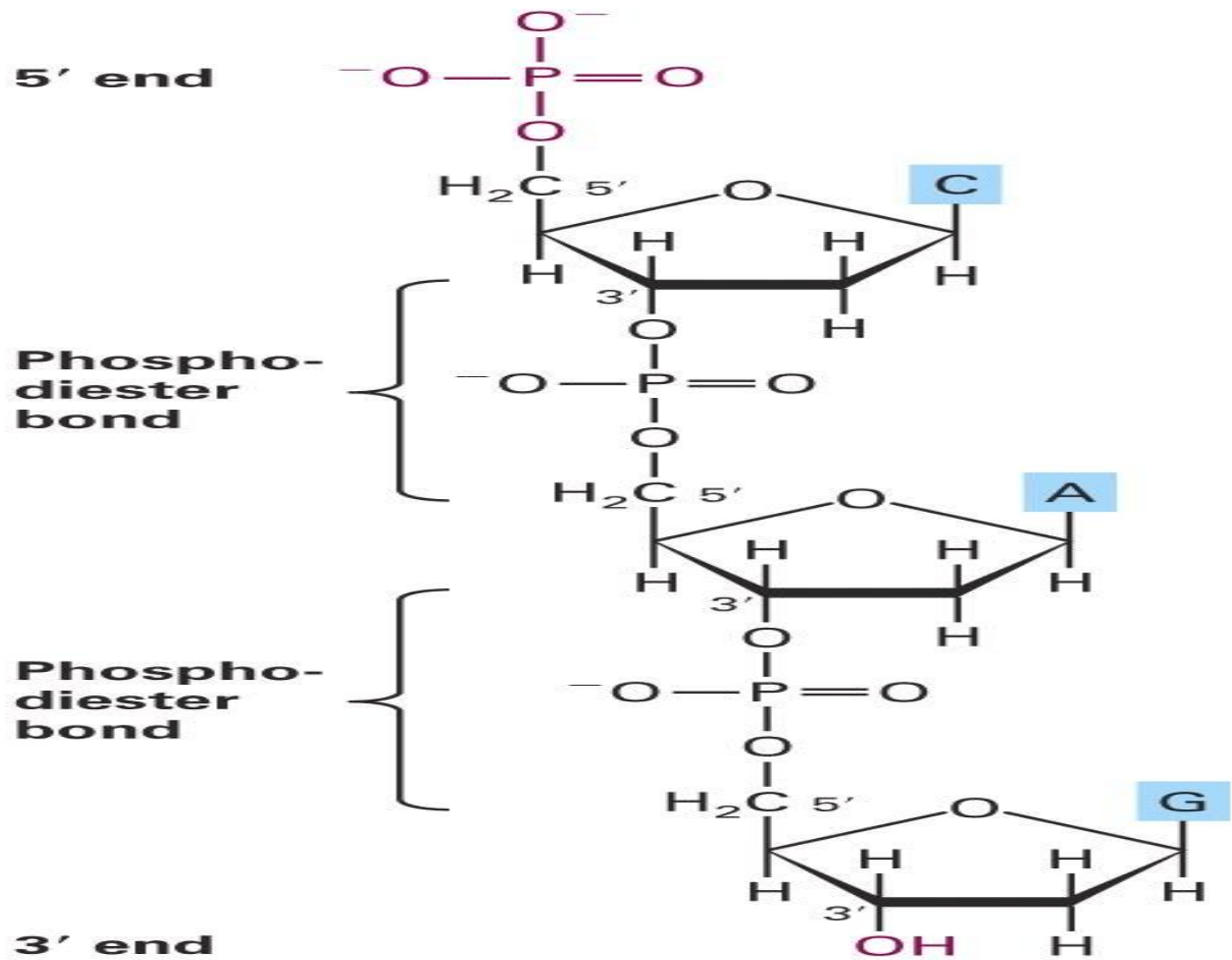
DNA Structure

- DNA consists of two molecules that are arranged into a ladder-like structure called a **Double Helix**.
- A molecule of DNA is made up of millions of tiny subunits called **Nucleotides**.
- Each nucleotide consists of:
 1. Phosphate group
 2. Pentose sugar
 3. Nitrogenous base



Nucleotides





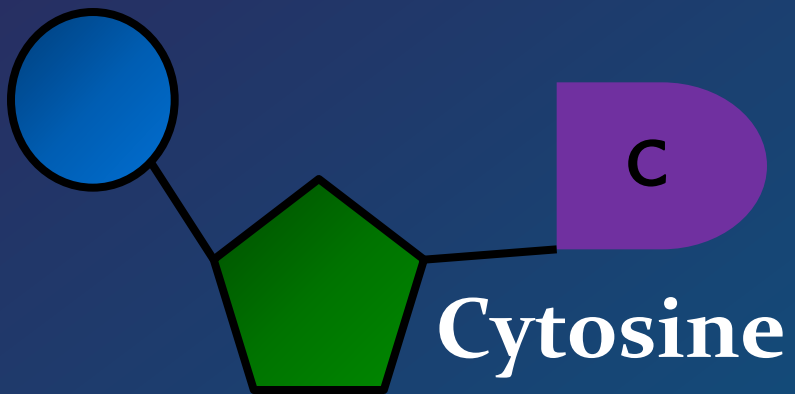
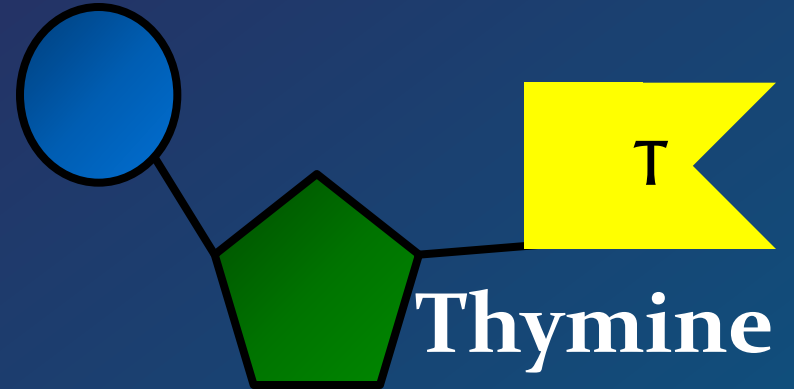
Nucleotides

- The phosphate and sugar form the backbone of the DNA molecule, whereas the bases form the “rungs”.



- There are four types of nitrogenous bases.

Nucleotides



Nucleotides

- Each base will only bond with **one** other specific base.

- Adenine (A)
 - Thymine (T)
- } Form a base pair.

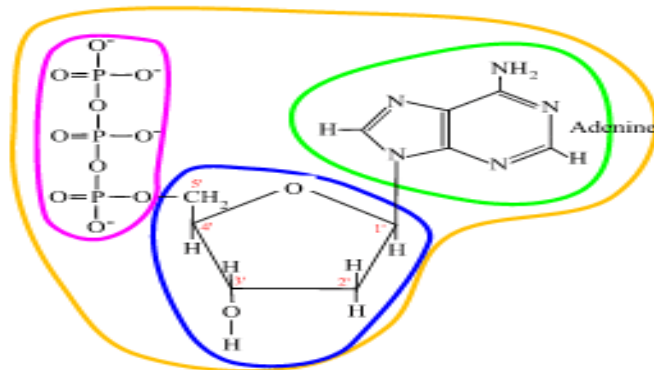
- Cytosine (C)
 - Guanine (G)
- } Form a base pair.

The components of nucleotides

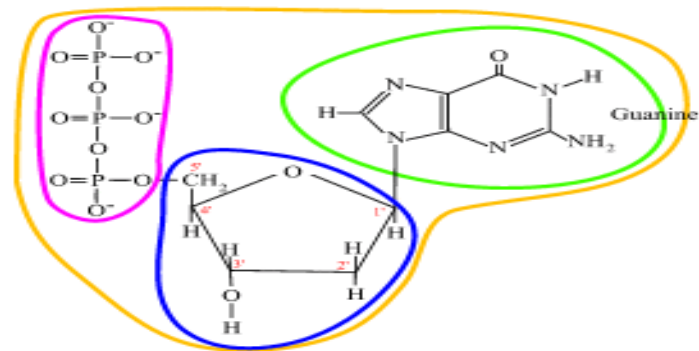
Nucleotide = base + sugar + phosphate

4 different dNTP's (deoxynucleoside triphosphate) :

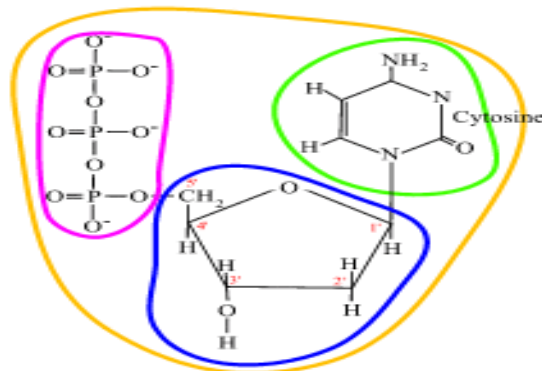
deoxyadenosine triphosphate = dATP



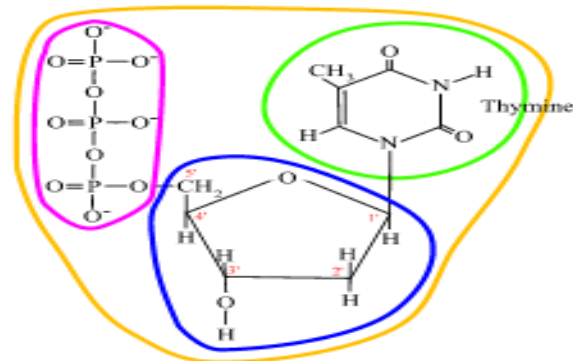
deoxyguanosine triphosphate = dGTP



deoxycytidine triphosphate = dCTP



deoxythymidine triphosphate = dTTP

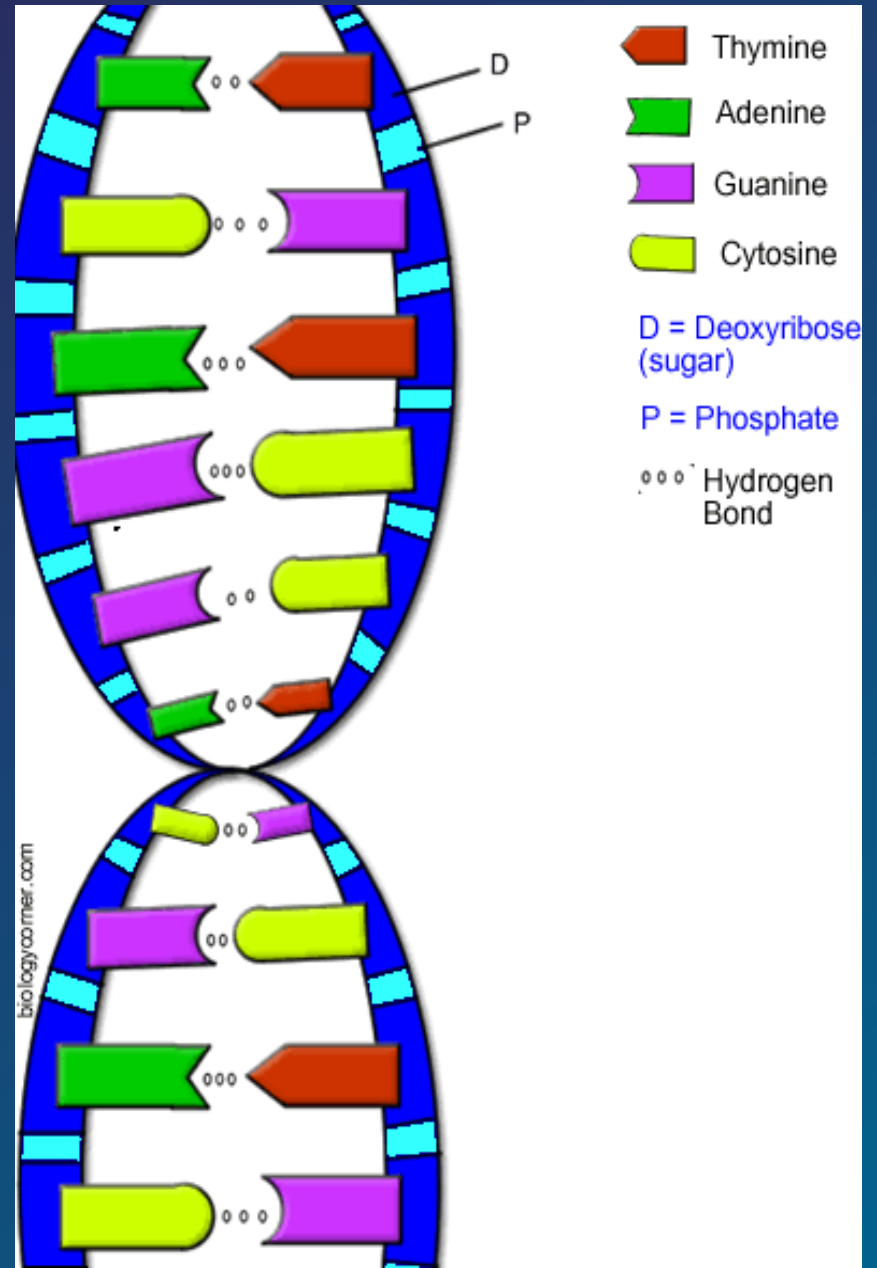


Base-Pair Rule

Adenine \leftrightarrow Thymine

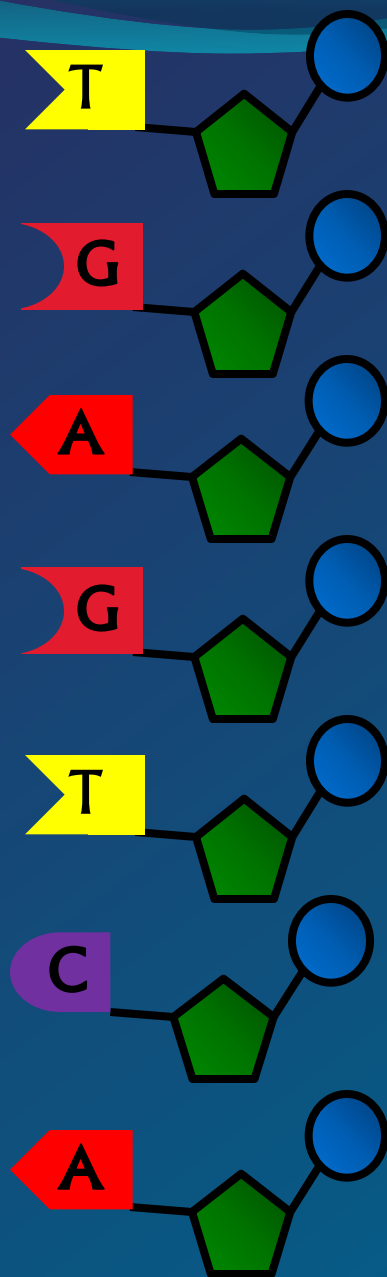
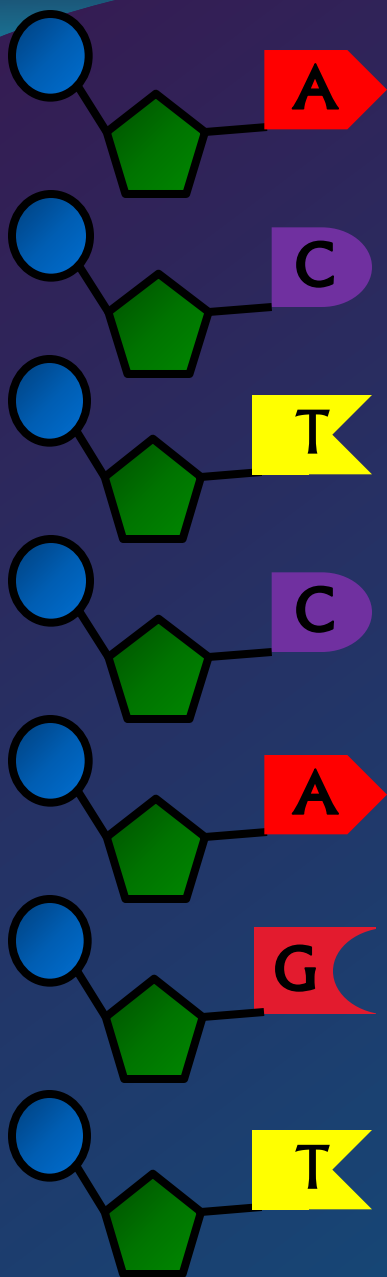
Guanine \leftrightarrow Cytosine

The sides of the DNA ladder are phosphate & sugar held together by hydrogen bonds



DNA Structure

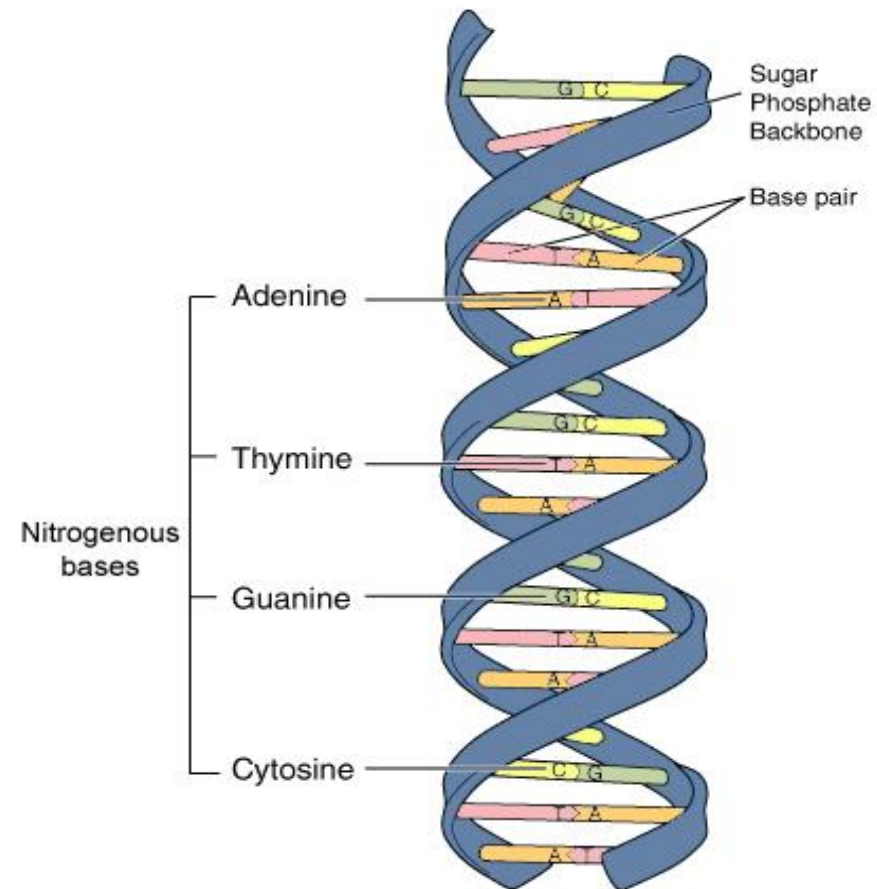
- Because of this **complementary** base pairing, the order of the bases in one strand determines the order of the bases in the other strand.



Base Pair Rule

One side: A T A T C A T G C G G G

Other side:



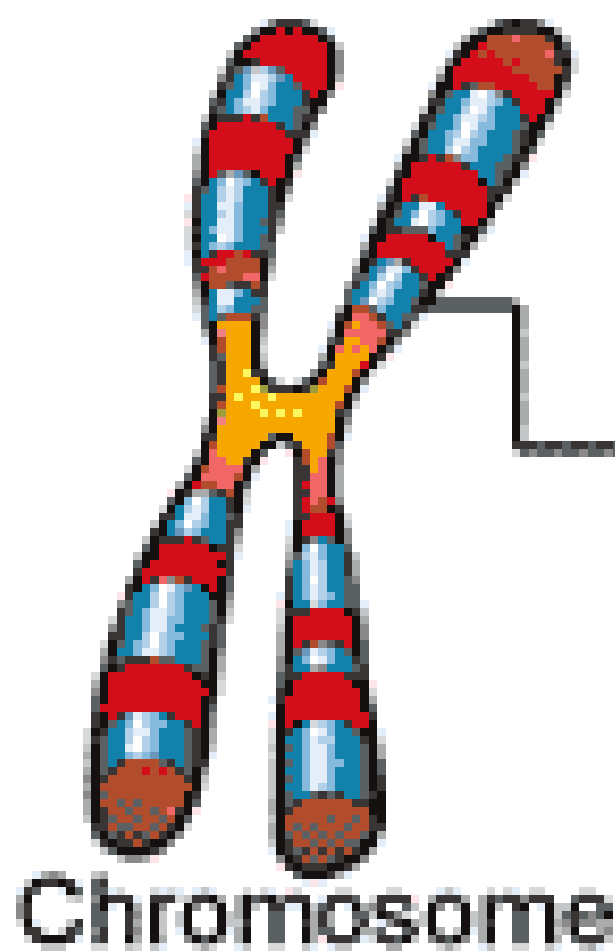
DNA Structure

- To crack the genetic code found in DNA we need to look at the sequence of bases.
- The bases are arranged in triplets called **codons**.

A G G - C T C - A A G - T C C - T A G
T C C - G A G - T T C - A G G - A T C

DNA Structure

- A gene is a section of DNA that codes for a **protein**.
- Each unique gene has a unique sequence of bases.
- This unique sequence of bases will code for the production of a unique protein.
- It is these proteins and combination of proteins that give us a unique **phenotype**.



Gene 1

Gene 2

G	T	C	A	G	T	C	A	G	T	C
C	A	G	T	C	A	G	T	C	A	G
C	T	A	G	C	T	A	G	C	T	A
G	C	A	T	G	C	A	T	G	C	A
T	C	A	T	T	C	A	T	T	C	A
C	A	T	G	C	A	T	G	C	A	T
G	T	C	A	G	T	C	A	G	T	C
C	A	G	T	C	A	G	T	C	A	G
G	T	C	A	G	T	C	A	G	T	C
C	A	G	T	C	A	G	T	C	A	G

How the Code Works

The combination of A,T,G,C determines what traits you might have, for ex.

C A T C A T = fruit colure

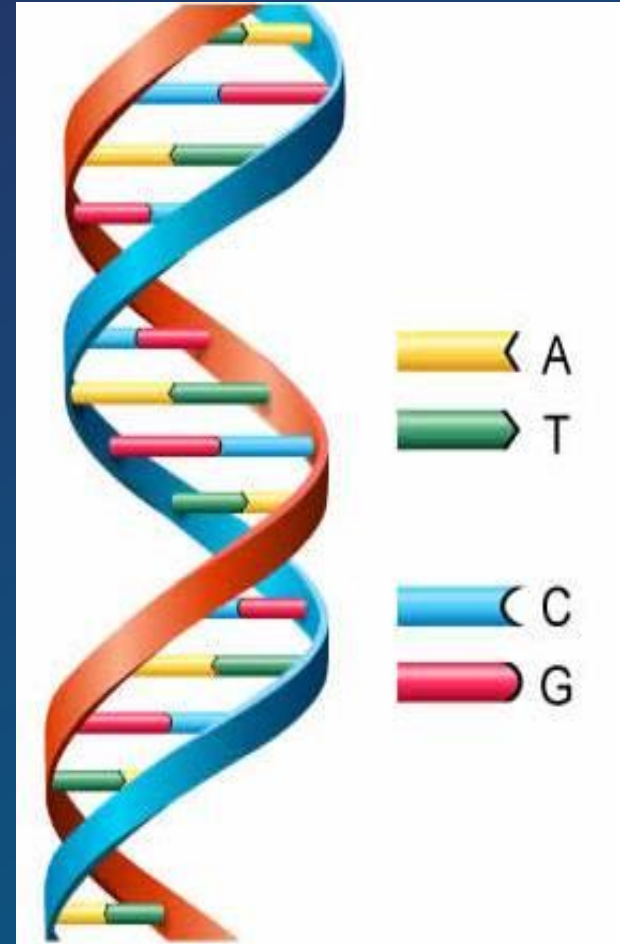
T A C T A C = fruit shape

Think of the bases of DNA like letters.

Letters form words....

Words form sentences....

*endless
combinations





Let's Review What We Know About DNA

1. DNA stands for: De _____ ribo _____ acid
2. What is the shape of DNA? _____
3. Adenine always pairs with _____
4. The sides of the DNA ladder are deoxyribose and _____
5. Guanine always pairs with _____
6. What is the complimentary sequence: A A T G C A
7. The two sides of DNA are held together by _____ bonds.
8. DNA is composed of repeating subunits called _____
9. What are the 4 bases that make up the rungs of the DNA ladder? _____