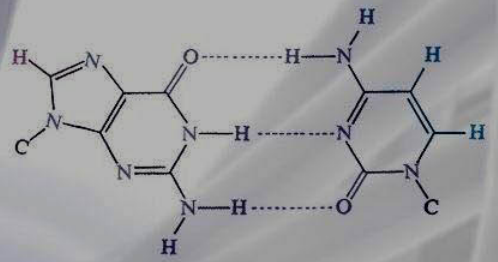
# DNA Structure

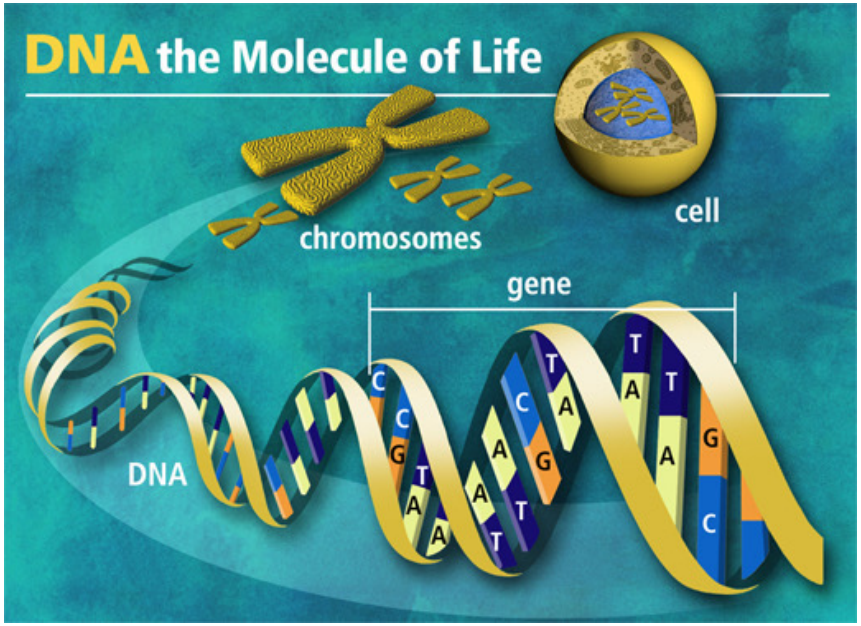


deoxyribonucleic acid

WJ

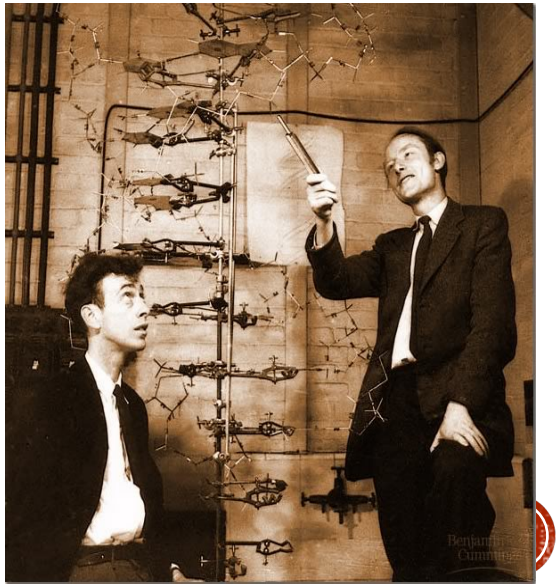
# DNA STANDS FOR

- Deoxyribonucleic acid
- This chemical substance is present in the nucleus of all cells in all living organisms

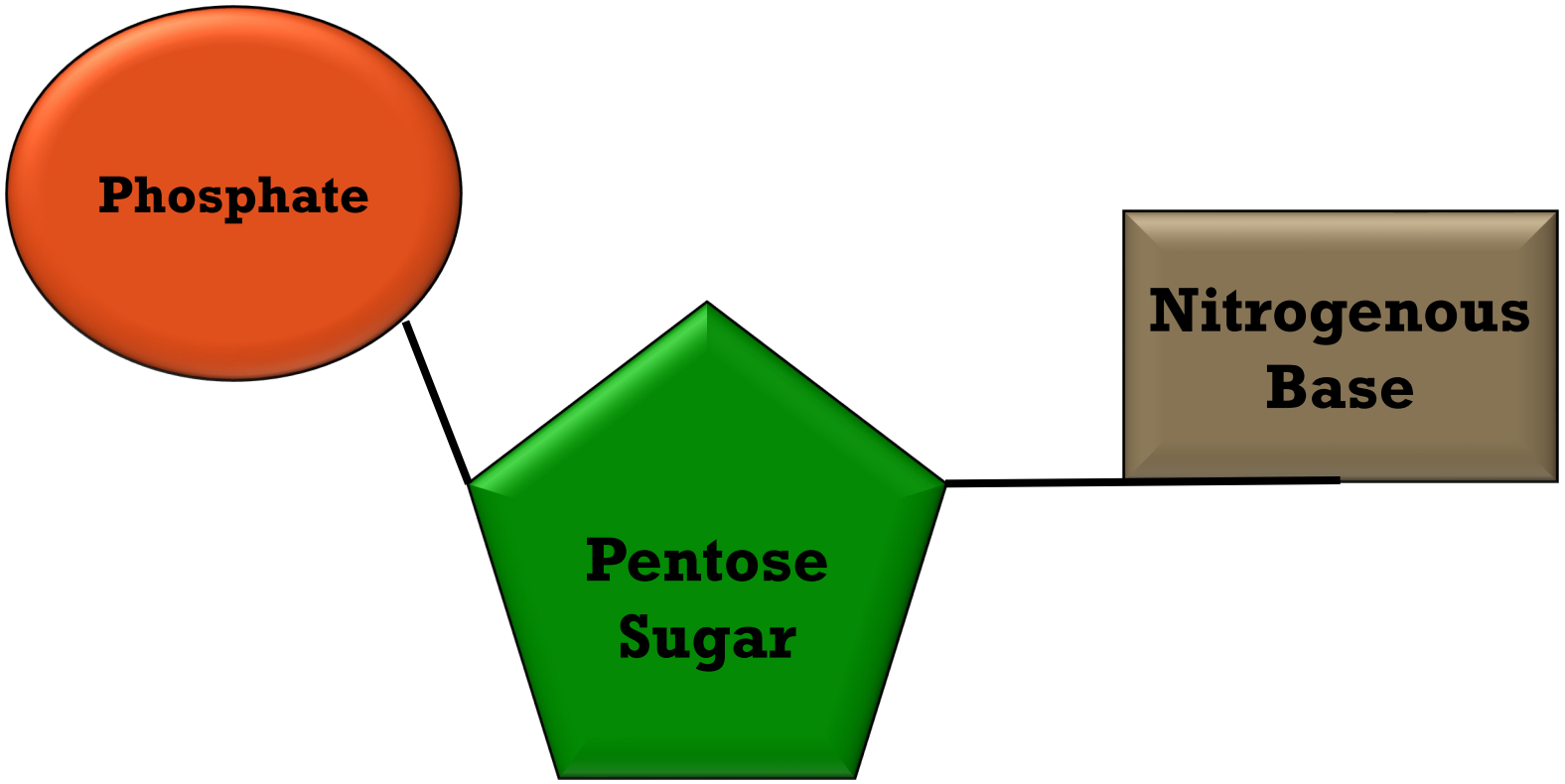


# DNA STRUCTURE

- 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



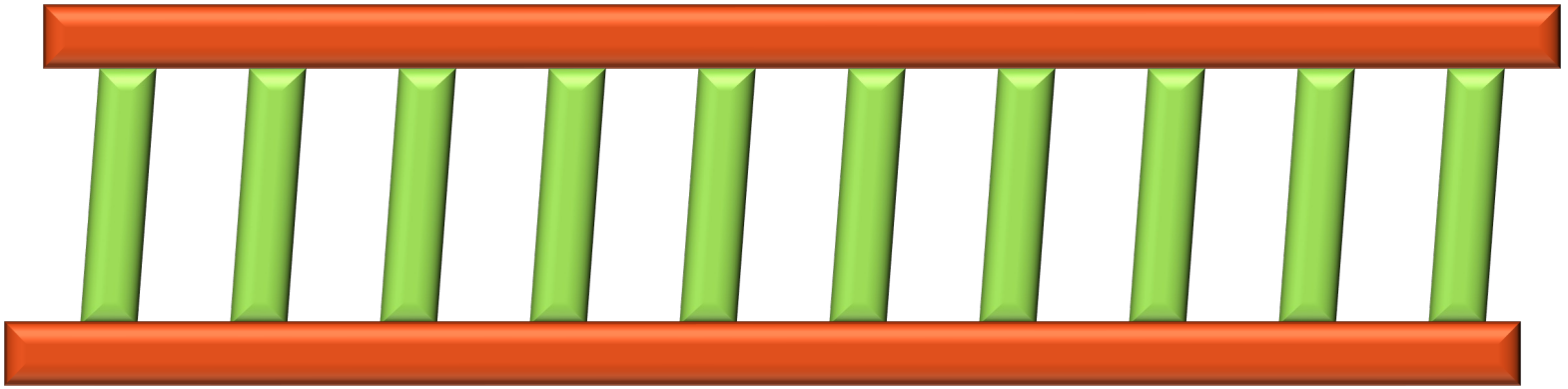
# NUCLEOTIDES



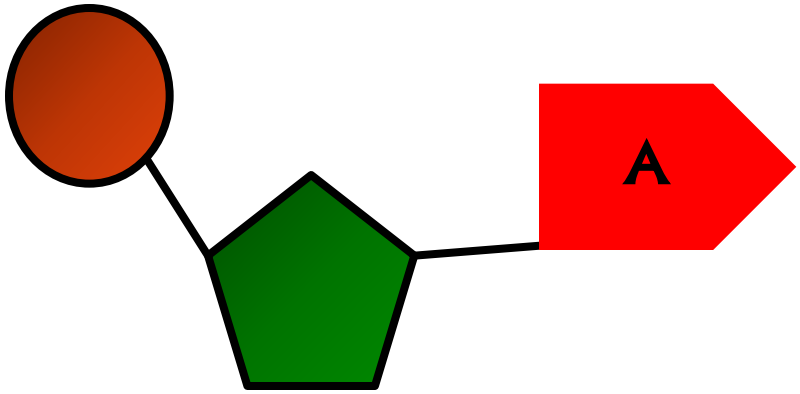
# NUCLEOTIDES

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

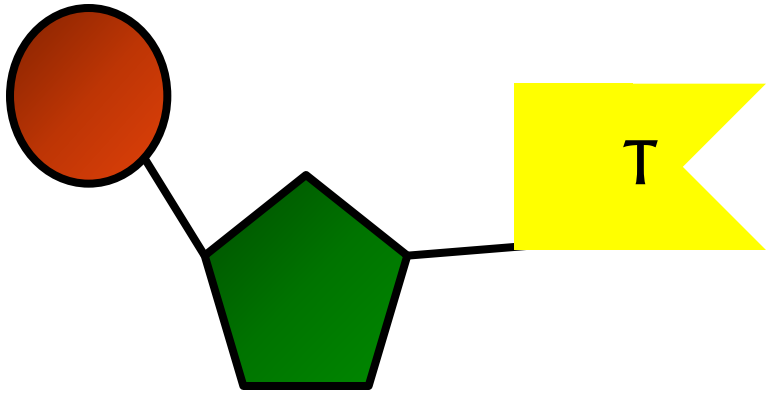
- There are four types of nitrogenous bases.



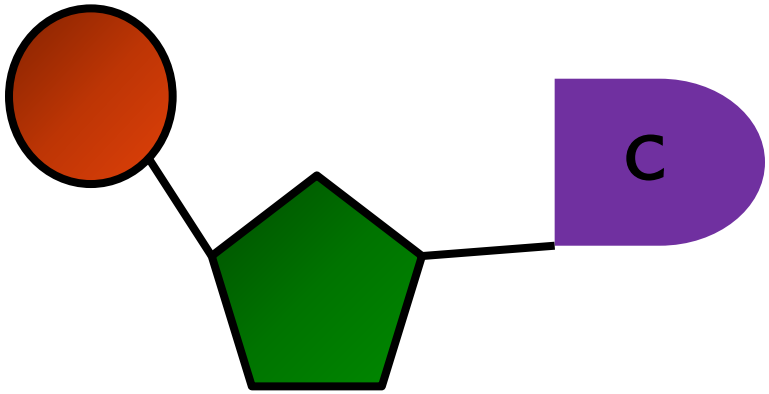
# NUCLEOTIDES



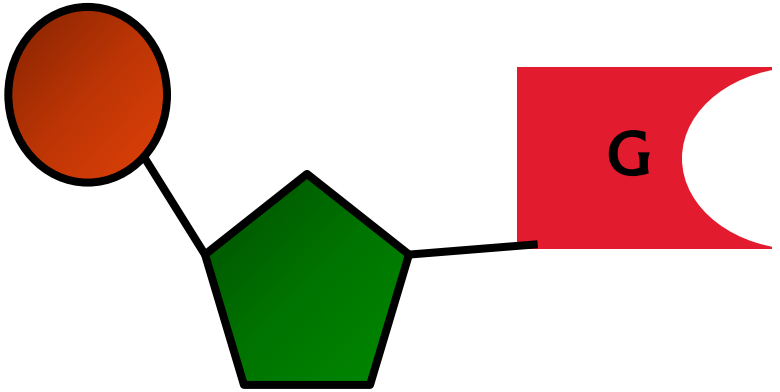

Adenine




Thymine




Cytosine




Guanine

# NUCLEOTIDES

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

- Adenine (A)
- Thymine (T)

Form a base pair.

- Cytosine (C)
- Guanine (G)

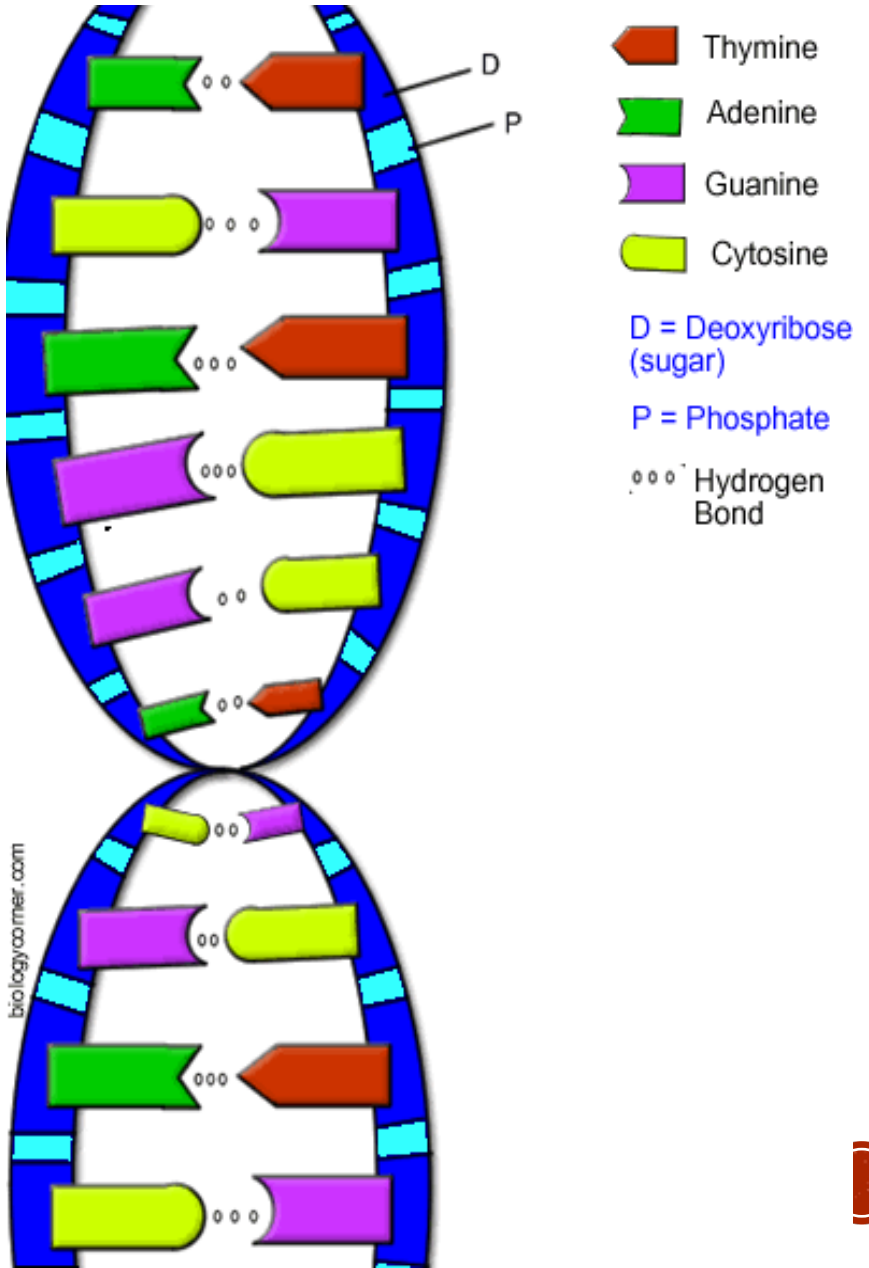
Form a base pair.

# BASE-PAIR RULE

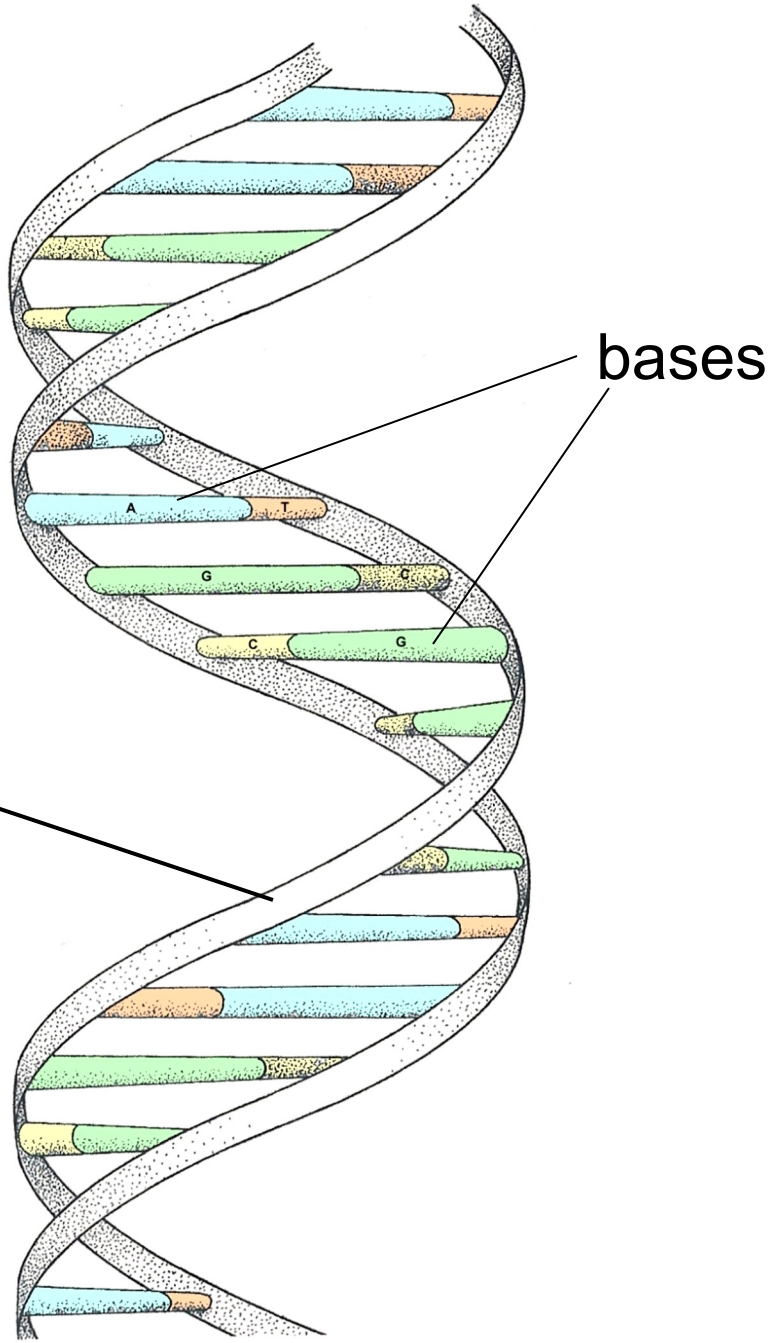
Adenine <==> Thymine

Guanine <==> Cytosine

The sides of the DNA ladder are <u>phosphate</u> & <u>sugar</u> held together by <u>hydrogen bonds</u>



# THE DOUBLE HELIX



# 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.

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

Other side:

# BASE PAIR RULE

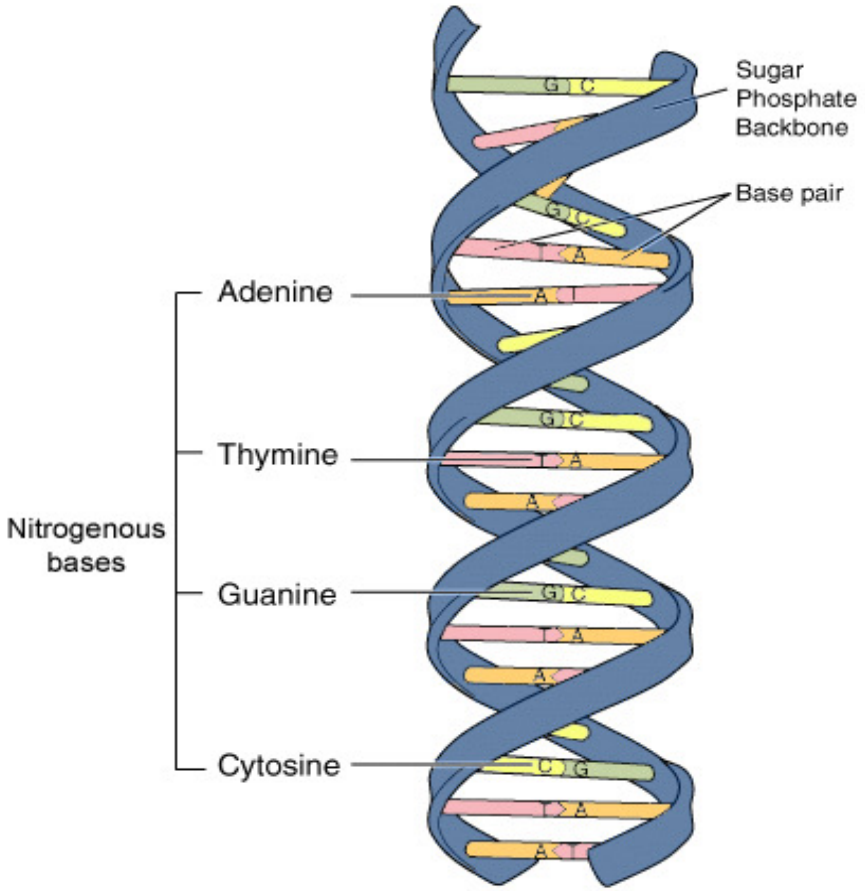
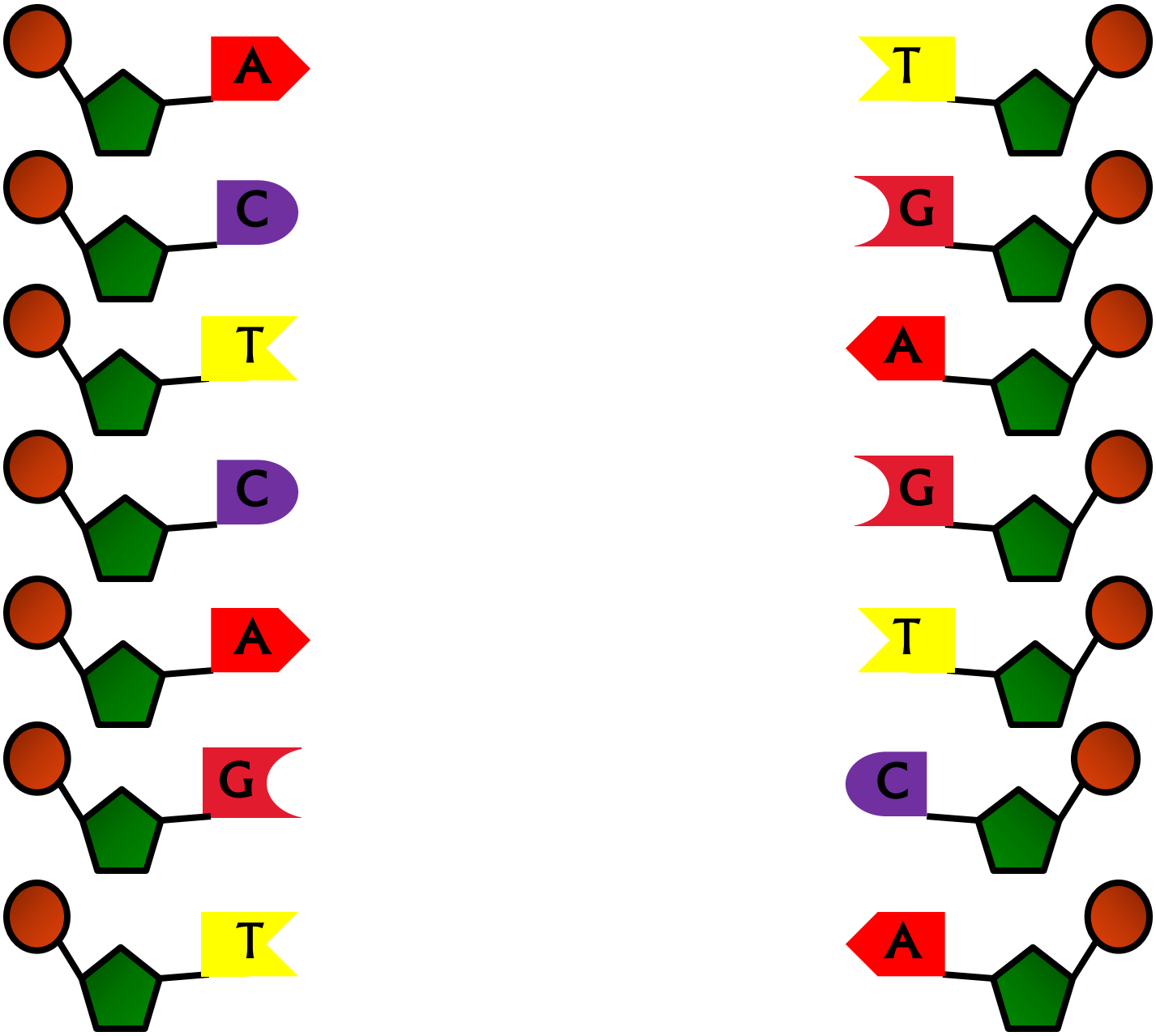



Image adapted from: National Human Genome Research Institute.


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

# 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.

# 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 = purple hair

T A C T A C = yellow hair

# THINK OF THE BASES OF DNA LIKE LETTERS.

LETTERS FORM WORDS...

WORDS FORM SENTENCE

*ENDLESS COMBINATION