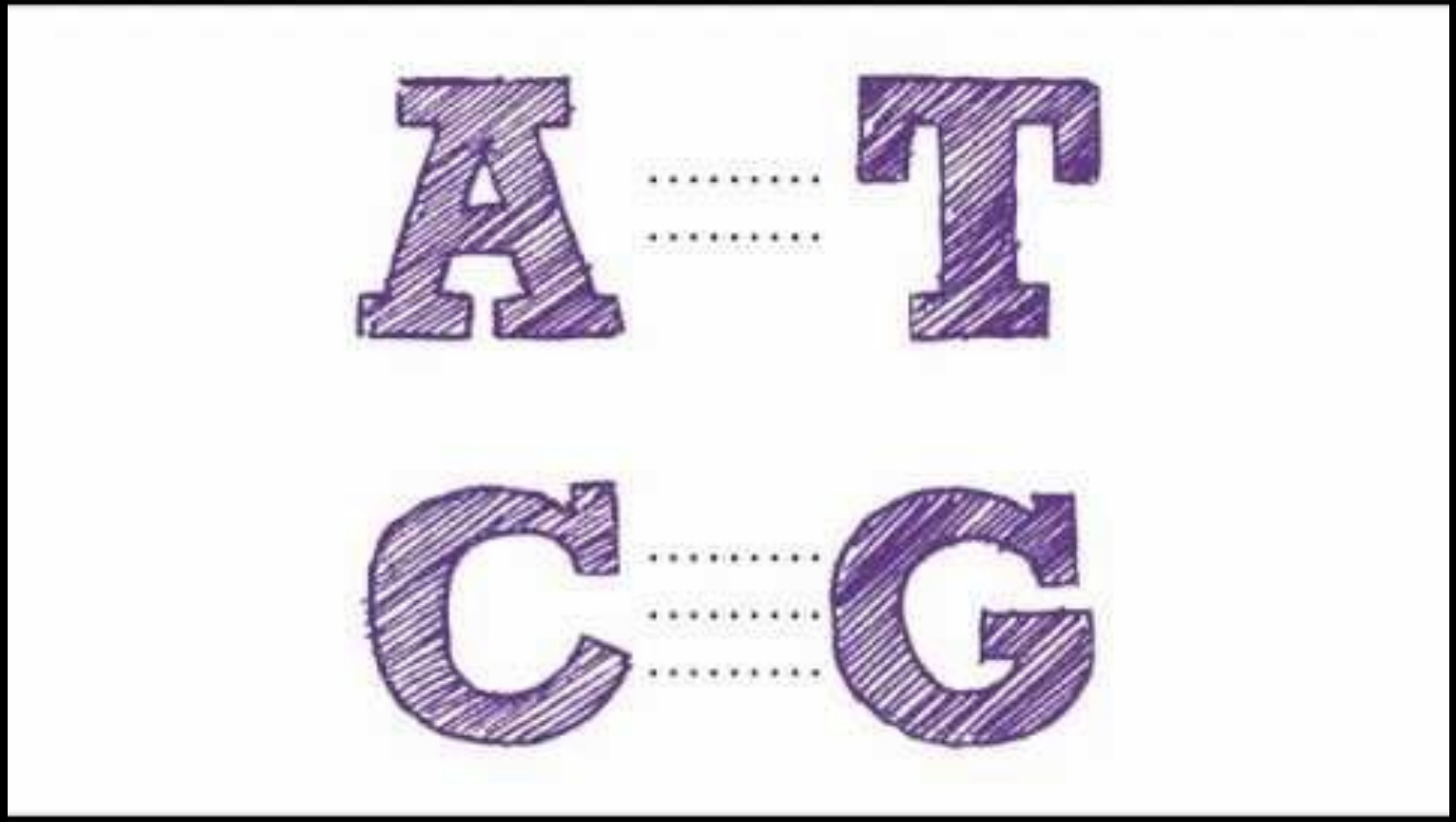
DNA Structure - Part 3

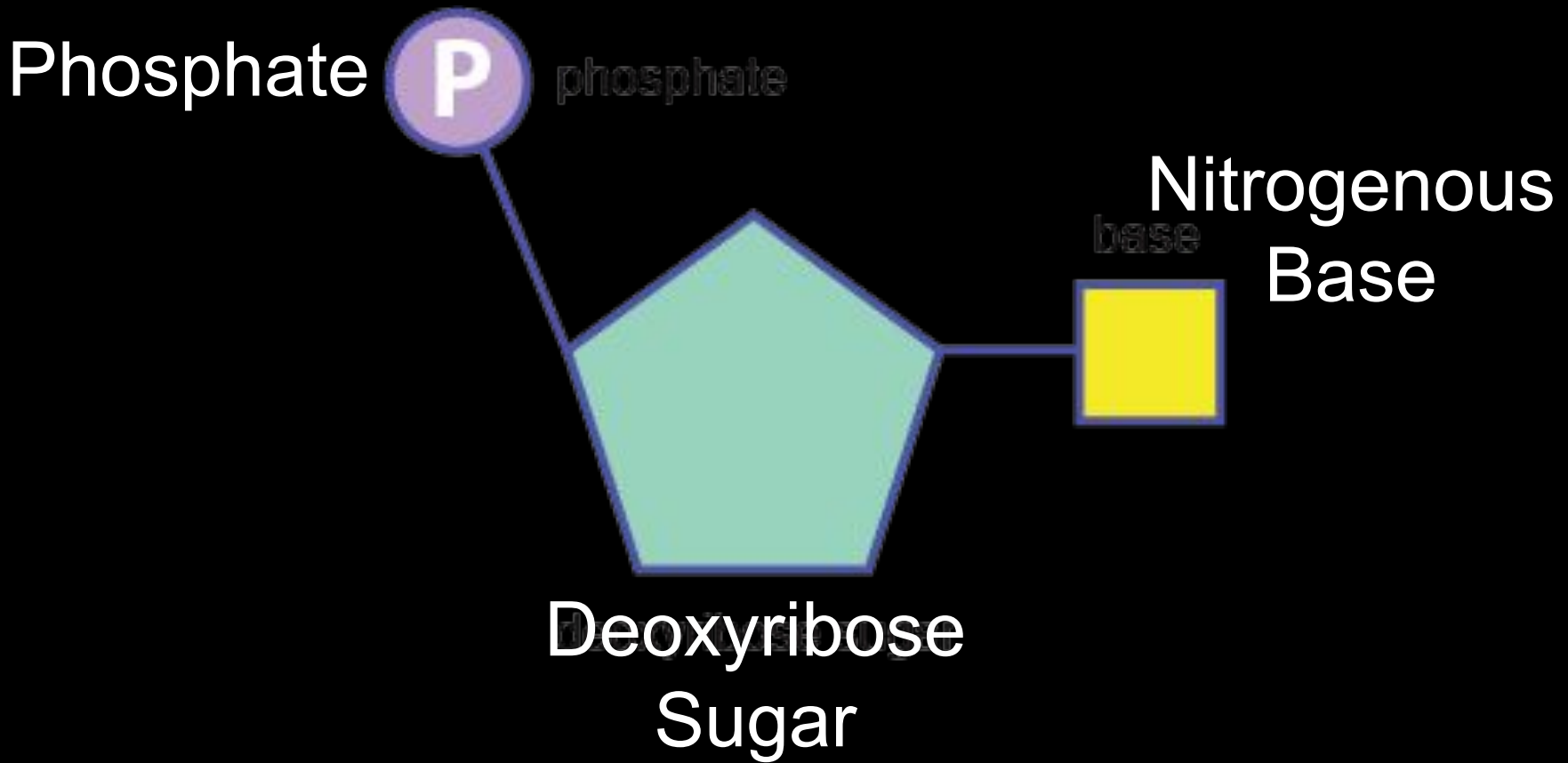
Learning Objectives

- Explain how bonds are formed between nitrogenous bases

YouTube Video

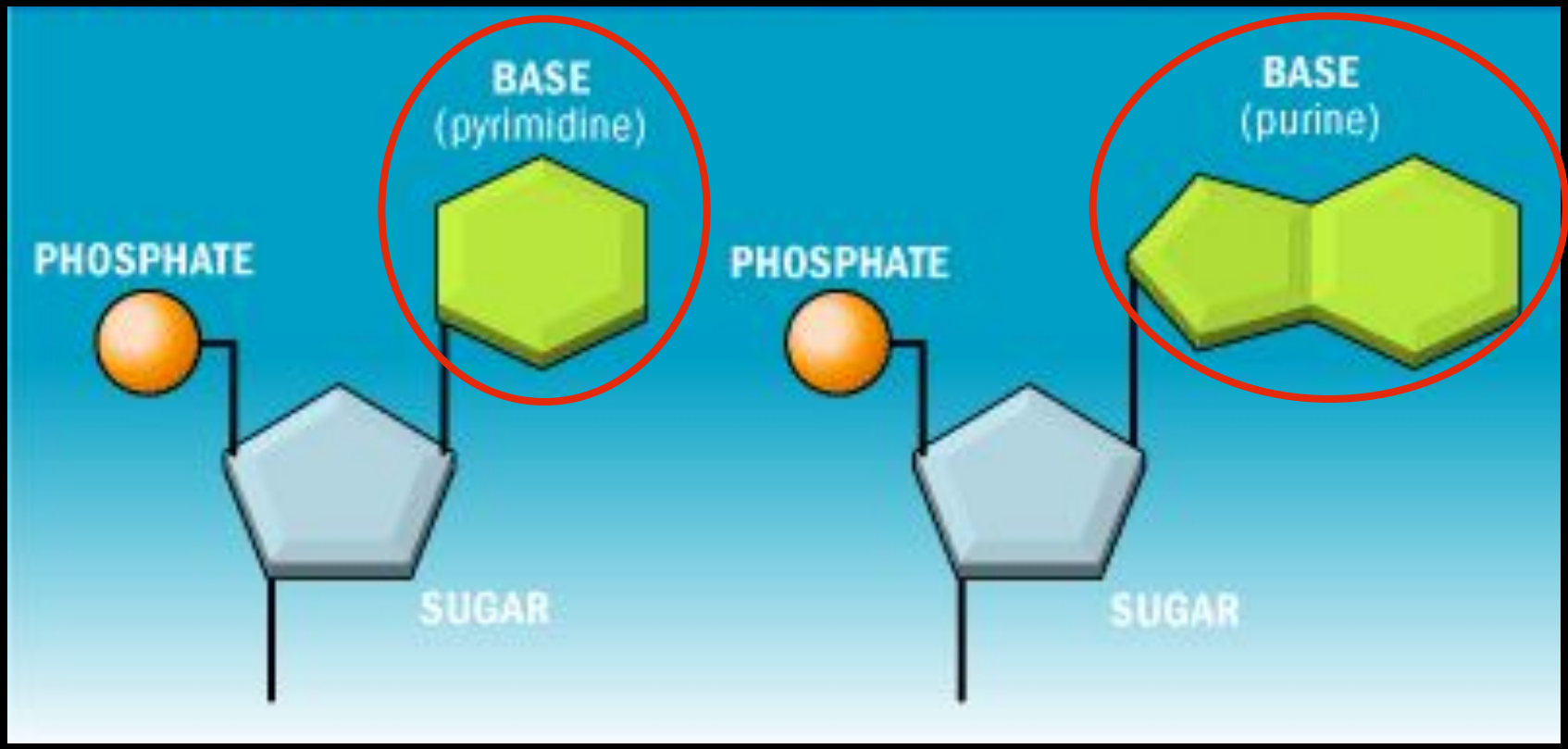


Review: Nucleotide



One deoxyribose sugar, one phosphate and one nitrogenous base make a nucleotide.

Nitrogenous Bases



DNA has two different types of nitrogenous bases - pyrimidines and purines.

Purines and Pyrimidines

Purines:

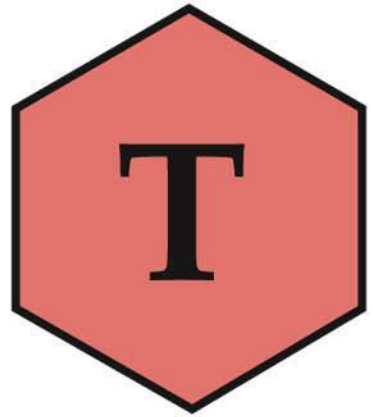
Adenine (A)

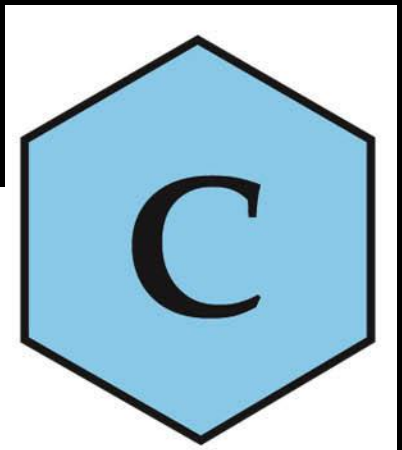
Guanine (G)

Pyrimidines:

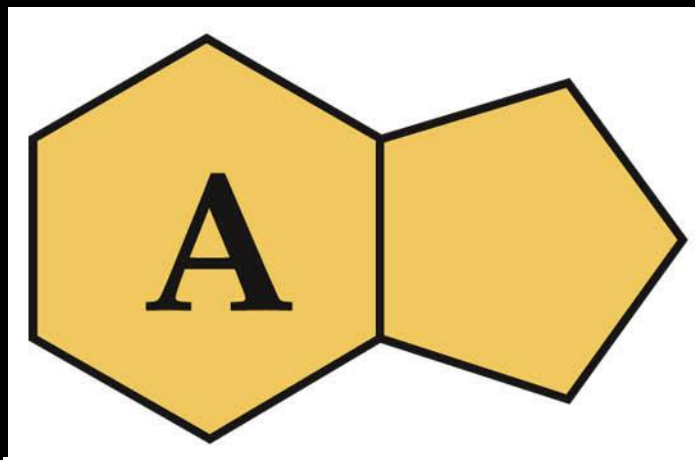
Cytosine (C)

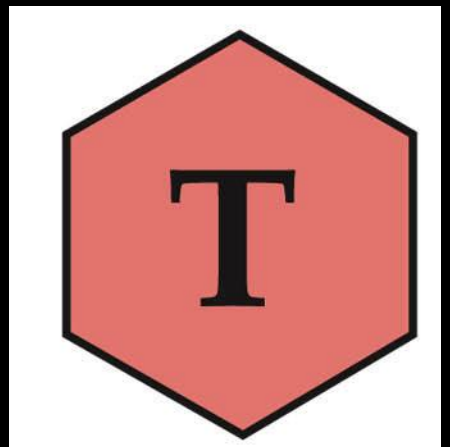
Thymine (T)

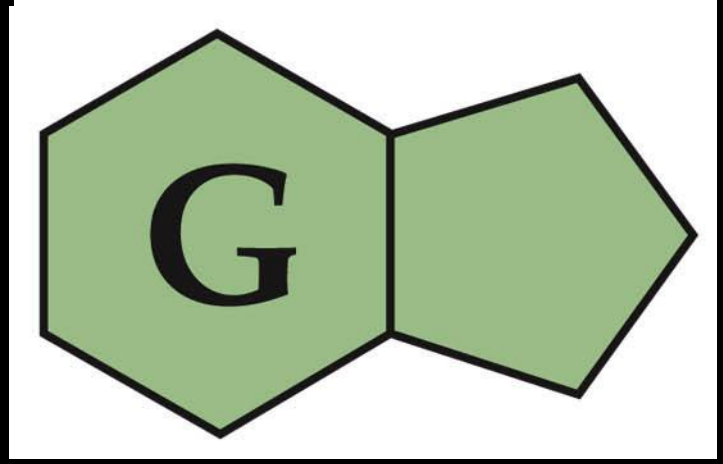


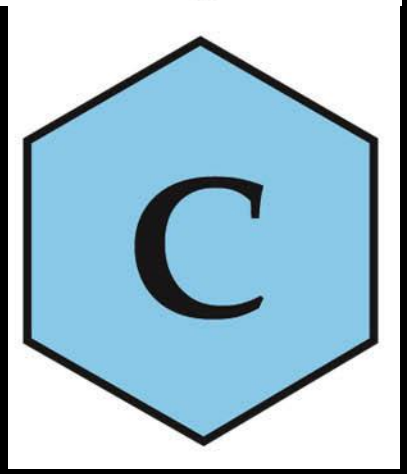


Chargaff's Rule

of 

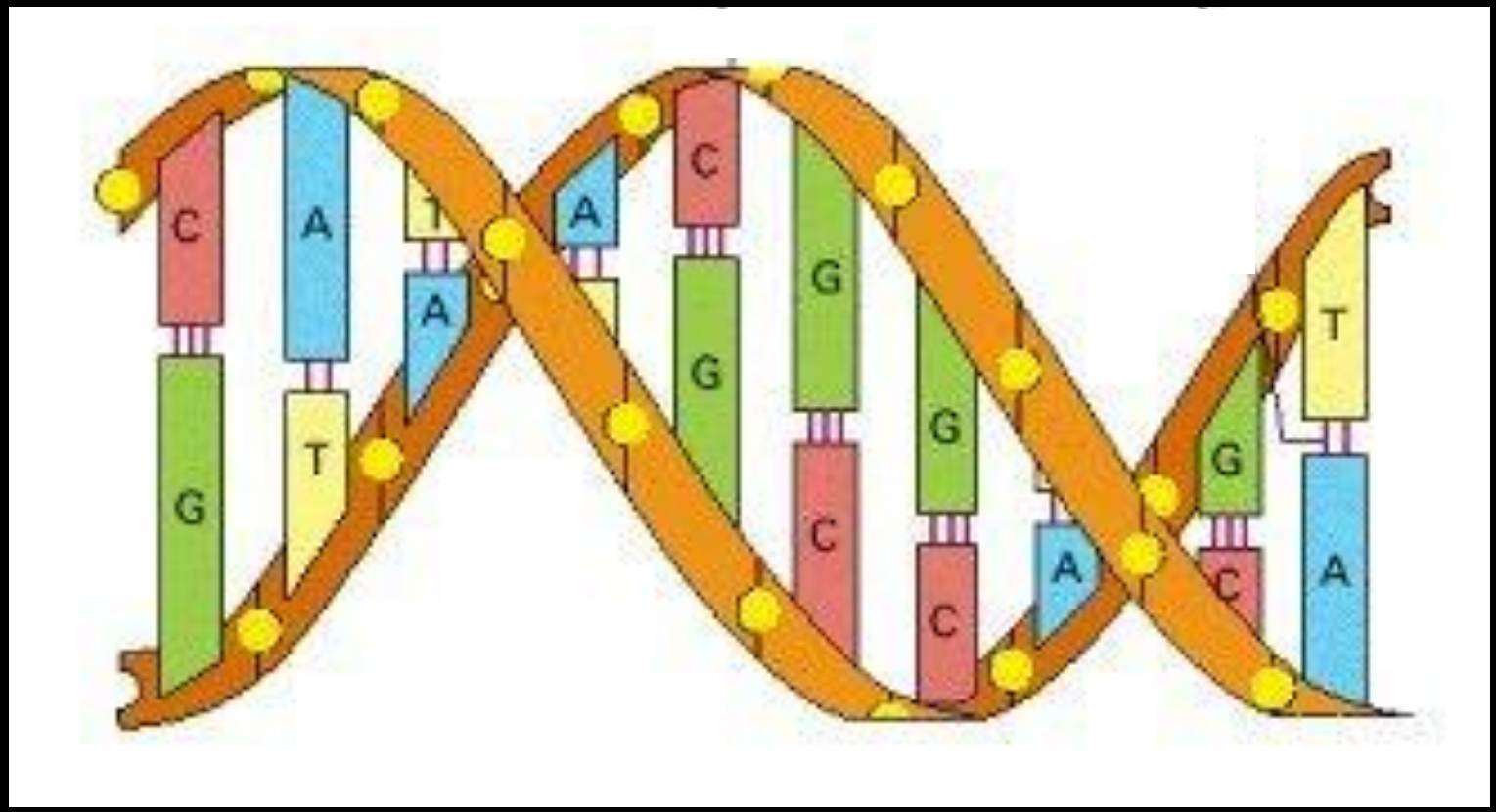
= 

of 

= 

Chargaff's Rule - In DNA, the amount of G is equal to C and the amount of A is equal to T

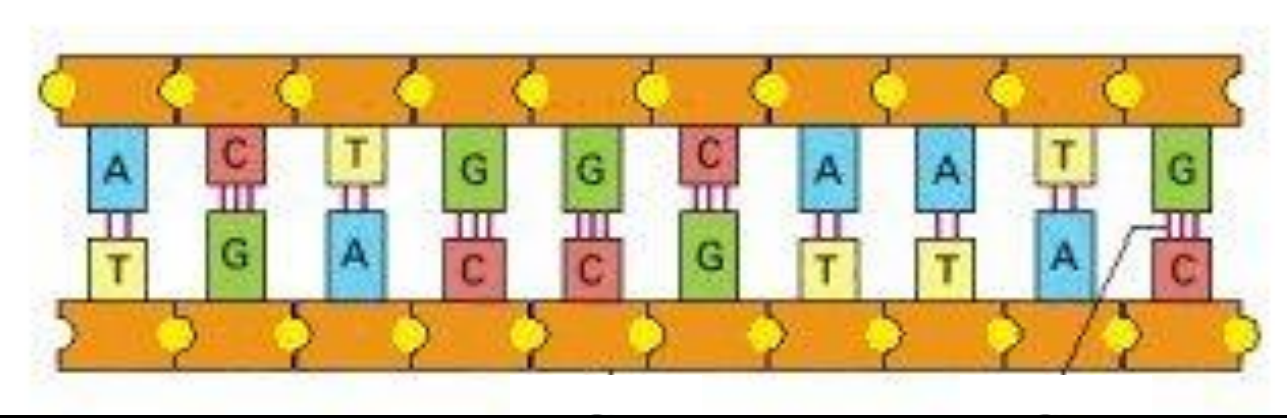
Complementary Base Pairing



Adenine is paired to Thymine and Guanine is paired to Cytosine

Two Strands of DNA

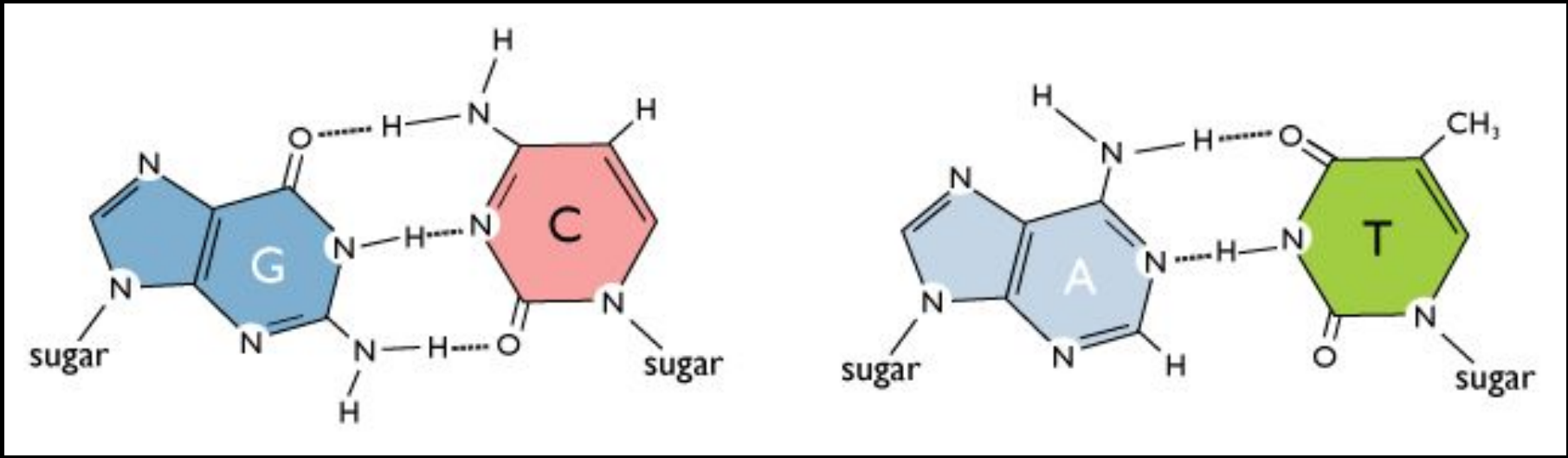
DNA has two strands of DNA that fit together like a zipper



The teeth of the zipper are the nitrogenous bases

How do the two strands stick together?

Hydrogen Bonds



Guanine ≡ Cytosine

3 Bonds

Adenine = Thymine

2 Bonds

The nitrogenous bases are attracted to each other because of hydrogen bonds.

Why Study DNA?

Better food crops

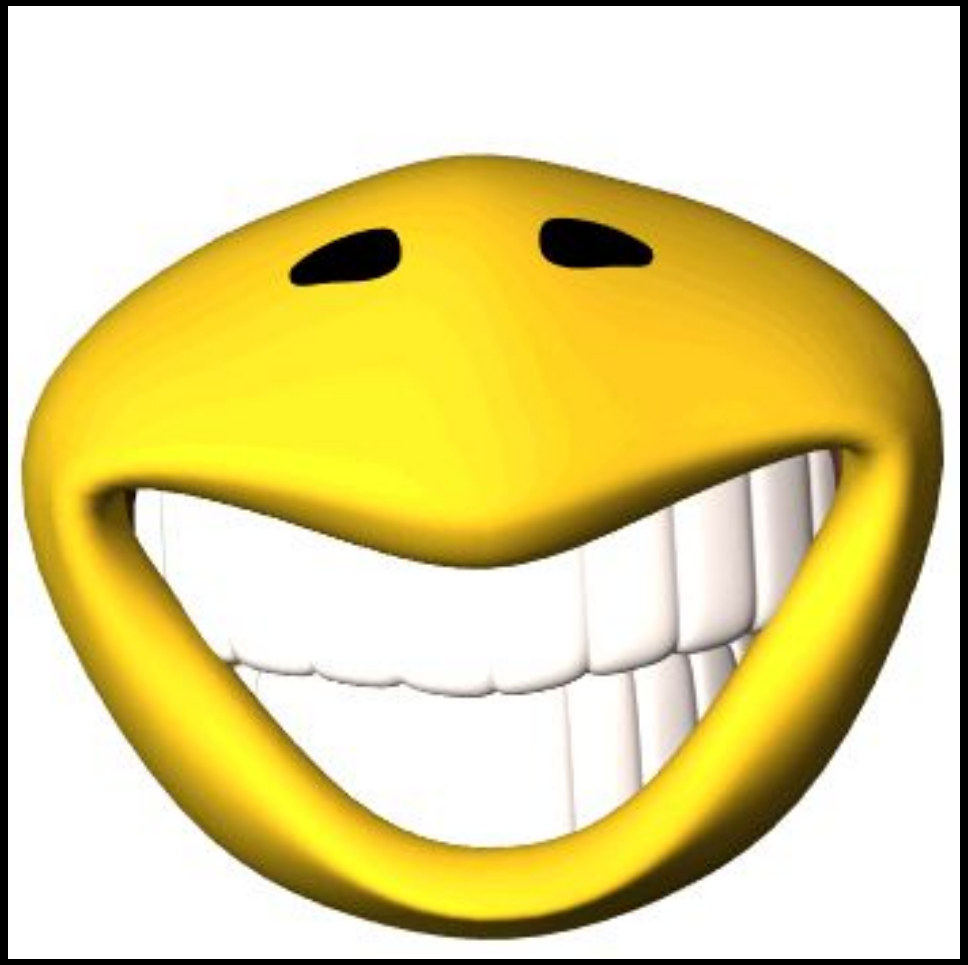
Central importance to all life on earth

Medical benefits such as cures for diseases

Brain Tofu
Biology DNA

What is DNA and How Does it Work?

Stop Here

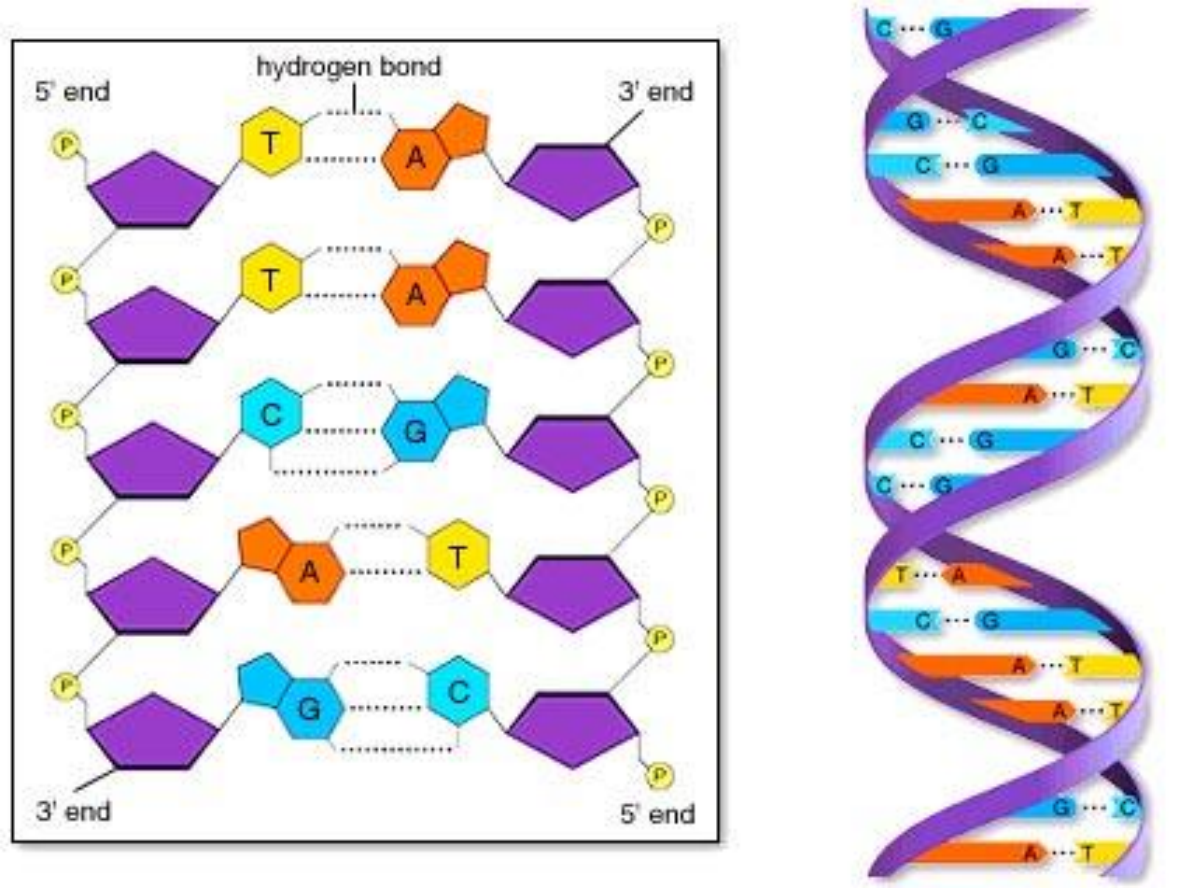


DNA Facts

- Each cell has about 2 meters of DNA
- The average human has 75 trillion cells
- The average human has enough DNA to go from the earth to the sun more than 400 times.

The earth is 150 billion meters from the sun

Summary of DNA Structure



Nucleotides joined together make up a strand of DNA.

Nucleotide: deoxyribose sugar, phosphate and nitrogenous base

Adenine - Thymine
Guanine - Cytosine

A - T G - C

Hydrogen bonds hold DNA strands together