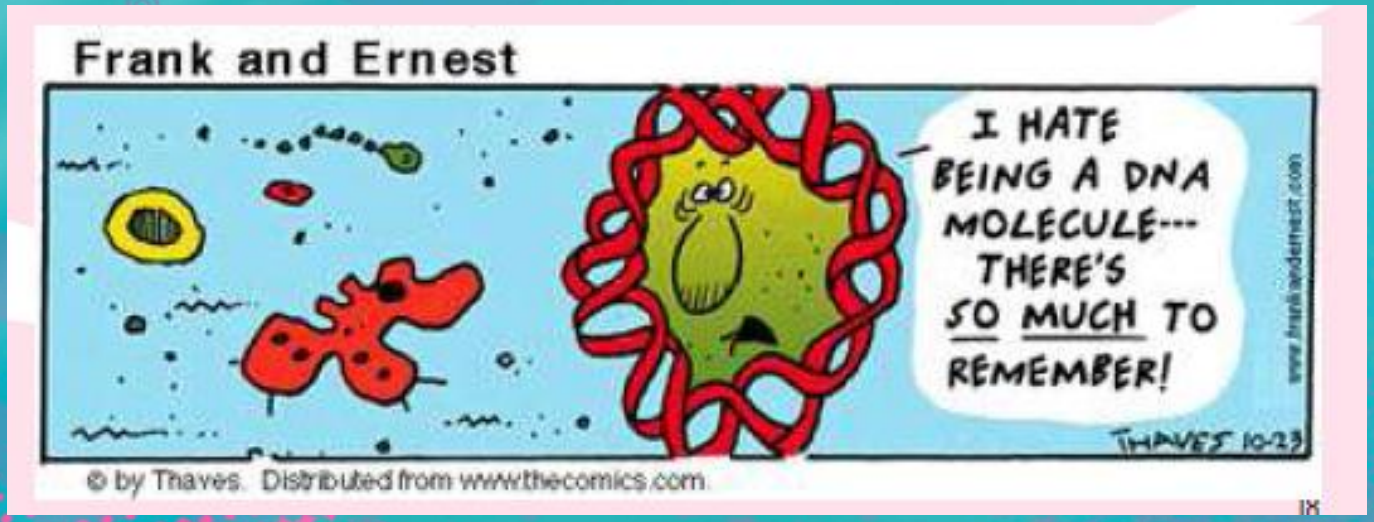
DNA

Blueprint for Life!



TEK 6A, 6B and 6H

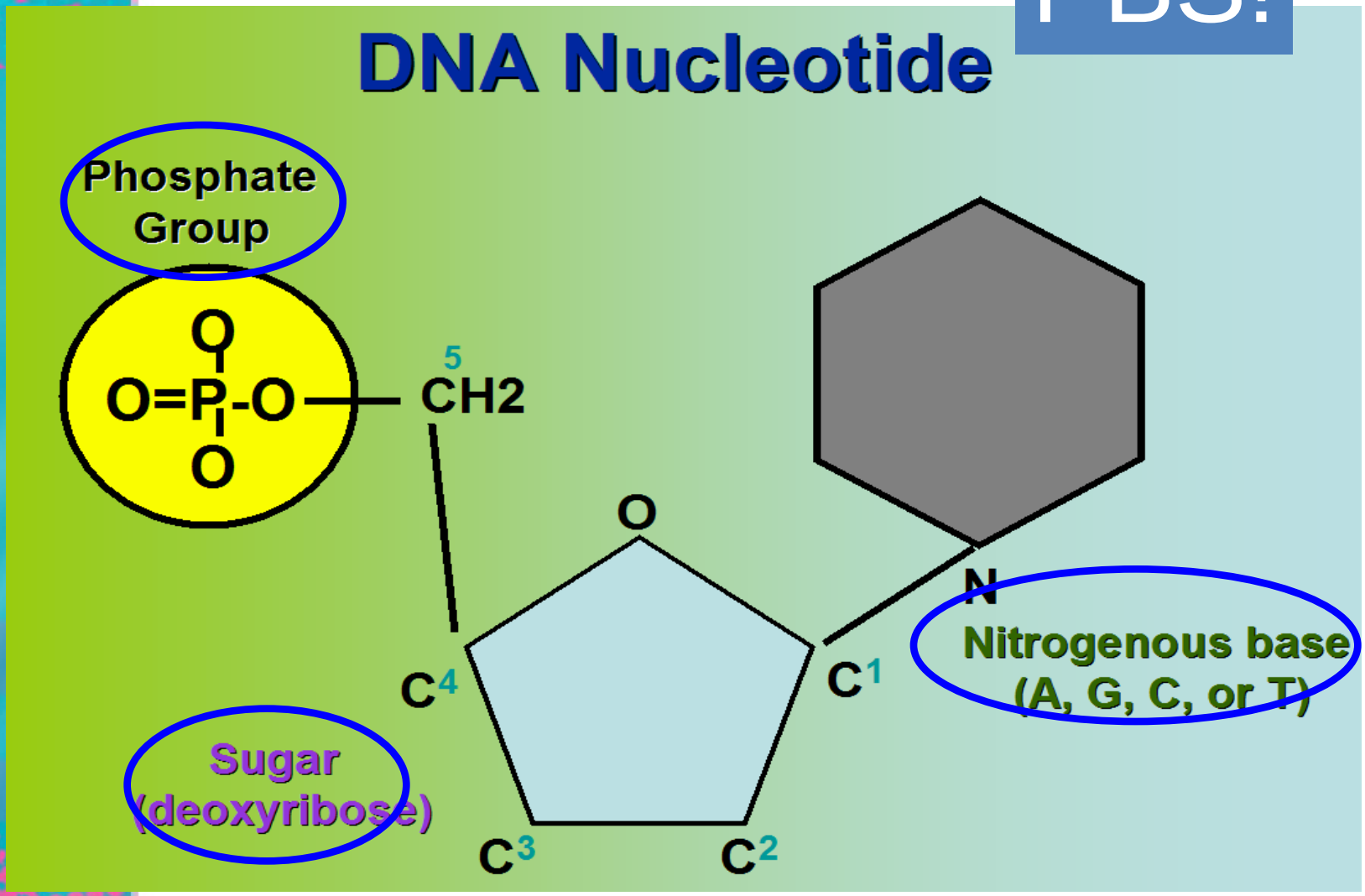
- Identify components of DNA
- Describe how information for specifying traits of an organism is carried in the DNA
- Recognize that components that make up the genetic code are common to all organisms
- Describe how DNA fingerprinting is used to study the genome of organisms

DNA Basics

- DNA =Deoxyribonucleic Acid
- DNA is made of nucleotides (PBS)
  - P- phosphate group
  - B- nitrogenous bases (A, T, C, G)
  - S- sugar (deoxyribose)
- The structure of DNA is a double helix

What is in a nucleotide?

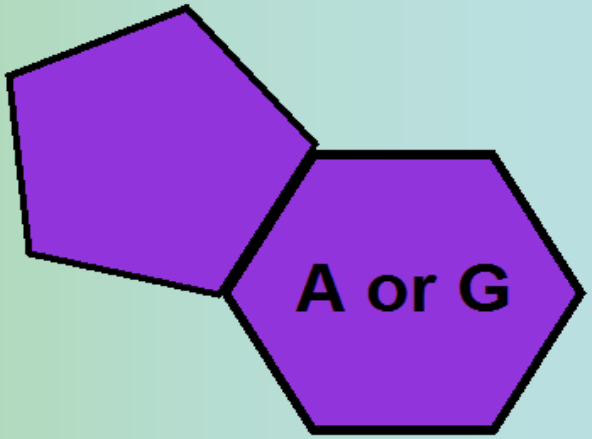
PBS!

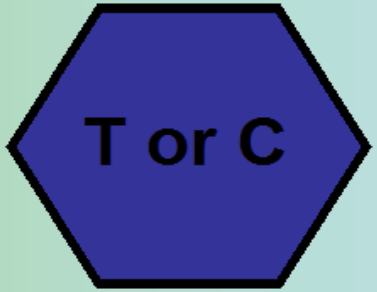


Bases of DNA

Nitrogenous Bases

- **PURINES** (2 Rings)
  1. Adenine (A)
  2. Guanine (G)
- **PYRIMIDINES** (1 Ring)
  3. Thymine (T)
  4. Cytosine (C)

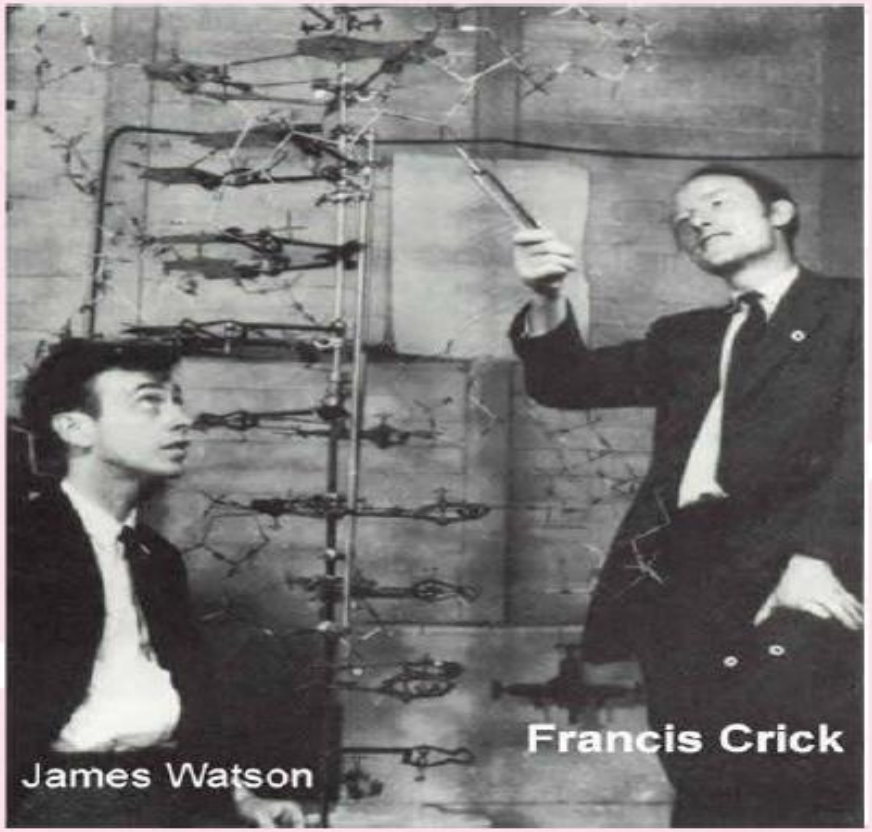




Who figured out what DNA looks like?

James Watson & Francis Crick

- Watson & Crick came up with the first model of DNA in the early 1950's and won the Nobel Prize for their work in 1962.



Watson & Crick proposed…

- **DNA had specific pairing between the nitrogen bases:**

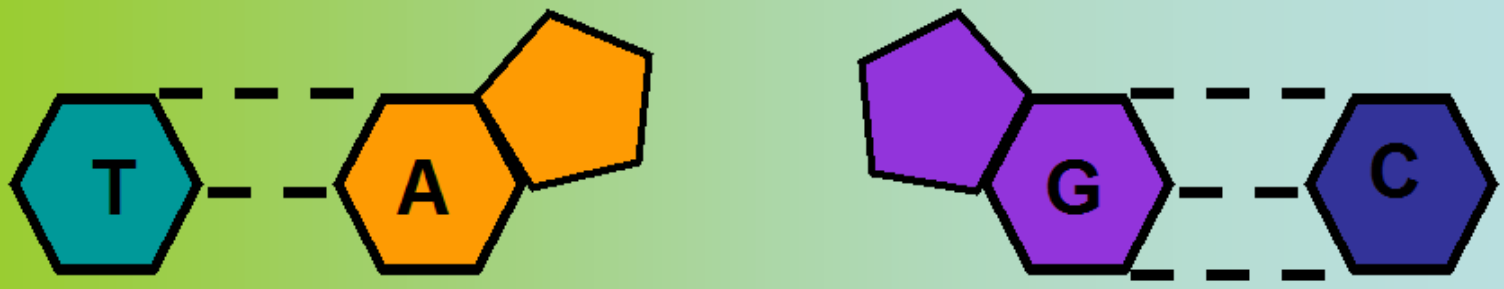
ADENINE – THYMINE

CYTOSINE - GUANINE

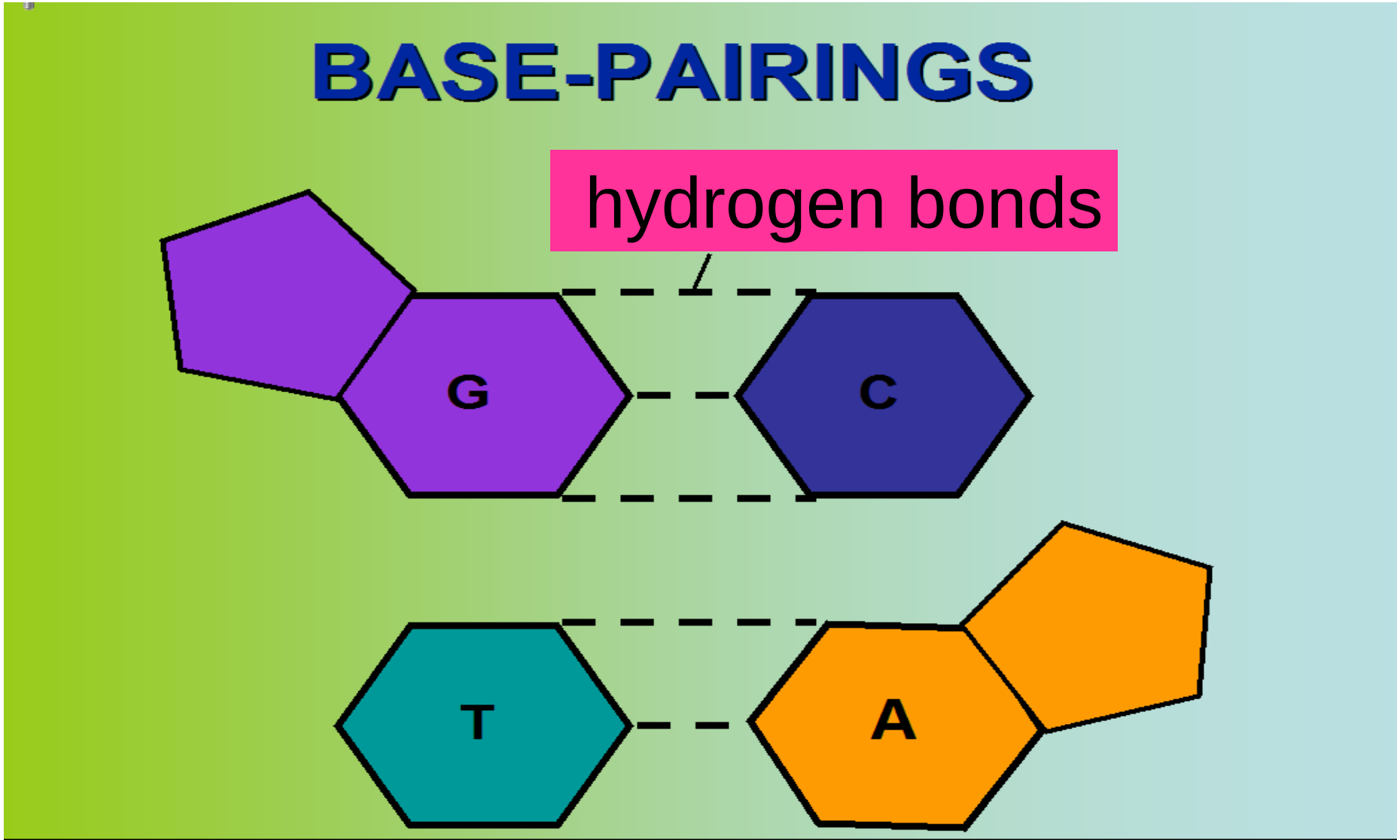
- **DNA was made of 2 long stands of nucleotides arranged in a specific way called the "Complementary Rule"**

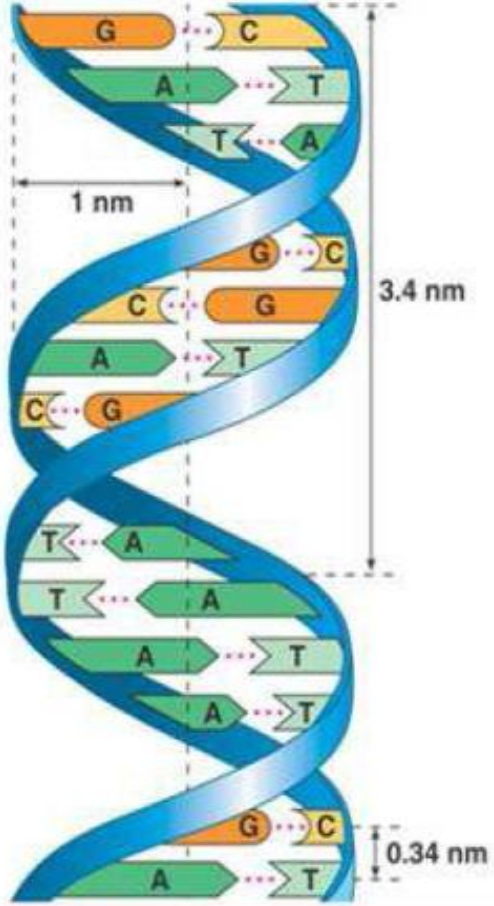
Chargaff's Rule

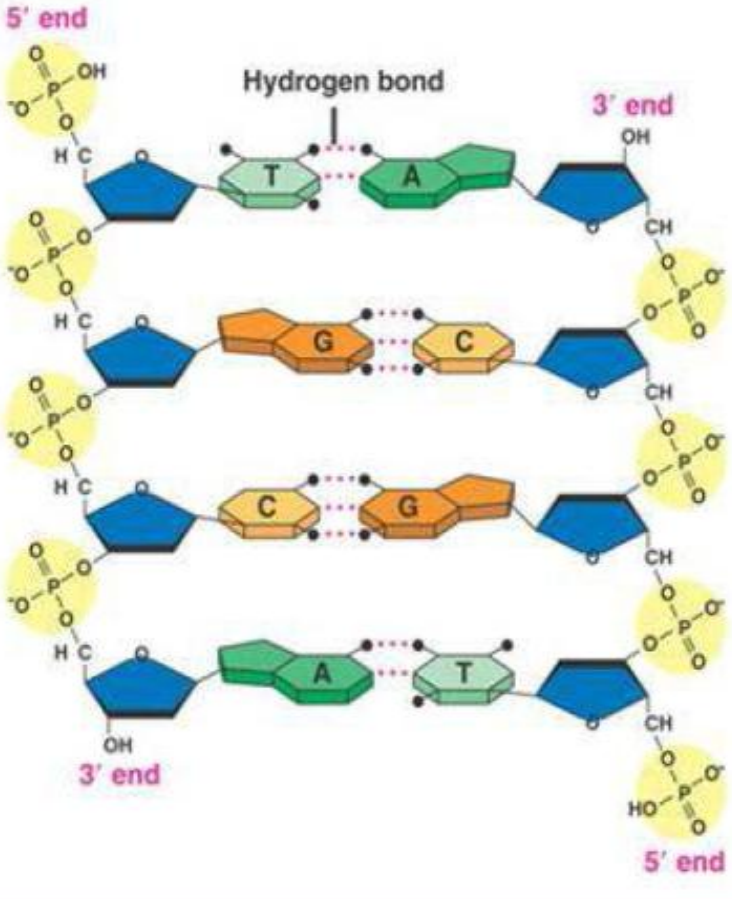
- **Adenine** must pair with **Thymine**
- **Guanine** must pair with **Cytosine**
- Their amounts in a given DNA molecule will be **about the same**.

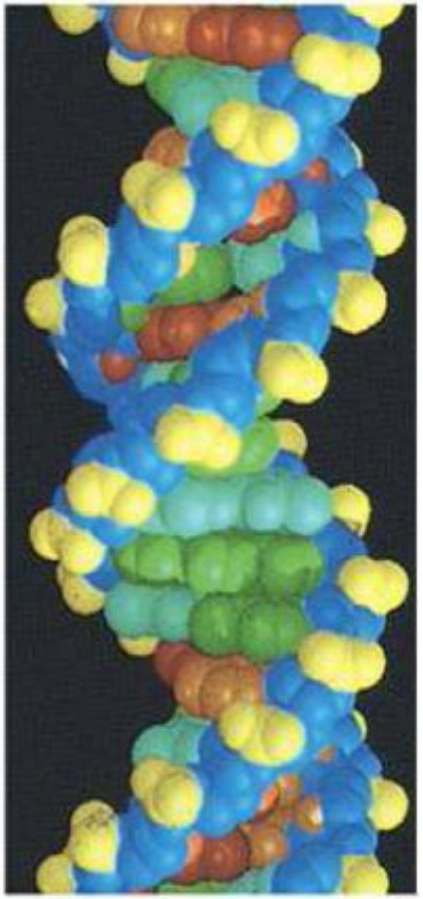


What holds the bases together?





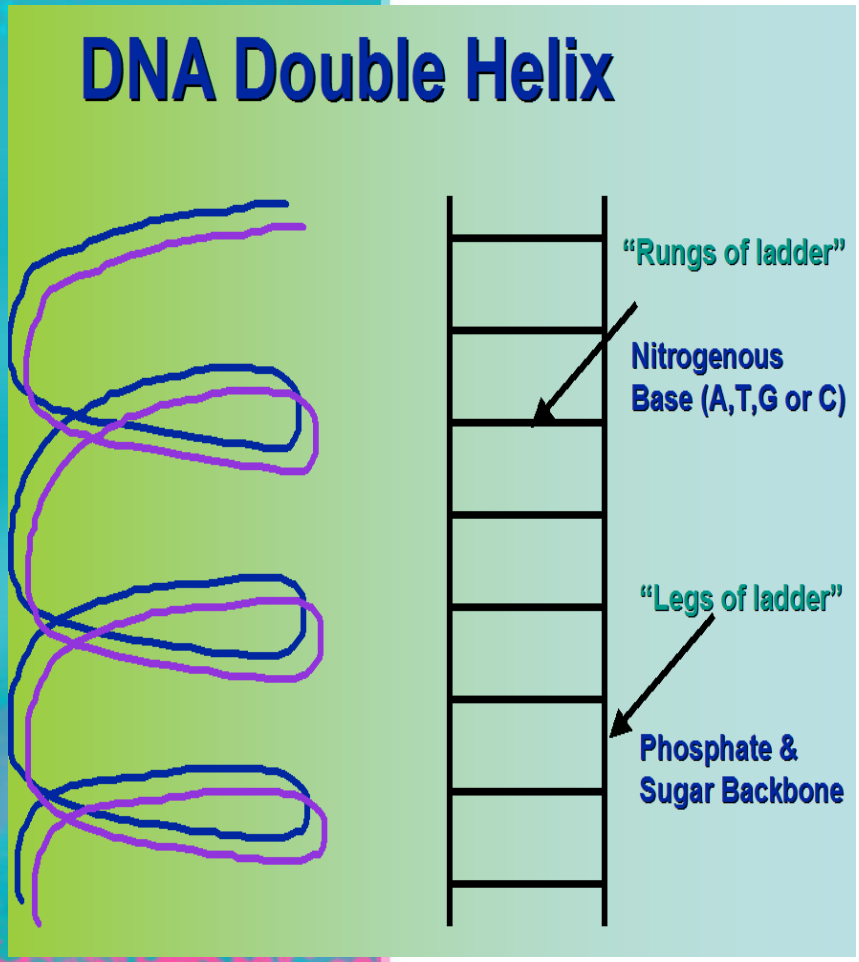


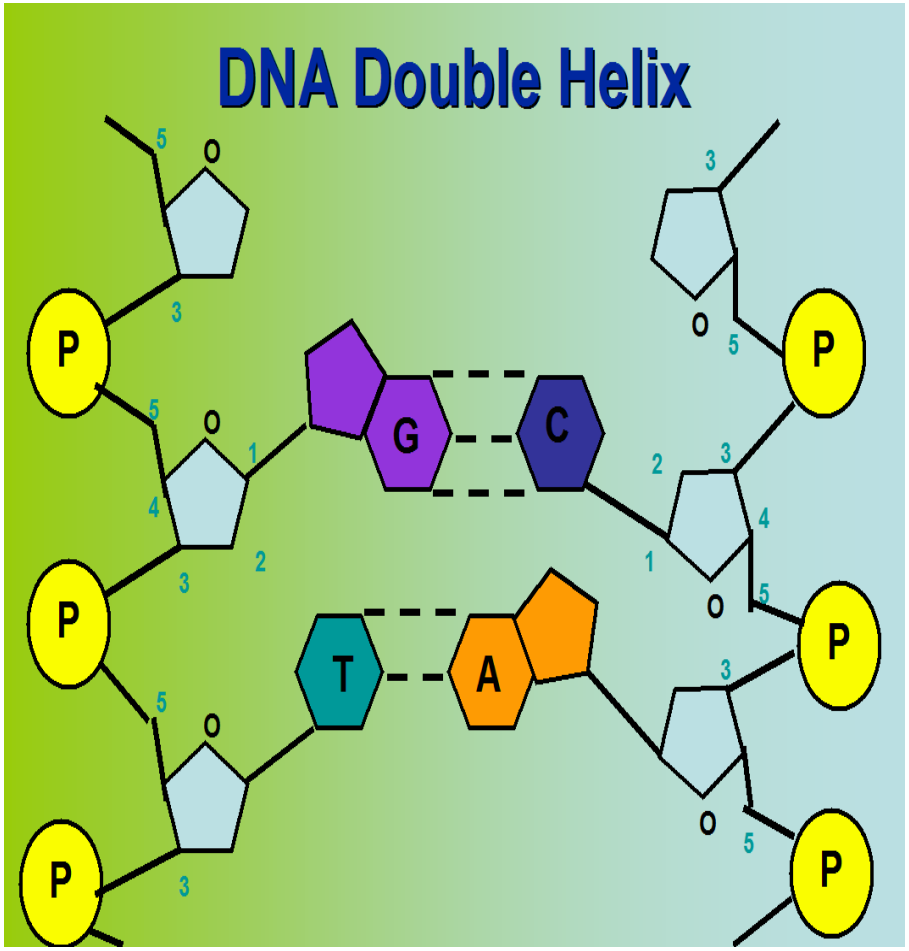


Remember "The apple goes on the tree and the car goes in the garage" to help you remember A pairs with T and G pairs with C

What does a double helix look like?

A twisted ladder!





If we all have DNA, why don't we all look the same?

The Code of Life…

- **The "code" of the chromosome is the SEQUENCE that bases occur.**

A T C G T A T G C G G…

Where is your DNA found?

Location of DNA

- DNA is found in the nucleus of the cell.

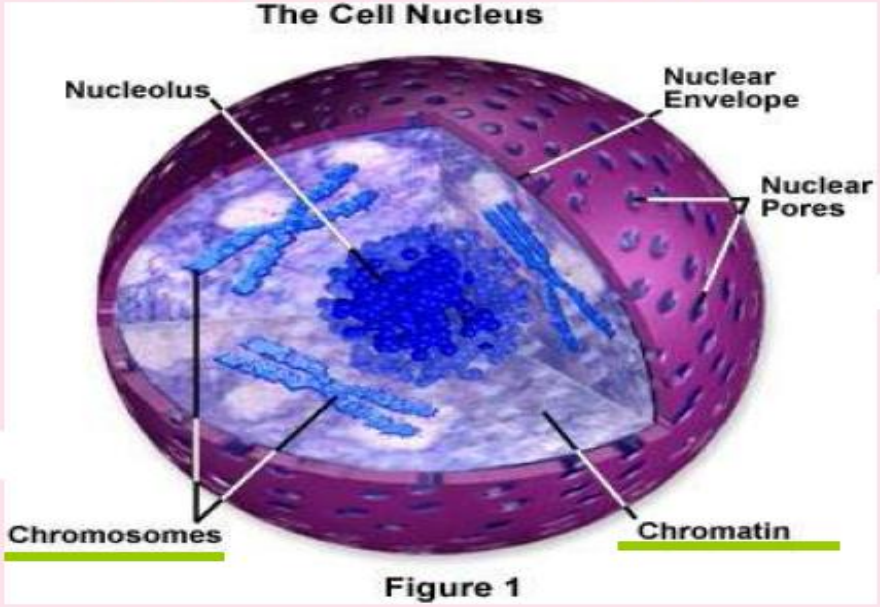


Figure 1

Are you a DNA expert?

1. What are the 4 bases of DNA?

A, T, C, and G

2. Describe the structure of a DNA molecule.

Double helix

3. What type of 'bonds' hold the bases together?

Hydrogen bonds

4. What bonds with adenine?

Thymine

5. What bonds with cytosine?

Guanine

Which of the following statements best describes a DNA molecule?

A. It is a double helix.

B. It contains the sugar ribose.

C. It is composed of amino acids.

D. It contains the nitrogenous base uracil.

Scientists can use genetic information to identify people because it is unique to each person. Which specific characteristic is unique to an individual?

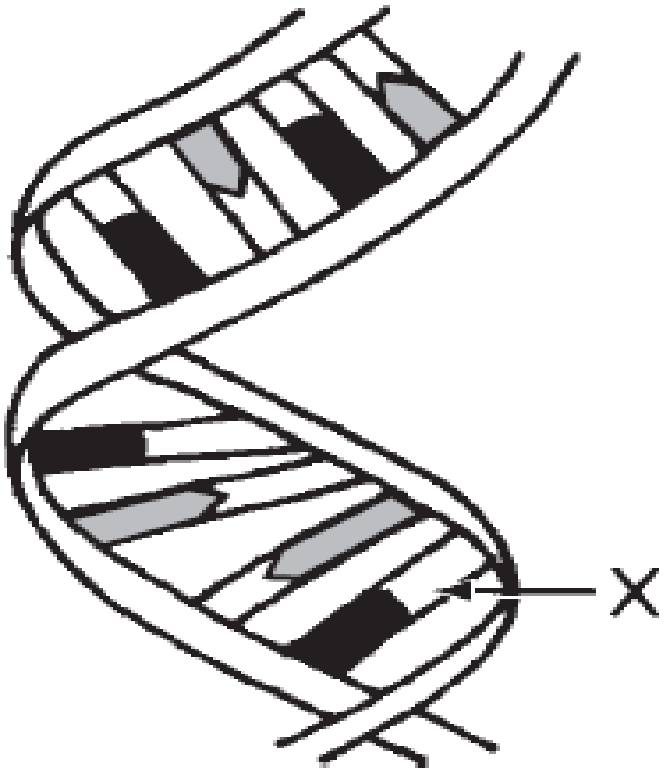
A The shape of the DNA molecules in cells

B The number of chromosomes in each cell

C The sequence of DNA nucleotides in cells

D The size of each chromosome in a cell

44 The diagram below represents a portion of a nucleic acid molecule.



The part indicated by arrow *X* could be

1 adenine
2 ribose
3 deoxyribose
4 phosphate

24 A portion of one strand of a DNA molecule has the sequence shown below.

ACCTGAAGG

Assuming there are no mutations in this portion of the DNA, what is the corresponding sequence on the complementary DNA strand?

A. **ACCTGAAGG**

B. **GTTCAGGAA**

C. **TGGACTTCC**

D. **UGGACUUCC**

Using what you have learned, write to explain the cartoon strip below.