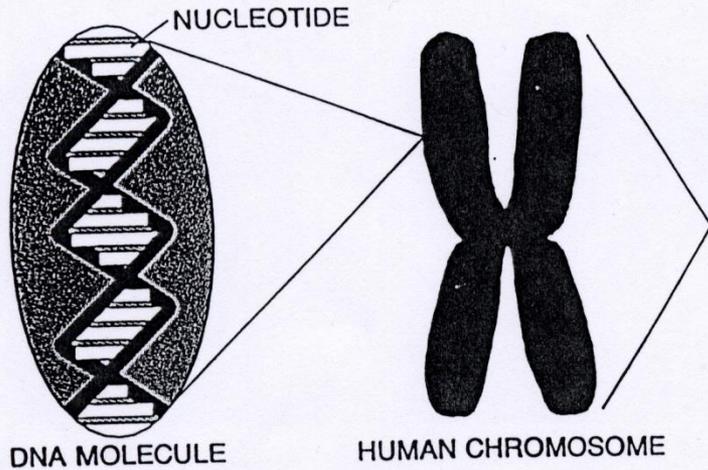


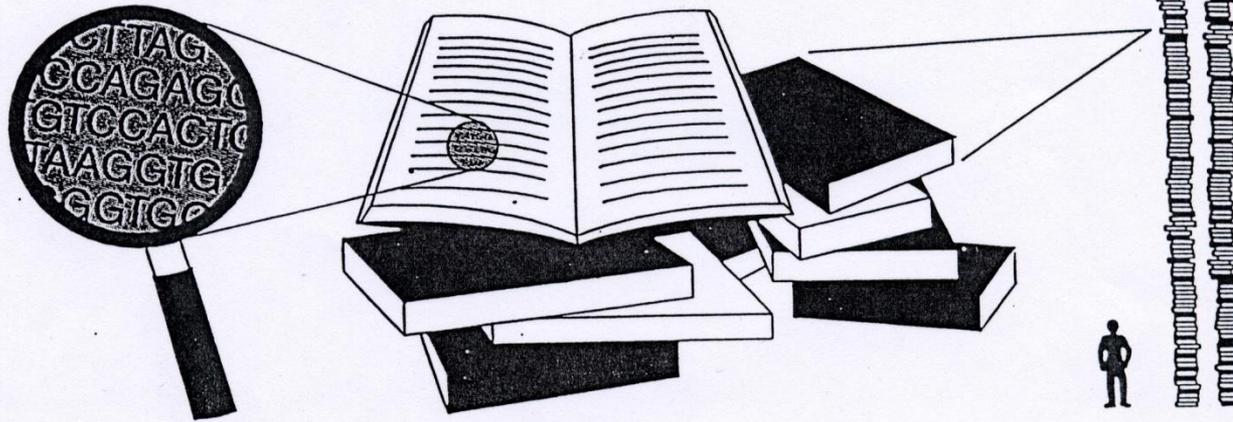
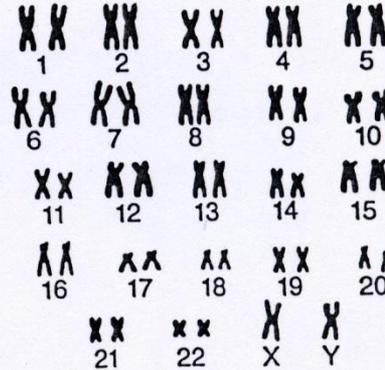
# What is DNA?

- \_\_\_\_\_
- It is the \_\_\_\_\_ in which the \_\_\_\_\_  
\_\_\_\_\_ (and traits of all living things) are written.
- Our traits are a result of products (usually \_\_\_\_\_) made from these instructions.
- Very thin
  - DNA fiber is 0.000002 mm in diameter
  - Hair is 0.01 mm (5,000 X DNA diameter)
  - Thread is 0.1 mm (50,000 X DNA diameter)
  - Yarn is 2.0 mm (1,000,000 X DNA diameter)
- Very long
  - DNA from one cell is about \_\_\_\_\_ long
  - Total DNA in one person from end to end is 25,000,000,000 km long (\_\_\_\_\_ X distance from the Earth to the Sun)

# What does DNA do?



DIPLOID HUMAN GENOME



- DNA is the molecule that stores genetic information in cells (The \_\_\_\_\_ for Life)
- Chromosomes are DNA molecules containing many \_\_\_\_\_ one after another (\_\_\_\_\_)
- Genes contain the information to make \_\_\_\_\_ (\_\_\_\_\_)
- DNA is made up of \_\_\_\_\_ different basic chemical units (\_\_\_\_\_)

# DNA, Genes, Chromosomes & the Nucleus

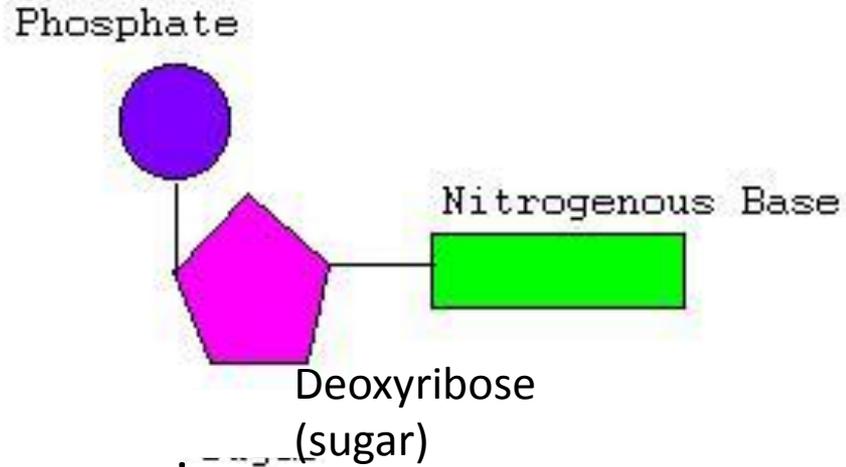
- The \_\_\_\_\_ contains our \_\_\_\_\_  
\_\_\_\_\_
- Humans have \_\_\_\_\_ of chromosomes (\_\_\_\_\_ total: \_\_\_\_\_ from mother, \_\_\_\_\_ from father).
- \_\_\_\_\_ are composed of \_\_\_\_\_. Many genes can be found on a single chromosome.
- A \_\_\_\_\_ is a \_\_\_\_\_ that \_\_\_\_\_ for a particular \_\_\_\_\_ (which codes for a particular trait).

# DNA Structure

- The DNA molecule is a very long \_\_\_\_\_ (chain of repeating units).
- The small units (monomers) are called \_\_\_\_\_.

- Each nucleotide has three parts

- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_



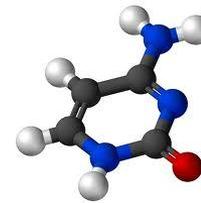
- There are \_\_\_\_\_ in DNA.

- \_\_\_\_\_: have a \_\_\_\_\_ ring structure

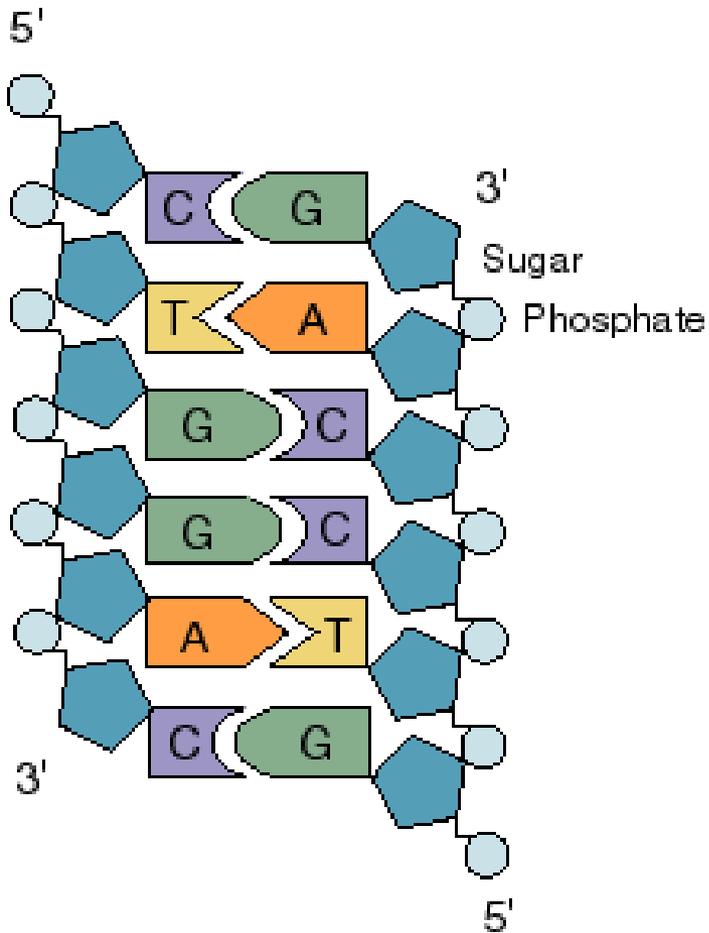
- \_\_\_\_\_
- \_\_\_\_\_

- \_\_\_\_\_: have a \_\_\_\_\_ ring structure

- \_\_\_\_\_
- \_\_\_\_\_



# Nucleotide Bases



- The bases of the two DNA strands always pair up the same way!

- Base pairing rules:

— \_\_\_\_\_

— \_\_\_\_\_

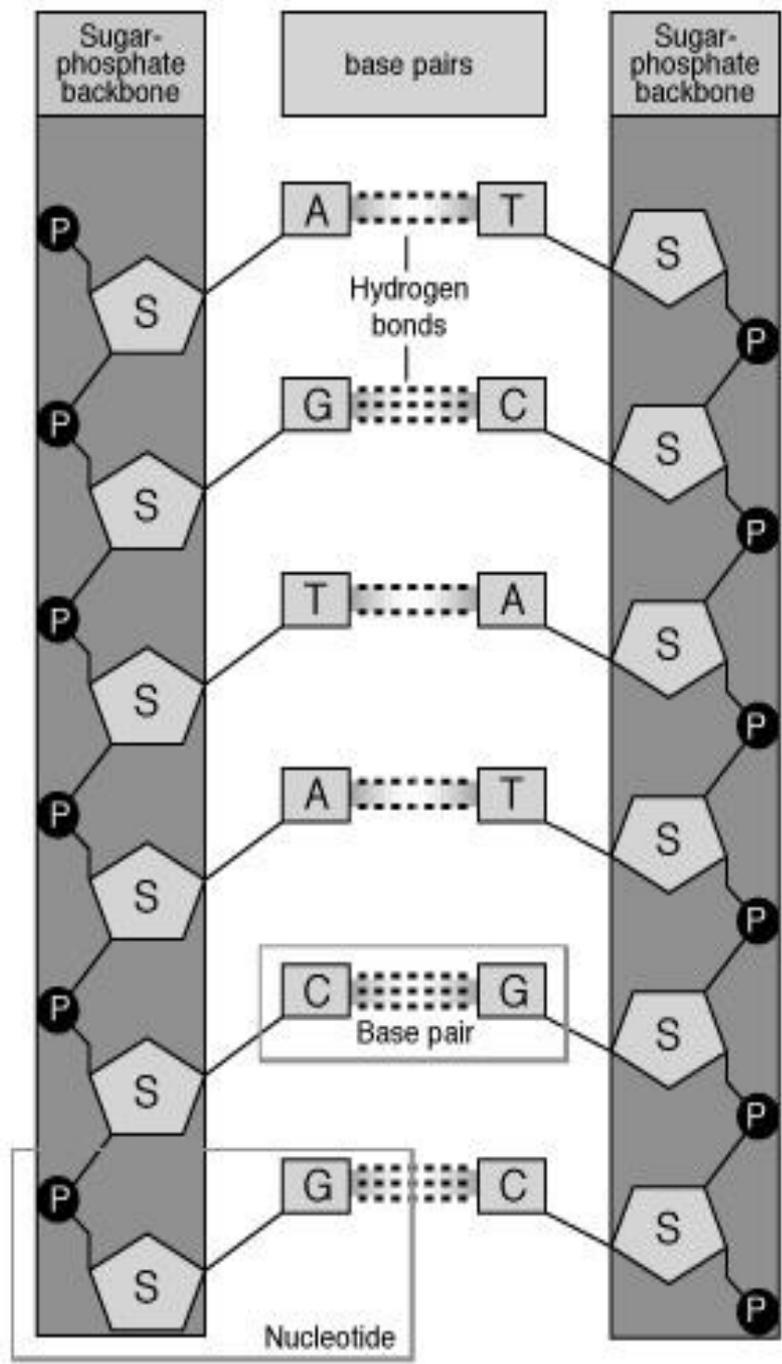
Pairings occur because of the sizes of the bases and their ability to form \_\_\_\_\_

bonds with each other.

Base pairs are held together by \_\_\_\_\_.

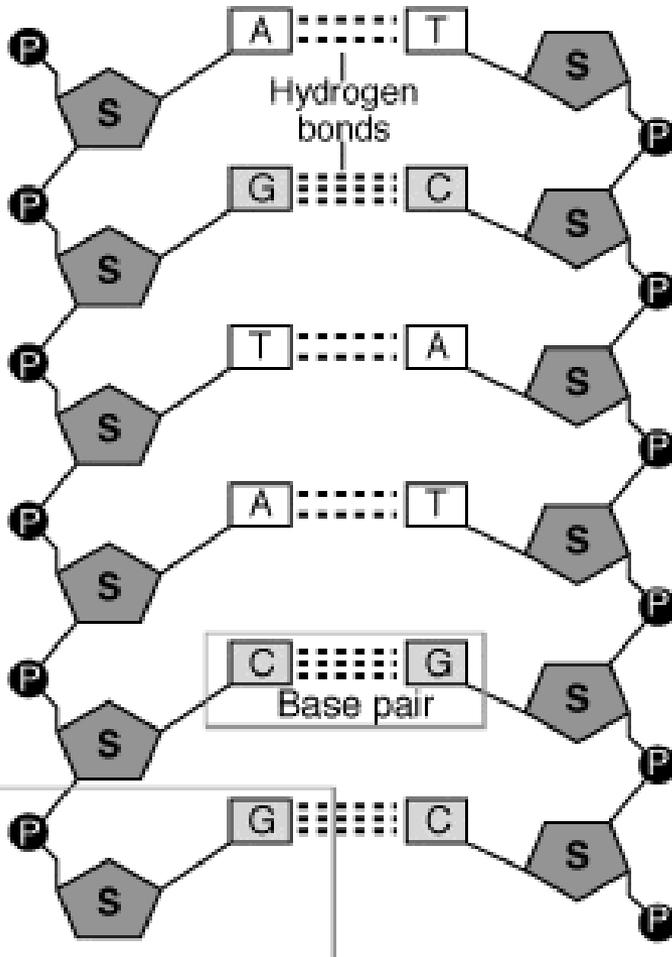
These bonds are \_\_\_\_\_ than covalent bonds allowing the two strands to be separated.

Which base pairs have a stronger bond?



# DNA Structure

Deoxyribonucleic Acid (DNA)

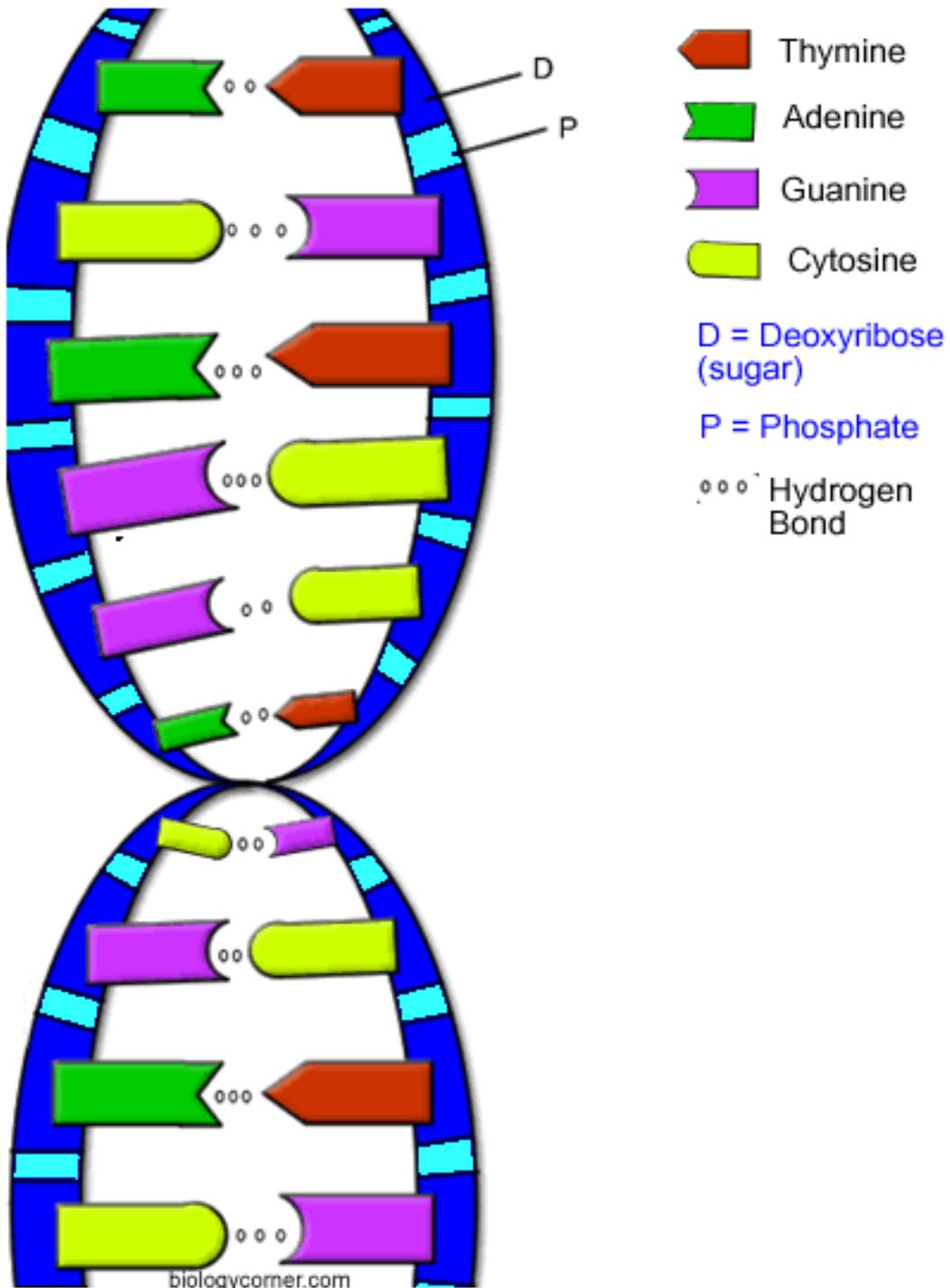


Nucleotide

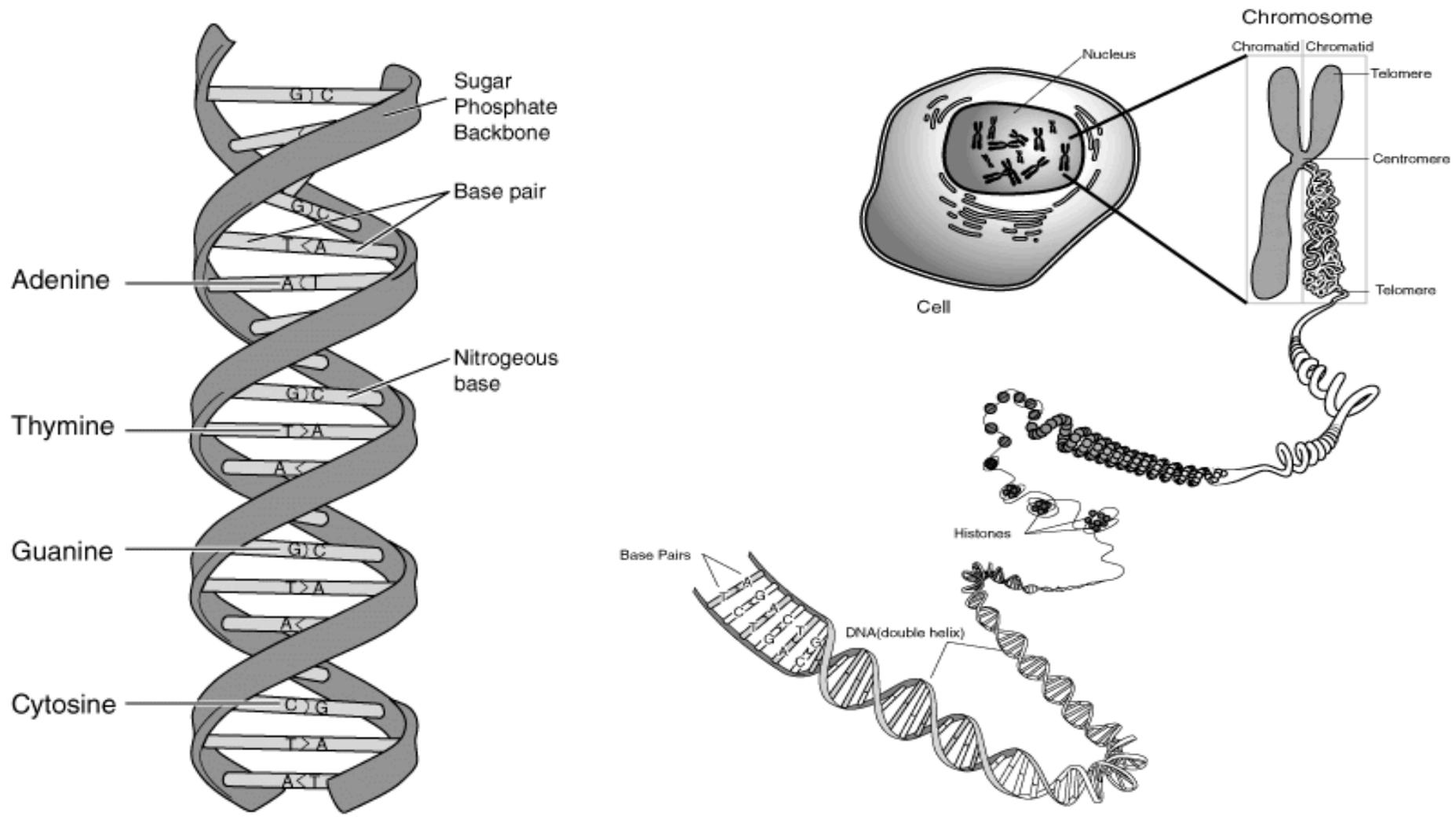
- DNA is made up of two separate molecules (called \_\_\_\_\_) that are held together like a ladder by interlocking rungs (\_\_\_\_\_)
- The invariable \_\_\_\_\_ (sides of the ladder) is made up of \_\_\_\_\_ and \_\_\_\_\_.
- The variable portion (the rungs of the ladder) is made up of bases (\_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_)
- The two strands are “\_\_\_\_\_” so that if you know the bases that make up one strand, you automatically know the bases (or sequence) of the other strand
- The two strands are directional. They are read in \_\_\_\_\_ directions (\_\_\_\_\_)
- **The two strands can be pulled apart**

Below is the sequence of nucleotide bases on one strand of DNA. Write the appropriate base pair that the other strand of DNA would have:

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



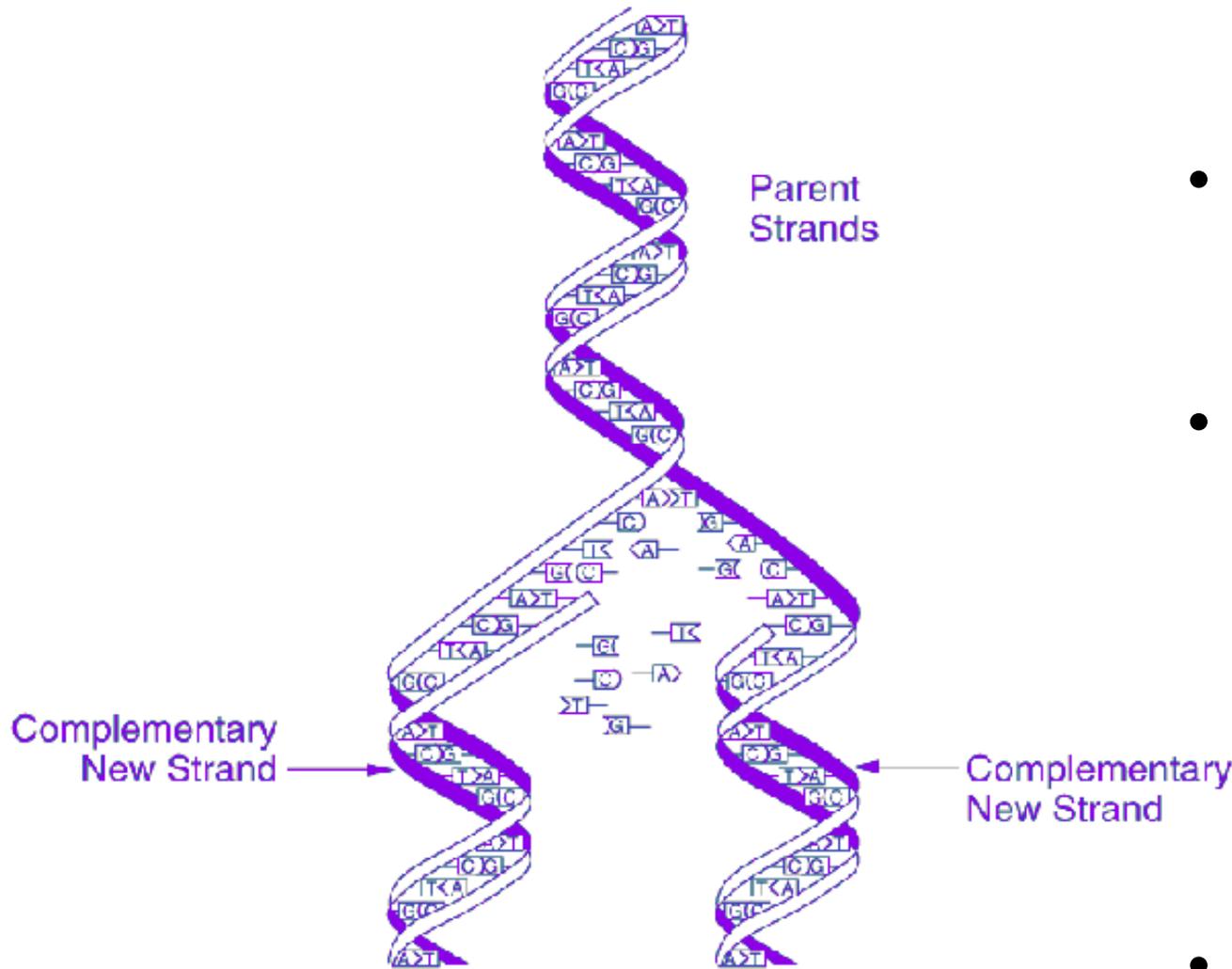
# It is a \_\_\_\_\_ !



# DNA & Genes

- \_\_\_\_\_ are especially important  
\_\_\_\_\_ that directly influence one or more traits.
- They are relatively small segments of chromosomes, where the  
\_\_\_\_\_ encodes a recipe for making a  
\_\_\_\_\_.
- Small differences in the sequence of DNA nucleotides of a particular gene can lead to differences in the structure and behavior of the \_\_\_\_\_.
- It is these differences, in turn, that account for the variable characteristics of the people around you.
- The long chains of DNA form the 'words' and 'sentences' of your genetic code, in which nucleotides are the 'letters'.

# DNA is copied during cell division



- The DNA “parent” strands

- 
- \_\_\_\_\_  
are added (A-T, C-G)

- The result is two complete DNA molecules that are an

\_\_\_\_\_ of the original molecule!

- Each cell gets a complete copy

# DNA Replication

- Enzymes involved in DNA replication:
  - \_\_\_\_\_: “unzips” or “unwinds” DNA double helix
  - \_\_\_\_\_: form bonds between nucleotides during replication.
- 1) DNA Replication takes place during the “\_\_\_\_\_” of interphase before cell division.
- 2) At this time, the enzyme helicase \_\_\_\_\_ the DNA double helix, \_\_\_\_\_ the two strands of DNA from one another. Base pairs are separated.
- 3) \_\_\_\_\_ attach to the template strands by DNA polymerase. Remember nucleotides are made from a phosphate group, a deoxyribose (sugar) and a nitrogen base.
- 4) This results in two identical sets (2 double helixes) of DNA; known as sister chromatids.