

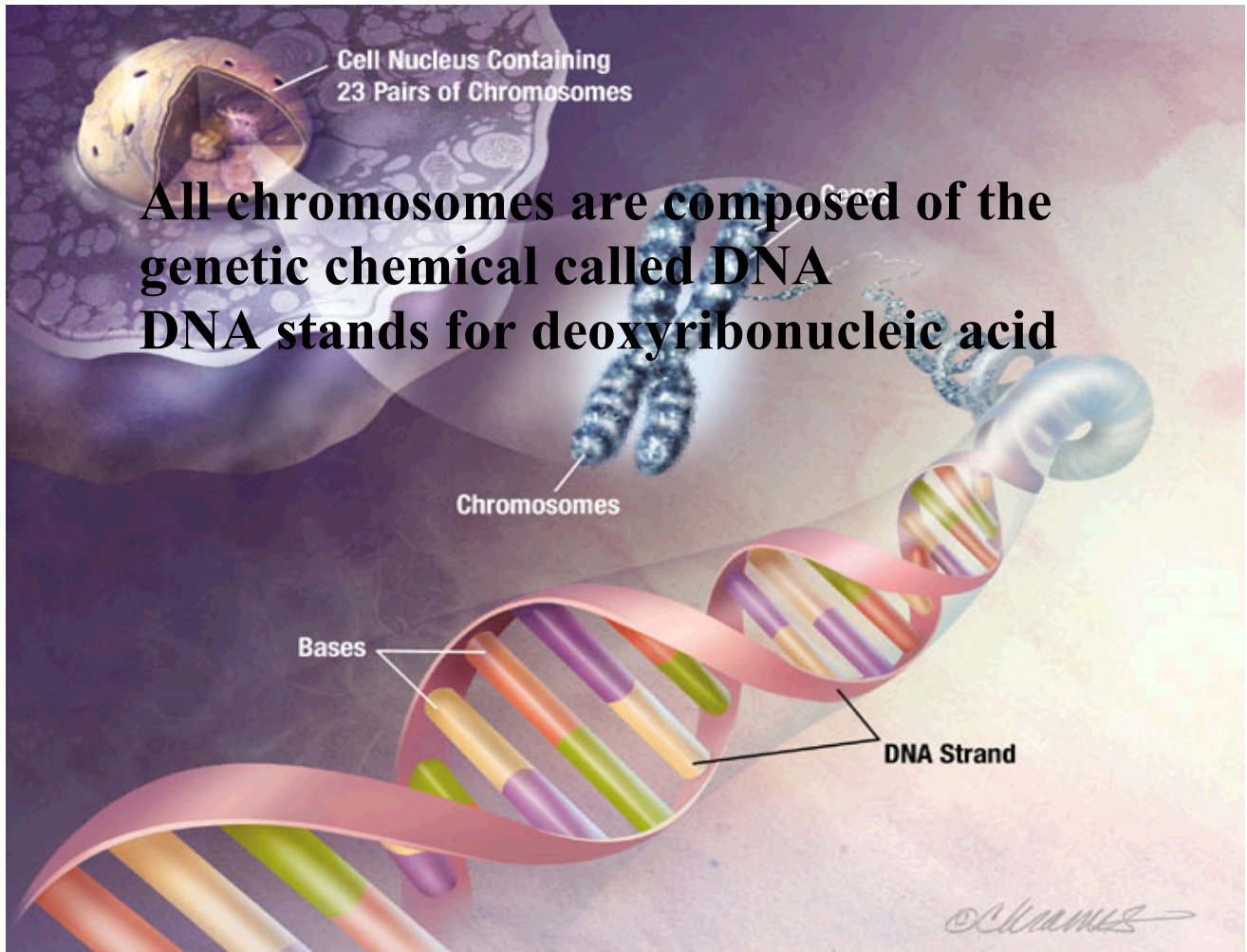
Chapter 6

A Closer Look at Cell Division

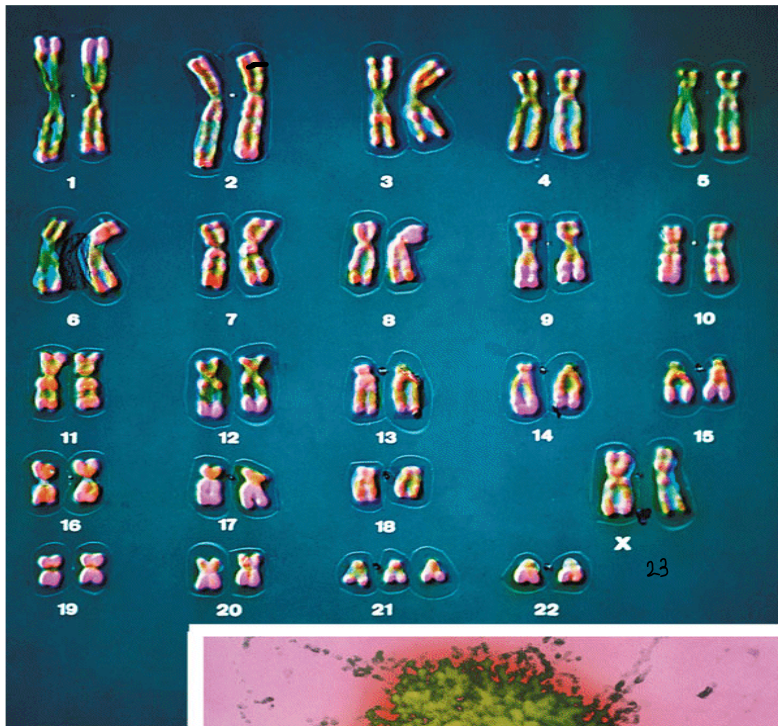
DNA: The Genetic Material

Deoxyribonucleic Acid

DNA is the genetic material found in the chromosomes of a cell. It contains all the information that determine how cells function and respond to their environment.



**All chromosomes are composed of the genetic chemical called DNA
DNA stands for deoxyribonucleic acid**



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- Chromosomes exist in “matching pairs” in the nucleus of a cell XX
- Scientists call the matching pairs “homologous pairs”.
- In every human body cell, there are 23 homologous pairs of chromosomes

IN HUMANS

Pair # 1- 22 = "autosomes"

Pair #23 =
"Sex chromosomes"

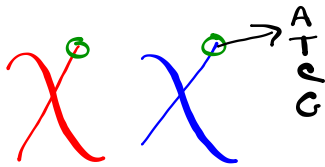
* XX = **G**

* XY = **B**



Figure 9-1 Biology: Understanding Life 1/e

Humans have 46 chromosomes which contain 100 000 genes and 6 billion nitrogen bases.



DNA is made up of a series of chemicals called nitrogen bases

Nitrogen bases:

A - T
or
T - A

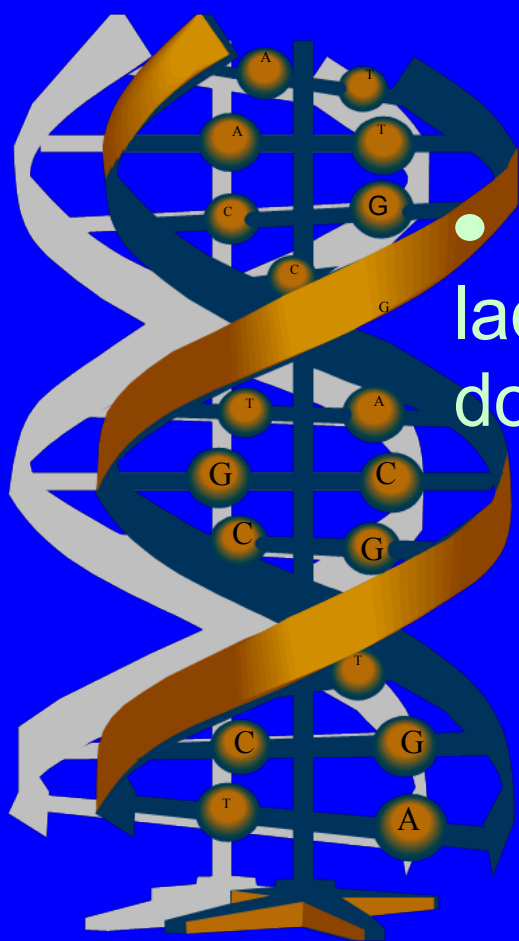
A - Adenine
T - Thymine

C - G
G - C

C - Cytosine
G - Guanine

DNA uses these four letter as codes to make up the nitrogen base. The order that the bases appear in is the code.

What does DNA look like?



- DNA looks like a twisted ladder, also known as a double helix.

- The rungs of the ladder are composed of pairs of nucleotide bases.

- Adenine always pairs with thymine.

- Cytosine always pairs with guanine

- One side of the DNA molecule is always complementary to the other.

A — T

C — G

C — G

T — A

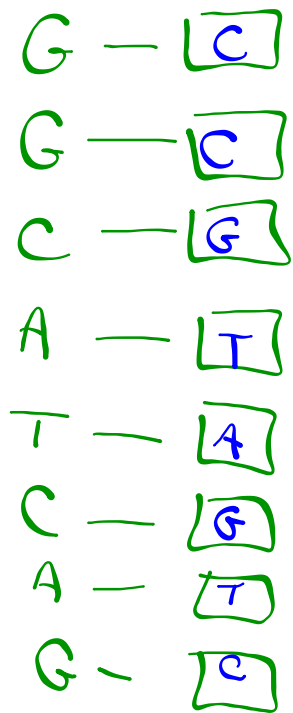
T — A

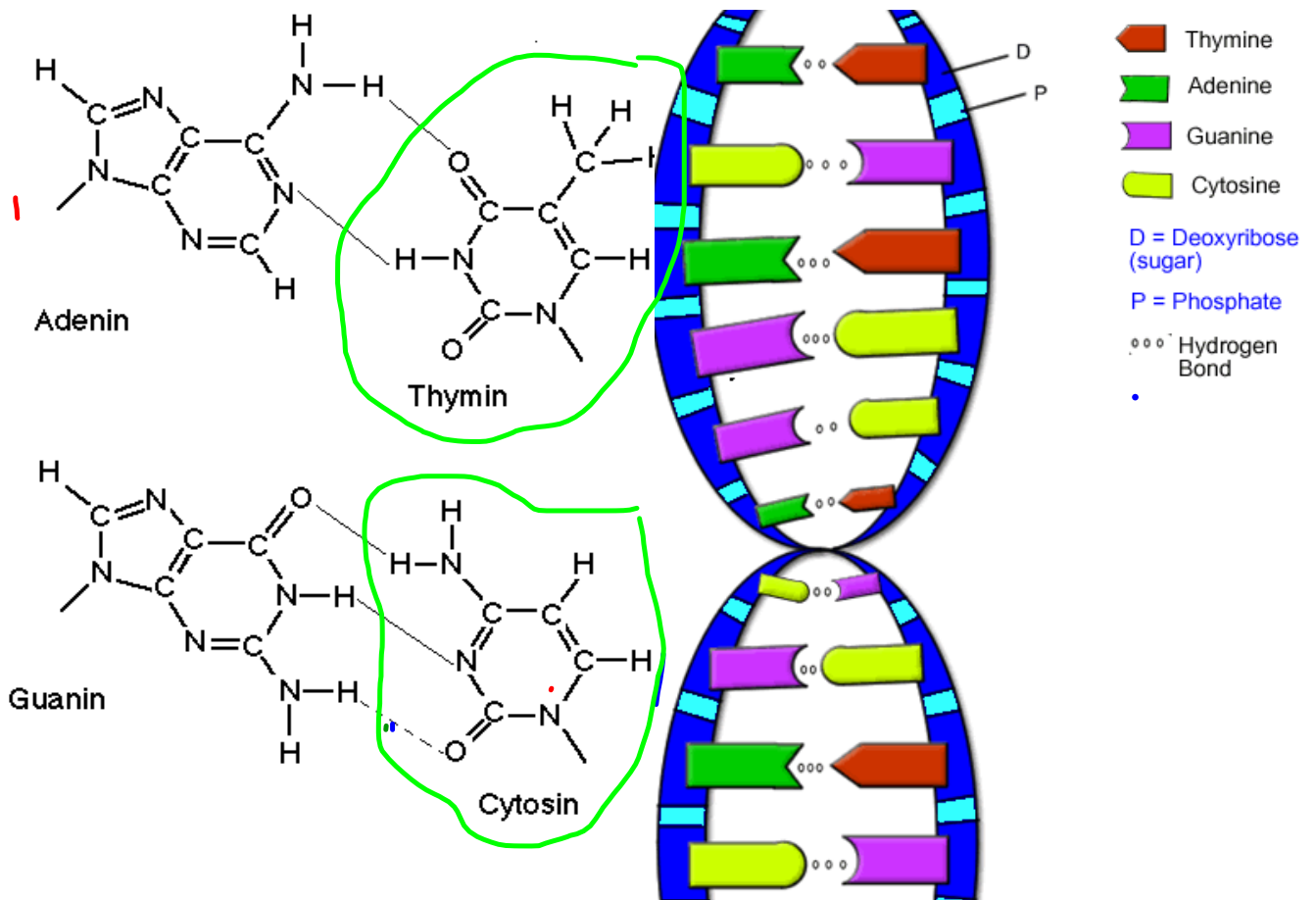
A — T

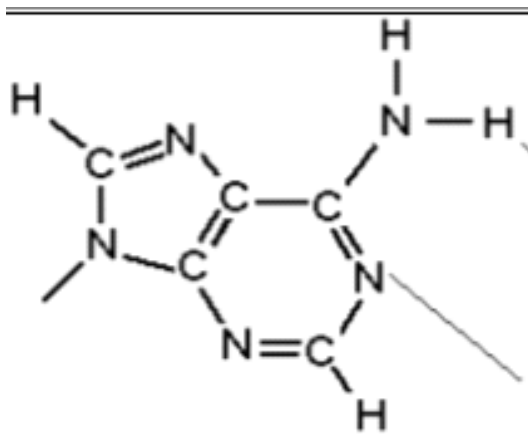
A — T

G — C

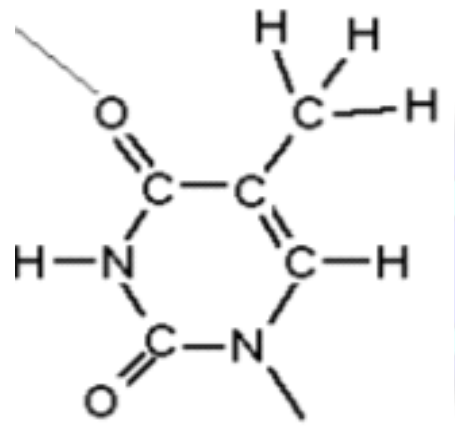
C — G



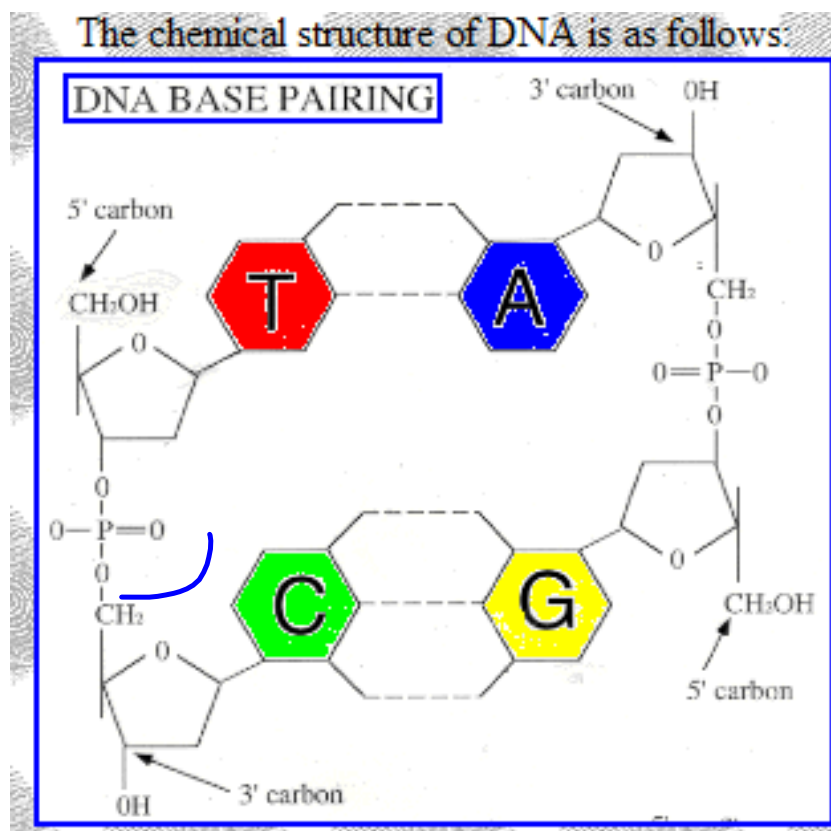




Adenin



Thymin



5' T-T-G-A-C-T-A-T-C-C-A-G-A-T-C 3'
3' A-A-C-T-G-A-T-A-G-G-T-C-T-A-G 5'

Fun Fact

- **If you unravelled all your chromosomes from all of your cells and laid out the DNA end to end, the strands would stretch from the Earth to the Moon about 8,000 times. (23)**



DNA Replication: The Cell's Extreme Team Sport



Amoeba Sisters

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DNA Replication

- DNA molecules being composed of complementary strands allow DNA to copy itself or replicate.
- Replication creates two identical molecules of DNA.
- DNA replication ensures that each cell will have all of the genetic information it needs to carry out its activities.