

**The Chemistry of a short strand of DNA:**

1. Use a labeled DNA image. Write the number of atoms of each of the elements in each of the following sections of the DNA molecule.

Section Name	Hydrogen	Carbon	Nitrogen	Oxygen	Phosphorus
1) Phosphate					
2) Sugar					
The 4 Bases:					
T) thymine (T)					
A) adenine (A)					
C) cytosine (C)					
G) guanine (G)					
<b>TOTALS:.....</b>					

- P \_\_\_\_\_ and s \_\_\_\_\_ are the strength or "sides" of the DNA ladder.
- The "rungs" of the DNA ladder are called b \_\_\_\_\_.
- A NUCLEOTIDE consists of a s \_\_\_\_\_, a p \_\_\_\_\_, and a b \_\_\_\_\_.
- Thymine (T) connects only to adenine (A) and cytosine (C) to g \_\_\_\_\_ ( ).

On average, one mistake may exist in every billion base pairs. That's the same as typing out the entire *Encyclopaedia Britannica* five times and typing in a wrong letter only once! ([www.pbs.org](http://www.pbs.org))

- When a mistake, injury or break causes a permanent change in the DNA sequence so that the message to the cell changes, we call it a m \_\_\_\_\_.
- Most mutations go unnoticed. A few are considered g \_\_\_\_\_, a few b \_\_\_\_\_.
- After time and other changes, mutations considered bad, may be then be considered g \_\_\_\_\_. Evol \_\_\_\_\_ is defined as change(s) over time.

## Your paper DNA Model → Class DNA Model:

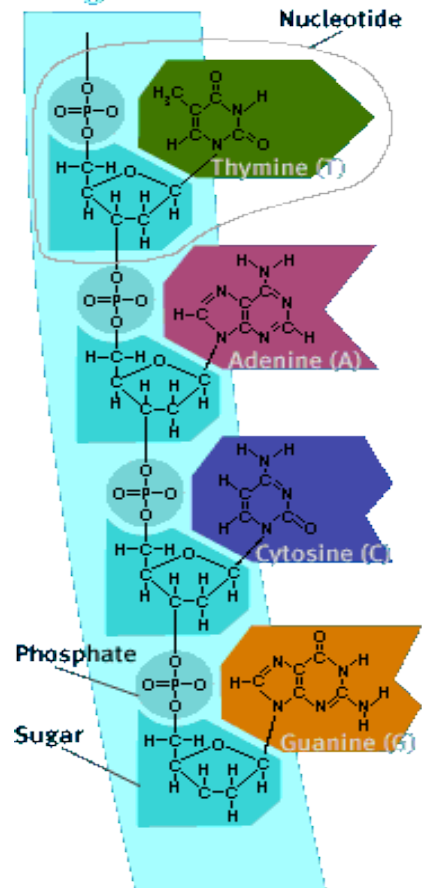
- Pickup a paper model handout.  
Color both sides of all of the sections of the DNA according to this KEY:

### KEY:

Adenine (A) BLUE  
 Thymine (T) PURPLE  
 Guanine (G) GREEN  
 Cytosine (S) RED  
 Sugars YELLOW  
 Phosphates ORANGE

- Cut out the left side leaving the 4 sections together
- Cut out the right side in 2 or more sections.
- Match the bases to make a double strand of DNA. Be sure to match the bases according to molecule shape. Chemical bonds determine that A connects to T and C connects to G.
- Tape all parts together.
- Find another person and tape your strand to theirs.
- As a class, connect all strands and twist to make a class DNA molecule. Hang from the ceiling.

### Single Strand of DNA



**Weird:** The DNA is wrapped around spools of a protein called histone. The histone, in turn, forms large loops. So the DNA is much, much longer than the chromosome it makes up. The DNA of one of a fruit fly's chromosomes, for example, would be 12 times longer than the fly if it could be stretched out. That's quite amazing, especially when you consider that each of the fly's cells have four chromosomes and that each fly is made up of millions of cells!