

## Vocabulary

### Cell:

A cell is sometimes called the “basic unit of life.” That’s because everything that is alive has at least one cell. Some living things have only a couple of cells, while other living things have trillions of cells. Like you!

### DNA:

DNA is your genetic information. Think of your DNA as a recipe instructing the cells of your body on what proteins to make. Proteins determine a lot about you. You have the color hair you have because of proteins. Your hair is straight or curly because of proteins. Your eye color? You guessed it. Proteins!

### Nucleus:

Every plant and animal cell has a cellular organelle called a nucleus. The nucleus can be thought of as the control center of the cell or the “brain” of the cell. The nucleus has a very important job; it not only stores your DNA but it plays an important role in the process of taking the instructions in your DNA and making proteins from them.

### Chromosome:

Your DNA is wound up in threadlike structures called chromosomes. Chromosomes are made up of about ½ DNA ½ proteins. Your DNA is wrapped up around proteins called histones. Histones help package the DNA!

Analogy: Think back to the recipe analogy. If your DNA is the letters and words spelling out the recipes for all of your bodies proteins, then the chromosomes is the recipe book. You don’t have just one recipe book of genetic information either. You have 46! You have 23 pairs of chromosomes. For each “book” or different chromosome, you get one from your mom and one from your dad.

### Genes:

A gene is a section of the DNA that contains the information for making one particular protein. You have over 25,000 genes in your cells!

## Did you know?

Almost every cell in your body has the same DNA. Your skin cell looks way different than a muscle cell for example because different genes are turned “on” or “off”. If a gene is turned “off” in a cell, then the protein that gene codes for won’t be made. If a gene is turned “on” in a cell, then the protein will be made!

### Basic Components of DNA:

DNA is a double stranded molecule made of three types of compounds: a sugar, a phosphate, and a base.

**Sugar Phosphate Backbone:** The backbone of each strand of your DNA is made of sugars and phosphates chemically bonded to each other. The phosphates have a negative charge, resulting in the entire DNA molecule having an overall negative charge. (This fact will be important to the Crime Scene Investigation Lab)

#### Laws of Charges:

Opposites Attract- Something with a negative charge like DNA will be attracted to a positive charge.

Like Charges Repel- DNA with it's negative charge will be pushed a way, or repelled, from a negative charge.

**DNA bases:** When you read a book, the order of the 26 letters of our alphabet forms words and sentences that help you understand the author's meaning. The alphabet of your DNA only has 4 letters: A,C,G, and T! These letters aren't the same as the letters of our alphabet; they are actually 4 different chemical compounds called nitrogenous bases. The order of these bases communicates to your cells what proteins need to be made. For example, AGGGGGGGCCCAAATTTAAAATTTTAAAAA may be the recipe for making one particular protein but GGGGGGGGGCCCCCCCCCAAAAA would be a totally different protein!

Remember that DNA is a double stranded molecule. Have you ever thought about what holds the two strands of DNA together? Hydrogen bonds between the bases do! Think about a magnet. What happens when you hold the two opposite poles of a magnet together? They are attracted and they stick together! That's kind of what happens with the two strands of DNA. The nucleotide bases are "attracted" to each other and form a chemical bond.

These 4 different bases form chemical bonds with each other in a very specific pattern. Below are the base pairing rules

A will always pair with T (If you need an easy way to remember, think of the word "AT")

G will always pair with C (If you are a Clemson fan you can think of "Go Clemson!" If you aren't, you are on your own for this one.)