



PLTW Virtual Learning

Medical Detectives

Lesson 9

April 16, 2020



7 & 8 Grade Medical Detectives

Lesson: April 16, 2020

Objective/Learning Target:
Lesson 9, Part 4

Students will be able to understand the DNA double helix.

Warm-Ups:

Let's find out about DNA. Watch the video and answer the questions below.

[The Discovery of the Structure of DNA](#)



1. What does DNA contain?
2. What are the 4 components (nucleotides) of DNA?
3. What holds all of the DNA components?

Lesson Introduction/Background Information:

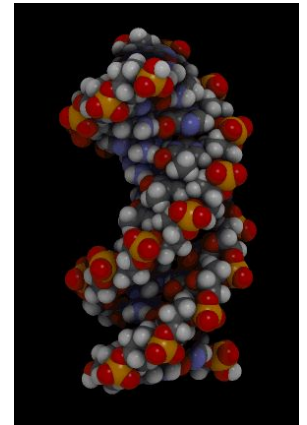
(Answers in **red** are the Warm-up answers.)

DNA stands for **deoxyribonucleic acid**.

DNA contains all of the **genetic information** for all known living organisms. It is made up of **four compounds (nucleotides): 1) adenine, 2) thymine, 3) cytosine and 4) guanine** which make up base pairs. All of these are held together in what looks like a twisted ladder that is call the **double helix**.

[What is a Gene?](#)

[What is DNA?](#) -- Some fun facts and examples.



Practice: DNA Information

*****Our bodies have around 210 different types of cells. Each cell does a different job to help our body to function. There are blood cells, bone cells, and cells that make up our muscles.**

*****Cells get instructions from DNA so they will know what to do. DNA acts sort of like a computer program. A good way to put this in perspective is to think of the the cell as the computer, or the hardware, and the DNA is the program or code.**

*****The DNA code is held by the different letters of the nucleotides. As the cell "reads" the instructions of the DNA the different letters represent the instructions. Every three letters makes up a word called a codon. An example of these codons could be: ATC TGA GGA AAT GAC CAG**

*****Even though there are only four different letters, DNA molecules are thousands of letters long. This allows for billions and billions of different combinations.**

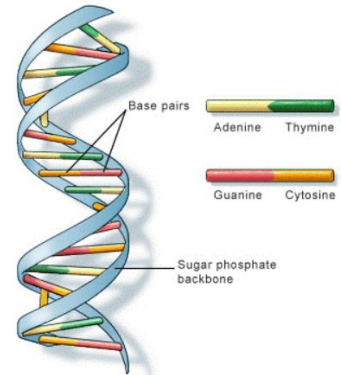
Practice:

*About 99.9 percent of the DNA of every person on the planet is exactly the same. It's that 0.1 percent that makes us all unique.

*Identical twins have exactly the same DNA, 100%.

*If you unraveled all the DNA molecules in your body and placed them end to end, it would stretch to the sun and back 100 times.

** Now watch the BrainPop video on [DNA](#) for more information.



U.S. National Library of Medicine

The basic structure of the DNA molecule

Self Assessment:

Take the following quiz and see how well you do.

1) What does DNA stand for?

- *Double nitrogen argon
- *Dioxide nickel acid
- *Deoxyribonucleic acid
- *Do not ask
- *Does not apply

2) How many types of nucleotides are there in DNA?

- *One
- *Two
- *Three
- *Four
- *Five

3) Which of the following is not a letter that represents a nucleotide in DNA?

- *A
- *T
- *C
- *G
- *R

4) What is another name for the nucleotides in DNA?

- *Chromosomes
- *Bases
- *Genes
- *Backbone
- *Alleles

5) True or False: Over 99% of the DNA in different human beings is the same.

- *TRUE
- *FALSE

Answer Key:

Answers to the quiz:

1. Deoxyribonucleic Acid
2. Four
3. R
4. Bases
5. True



Extend Your Learning/Continued Practice:

Watch the videos below and use them as examples to create your own DNA double helix strand at home. Be creative and see what items you can use to make the strand. Have fun!

[How to Make a DNA Structure](#)

[Make Your Own Double Helix DNA Strand](#)