

Nucleic Acids

by Sophia



WHAT'S COVERED

In this lesson, you will learn about the structure and function of nucleic acids and the role they play in the body. Specifically, this lesson will cover:

1. Overview of Nucleic Acids

Nucleic acids are organic compounds; this means that they contain the element carbon.



TERM TO KNOW

Nucleic Acid

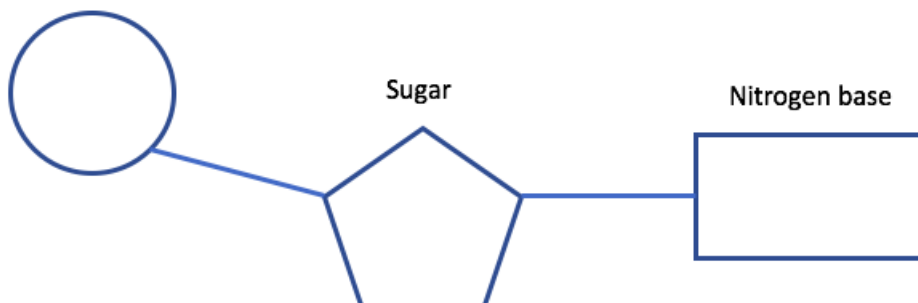
An organic compound composed of nucleotides; this includes DNA and RNA.

2. Nucleotides

Nucleotides are the building blocks of nucleic acids and are what compose nucleic acids, DNA and RNA.

Below is a simple drawing of a nucleotide to help you see its structure.

Phosphate group



All nucleotides have this similar structure, but there are some differences between certain nucleotides. You'll learn more about that when you focus on the structure of DNA and RNA a little bit more.

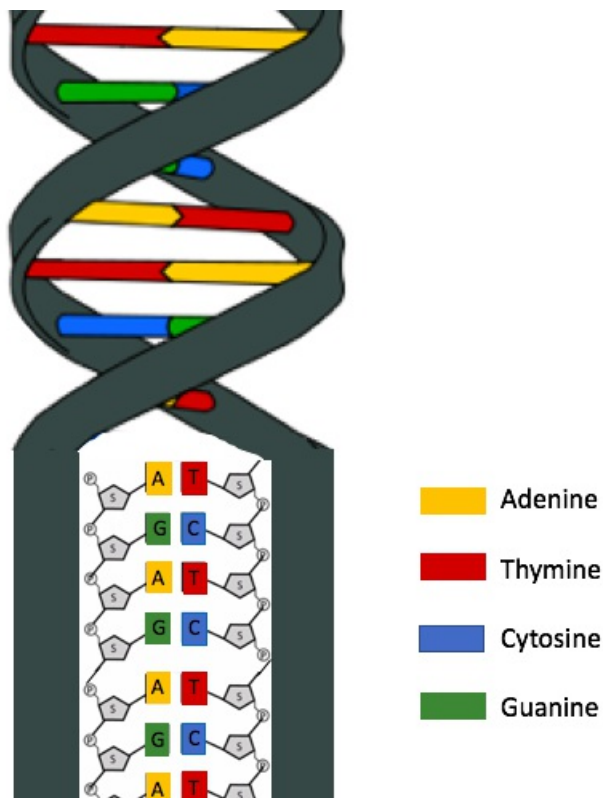
**Nucleotide**

The building blocks of nucleic acids composed of a sugar, a phosphate group, and a nitrogen base.

3. DNA

Within our bodies, **DNA** contains all of our genetic information. All of our genes, all of the information needed to make all the molecules of our bodies, is contained in our DNA.

DNA has four nitrogen bases: adenine, thymine, cytosine, and guanine. The way that the nitrogen bases pair up within the structure of DNA is very specific. Adenine will always pair up with thymine, and cytosine will always pair up with guanine. DNA is described as being a double helix. Take a look at the image of DNA below.



You'll notice it is kind of like a ladder that's been twisted. The rungs of the ladder are composed of the four nitrogen bases. If you look at the image above, you can identify where the nucleotides reside in the DNA structure, and how that allows DNA to look like it does. The DNA is made up of the phosphate group, the sugar and the nitrogenous base. The sugar for DNA is deoxyribose sugar; that type of sugar is specific to DNA and is bonded together by a hydrogen bond.

You'll also notice that you have the phosphates and the sugar making the outer part of the double helix. The rungs of the ladder, if you will, are made up of the nitrogen bases bonded by hydrogen bonds.

DNA is different from RNA in the fact that it's double-stranded, has different bases, and includes a deoxyribose sugar.



TERM TO KNOW

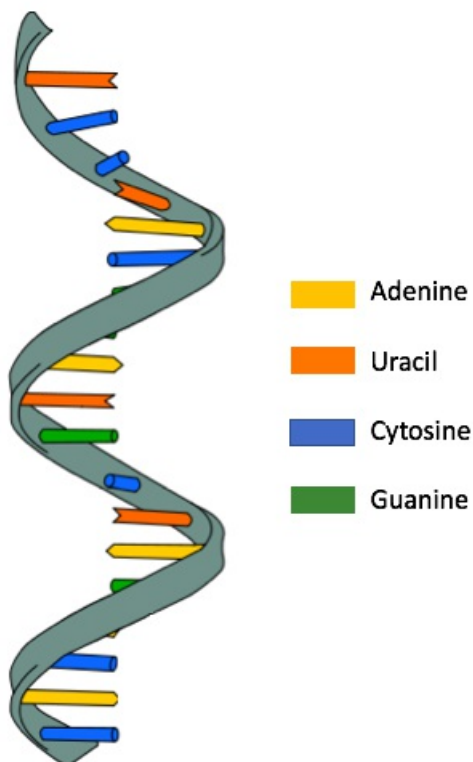
DNA

Deoxyribonucleic acid; a nucleic acid that contains all the genetic information of an organism.

4. RNA

RNA does carry genetic information, but the genetic information it carries helps to build proteins for our body.

RNA, rather than being double-stranded, is single-stranded; it doesn't have the same structure as DNA does. The image below shows RNA as a single strand.



The sugar in the nucleotides of RNA, rather than being a deoxyribose sugar, is just a ribose sugar.

The nitrogenous bases vary a little in RNA as well. Rather than having adenine, thymine, cytosine, and guanine, RNA has adenine, uracil, cytosine, and guanine. So RNA has uracil in place of thymine.



TERM TO KNOW

RNA

Ribonucleic acid; a nucleic acid that helps proteins in cells.



LEARN MORE

Investigate the DNA molecule in three dimensions using augmented reality (AR)!

If you're on a laptop or desktop computer: Scan the QR code using the camera on your smartphone or tablet.

If you are on a phone or tablet [click here](#).



SUMMARY

This has been an **overview of the structure and function of nucleic acids**. Specifically, you have learned more about **nucleotides** and the differences between **DNA** and **RNA**.

Keep up the learning and have a great day!

Source: THIS WORK IS ADAPTED FROM SOPHIA AUTHOR AMANDA SODERLIND



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TERMS TO KNOW

DNA

Deoxyribonucleic acid; a nucleic acid that contains all the genetic information of an organism.

Nucleic Acid

An organic compound composed of nucleotides; Includes DNA and RNA.

Nucleotide

The building blocks of nucleic acids composed of a sugar, a phosphate group, and a nitrogenous base.

RNA

Ribonucleic acid; a nucleic acid that helps protein in cells.