

GENETICS

LESSON 1: DNA

Learning Outcomes:

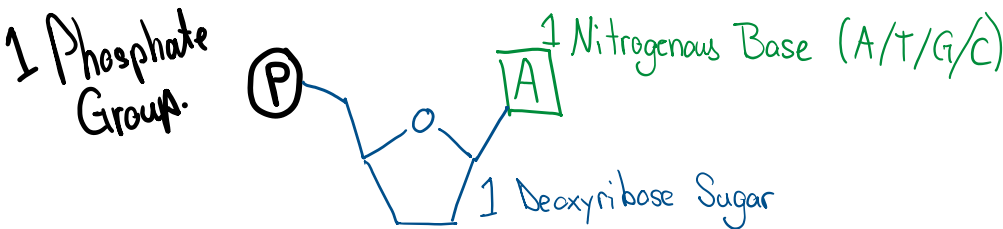
- I can describe the basic structure and function of DNA.

Video: What is DNA?

<https://www.youtube.com/watch?v=6rv5Z8EBXwY>

Structure

- first observed in 1869 by the German biochemist Frederick Miescher
 - did not realize the importance of the molecule he had found
 - discovery of the structure of structure of DNA:
 - Maurice Wilkins (1950) – first used X-ray diffraction on ram sperm to try to discover the shape of DNA
 - Rosalind Franklin (1952) – extended the work of Wilkins to produce a higher quality X-ray diffraction image
 - James Watson & Francis Crick (1953) – used the information from Wilkins and Franklin to hypothesize a correct model of the shape of DNA
 - Looks like a twisted ladder → called a double helix
 - Sugar and phosphate groups make up the “sides” of the ladder
 - Nitrogenous bases make up the steps/rungs
- ❖ 1 sugar, 1 phosphate group and 1 nitrogenous base is called a nucleotide **(Draw this)**



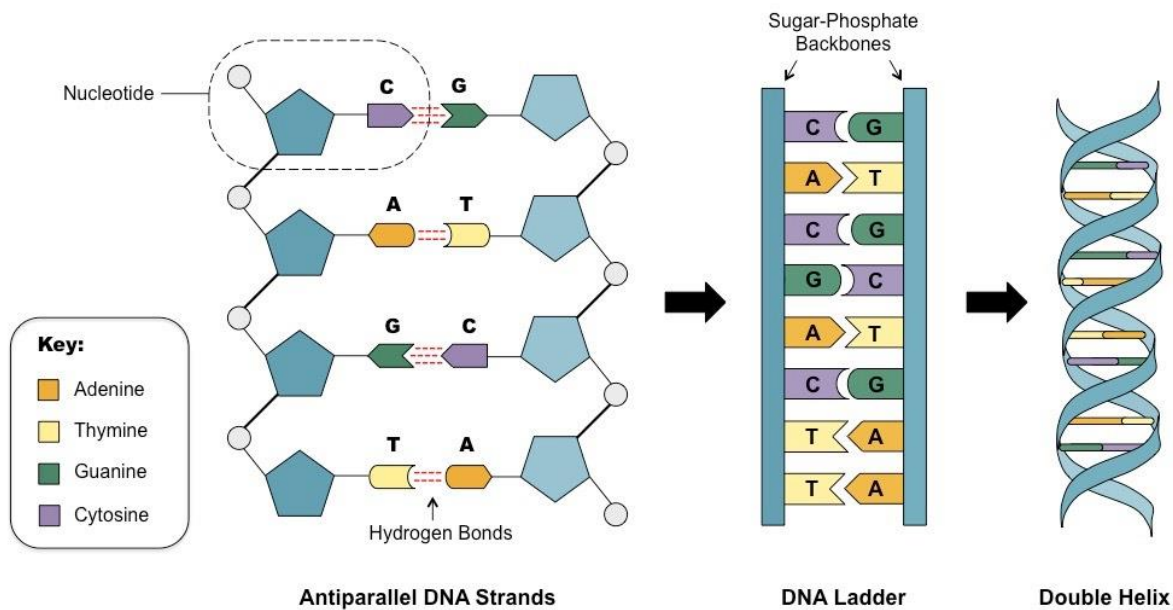
- 4 different nucleotides that are identified by the nitrogen base
 - Adenine (A) ----- Thymine (T)
 - Cytosine (C) ----- Guanine (G) } called Complimentary Base Pairing

Example:

Strand 1	A T A A C G T C A
Strand 2	T A T T G C A G T (Students do strand 2)

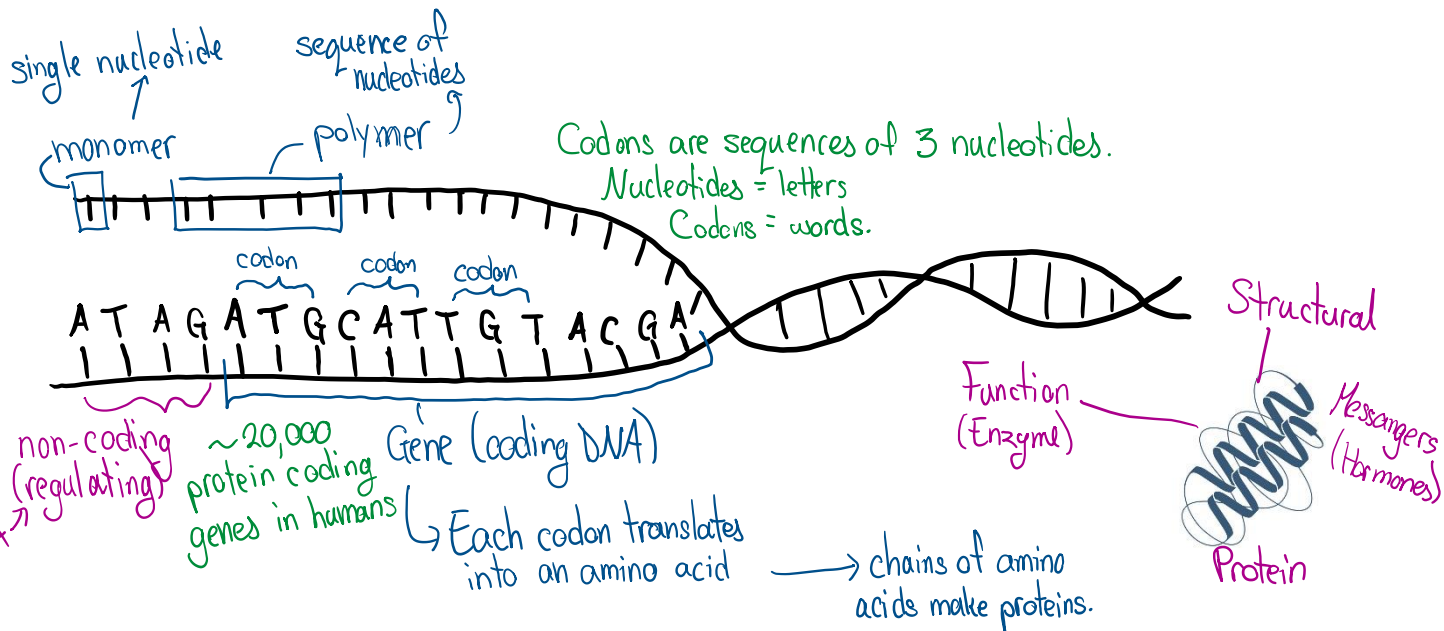
- Human DNA is composed of around 3 billion nucleotides on 46 chromosomes

DNA stands for Deoxyribonucleic acid.



DNA Function

- DNA codes for the blue prints of life → it is an information molecule



The process of DNA replication produces a full new copy of an organism's genetic information which is passed onto a new cell.

<https://www.youtube.com/watch?v=TNKWgcFPHqw>

Build and Pair a DNA Strand

- Students will each randomly pick one strand of DNA.
- Students will build their DNA sequence out of coloured mini marshmallows, toothpicks and a piece of licorice (or other types of candy).
- Once built, students will need to compare their DNA strand against other students' DNA to find the opposite matching half of DNA.
- When a match has been found, students will call the teacher over to verify their match.
- Once verified, students can eat their half of DNA.