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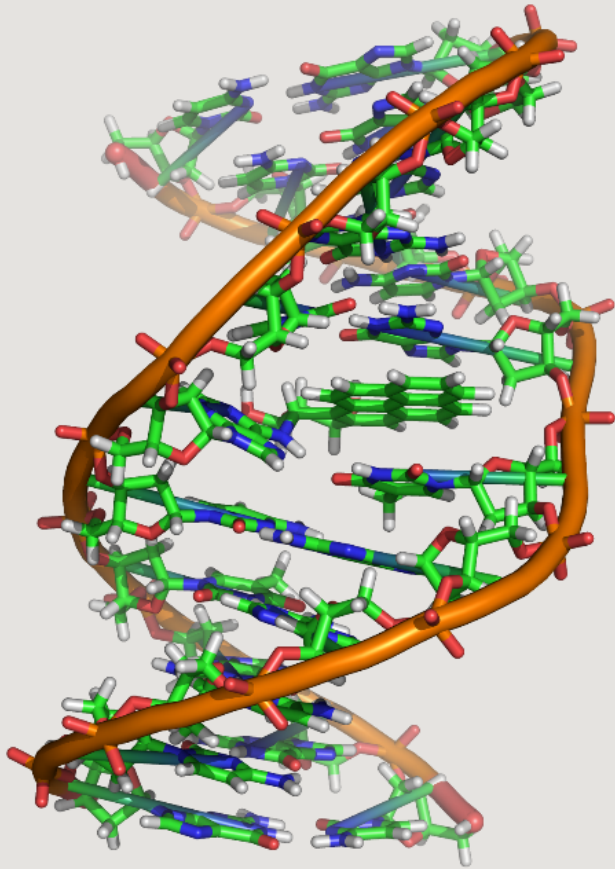
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# Exploring DNA

Stephanie & Andreea









# The Basics

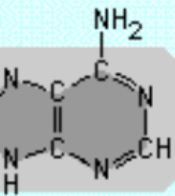
DNA stands for Deoxyribonucleic Acid

Found in the nucleus of all cells

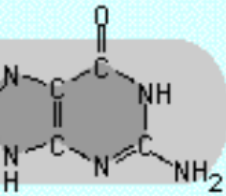
Purpose:

- Instructions for all living things (by making proteins)
  - DNA  $\rightarrow$  RNA  $\rightarrow$  protein
  - DNA -- transcription  $\rightarrow$  RNA
  - RNA -- translation  $\rightarrow$  Protein
- Carry on heritable information (genes)

s  
urines



enine (A)



anine (G)

ide

Base

1'  
Deoxyribose  
(sugar)

# Components

Shape: double helix

- Compared to ladder with rungs
- backbone: sugar & phosphate

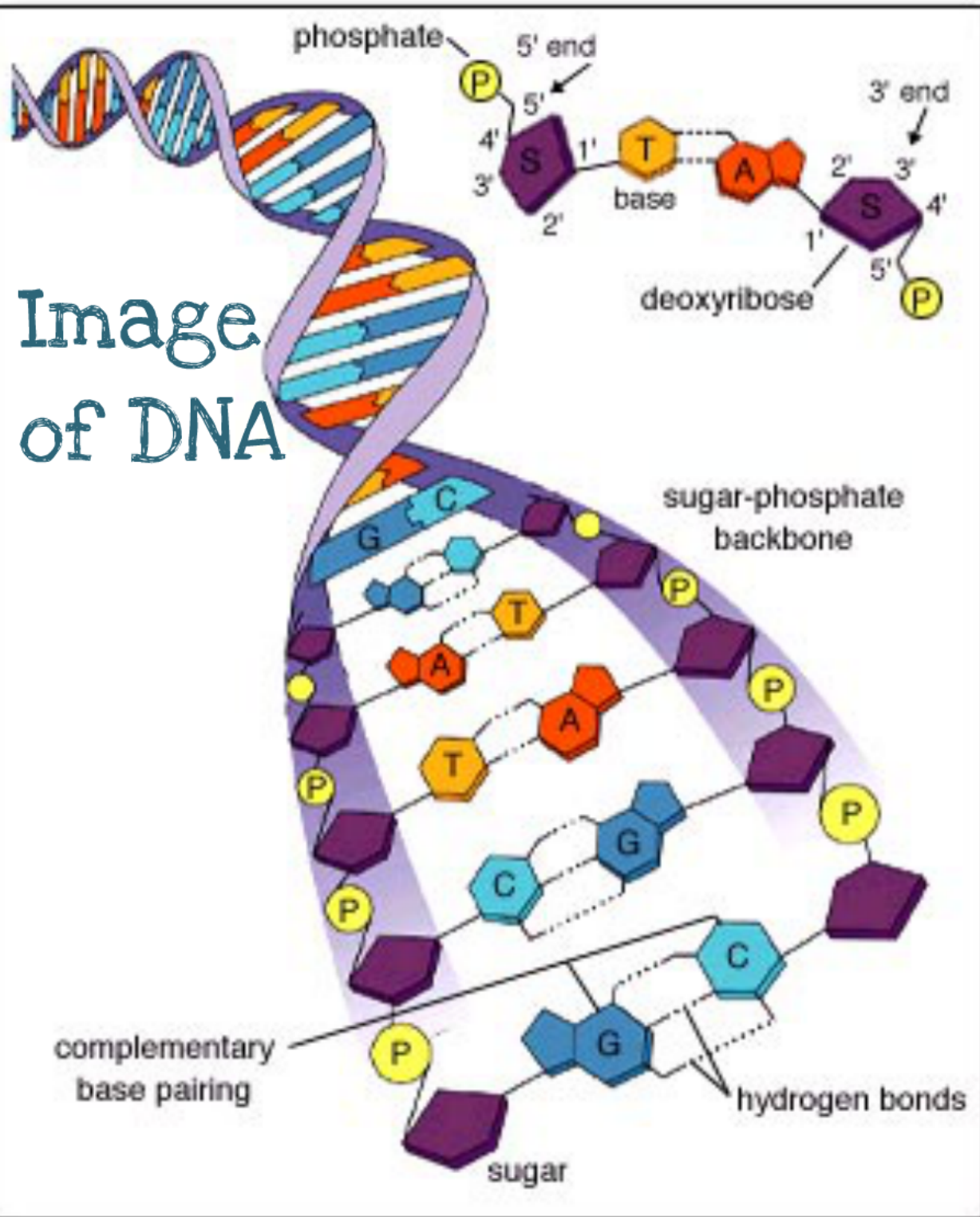
4 Bases:

- Adenine, Thymine, Guanine, Cytosine
- 2 Types: Pyrimidines & Purines
- Complementary Pairs held by Hydrogen Bonds

Nucleotide = 1 base, 1 phosphorous group, & 1 sugar group



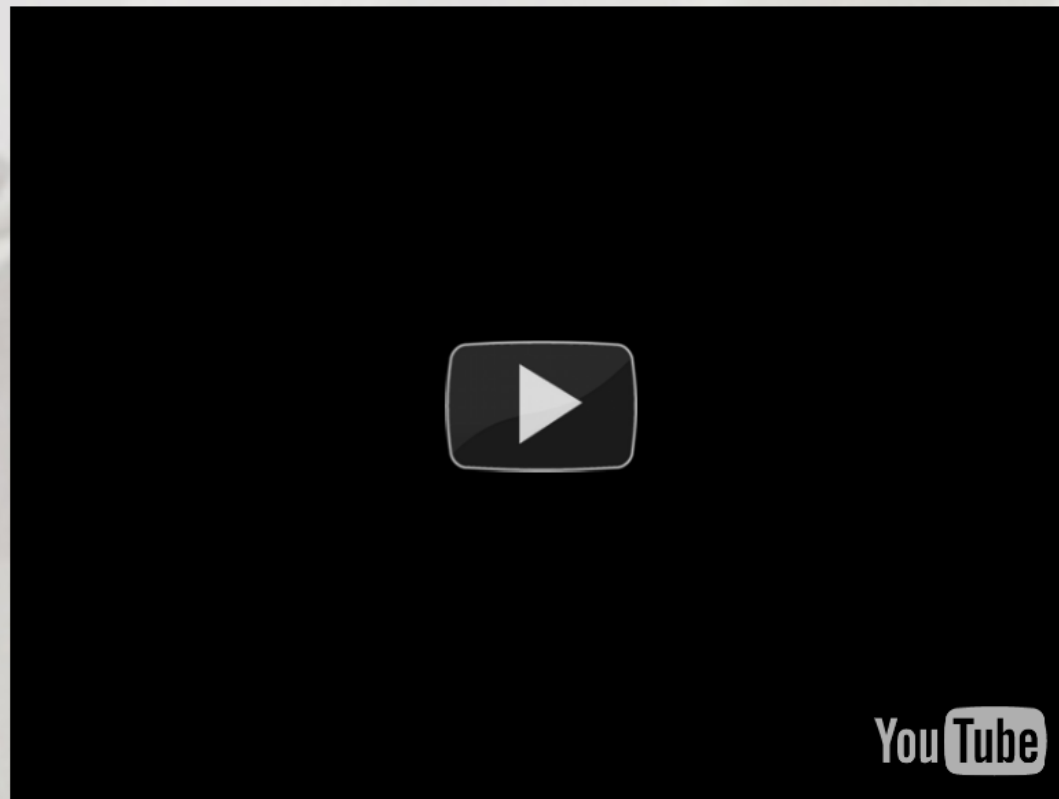
# Image of DNA







# Animation of DNA Replication



# DNA Replication

1. Helicase : unwinds DNA
2. DNA polymerase III works down leading strand (old strand) up lagging strand (new strand)
  - a. Pair free nucleotides with complementary bases
  - b. Complementary bases = A&T and G&C
3. DNA is successfully copied
  - a. original & copy each contains one strand of original DNA

## Lets Make Our Own DNA!

2 pieces of licorice:

2 sugar phosphate backbones

12 toothpicks

Marshmallows: The 4 Bases

9 pink marshmallows

9 yellow marshmallows

9 green marshmallows

9 orange marshmallows





## The Marshmallows

Adenine (A) = Green

Thymine (T) = Pink

Cytosine (C) = Yellow

Guanine (G) = Orange

Our sequence: T A C G T A T G A A A C

## Putting it Together

1st Backbone: Put a marshmallow on the toothpick and then stick the toothpick into the licorice. Then slide the second matching marshmallow onto the toothpick

Remember A with T and C with G!

2nd Backbone: Attach the second piece of licorice to the toothpicks so that it looks like a ladder

Then carefully twist to form a double helix!

T A C G T A T G A A A C

