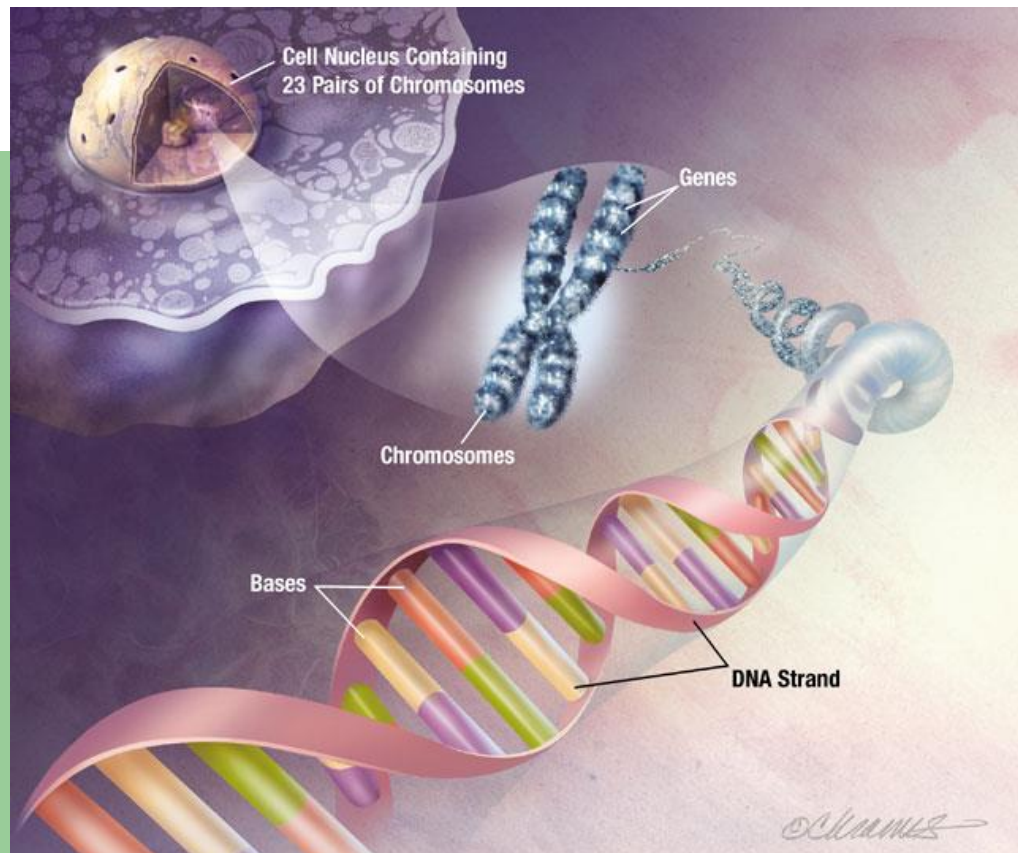


# DNA Structure and Transcription



# What is this all about?

- What is DNA good for?
- Why do we need genes?
- Why do we need proteins?
- What's so special about enzymes?



# Objectives:

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- Students will know the structure and composition of DNA
- Students will understand the physical differences between DNA and RNA.
- Students will be able to describe the basic process and end product of DNA transcription.

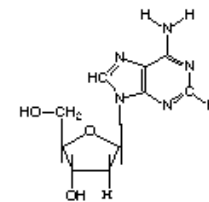
# DNA in the Cell



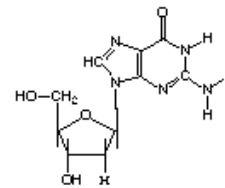
# DNA Bases

- Only four bases in DNA
- A – adenosine
- C – cytosine
- G – guanine
- T – thymine

The Nucleotides of DNA

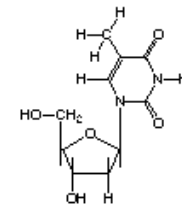


Adenine

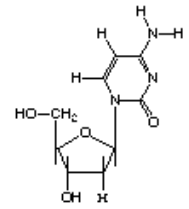


Guanosine

Purines



Thymine

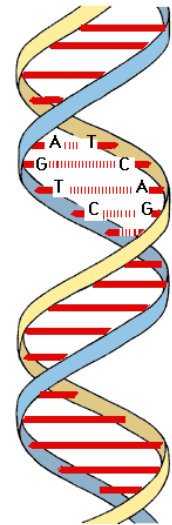
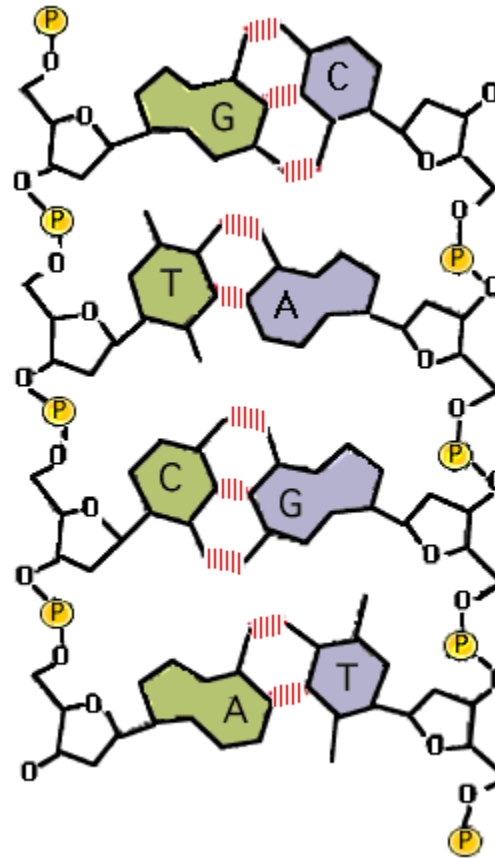


Cytosine

Pyrimidines

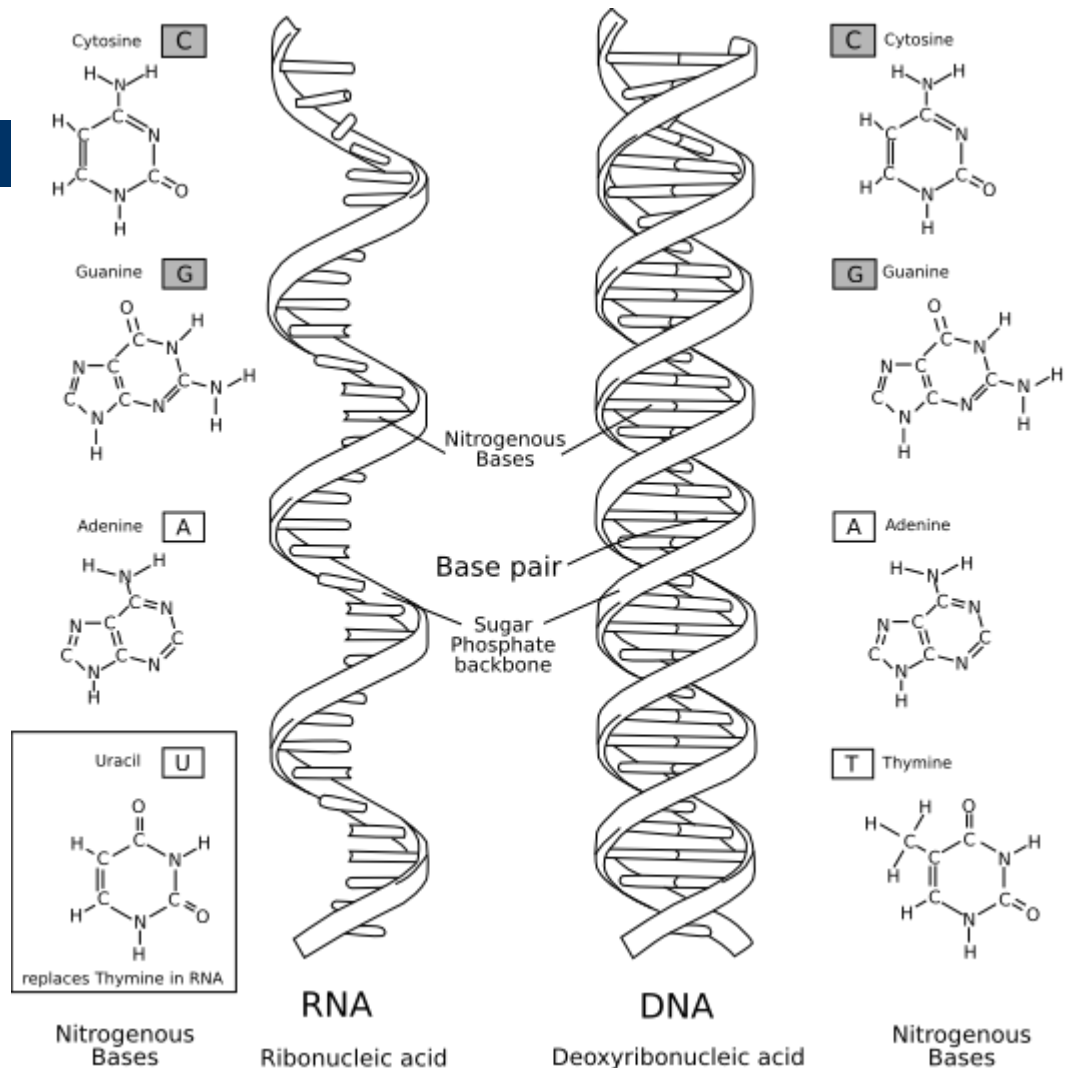
# DNA Base Pairs

- DNA bonds in a double helix
- A always pairs with T
- C always pairs with G
- Pyrimidine + Purine

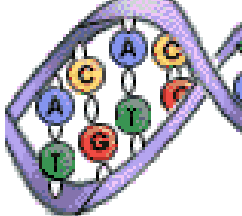


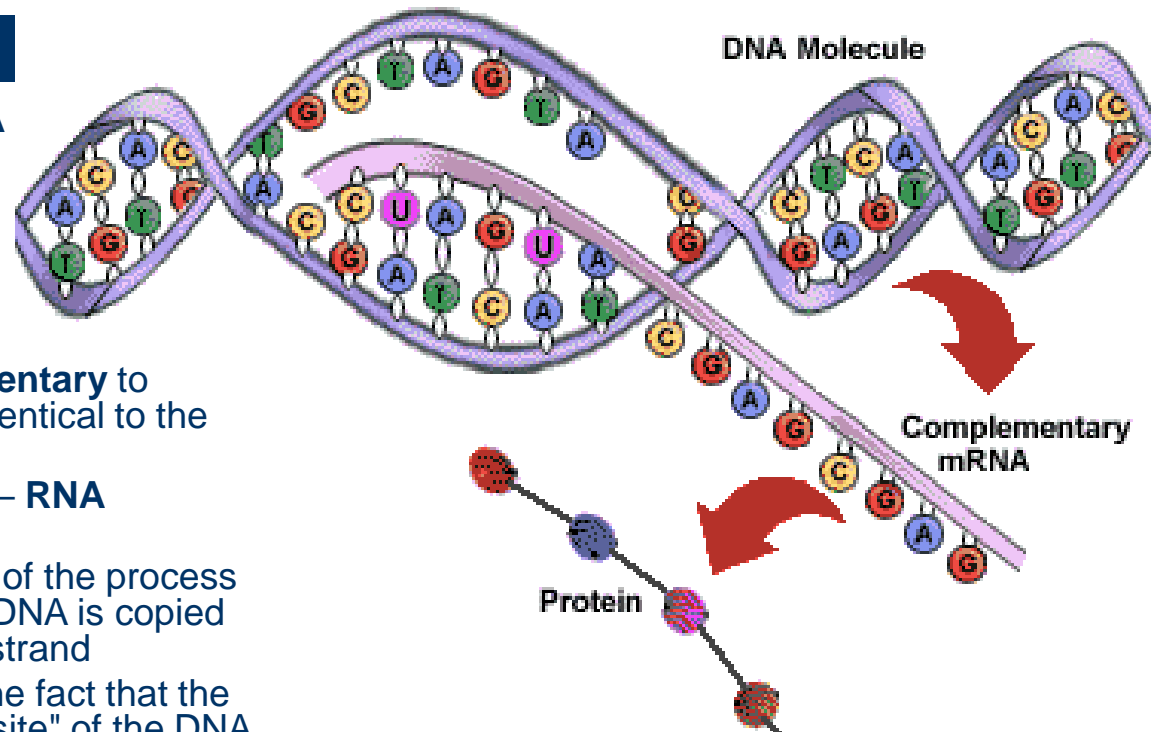
# RNA Bases

- Four bases – one different from DNA
- U – Uracil (instead of Thymine)
- RNA does not form double-helix



# DNA Transcription

- DNA gets copied to **mRNA** (messenger RNA)
  - DNA A pairs with RNA U
  - DNA C pairs with RNA G
  - DNA G pairs with RNA C
  - DNA T pairs with RNA A
  - mRNA strand is **complementary** to transcribed DNA strand; identical to the **sister DNA** strand
  - Work done by an enzyme – **RNA polymerase**
  - **transcription** is the name of the process through which a strand of DNA is copied into its associated mRNA strand
  - complementary refers to the fact that the mRNA strand is the "opposite" of the DNA strand - each RNA base is the opposite of each DNA base
- 
- A diagram of a DNA double helix. The two strands are represented by purple ribbons. Between the strands are colored circles representing nitrogenous bases: blue (A), red (T), green (C), and yellow (G). One strand is partially unwound, and a new mRNA strand is being synthesized from it. The mRNA strand is shown as a single purple ribbon with colored circles (A, C, G, U) representing its bases. The bases of the mRNA are complementary to the bases of the template DNA strand.





# DNA Transcription in Action

<http://vcell.ndsu.edu/animations/transcription/movie-flash.htm>

