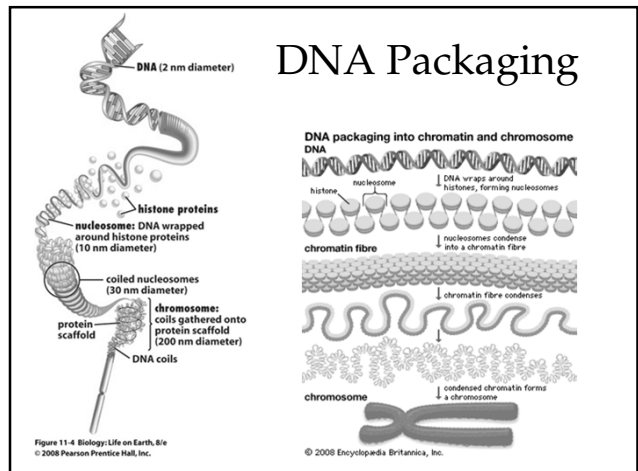


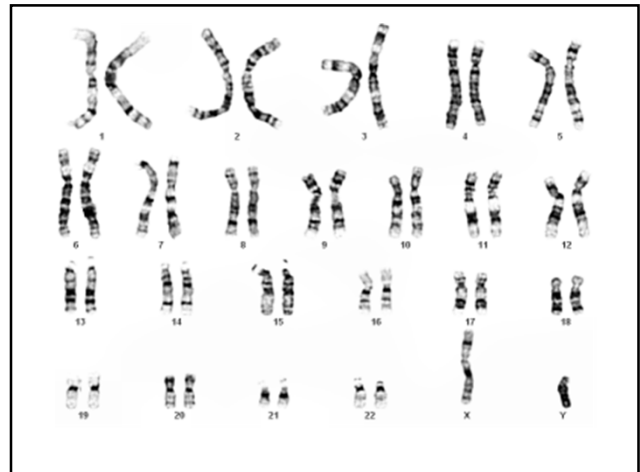
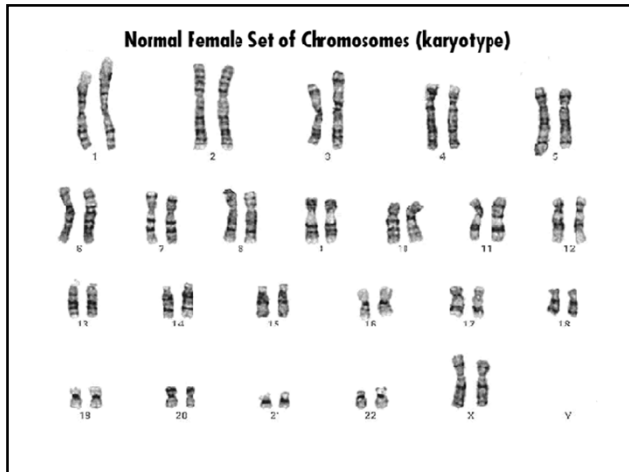
DNA Function

- To **store** and **transmit** genetic info.
- Tells a **cell** which **proteins** to make
- * **Proteins** control processes within cells

DNA Storage

- DNA is stored in the **nucleus**
 - DNA **cannot** leave the nucleus
 - Protected by the nuclear **envelope (membrane)**
- **Structure:**
 - Coiled tightly around **proteins** (histones)
 - Condense to form **chromosomes**

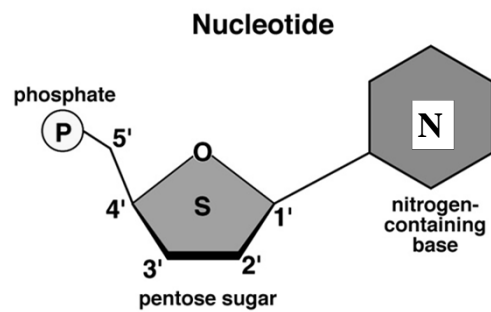




Structure of DNA?

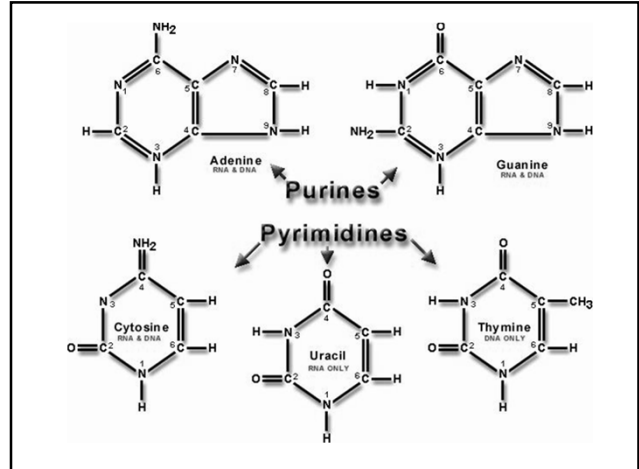
- **Repeating** units called **nucleotides**
- Each nucleotide has **three (3)** parts:
 - 1) A **deoxyribose** sugar
 - 2) A **phosphate** group
 - 3) A **nitrogen** – containing **base**

Nucleotide Structure



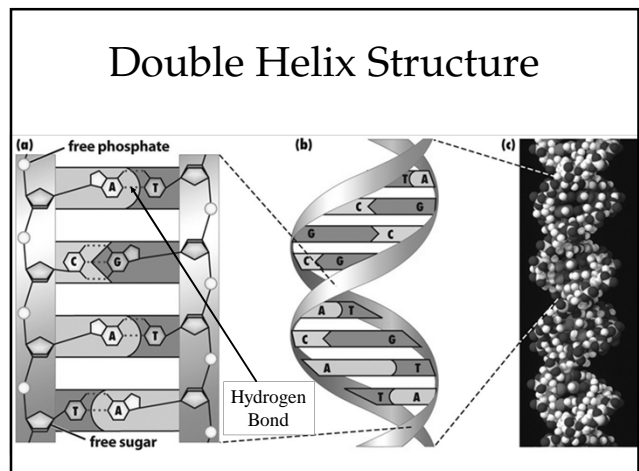
Nitrogen Bases

- There are 4 nitrogen **bases** found in DNA
- 2 groups: **Purines** and Pyrimidines
 - Purines – **Two (2)** – ringed
 - **Adenine (A)** and **Guanine (G)**
 - Pyrimidines – **One (1)** – ringed
 - **Cytosine (C)** and **Thymine (T)**

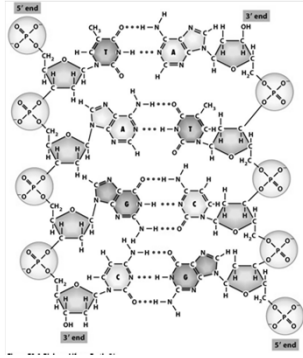


DNA Double Helix

- 2 strands in **opposite** directions and wrapping around each other
 - Known as **antiparallel**
- Sides of the **helix** (rails):
 - Repeating **sugars** and **phosphates**
- Middle of the **helix** (steps/rungs):
 - Paired up bases



Antiparallel Nature of DNA



DNA Double Helix (Cont..)

- The **complementary** base pairs are:
 - A always with **T**
 - C always with **G**
- **Hydrogen** bonds hold the **bases** together

Complimentary Base Pair Practice

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

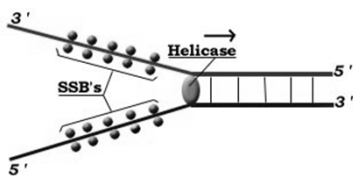
[Video](#)

DNA Replication

- Process of **copying** DNA
 - Timing: during the **S**-phase of the cell cycle
- Termed **semi-conservative**
 - Two (2) chains will **separate**
 - Each serves as a **template** for new chain

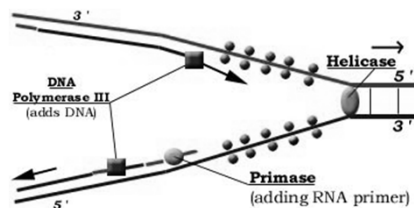
Step 1: "Unzip"

- **Helicase** separate the 2 DNA strands
 - Breaks the **hydrogen** bonds
 - Location = **replication** fork



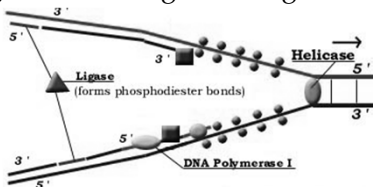
Step 2: "Create"

- DNA **Polymerase** binds to each strand
 - Bring in **complimentary** nucleotides
- Will create leading and lagging strands



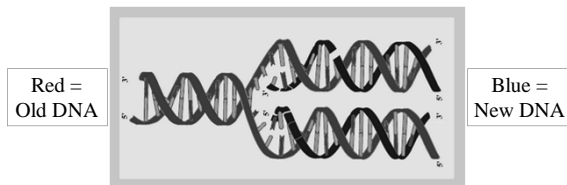
Step 3: "Lagging Difference"

- DNA is antiparallel; can only read in 1 direction
- Lagging strand = made backwards & in chunks
- Uses **ligase** to link together fragments



Step 4

- Two (2) molecules of DNA **recoil**
- **Semi-conservative nature:**
both are $\frac{1}{2}$ new and $\frac{1}{2}$ old



Genetics Introduction

- Each chromosome is made of hundreds of genes
- Each gene codes for the production of ONE protein
- All the genes for an organism make up its genome
- The total number of chromosomes and genes is different for every species