DNA & the future generations

The structure of nucleic acids

A nucleic (noo KLAY ihk) acid is a complex biomolecule that stores cellular information in the form of a code.

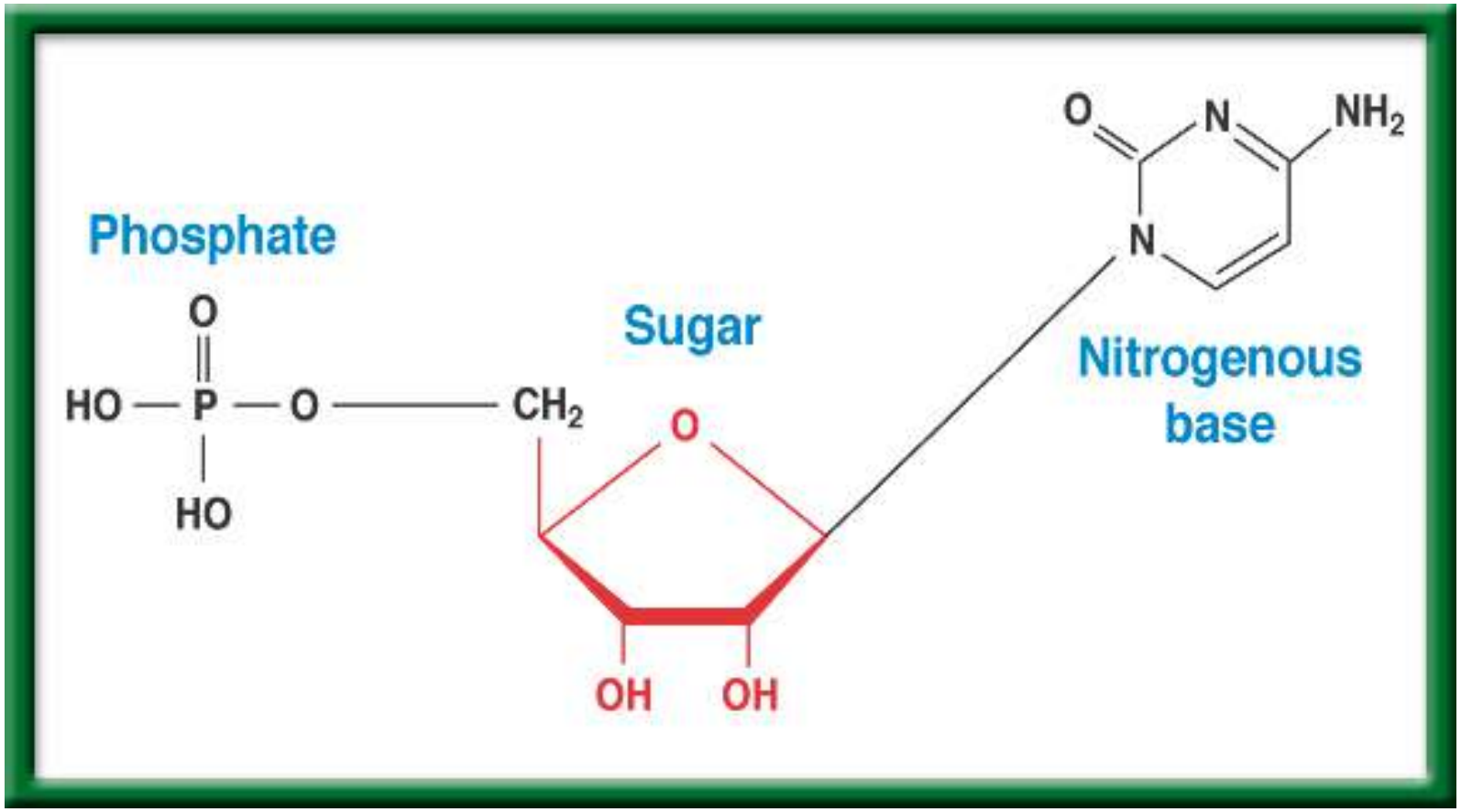
Nucleic acids are polymers made of smaller subunits called nucleotides.

The structure of nucleic acids

The information coded in DNA contains the instructions used to form all of an organism's enzymes and structural proteins.

Another important nucleic acid is RNA, which stands for ribonucleic acid. RNA is a nucleic acid that forms a copy of DNA for use in making proteins.

Nucleotides

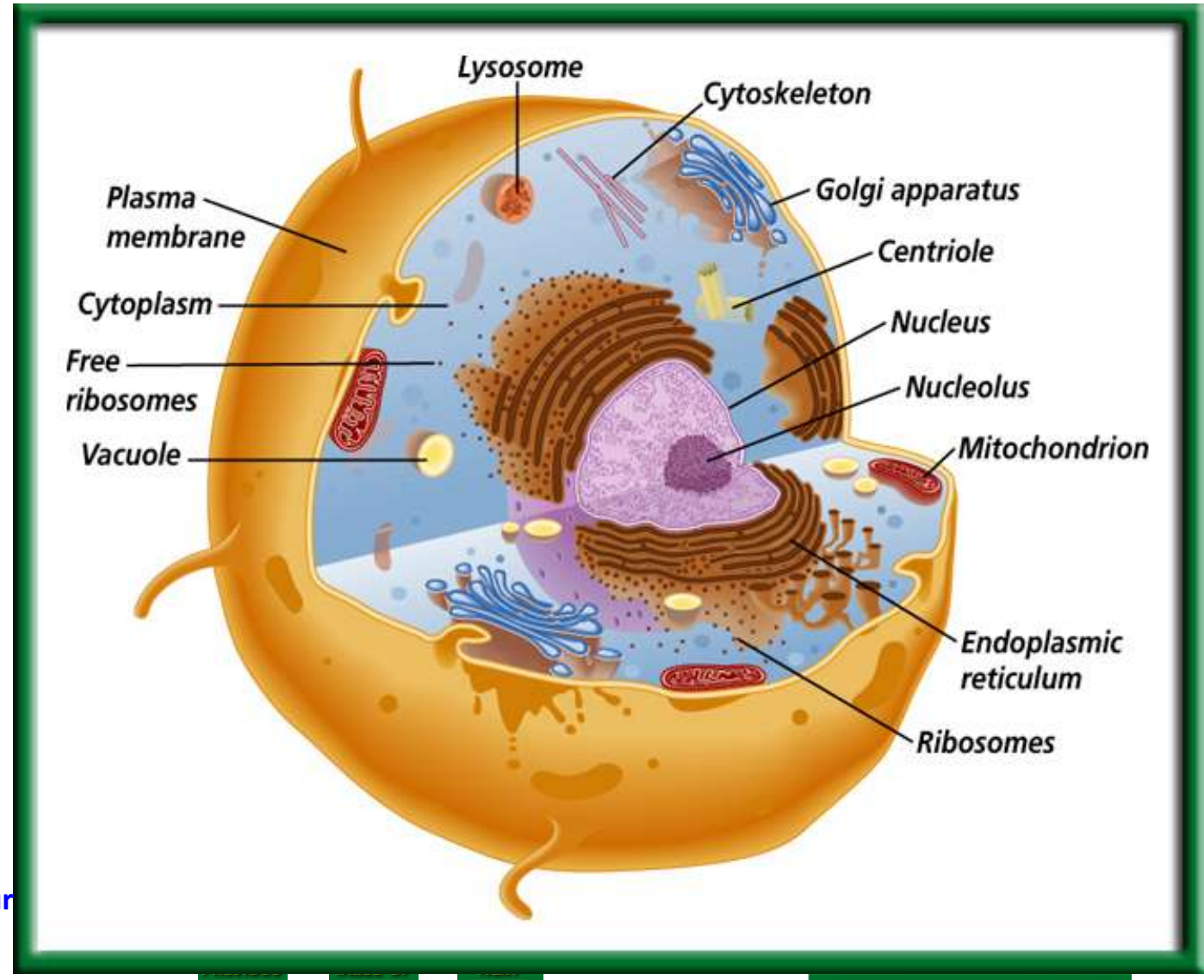


To return to the chapter summary click escape or close this document.

Image Bank

Animal Cell or Plant cell?

Eukaryotic or Prokaryotic?



To retur

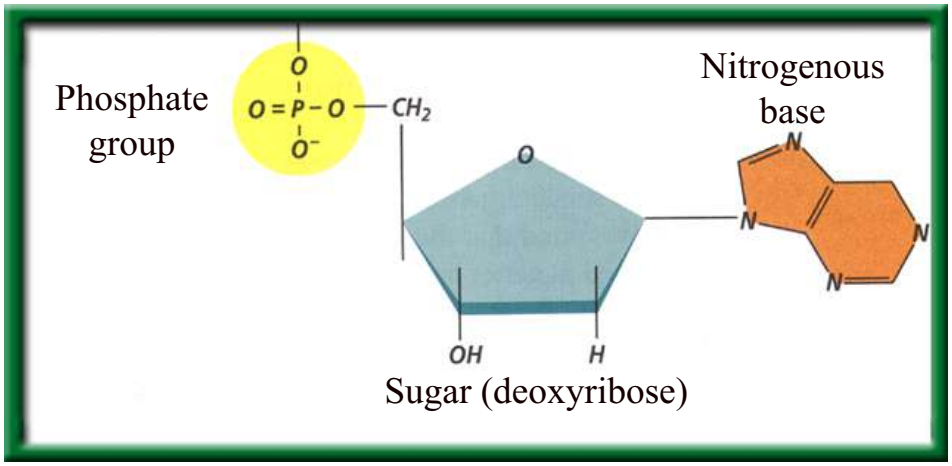
The structure of nucleotides

#1. The simple sugar in DNA, called deoxyribose (dee ahk sih RI bos), gives DNA its name— **deoxyribonucleic acid.**

The phosphate group is composed of one atom of phosphorus surrounded by four oxygen atoms, it has a negative charge.

The structure of nucleotides

#2. DNA is a polymer made of repeating subunits called nucleotides. The backbone is made up of the Sugar and Phosphate group.



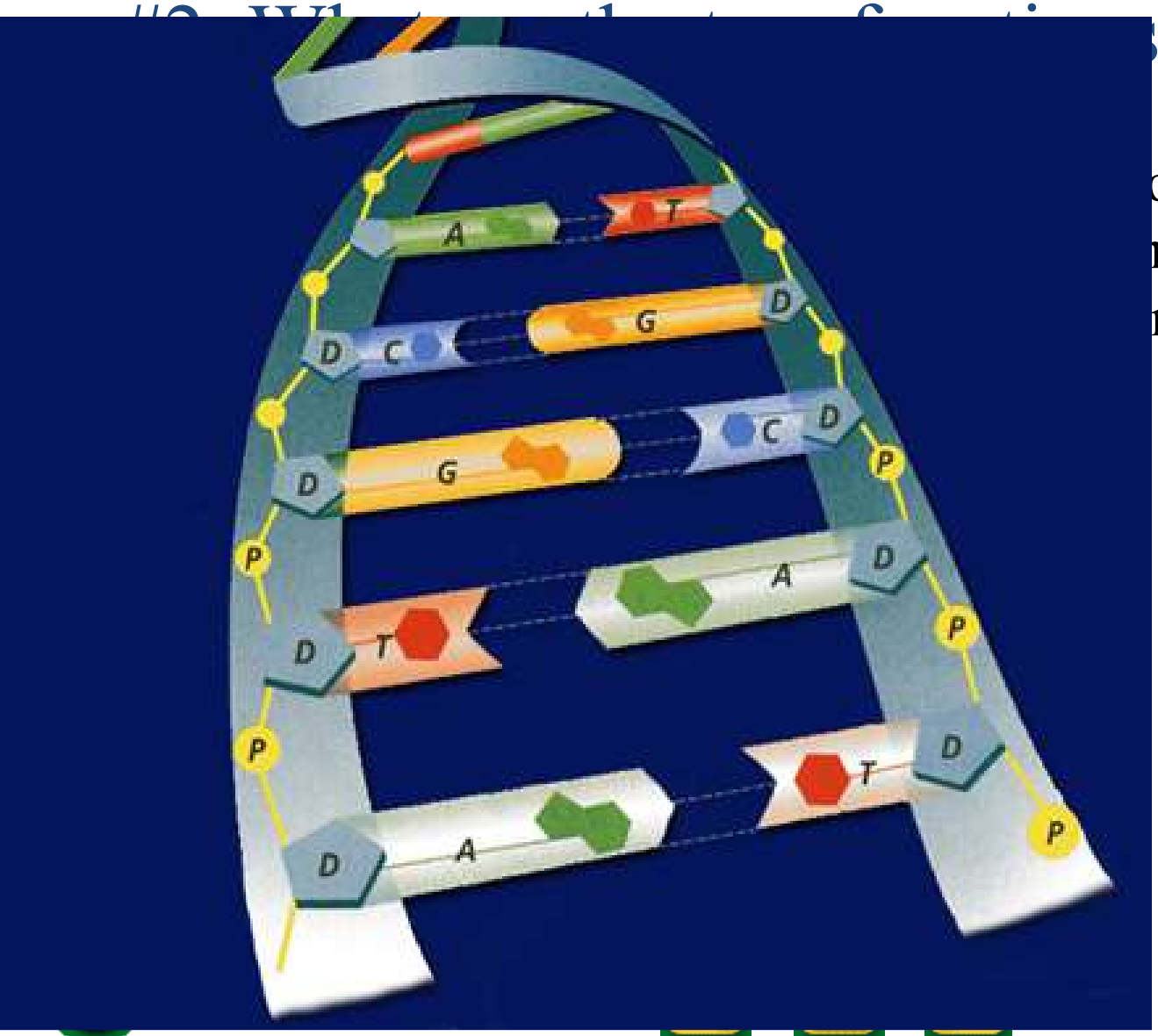
Nucleotides have three parts: a **simple sugar,** a **phosphate group,** and a **nitrogenous base.**

DNA: The Molecule of Heredity

#2 What are the functions of DNA?

organism
held in the
n organism's

structure of



DNA/ RNA Beads p. 43NB

- Back bone= Phosphate & Sugar (Red &)
- Nitrogen Bases= Adenine (Blue)=Thymine (Green)

  Cytosine (Yellow)=-Guanine (Orange)

  Uracil (Pink) RNA
- Hydrogen bond (clear barbell)
- http://learn.genetics.utah.edu/

WS - DNA Model Discussion questions

DNA Model Discussion Questions p. 43NB

1. What is the general Structure of the DNA molecule?
2. What are the 3 parts of a nucleotide?
3. Name the 2 molecules which alternate to make the sides or “backbone” of the DNA molecule.
4. Name the 4 nitrogen bases.
5. To which molecules does the nitrogenous base attach?
6. What are the base – paring rule for DNA?
7. If there are three thymine bases on your model, how many adenine bases will there be?

DNA Model Discussion Questions

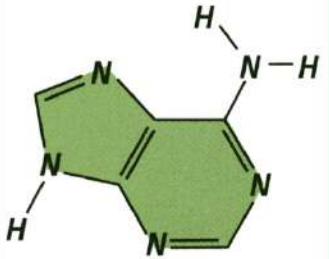
8. Draw a picture of your DNA. Label the sugar, a phosphate, and all the bases on the left and right side of the molecule you constructed.
9. If you were to open the entire DNA molecule along the hydrogen bonds and attached new bases to the sides you would have two new DNA molecules. Would these 2 DNA strands have the same base pairs?
10. Would the two DNA molecules that resulted fro replication be the exact copies of each other? Explain. Why is this important?

The structure of nucleotides

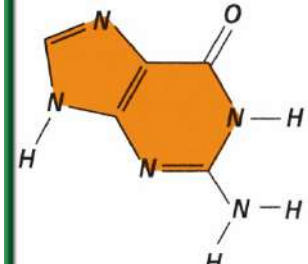
A nitrogenous base is a carbon ring structure that contains one or more atoms of nitrogen.

In DNA, there are four possible nitrogenous bases: adenine (A), guanine (G), cytosine (C), and thymine (T).

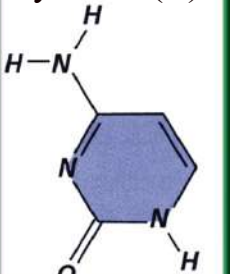
Adenine (A)



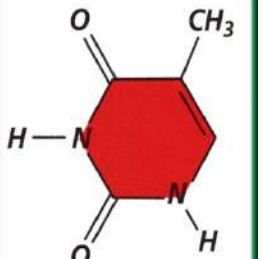
Guanine (G)



Cytosine (C)



Thymine (T)



END OF SLIDE

PREVIOUS SLIDE TABLE OF CONTENTS NEXT SLIDE RESOURCES

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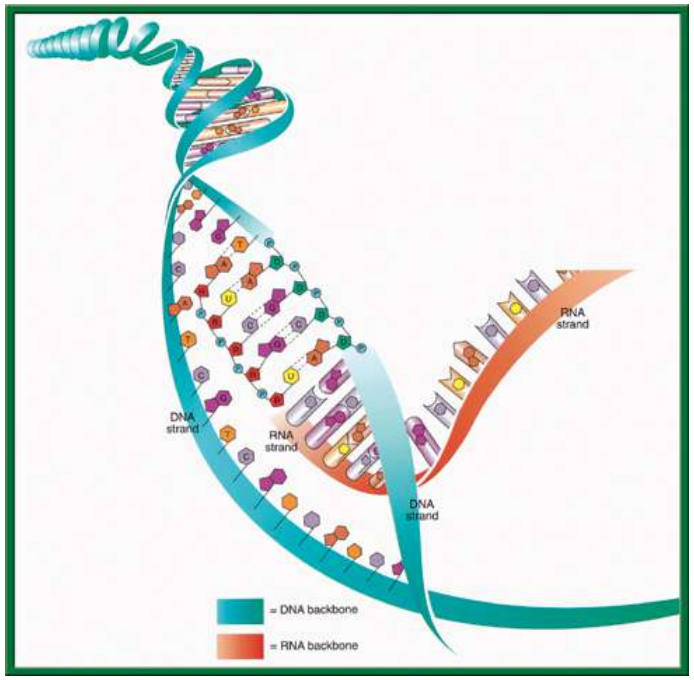
- Build a DNA Molecule
- Match the nucleotide base pair
  - What bases always pair together?
  - What holds the base pairs together?

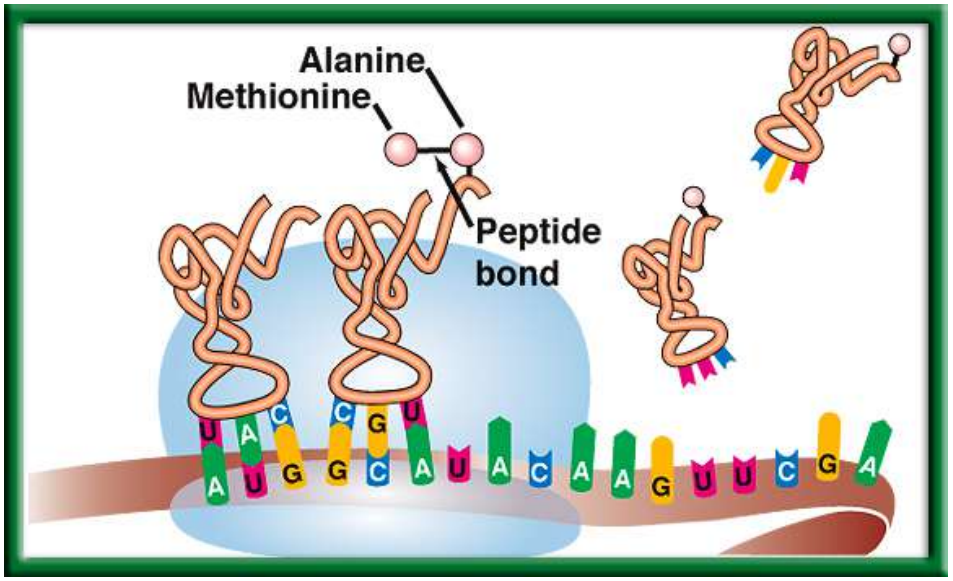
Cracking the Code

- Answer the Questions on the ½ sheet of paper

Protein Synthesis

DNA -> **transcription** -> RNA -> **translation** -> Proteins



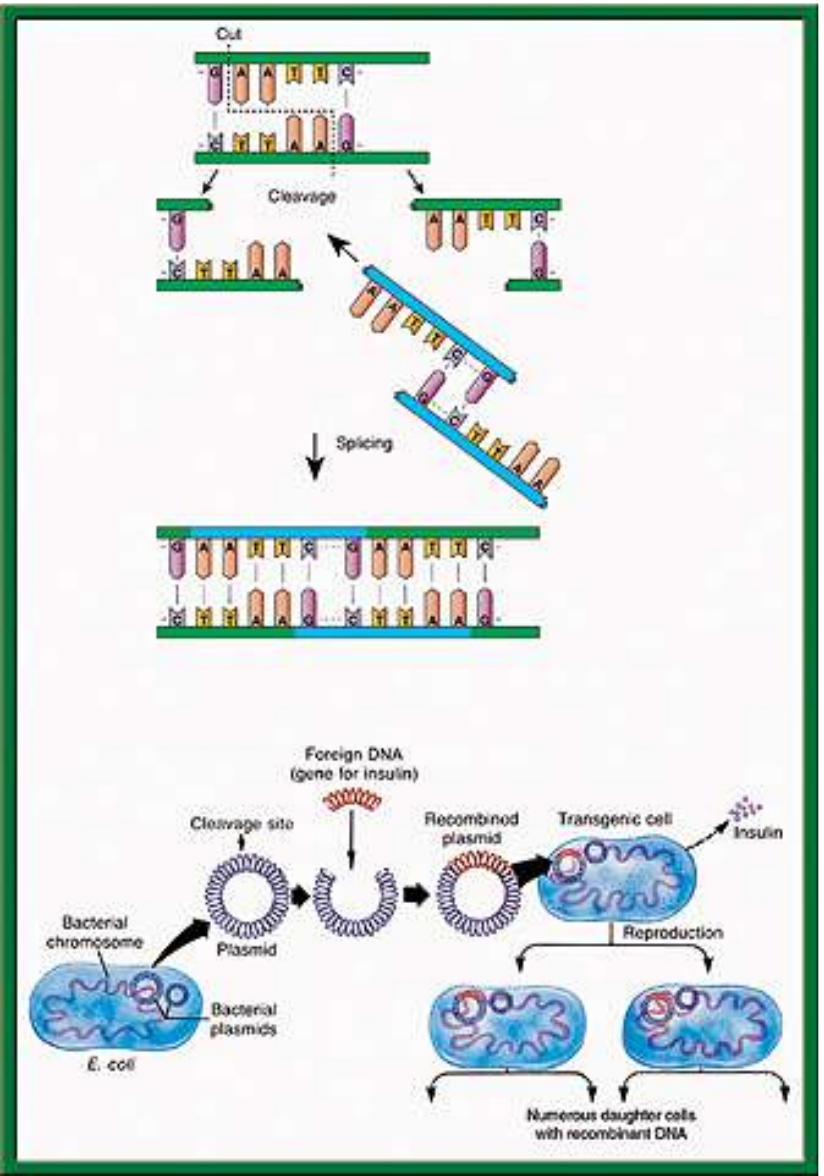


The Genetic Code P.292 BB

The Messenger RNA Genetic Code

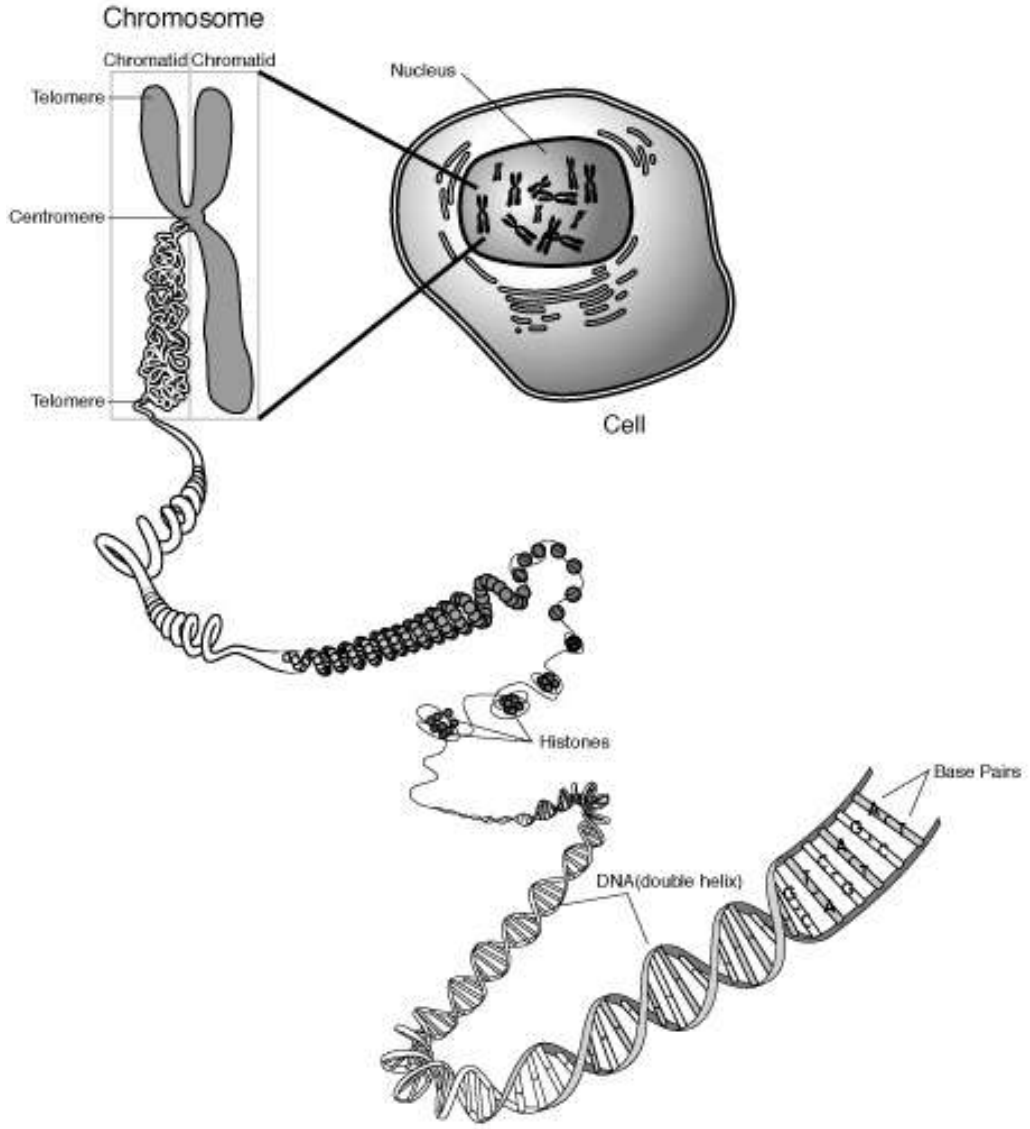
First Letter	Second Letter				Third Letter
	U	C	A	G	
U	Phenylalanine (UUU)	Serine (UCU)	Tyrosine (UAU)	Cysteine (UGU)	U
	Phenylalanine (UUC)	Serine (UCC)	Tyrosine (UAC)	Cysteine (UGC)	C
	Leucine (UUA)	Serine (UCA)	Stop (UAA)	Stop (UGA)	A
	Leucine (UUG)	Serine (UCG)	Stop (UAG)	Tryptophan (UGG)	G
C	Leucine (CUU)	Proline (CCU)	Histadine (CAU)	Arginine (CGU)	U
	Leucine (CUC)	Proline (CCC)	Histadine (CAC)	Arginine (CGC)	C
	Leucine (CUA)	Proline (CCA)	Glutamine (CAA)	Arginine (CGA)	A
	Leucine (CUG)	Proline (CCG)	Glutamine (CAG)	Arginine (CGG)	G
A	Isoleucine (AUU)	Threonine (ACU)	Asparagine (AAU)	Serine (AGU)	U
	Isoleucine (AUC)	Threonine (ACC)	Asparagine (AAC)	Serine (AGC)	C
	Isoleucine (AUA)	Threonine (ACA)	Lysine (AAA)	Arginine (AGA)	A
	Methionine; Start (AUG)	Threonine (ACG)	Lysine (AAG)	Arginine (AGG)	G
G	Valine (GUU)	Alanine (GCU)	Aspartate (GAU)	Glycine (GGU)	U
	Valine (GUC)	Alanine (GCC)	Aspartate (GAC)	Glycine (GGC)	C
	Valine (GUA)	Alanine (GCA)	Glutamate (GAA)	Glycine (GGA)	A
	Valine (GUG)	Alanine (GCG)	Glutamate (GAG)	Glycine (GGG)	G

Genetically Modified Organisms



Rice
Corn
Soybeans
Cotton
Canola

Place the following in order from smallest to largest:
chromosome, nucleotide, cell, DNA, nucleus



Epigenetics

- Ghost in your genes
- Video
- After watching this video, what are the implications of how environmental factors can alter the way your genes are expressed?
- HW – Find other videos/ cite them and take notes. Write a summary paragraph for each one.

What would you like to learn next time?

Works Cited

- Glencoe, The Dynamics of Life, McGraw-Hill Companies, Inc., 2005
- NOVA
- PBS