Opening Ceremonies:
All Members in Unison:

- “To practice brotherhood, honor agricultural opportunities and responsibilities and develop those qualities of leadership which an FFA member should possess.”
- All Officers memorize your parts.
- Greenhand FFA Degree: See FFA Manual page 26.

10/3	**WU – Protein Synthesis: Transcription CH 11.2**	**64**
10/3	Transcription Practice	65
10/4	WU – Protein Synthesis: Translation	66
10/4	The Genetic Code	67
10/5	WU – Protein Synthesis: Translation CH 11.2	68
10/4	DNA Quiz	69
10/6	Mutations: A change in a gene CH 11.3	70
10/5	Molecular Genetics –Protein Synthesis Practice	71
10/10	WU – Applied Genetics CH 13.2	72
10/6	Mini Lab CH 11.1 p. 293 BB	73
10/11	WU – Gel Electrophoresis CH 13.1	74
10/5	Draw Protein Synthesis	75
10/12	WU – Genetically Modified Organisms EEI Curriculum	76
10/6	Molecular Genetics AXES Paragraph	77 Notebook Check P.64 – 77 (70 Points)

Protein Synthesis

Transcription Practice p. 65NB

- **Directions:** Using the DNA strand as a template, transcribe mRNA. Make sure to use the correct Nitrogen bases.

1. ATA CCT TAA CGC GTC
2. TAT TAG GCA AAA TTC
3. GTG TGA TTA ATA GCC
4. CTA AAG GAA TAG GAT
5. GAT GAA TAC CCA CGA
6. TAA TAT GCA CAT TAC
7. GAA CCT TAC GGG GTG
8. TAT AAC CAG GAG TTT
9. ATC CGT AGT GTA AAT
10. GGA TTA CCC TTA CCA

Cracking the Code

- Students will take a page of notes on Notebook Paper and tape into their NB page 71 NB

RNA Processing = Gene Expression

Not all the nucleotides in the DNA of eukaryotic cells carry instructions—or code—for making proteins.

Genes usually contain many long noncoding nucleotide sequences, called introns, that are scattered among the coding sequences.

HW CH 11 DNA & Genes p.41 NB

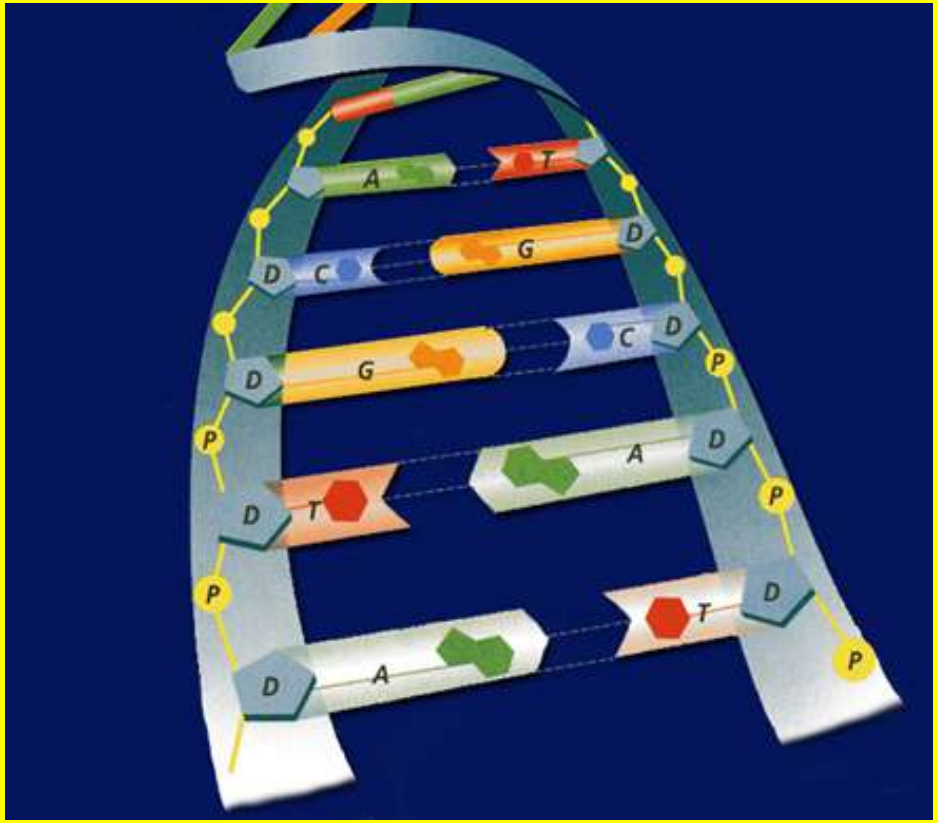
1. Deoxyribose
2. Nitrogenous Base
3. Nucleotide
4. Base Pair
5. Hydrogen Bond
6. Phosphate
7. Adenine (A) & Nitrogen Bases
8. Cytosine
9. *Nucleotides
10. DNA Replication
11. Double Helix

HW CH 11 DNA &Genes*

1. DNA – Double RNA – single
2. DNA – Deoxyribose RNA – Ribose
3. DNA – ATCG RNA – AUCG
4. Amino Acids
5. Amino Acids
6. Proteins
7. Codon*
8. Threonine

POP QUIZ Write your name on your binder paper.

1. What is this molecule? Spell it out.
2. What is the shape of the molecule?
3. What are the two purposes/ functions of this molecule?
4. Write the three names for the parts of a nucleotide. Be specific.
5. The Nitrogen bases are: Adenine, Cytosine, Guanine, & Thymine – Base Pair them together correctly.
6. What holds the Nitrogen bases together?
7. DNA is a Nucleic Acid, write an example of another one.
8. Can a Nucleic Acid leave the nucleus?
9. What is DNA Replication?
10. What is the name for how DNA Replications?



The process through which the order of bases in messenger RNA codes for the order of amino acids in a protein is:

A. transcription

B. translation

C. replication

D. point mutation

The answer is B.

Why would scientists use nucleotide sequences to identify bodies of crime victims?

In comparing nucleotide sequences in the DNA of a crime victim with nucleotide sequences from a possible close relative of the crime victim, scientists can determine if the two are related.

From DNA to Protein

The Genetic Code P.292 BB p. 67 NB

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

END OF SLIDE

?

PREVIOUS SLIDE

TABLE OF CONTENTS

NEXT SLIDE

RESOURCES

Write a 4 sentence summary P. 67 NB

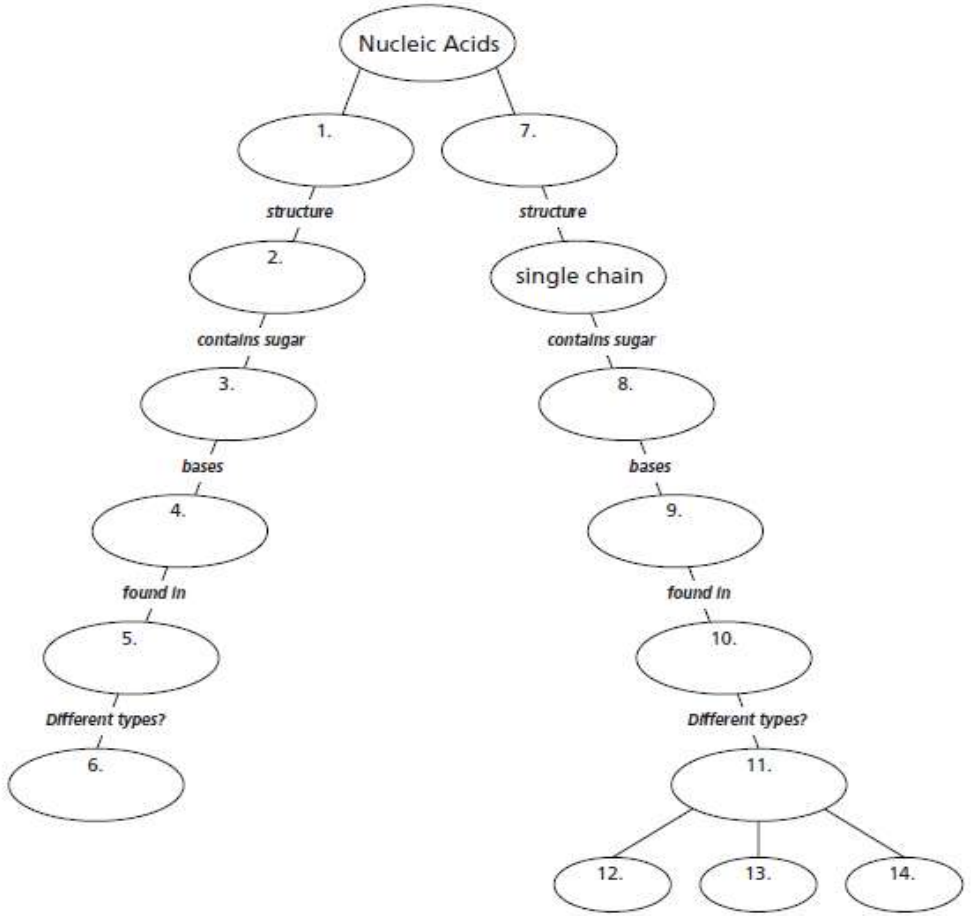
Chapter 11 DNA and Genes

Concept Mapping

Use with Chapter 11, Section 11.2

DNA and RNA

Complete the concept map to show how DNA and RNA are alike and how they are different. Use these words or phrases once: *ACGT, ACGU, DNA, deoxyribose, double chain, mRNA, ribose, yes, no, nucleus, nucleus and cytoplasm, RNA, rRNA, tRNA.*

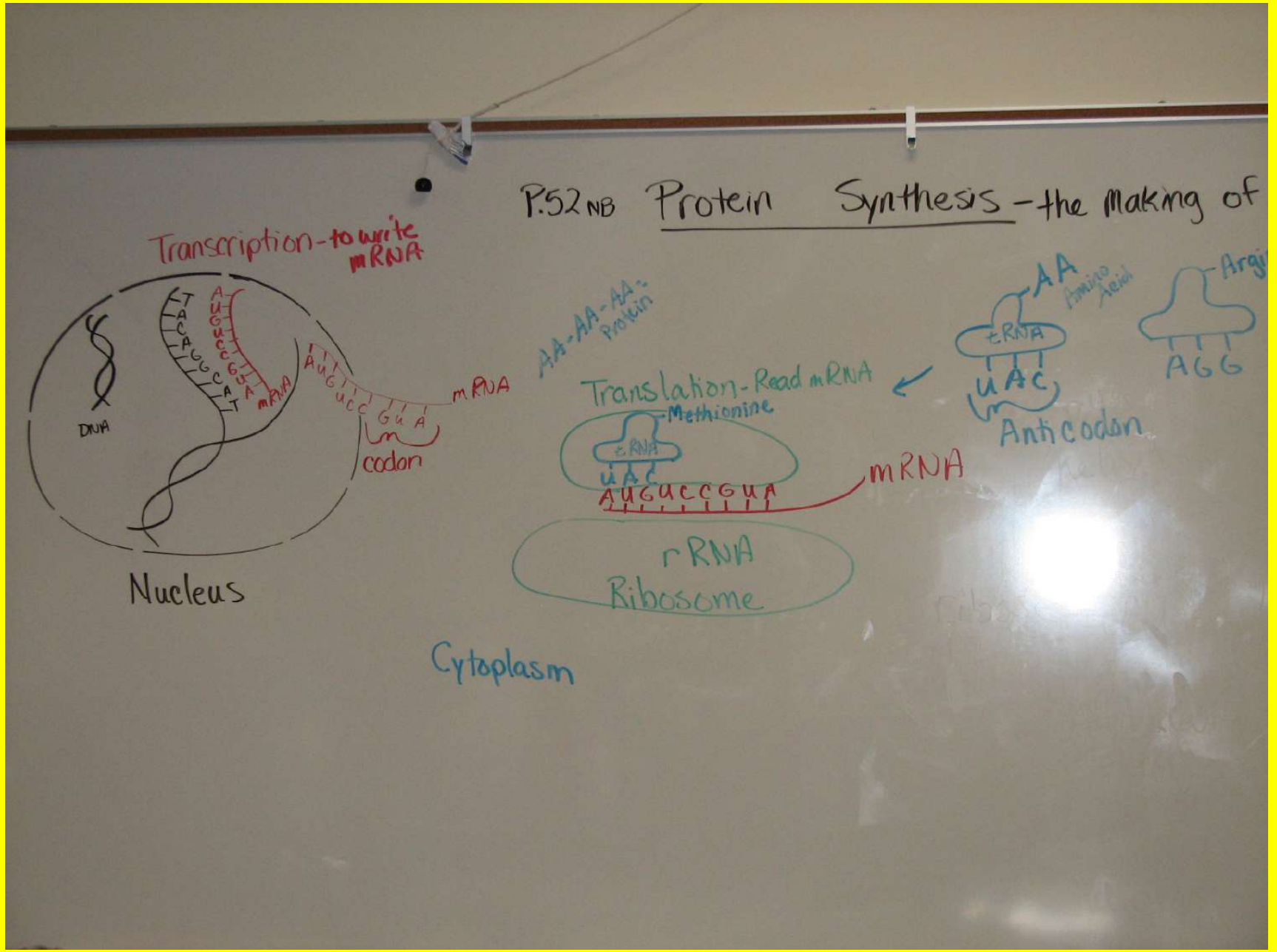


ACGT
ACGU
DNA
Deoxyribose
Double chain/ Helix
mRNA
Ribose
Yes
No
Nucleus
Nucleus & Cytoplasm
RNA
rRNA
tRNA

Page 292 Biology Book

The Genetic Code

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


P.52 NB Protein Synthesis - the making of
Transcription - to write mRNA
DNA
mRNA
codon
Nucleus
AA-AA-AA = Protein
Translation - Read mRNA
Methionine
tRNA
UAC
AUGUCCGUA
mRNA
rRNA
Ribosome
Cytoplasm
AA
Amino Acid
tRNA
UAC
Anticodon
AGG

Page 75 NB

1st Period P. 77 NB

- Write a paragraph after building your DNA molecule that include the vocabulary words: Double helix, Nitrogen bases, Hydrogen bond, Nucleotide, Backbone, Deoxyribose, Phosphate, Adenine, Thymine, Cytosine, Guanine.

Chapter 11

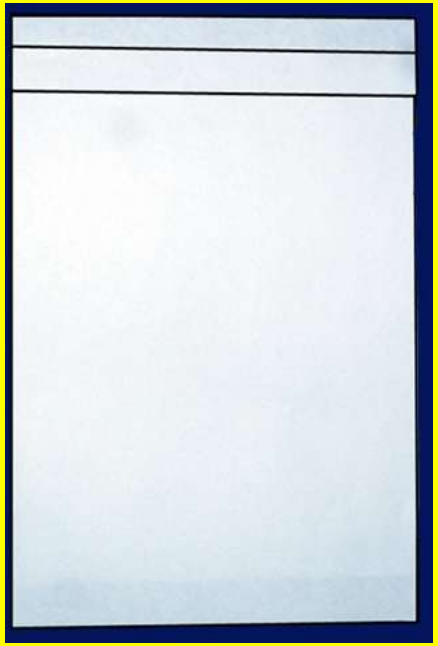
Foldables Study Organizers

STEP 1

Collect 3 sheets of paper and layer them about 1.5 cm apart vertically. Keep the edges level.

P. 53 NB

FOLDABLES™ Study Organizer



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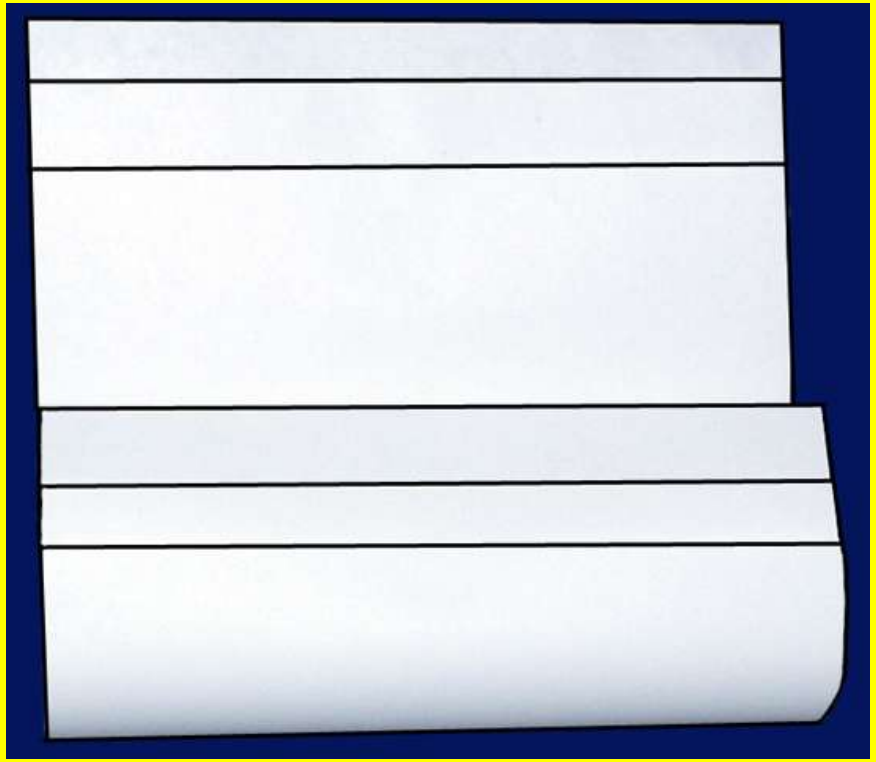
END OF SLIDE

Foldables Study Organizers

STEP 2

Fold up the bottom edges of the paper to form 6 equal tabs. P. 53NB



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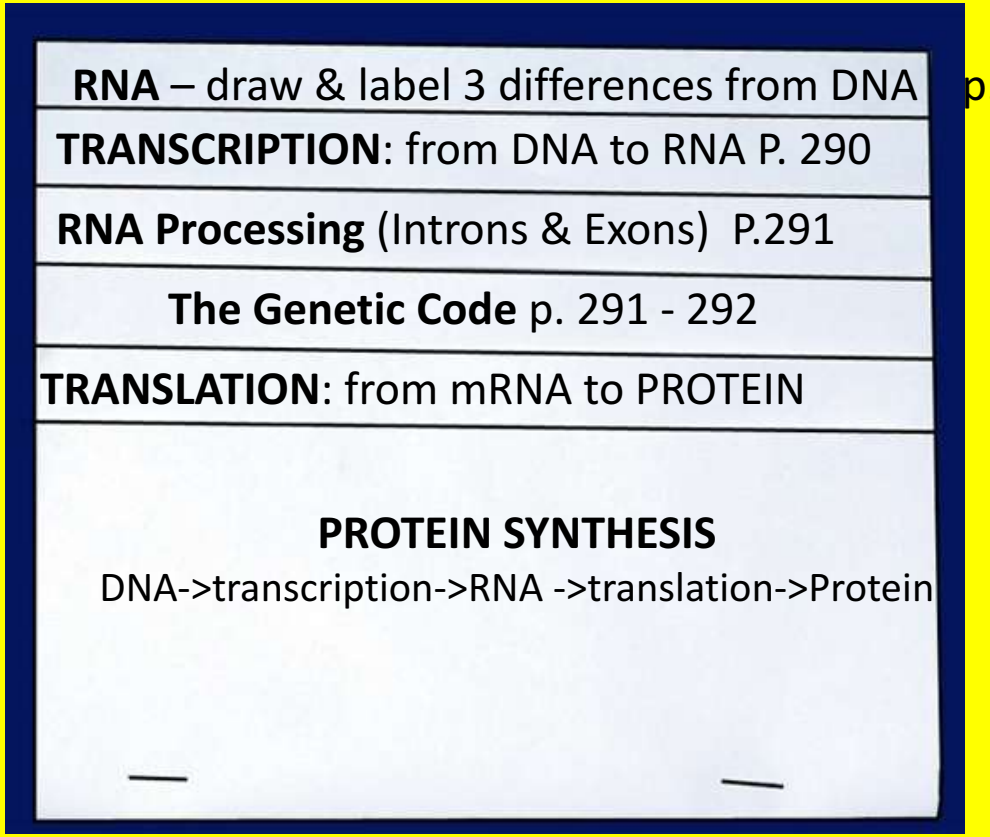
Chapter 11

Foldables Study Organizers

STEP 3

Fold the papers and crease well to hold the tabs in place. Staple along the fold. **Label** each tab. P. 53NB



p. 289

p. 294 11.9A

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

END OF SLIDE

Rice Krispy Protein Synthesis P.79 NB

1. My protein looks like: Round, Flat, Color, M&M or Gummi Bears
2. Deleting the fifth nucleotide of your DNA will cause **a frameshift** mutation that changes every amino acid after the deletion. Change how many marshmallows were used.
3. Changing the 11th nucleotide of your DNA sequence from G to T would be a **point mutation** and will change the amino acid **Serine** to **STOP codon**, however, this is bad because the protein is not complete. Marshmellows would not be smooth.
4. If the 19th, 20th, 21st nucleotides of your DNA sequence were deleted the 7th codon were deleted the rice krispie treat would not have color.
5. Two proteins are different by some were flat, round, some were red, some blue, some M&M's &/ gummy bears.

Conclusion

1.If you were given the

Classwork – Transcription & Translation p. 53 NB

- Work on worksheet about Protein Synthesis.
- Transcribe the DNA sequence.
- Then, translate the Amino Acid sequence to the right of the Codons.

10/10 Applied Genetics 13.2

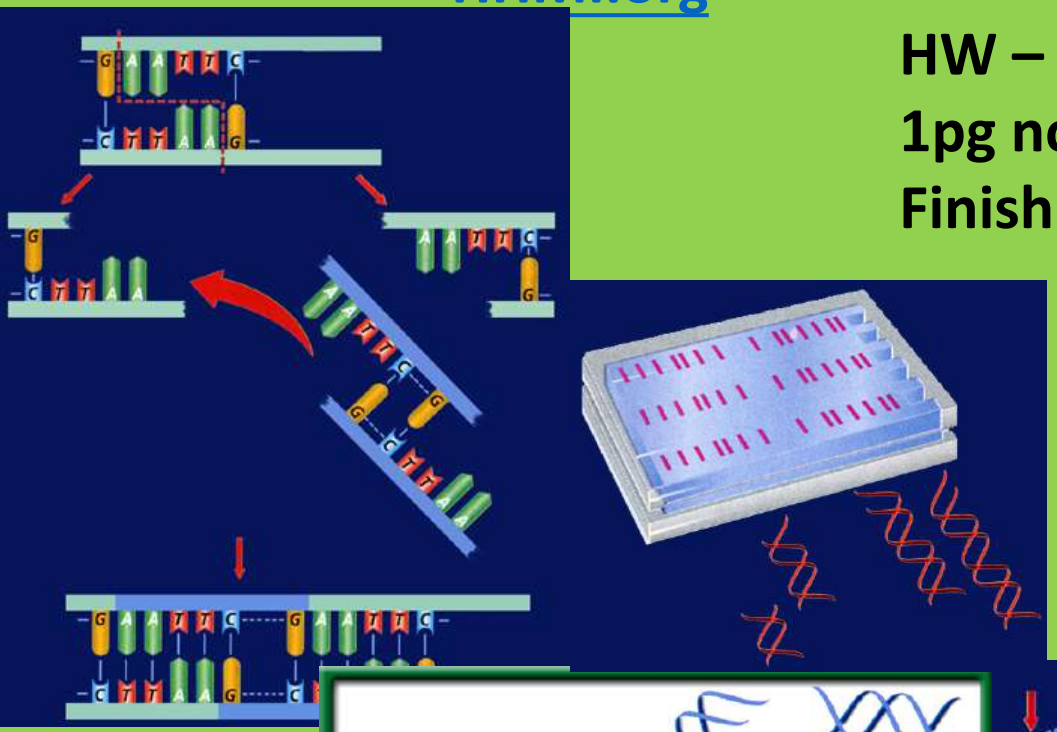
Obj. TSW be able to explain how basic DNA technology is used to construct recombinant DNA molecules in a Minilab 13.1 p.72 NB

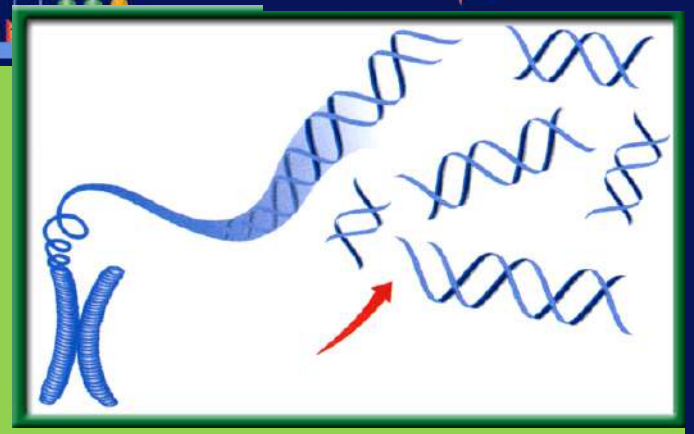
HHMI.org

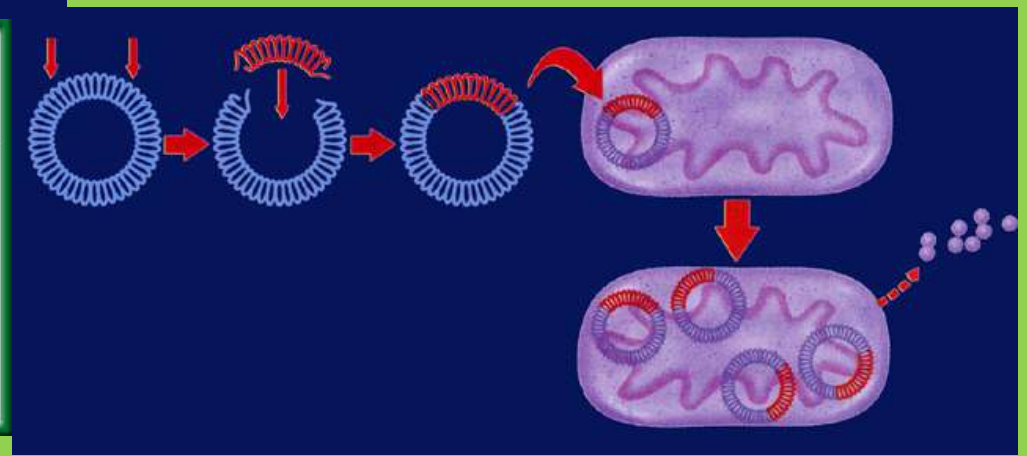
NOVA.pbs.org

HW – Read CH 13
1pg notes P. 81 NB
Finish Study Guide

1. Genetic Engineering uses Recombinant DNA, explain.
2. Explain a transgenic organism.
3. Explain two ways in which recombinant bacteria are used for human applications.







Genetic Engineering

#1. Recombinant DNA is DNA that has one or more genes from another organism in it's genome.

#2. A transgenic organism has Recombinant DNA.

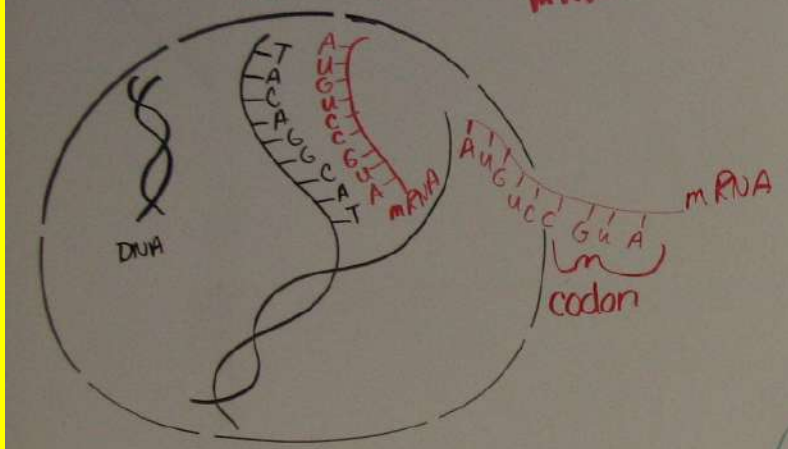
#3. Bacteria is a transgenic organism that can have the gene to make insulin for people who have Diabetes. They also can have the gene for Growth Hormone to help people who have Dwarfism be a more normal range of height.

Draw Protein Synthesis

- P. 75 NB
- Turn your book Landscape Style ←------→
- Have 4 different colored pencils.
- Write on the RED line at the top: **Protein Synthesis: the making of Proteins**
- Use ¾ of the page
- The last ¼ of the page will be a summary/ AXES paragraph.

P.52 NB **Protein Synthesis** – the making of

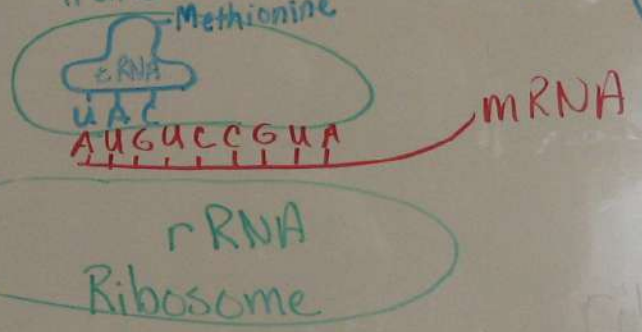
Transcription – to write mRNA

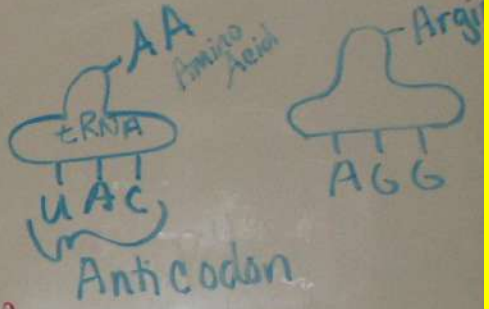


Nucleus

AA-AA-AA-... Protein

Translation – Read mRNA



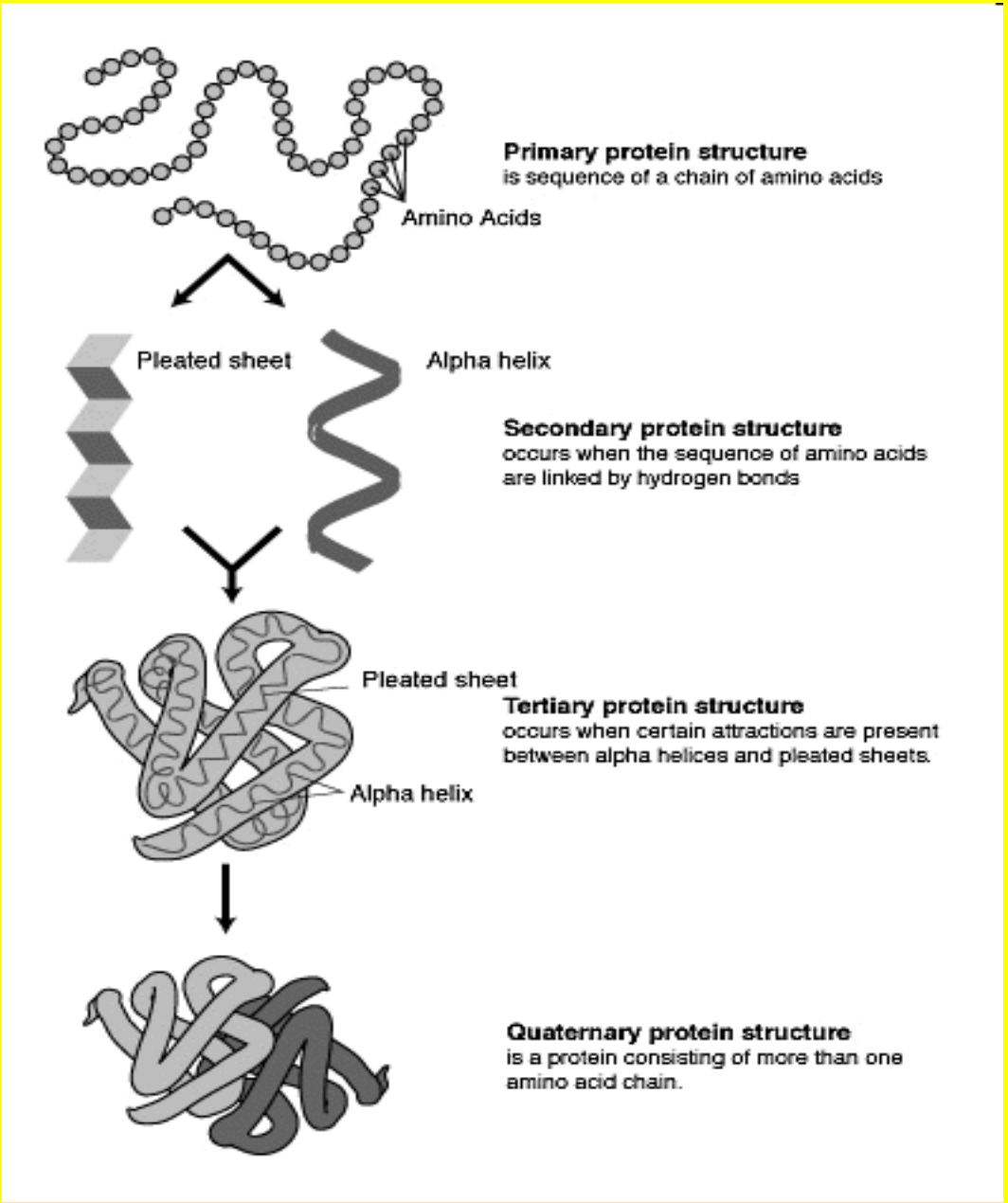


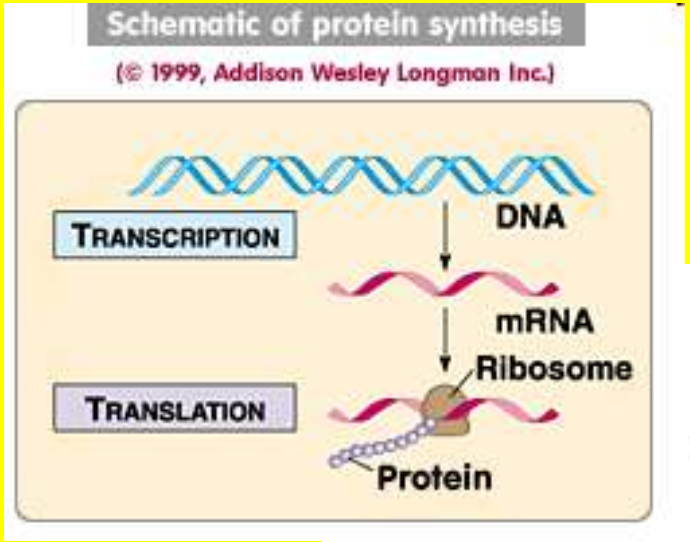
rRNA
Ribosome

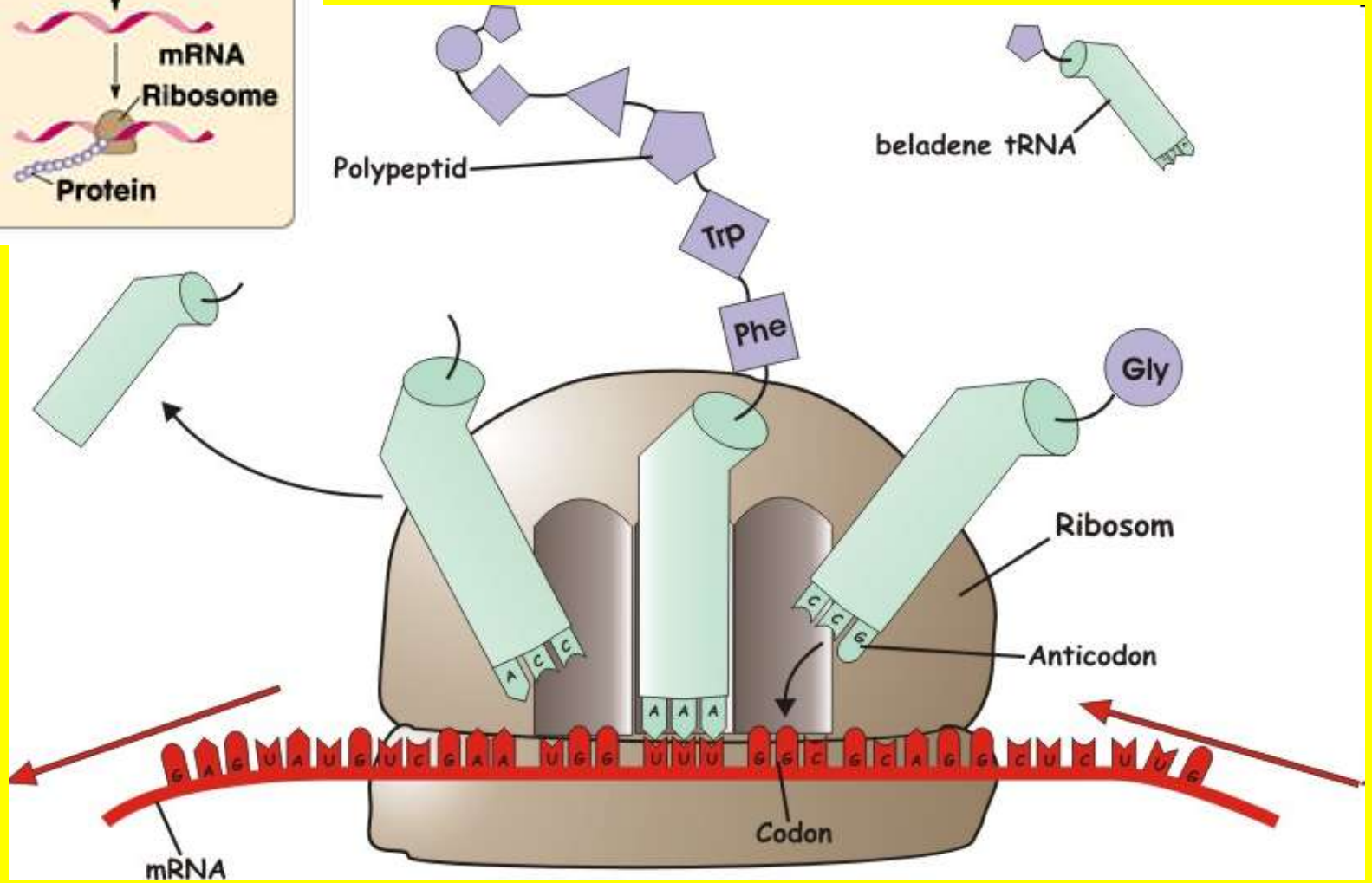
Cytoplasm

Proteins Notes P. 81 NB

- Proteins can come in many different shapes and sizes.
- The number & sequence of amino acids determine its a proteins shape.
- An example of proteins: ENZYMES!
- Proteins must have a specific structure in order to function properly.




Schematic of protein synthesis
(© 1999, Addison Wesley Longman Inc.)
TRANSCRIPTION
DNA
mRNA
Ribosome
TRANSLATION
Protein


Polypeptid
beladene tRNA
Trp
Phe
Gly
Ribosom
Anticodon
Codon
mRNA

Building a Protein

Choose the sequence you had when you did the Rice Krispy Protein Lab. Transcribe and Translate your DNA sequence. Then form a tertiary protein based on the chemical characteristics of the proteins you have. When you are finished, explain to McAllister what you have done.

Gene #1: TAC-CAC-AAC-AGC-TAG-AGT-CTA-TGC-GTA-ACG-ACC-CCT-ATT

Gene #2: TAC-CAC-AAC-AGC-TAG-AGT-CTA-TGC-ATA-ACG-ACC-GGG-ATC

Gene #3: TAC-CAC-AAC-AGC-TAG-AGT-CGA-TGC-GTA-ACG-ACC-GGG-ACT

Gene #4: TAC-CAC-AAC-AGC-TAG-AGT-CGA-TGC-ATA-ACG-ACC-CCT-ATT

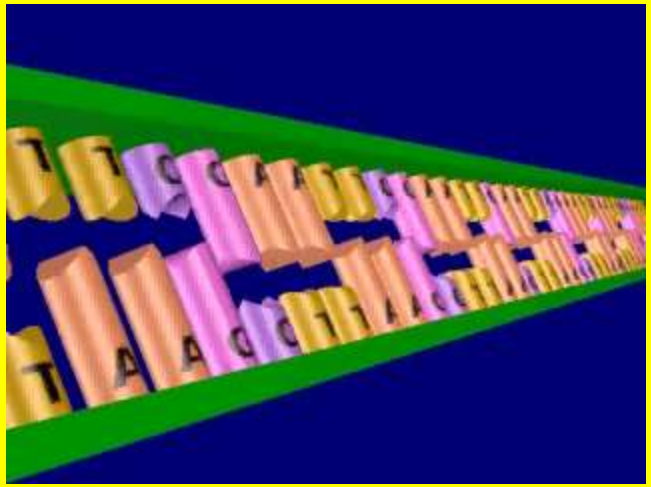
Gene #5: TAC-CAC-AAC-AGC-TAG-AGT-TTT-TGC-GTA-ACG-ACC-CCT-ATC

Gene #6: TAC-CAC-AAC-AGC-TAG-AGT-TTT-TGC-ATA-ACG-ACC-GGG-ACT

Gene #7: TAC-CAC-AAC-AGC-TAG-AGT-TCT-TGC-GTA-ACG-ACC-GGG-ATT

Gene #8: TAC-CAC-AAC-AGC-TAG-AGT-TCT-TGC-ATA-ACG-ACC-CCT-ATC

Restriction enzymes cleave DNA



Click image to view movie

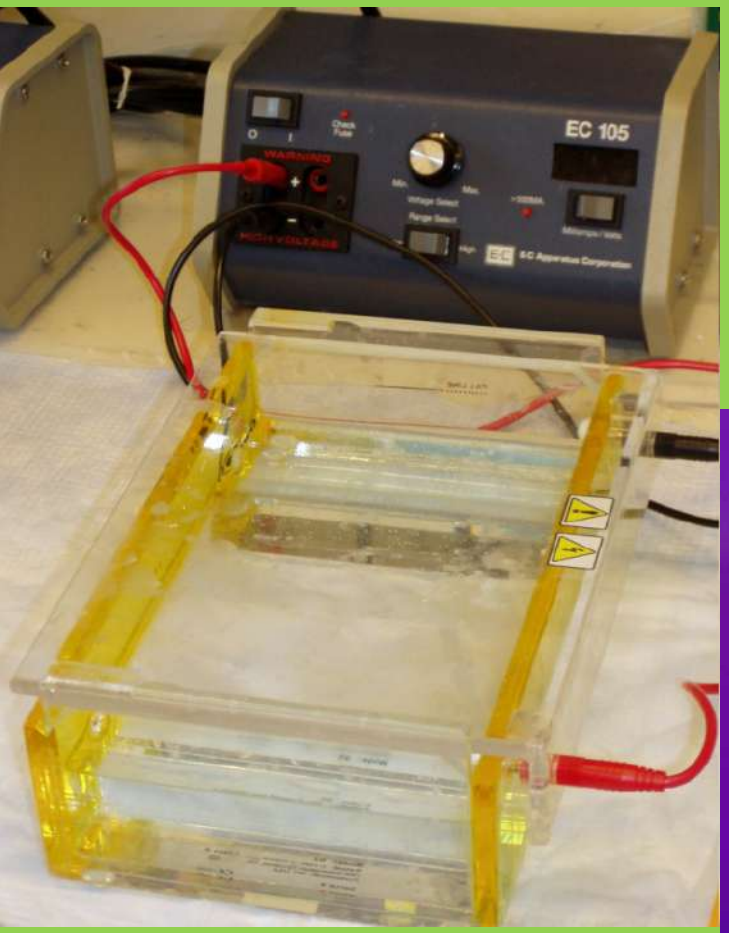
Vectors transfer DNA

- Biological vectors include viruses and plasmids. A plasmid, is a small ring of DNA found in a bacterial cell.

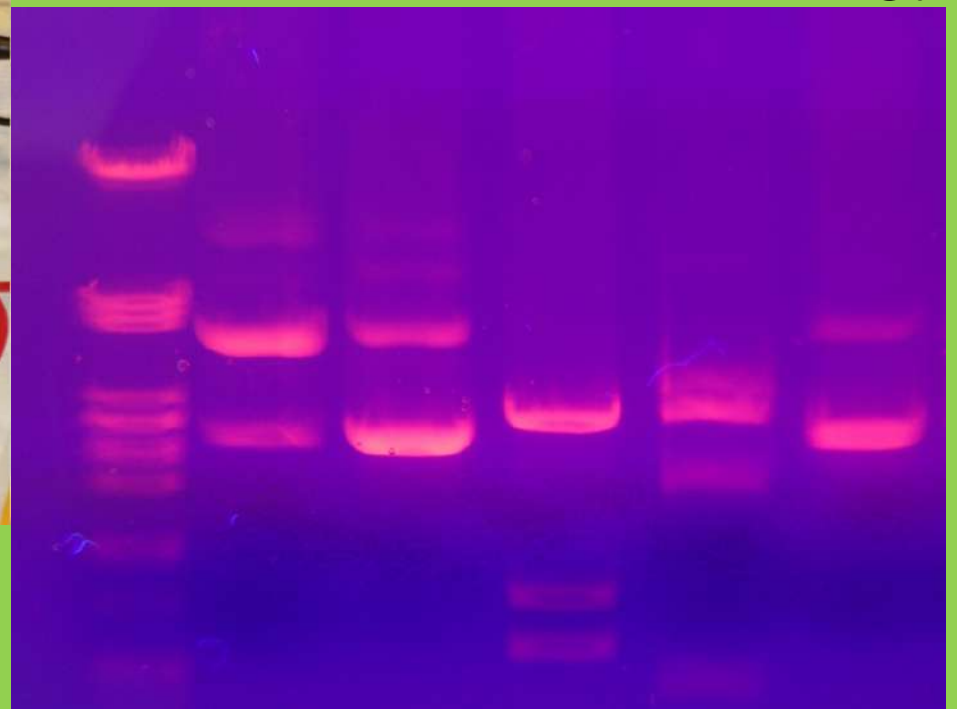
Click image to view movie

10/11 Gel Electrophoresis CH 13.1

Obj. TSW learn how to build a protein from an amino acid sequence using the hydrophobic and hydrophilic properties of the amino acids. P. 74 NB



Watch Gel Video
HW CH 13
HW Study Guide
Midterm Final 10/20



1. What is Gel Electrophoresis?
2. Why is DNA fingerprinting important?
3. Explain the field of Genetic Engineering and how a Gel Electrophoresis applies in the agricultural field.

Genetically Modified Organisms

- Bt Corn Concerns: Not good for peoples health, outcompetes native species and decreases Biodiversity.
  - Benefits: This corn is genetically resistant to the corn borer beetle. The farmer does not have to spray pesticides. Income for communities and increased tax base.
- Malaria Resistant Mosquitos Concerns: Not sure about the impact of the genetically modified mosquitos. They might impact animals they bite in negative ways. What happens when a malaria resistant mosquito breeds with a normal mosquito?
  - Benefits: People would live without fear of malaria- hopefully.
- Golden Rice Concerns: Not good for peoples health, outcompetes native species and decreases Biodiversity.
  - Benefits: Vitamin A nourishing people, people are not deficient anymore.


Jetlee
September 11th
2016
First day I got the girls!


Jetlee
September
18th 2016


Jetlee
September
28th


1 Month Later
Jetlee
October 11th
2016

2015 Midterm Study Guide answers

1. A. Age in Years

b. Number of Teens

2. The trend is increasing for teens with phones.

3. As teens get older, more have cell phones.

4. A decrease in 60 teens who have cell phones.

5. Eukaryotic: Nucleus, Membrane Bound Organelle, Animal cell, Plant cell

Prokaryotic: No Nucleus, Bacteria

Both: DNA, Ribosomes, Cell Wall, Plasma Membrane,

Study Guide for Midterm Final Biology

6. a. Proteins: Carbon Hydrogen and Oxygen, Nitrogen, Sulfur

b. Lipids: Carbon, Hydrogen, Oxygen

c. Carbohydrates: Carbon, Hydrogen, Oxygen

d. Nucleic Acids: Carbon, Hydrogen, Oxygen, Phosphorus, Nitrogen, Sulfur

7. The Mitochondria converts Glucose into ATP (energy) and it produces Heat, CO_2 & H_2O.

8. The Chloroplast captures light energy and converts it to sugar ($C_6H_{12}O_6$), Chemical Energy.

9. An Enzyme is a Protein, that speeds up chemical reactions.

10. Draw☺

11. Environmental Factors: Temperature, pH, Ionic Conditions

12. Plant – Cell Wall, Large Vacuole, Chloroplasts,

Animal – Small vacoule

Both: Eukayotic, Cell Organelles, Plasma Membrane, Nucleus, Mitochondria

1. A type of nucleic acid that has a double helix and contains thymine.
2. This process uses glucose and oxygen to produce ATP, CO2 (carbon dioxide), and water.
3. This is a three nucleotide sequence found on **tRNA** that codes for a specific amino acid.
4. This macromolecule is composed of amino acid chains.
5. This type of macromolecule that includes glucose, fructose, and other saccharides. It has oxygen, carbon, and hydrogen atoms.
6. This type of eukaryotic cell does not have cell walls or chloroplasts.
7. This type of cell has cell walls, mitochondria, chlorophyll, and it utilizes both cellular respiration and photosynthesis to convert solar or organic energy into ATP.
8. This nucleic acid is single stranded and contains uracil.

- A three base sequence that corresponds with a specific amino acid for protein synthesis.
- This is a pathogen that infects other cells and it hijacks a host cell's machinery to replicate.
- This process uses carbon dioxide and water to produce glucose and oxygen.
- This is a change in a nucleotide sequence that can cause the readings of the codons after the change to code for different amino acids. Can cause an abnormally short or abnormally long amino acid chain.
- This molecule is a pigment found in the chloroplasts of plants and is vital in the process of photosynthesis.
- These proteins increase the rate of chemical reactions and are affected by environmental conditions.
- This is a type of RNA that makes up part of the ribosome and is essential in protein synthesis.

- A process that occurs in the cytosol and involves different forms of RNA. It occurs at the ribosome where the mRNA is read.
- This organelle is used in cellular respiration and it is found in both animal and plant cells.

Study Guide

13. AXES Paragraph about folded membranes:

Having folded membranes in cells is better. Organelles in the cell that have folded membranes are: Mitochondria, Golgi Apparatus, Endoplasmic Reticulum, and Chloroplasts. The folded membranes increase the chemical reactions in the cell because it has more surface area. In addition, the chemical reactions are more efficient due to the increased surface area. The chemical reactions help maintain homeostasis in the body.

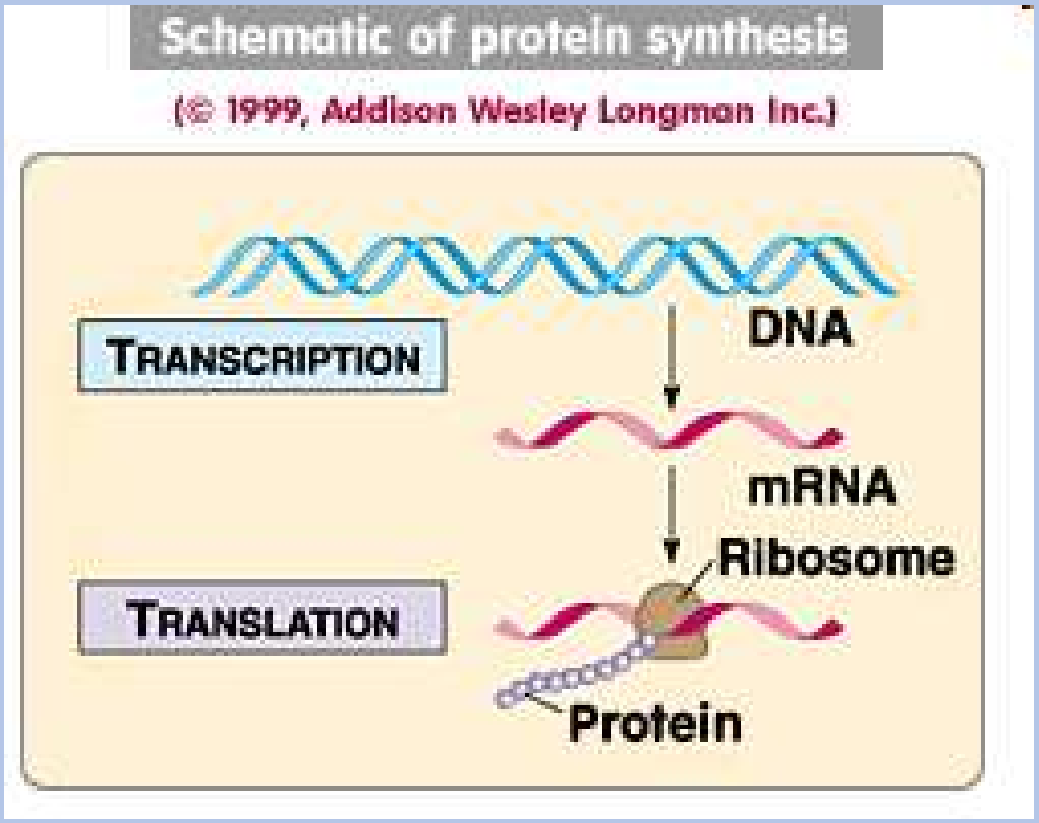
Study guide

14.Photosynthesis: Glucose & O2 as a Product, Chloroplast, Needs Sunlight, CO2 & H20 as a reactant,

Cellular Respiration: Glucose & O2 as a Reactant, animals, CO2 & H2O as a product,

Both: Mitochondria, Plants

15.



Study Guide

16. DNA: Adenine=Thymine

Cytosine=Guanine

17. RNA: Adenine= Uracil

Cytosine=Guanine

18. Frameshift Mutation: changes every amino acid after the addition or deletion, deletion of a nucleotide, addition of a nucleotide, is more severe

Point Mutation: changes one nucleotide, changes on amino acid,

Both: type of mutation

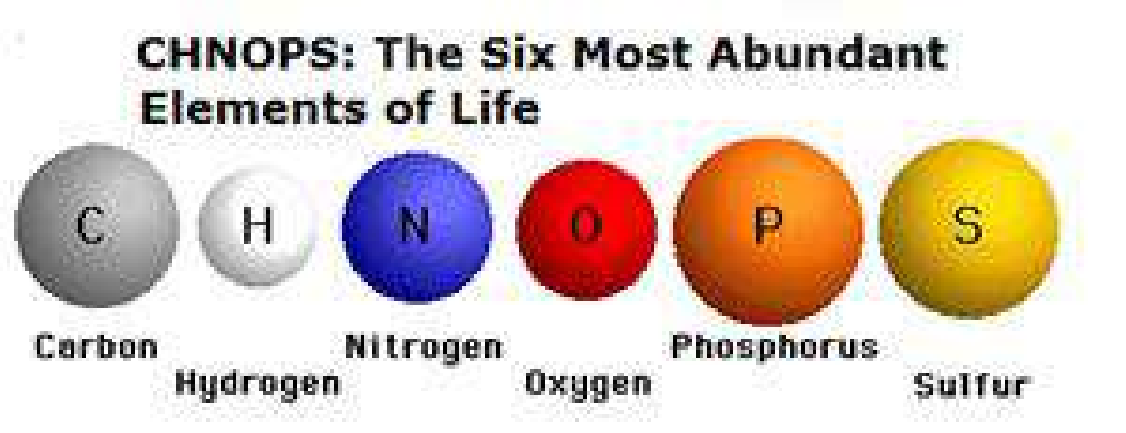
19. AXES paragraph:

Selective permeability allows some molecules in and out and other not. Glucose is a molecule that the cells need for energy. Carbon dioxide and water are released from the cell. Passive transport allows molecules across the cell membrane without energy. Active transport requires energy. Glucose provides energy for the body to perform cellular respiration, and maintains homeostasis for the body.

20. Virus – pathogen, needs a host cell to live and replicate.

10/13 Building Molecules & Enzymes CH 6.3

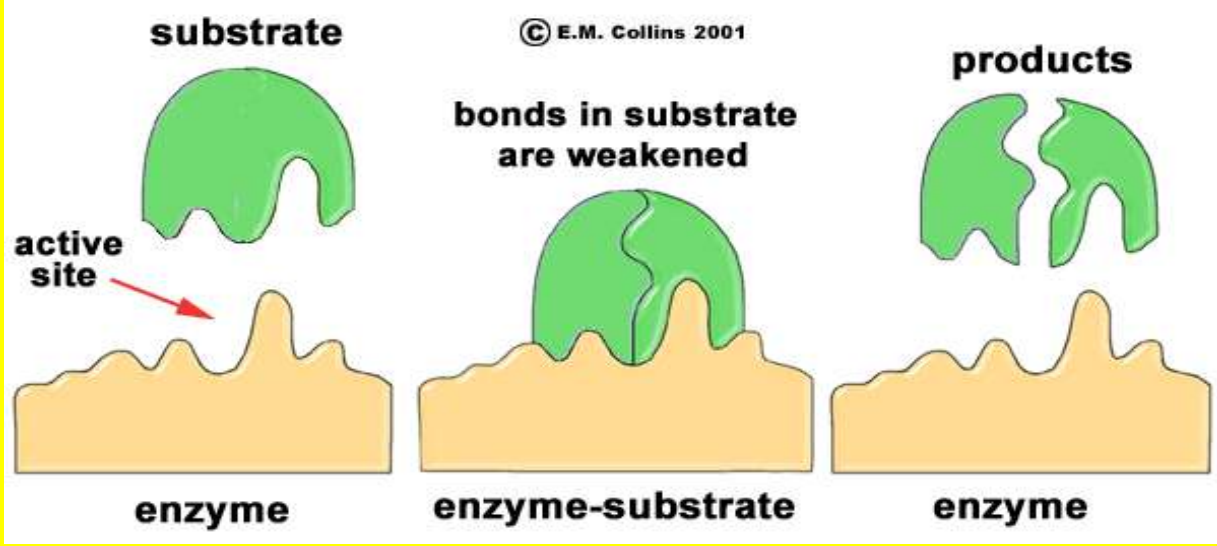
Obj. TSW identify the macromolecules living things are made of and describe their properties. P. 78NB



1. What are the 6 main elements that make up the 4 macromolecules?
2. What is an Enzyme? CH 6.3
3. What three environmental factors determine the enzymes function? CH 6.3

Enzymes

1. CHONPS- Carbon, Hydrogen, Oxygen, Nitrogen, Phosphorus, & Sulfur.



2. Enzymes are a type of protein that **catalyze** chemical reactions. This means they **speed up** the rate of chemical reactions.

3. There are three things that impact how well an enzyme will work:

- pH
- Temperature
- Amount of Substrate &/or the amount of Enzyme

Take notes P. 85 NB

The structure of proteins

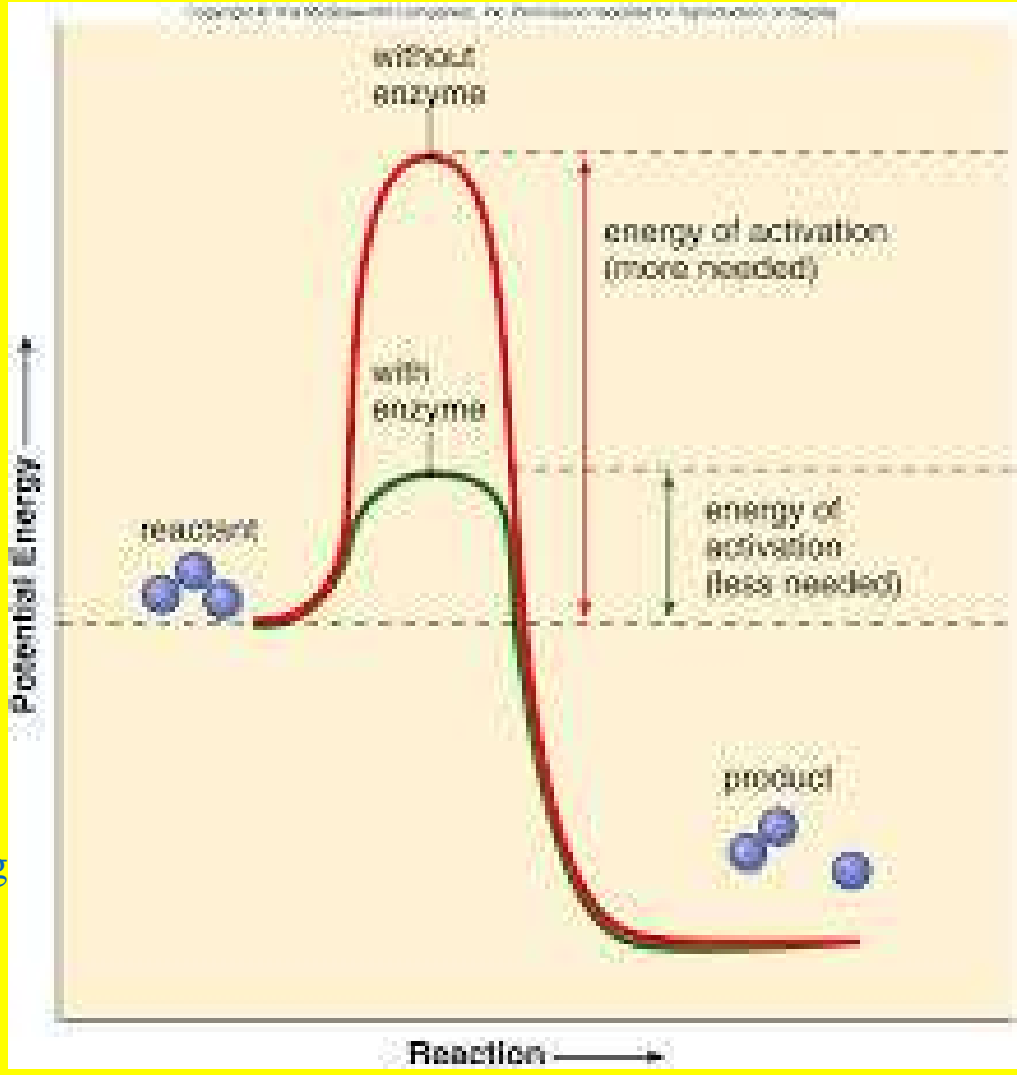
Enzymes are important proteins found in living things. *An enzyme is a protein that changes the rate of a chemical reaction.

They speed the reactions in digestion of food.

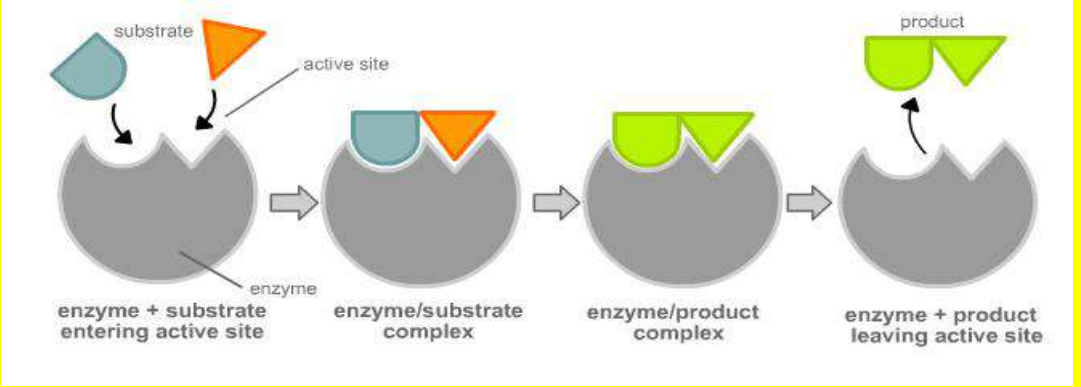
Made up of Amino Acids (20)

Enzymes can be used again and again without being used up.

Click imag



Enzyme Activity



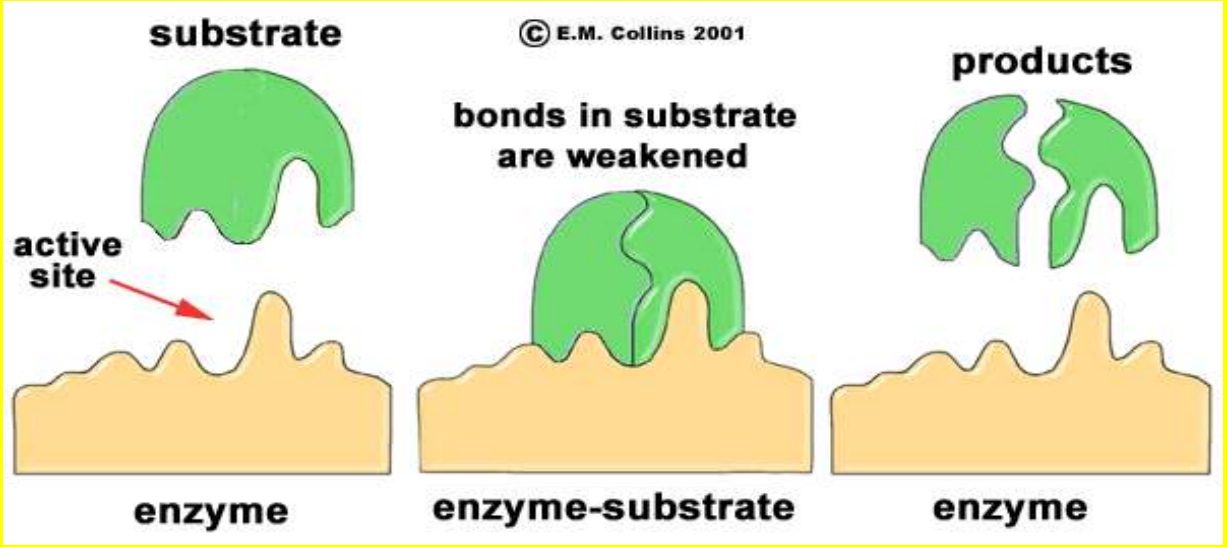
- You will be given a substrate or a part of an enzyme.
- Find the matching part, that fits your active site.
- Bring your matching Enzyme/ Substrate combinations (Lock & Key) to McAllister
- I will quiz you on your knowledge of monomers and polymers in endergonic & exergonic reactions.

10/14 Enzymes CH 6.3

Obj. TSW learn how enzymes function and the environmental factors that influence them in and activity/ lab. P.80NB

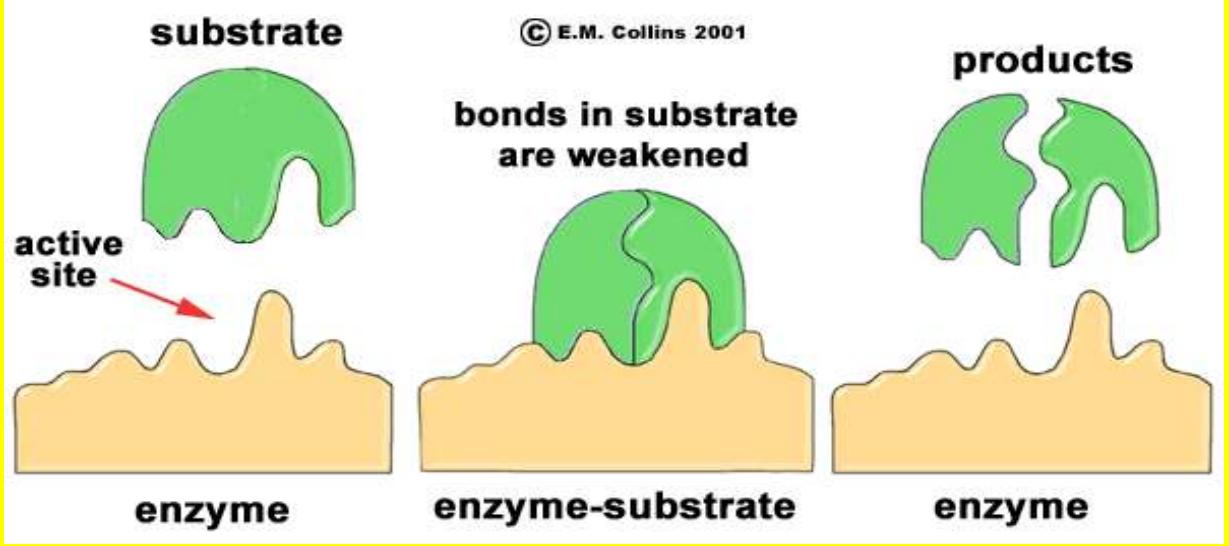
1. What type of macromolecule is an enzyme?
2. What is the purpose of an enzyme?
3. Name 3 environmental factors that influence an enzymes function.

Please Draw this picture on your Warm Up.



Macromolecules & Subunits Notes p. 85NB

Draw this

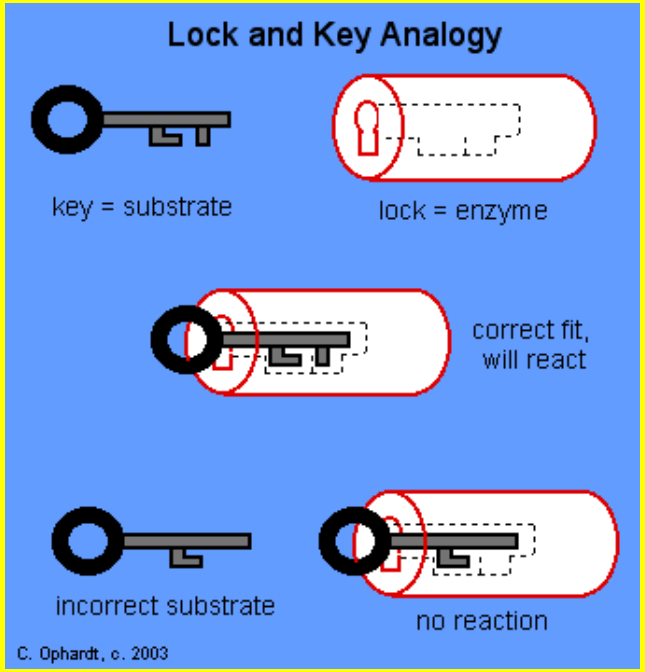


Write down these notes below.

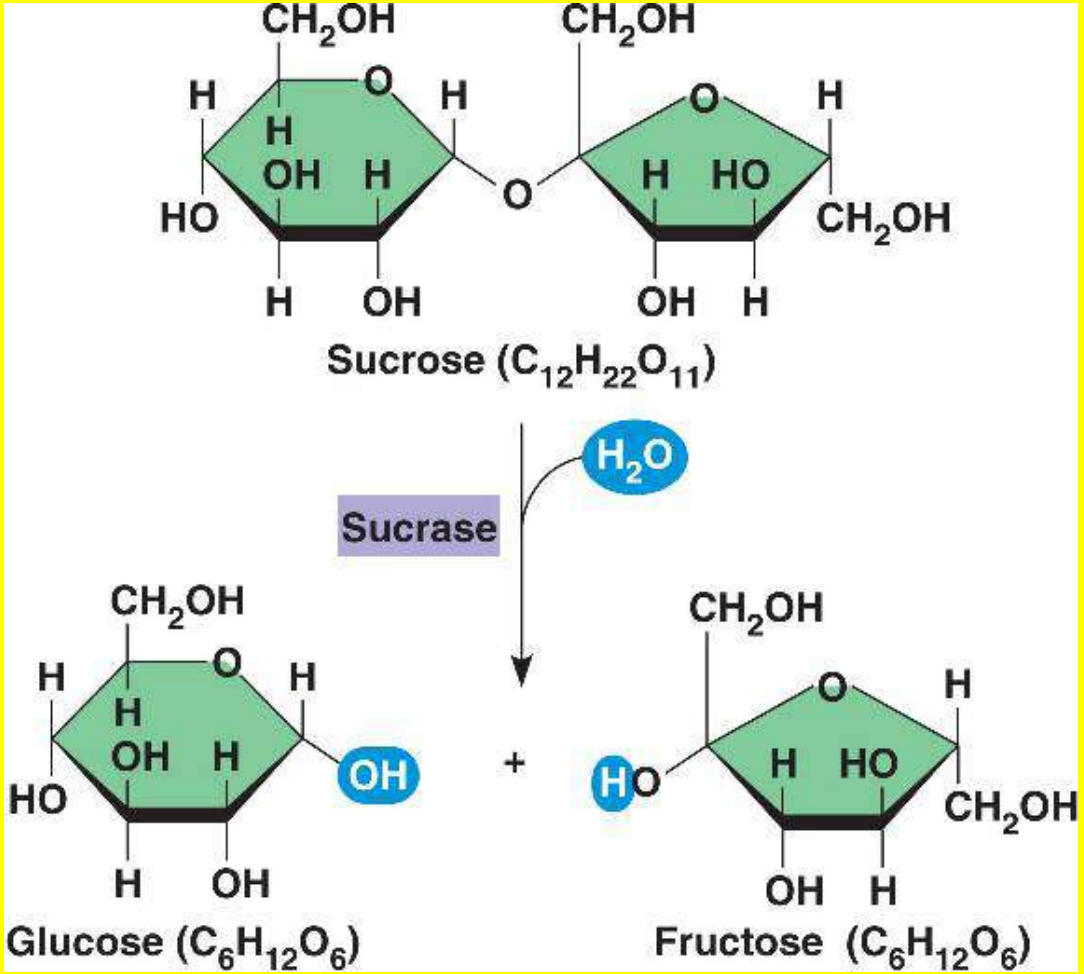
- **Lipid** – Fatty Acids
- **Carbohydrate**- Saccharides
- **Protein**(Enzymes)– Amino Acids
  - Temperature
  - pH
  - [Substrate] & [Enzymes]
  - [Salt]

***[ ] means concentration, or amount.

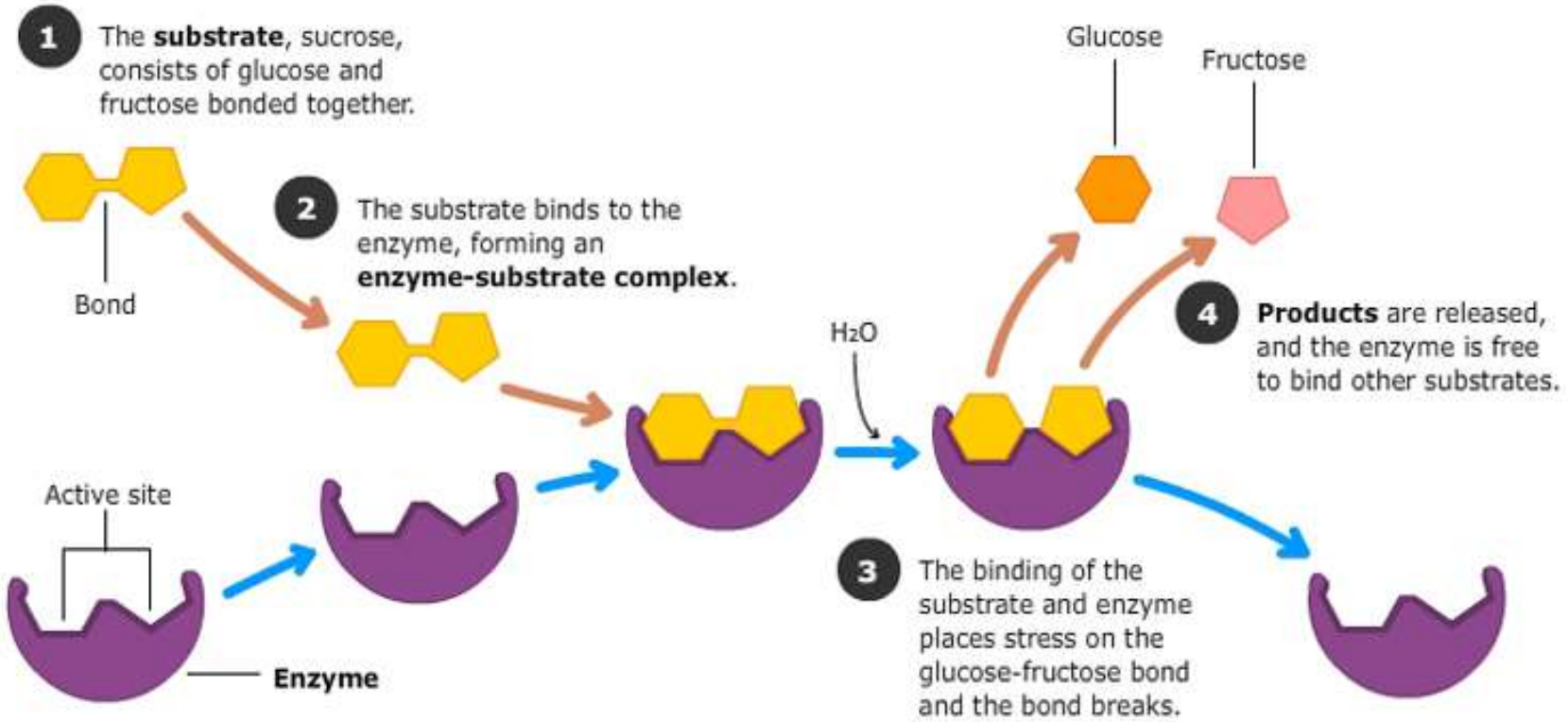
- **Nucleic Acid** - Nucleotides



Enzymatic Reaction of Sucrase on Sucrose



Enzymatic Reaction of Sucrase on Sucrose



Catalase Lab

ml H_2O_2	Person 1	Person 2	Person 3	Person 4	Person 5
5	100				
6					
7		120			
8			120		
9				170	
10					140

Catalase Lab P. 27

- 1 flask / 2 people
- GLX
- Pressure Probe
- Yeast – 1 tsp.
- Hydrogen Peroxide 5ml
- Swirl
- Make observations.
- Write a summary paragraph about the function of enzymes with a picture of a substrate & enzyme & active site. What factors allow for the enzyme to function? What volume of H_2O_2 did Catalase work the best? Why does the enzyme speed up chemical reactions? Enzymes can be used again & again (Catalytic), how is this important in chemical reactions? At what volumes (ml) did the Catalase work the best? Write the chemical equation.

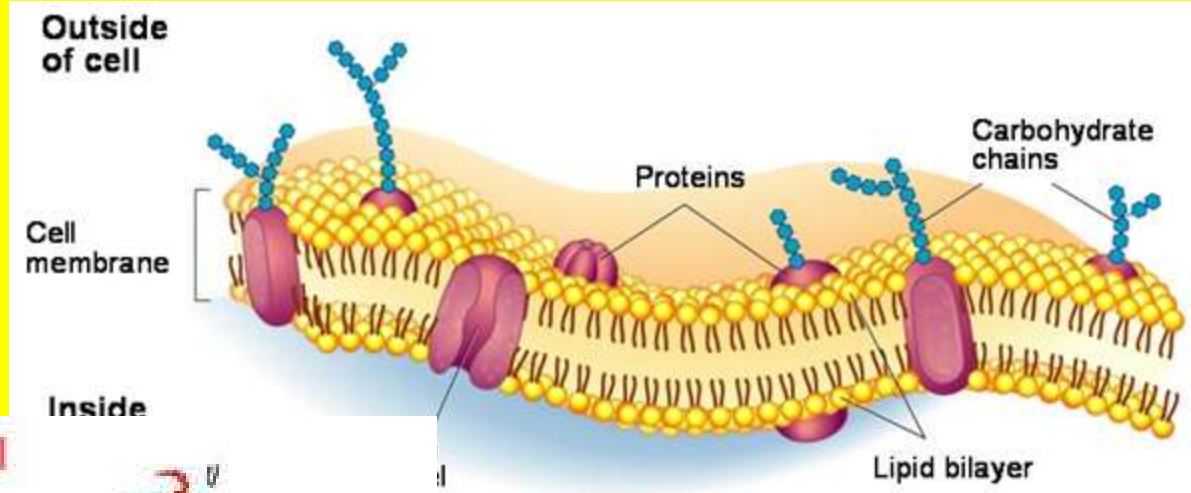
AXES Paragraph – Catalase Lab

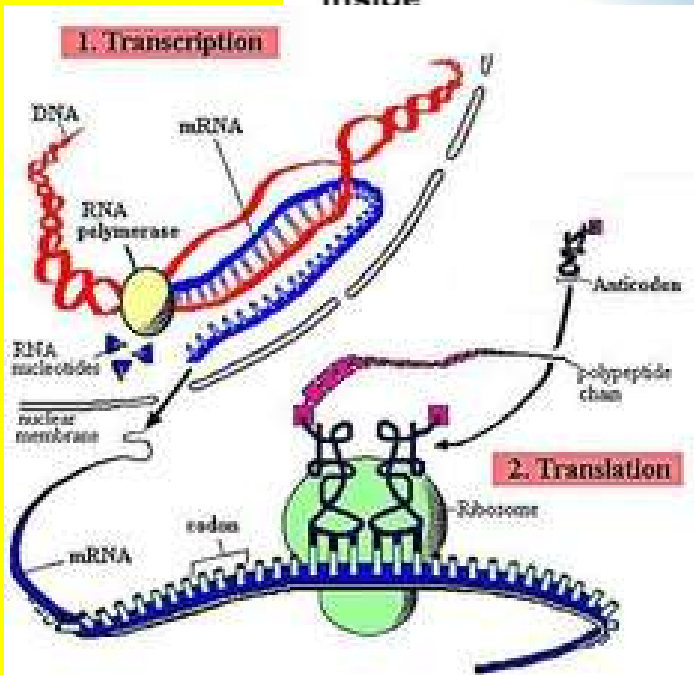
- Assertion What is Exothermic Reactions? Use vocabulary.
- eXample Discuss an example of an enzyme. Include details from the lab.
- Explanation Describe the function of the enzyme, and factors that influence it.
- Significance Why are enzymes important for us?

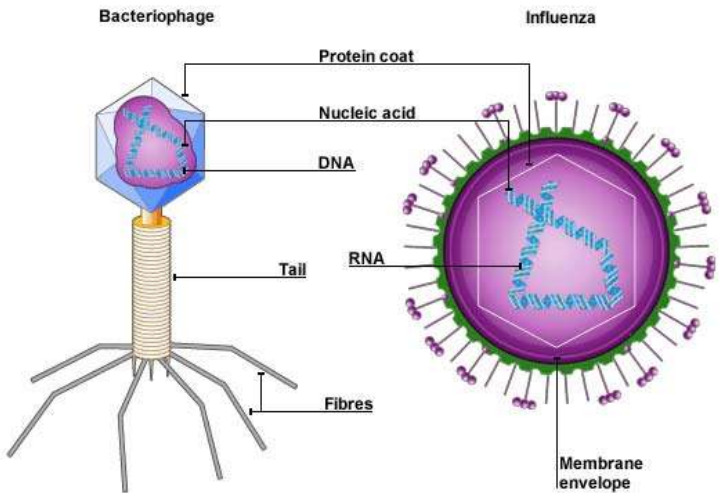
10/17 Review for Midterm Test

Obj. TSW review for the midterm test by answering the following questions relating to their study guide. P. 82 NB

1. How does selective permeability relate to the plasma membrane?
2. What is a virus? How does it replicate?
3. Explain in 3 – 5 sentences the process of protein synthesis.



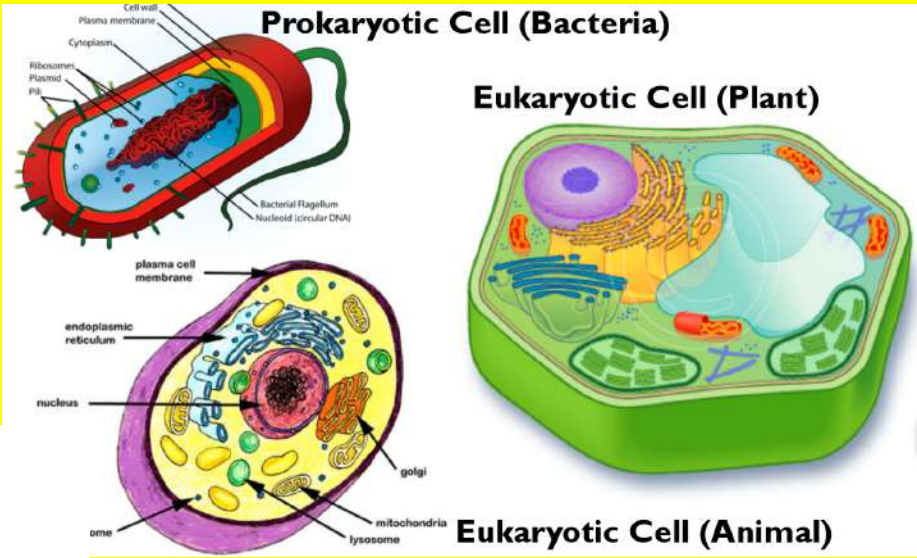


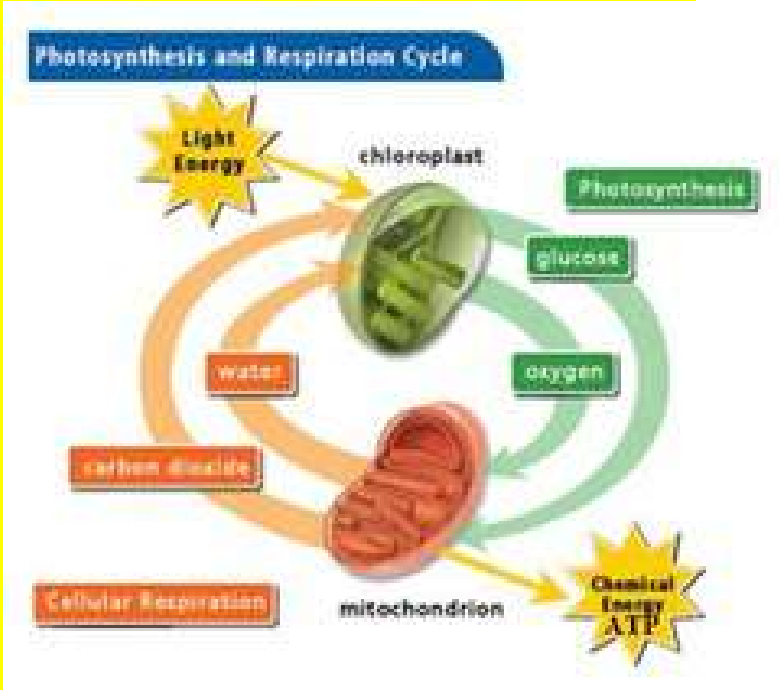


10/18 Review for Midterm

Obj. TSW learn compare and contrast major biological concepts for their study guide. P. 84 NB

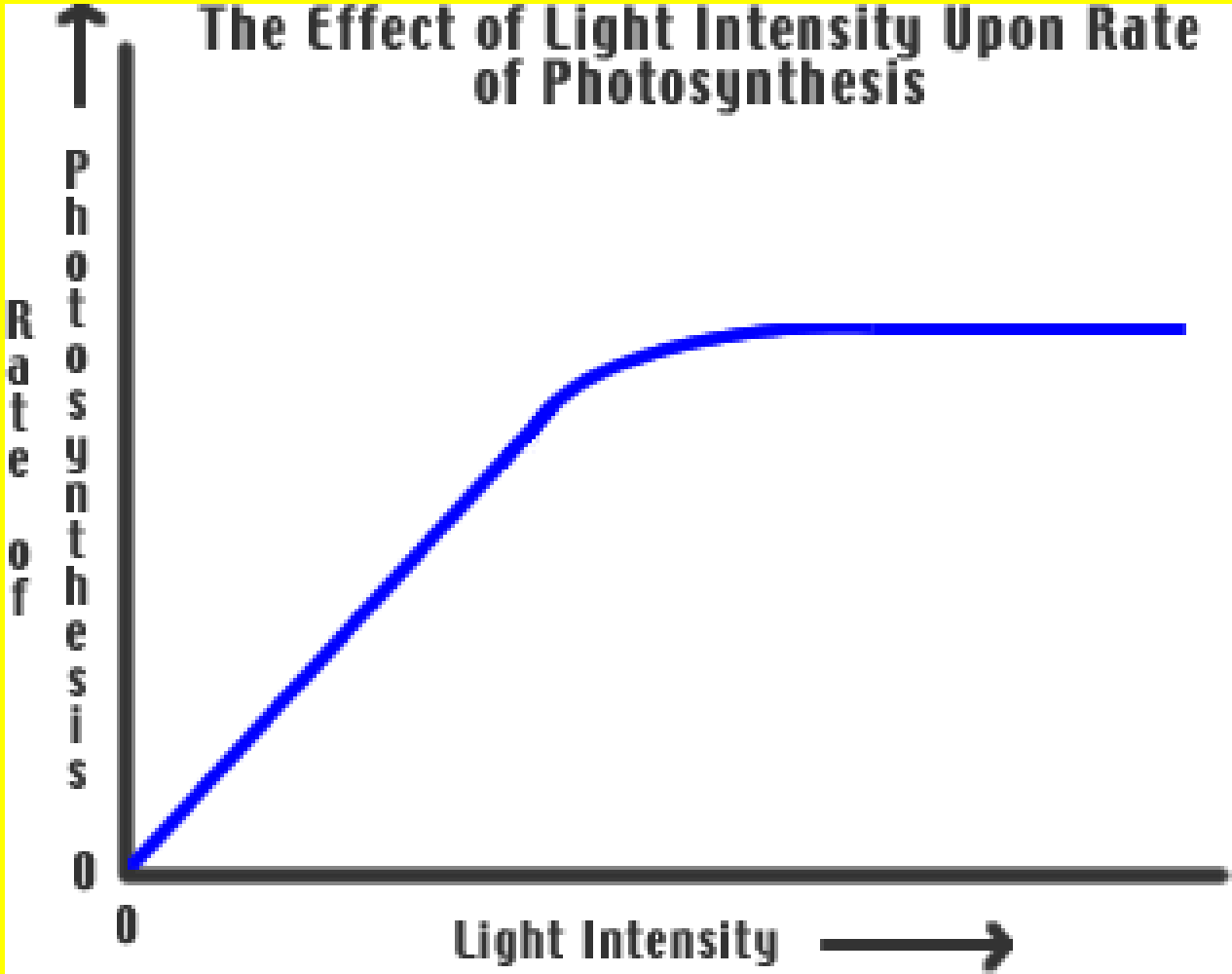
1. Compare & Contrast Eukaryotic and Prokaryotic Cells.
2. Compare & Contrast Plant & Animal Cells.
3. Compare & Contrast Photosynthesis & Cellular Respiration.





10/19 Review for Midterm
Obj. TSW review variables and the control in a lab and analyze the graph. P. 86 NB

1. Compare & Contrast Independent and Dependent Variables.
2. Why is the Control important?
3. Using the graph, what is the trend? How do you know?



Taboo

- Protein Synthesis
- Codon
- Anticodon
- RNA
- Amino Acid

Taboo

- Photosynthesis
- Cellular Respiration
- Animal
- Eukayrotic
- Nucleus

Taboo

- Folded Membranes
- Osmosis