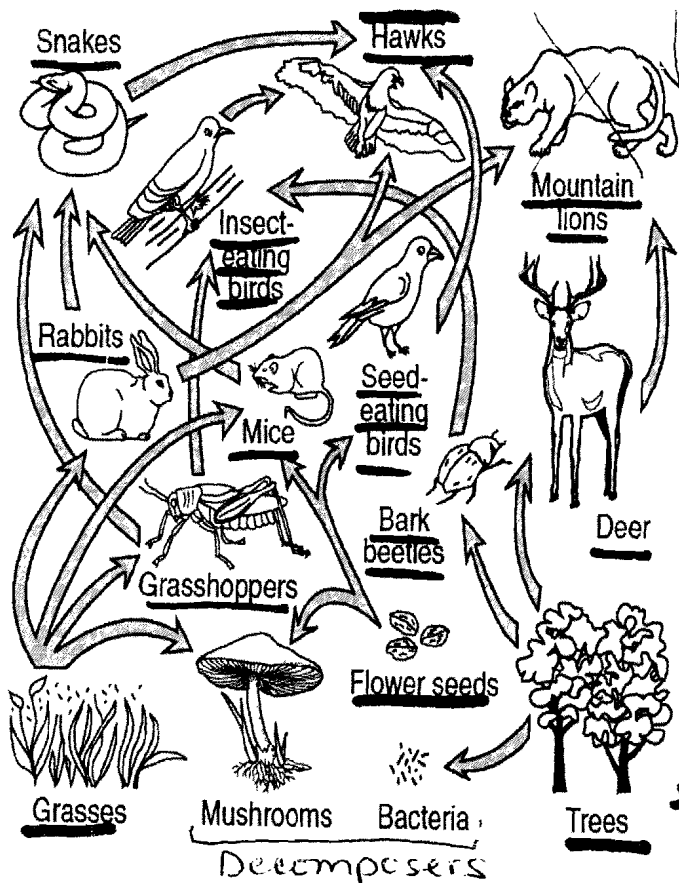


Teacher Notes:

Label the following food web including: producers, herbivore, carnivore, and decomposer, primary consumers, secondary consumers, tertiary consumers, heterotroph and autotroph Describe where the MOST energy is found and where the LEAST energy is found in the food web.
 (12C) Identify two specific populations that most likely increased in number after the mountain lion population decreased. Explain why.



• **Secondary Consumers (2nd level consumers)**
 carnivores = heterotrophs

• **Tertiary Consumer (3rd Level consumer)**

* If the mountain lion pop. ↓ then the rabbit pop and deer pop. would ↑

* **Most energy in producers**
 * **Least energy in (3rd level tertiary consumers)**

- **Producers** = Autotrophs → make their own food
- **Primary Consumers** = 1st Level = heterotrophs - eat / can not make own food. (herbivores)

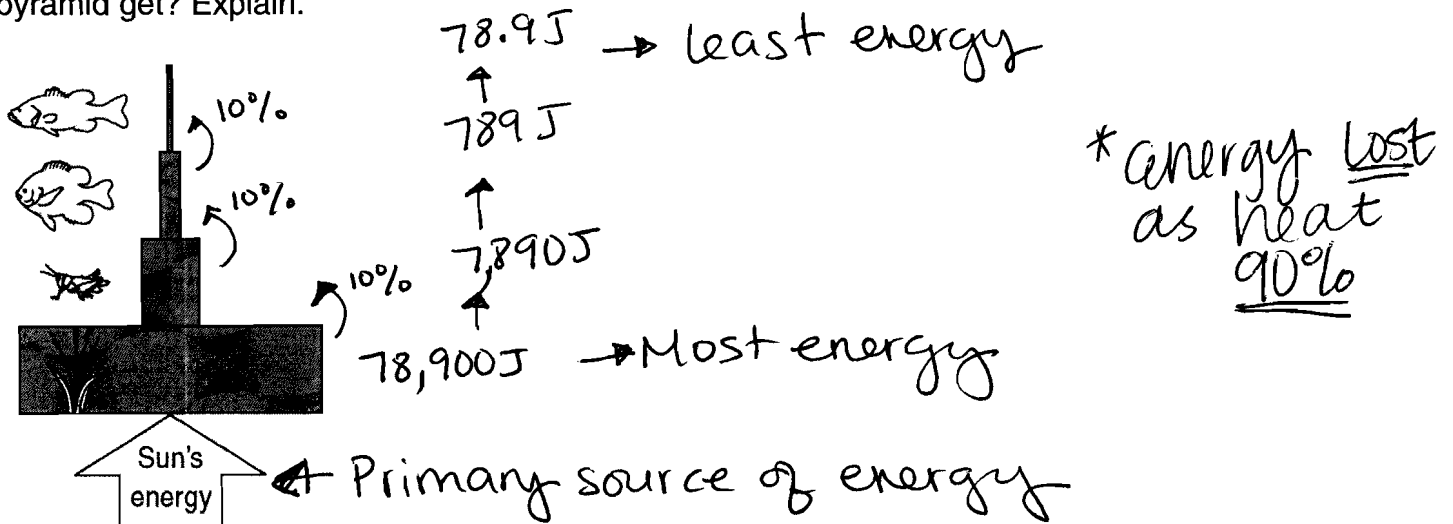
Interpret relationships:

Smiley, Unhappy OR ehhh face?	Type of Symbiosis	Definition
☺ ☺	1. Mutualism	Both organisms benefit
☺ ☹	2. Parasitism	One benefits; one harmed (host)
☺ ☹ ☹	3. Predation	one benefits; one dies
☺ 😐	4. Commensalism	one benefits; one unaffected
☹ ☹	5. Competition	neither benefit - fighting over limited resource

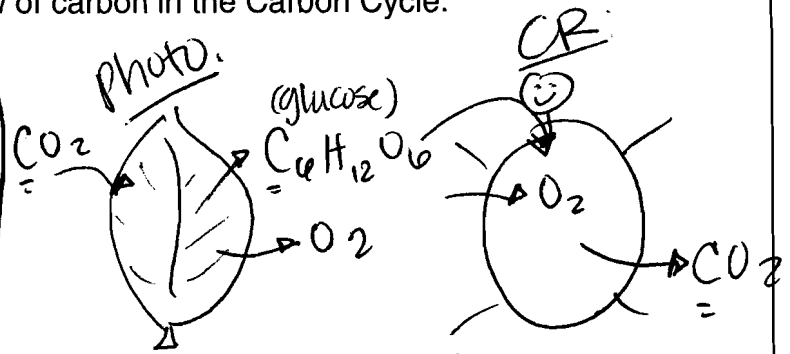
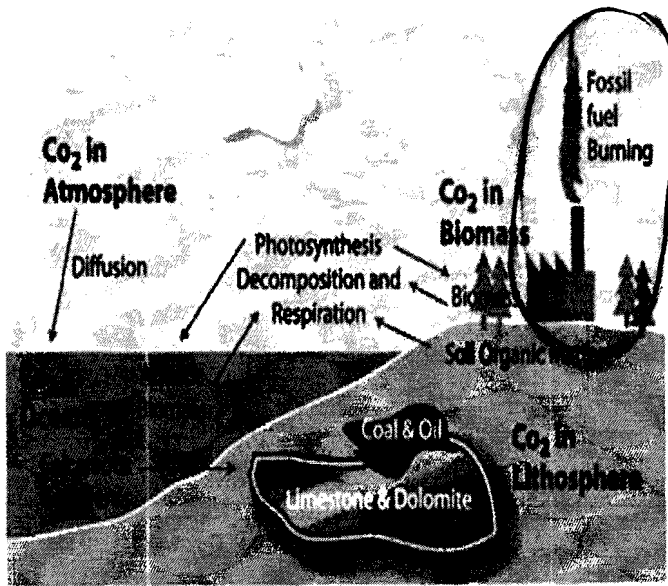
Identify the type of relationship between the two different species:

- Predation My sister's little pet dog, Fifi, was eaten by an alligator last summer while they were in Florida! ☹ ☺
- Parasitism My dog has a tick in its ear. ☺ ☹
- Mutualism A yellow flower is pollinated after being visited by a honeybee to get nectar. ☺ ☺

Describe what is happening to the energy in the diagram, include where the primary source of energy comes from. How much energy is transferred between each level of a pyramid? How is energy lost? If the producers have 100% = 78,900 J of energy, how much will the top level consumer in this pyramid get? Explain.

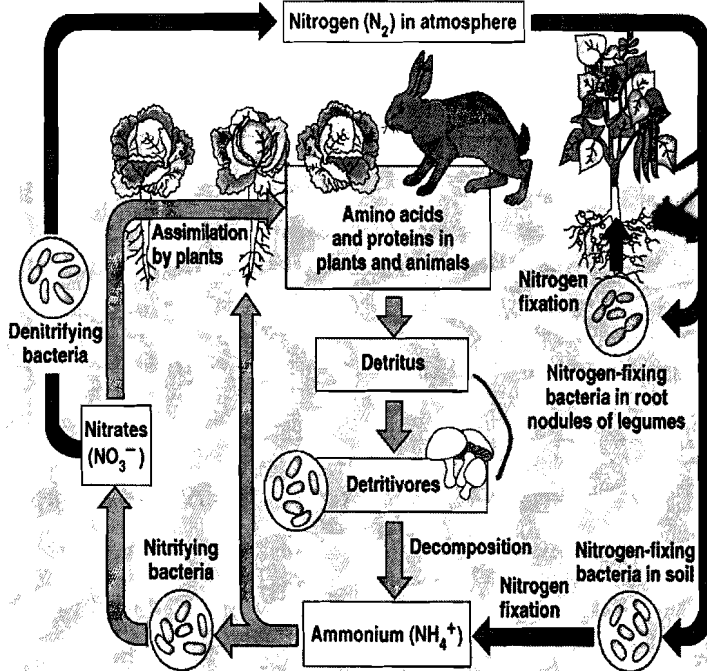


Describe the flow of carbon in the Carbon Cycle, include any biotic and abiotic factors in your description. Include how humans impact the flow of carbon in the Carbon Cycle.



- steps :-
- Deforestation
 - Combustion
 - fossil fuels (decomposition)
 - human activity
 - automobiles
 - factory emissions

Describe the flow of Nitrogen in the Nitrogen Cycle; include any biotic and abiotic factors in your description. Include how some organisms are IMPORTANT to recycling nitrogen. And what is the effect of lightning in this cycle?



- Denitrification
- N-Fixation
- Nitrification
- Ammonification

Carbohydrates

Describe the results of this data table.

Substance	Indicator Tests			
	Biuret's Reagent Tests for Protein	Iodine Solution Tests for Starch	Benedict's Solution Tests for Glucose	Lipid Test Test for Lipids
Gelatin	+	-	-	-
Potato	-	+	-	-
Dextrose	-	-	+	-

gelatin = protein
 potato = starch (polysaccharide; ^{Complex} carbohydrate)
 Dextrose = glucose (monosaccharide; simple carbohydrate)

*Biomolecules Quizlet = vocabulary Review

Describe: polymerization, dehydration synthesis and hydrolysis and how they affect the synthesis of new molecules

polymerization - joining monomers together to build polymers
dehydration synthesis - water is lost between monomers to join them together to form (or build) polymers.
Hydrolysis - adding water to polymer to break it into monomers

to make produce put together create

Hibernating Ground Squirrels

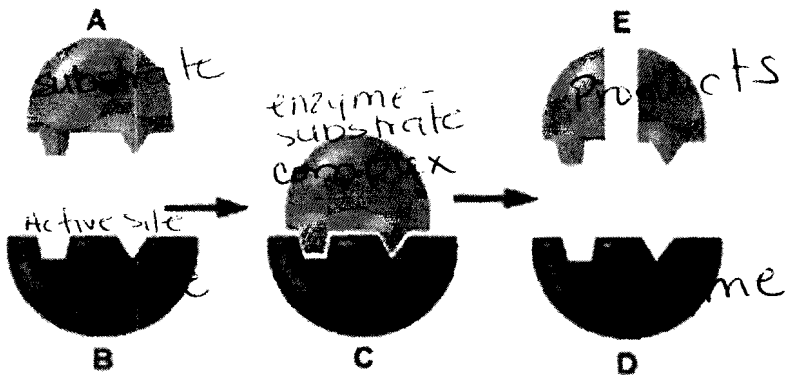
Hibernating ground squirrels may have abdominal temperatures as low as 0 °C, maintaining sub-zero abdominal temperatures for more than three weeks at a time, although the temperatures at the head and neck remain at 0 °C or above.

Before entering hibernation ground squirrels eat a large amount of food and store energy in fat deposits to survive the winter.

What types of food should these squirrels eat before they hibernate? What are the main components of this biomolecule?

nuts = LIPIDS = high energy storage

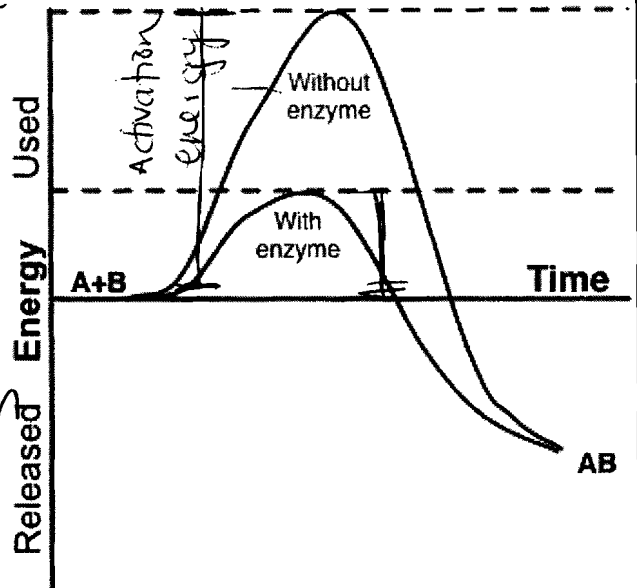
Label the following diagram AND describe what an enzyme is and what it does. What type of biomolecule? Where is this polymer synthesized?



* enzyme = protein
 ↳ speed up chemical reactions by lowering activation energy

Based on the graph, what effects do enzymes have on reactions?

lowers activation energy to speed up chem. reaction

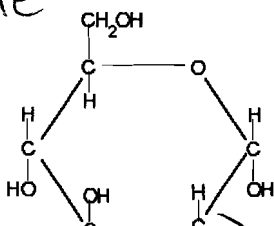


* Quizlet Biomolecules

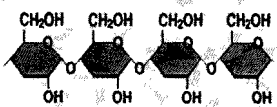
Identify the following diagrams, be specific, what type of biomolecule is it? What is its monomer? And name of each molecule.

Biomolecule: Carbohydrate
 monomer: saccharide

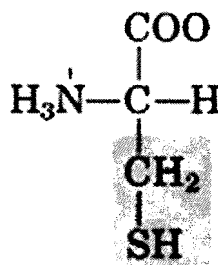
Glucose



starch (polysaccharide)

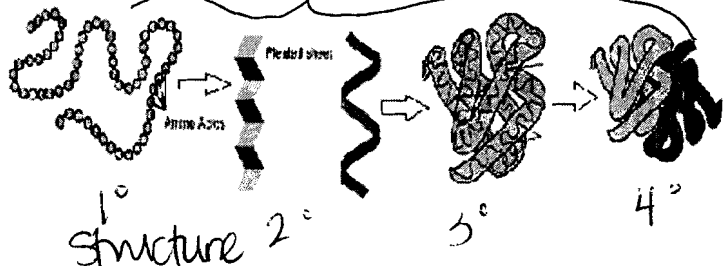


Biomolecule: Protein



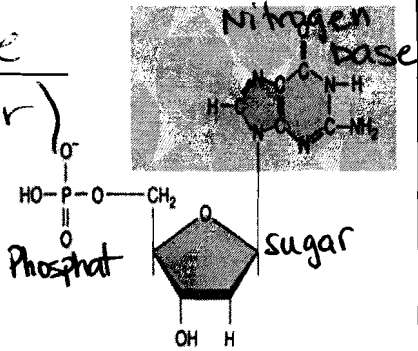
Amino Acid
 (Monomer)

Amino Acid → Peptide Bonds
 protein join by



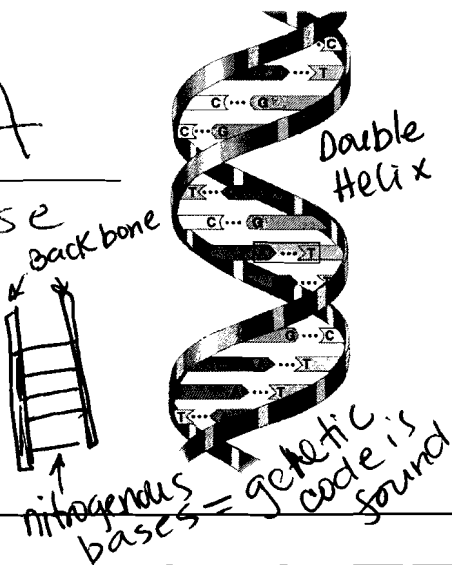
Biomolecule: Nucleic Acid
(DNA, RNA)

Nucleotide
(monomer)

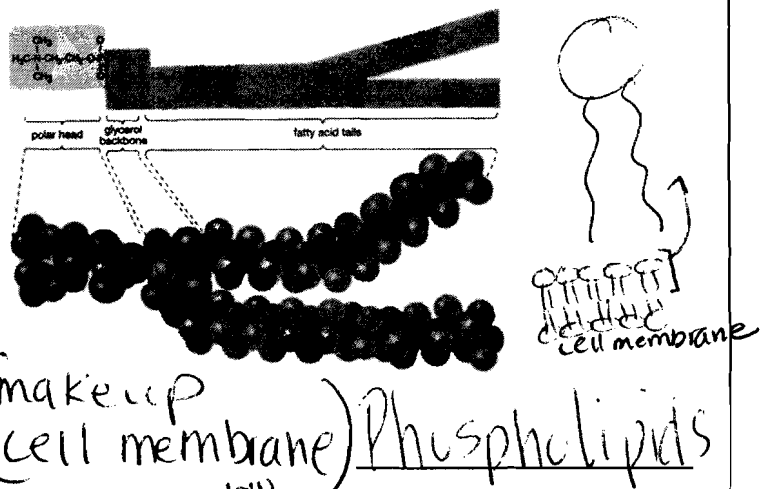
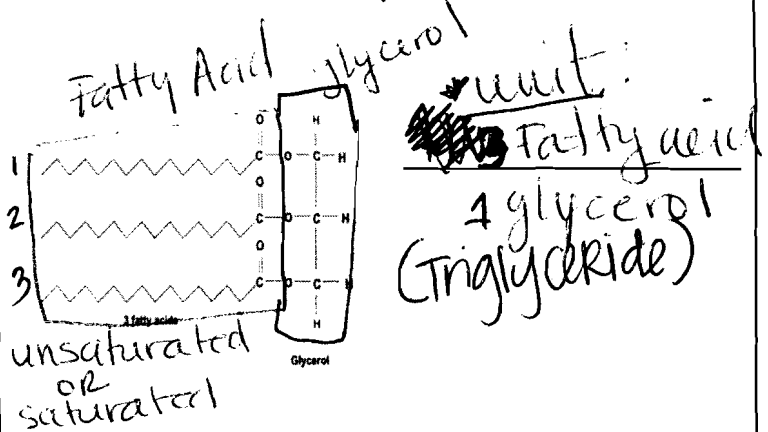


DNA

Deoxyribose
Nucleic
Acid



Biomolecule: Lipids

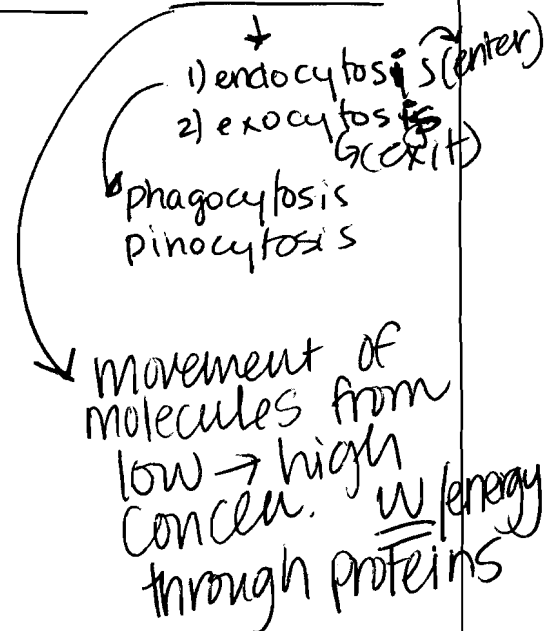


Define Diffusion. Describe the different types of diffusion: passive, facilitated and active transport. Include labeled drawings of all three.

Transport \uparrow high \rightarrow low energy \rightarrow diffusion w/ help of proteins

- 1) diffusion
- 2) osmosis

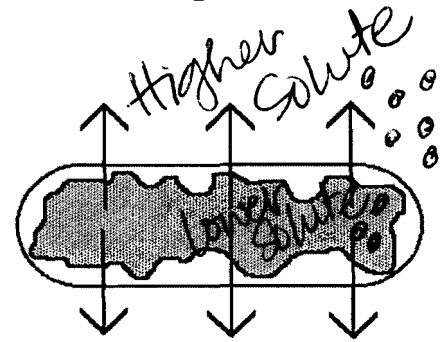
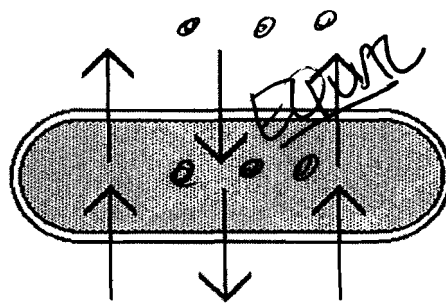
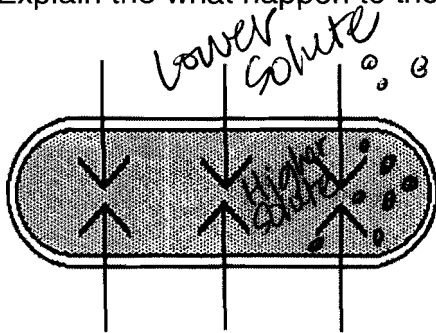
\rightarrow movement of molecules from an area of higher concentration to an area of lower concentration w/o the use of energy



Define homeostasis. Include any cell parts that are responsible for maintaining homeostasis in cells in your explanation.

- maintaining a stable internal environment despite external conditions
- cell parts: cell membrane, proteins

Label cells that are in the following solutions: hypotonic, isotonic, and hypertonic. Show where the High concentration of H₂O is and where the low concentration of H₂O is. Explain the what happen to the cells.



Hypo

~~LESS~~ solute outside cell

- water moves IN

cell swells

ISO

equal solute inside & outside cell

- water moves IN & OUT EQUALLY

- cell stays same

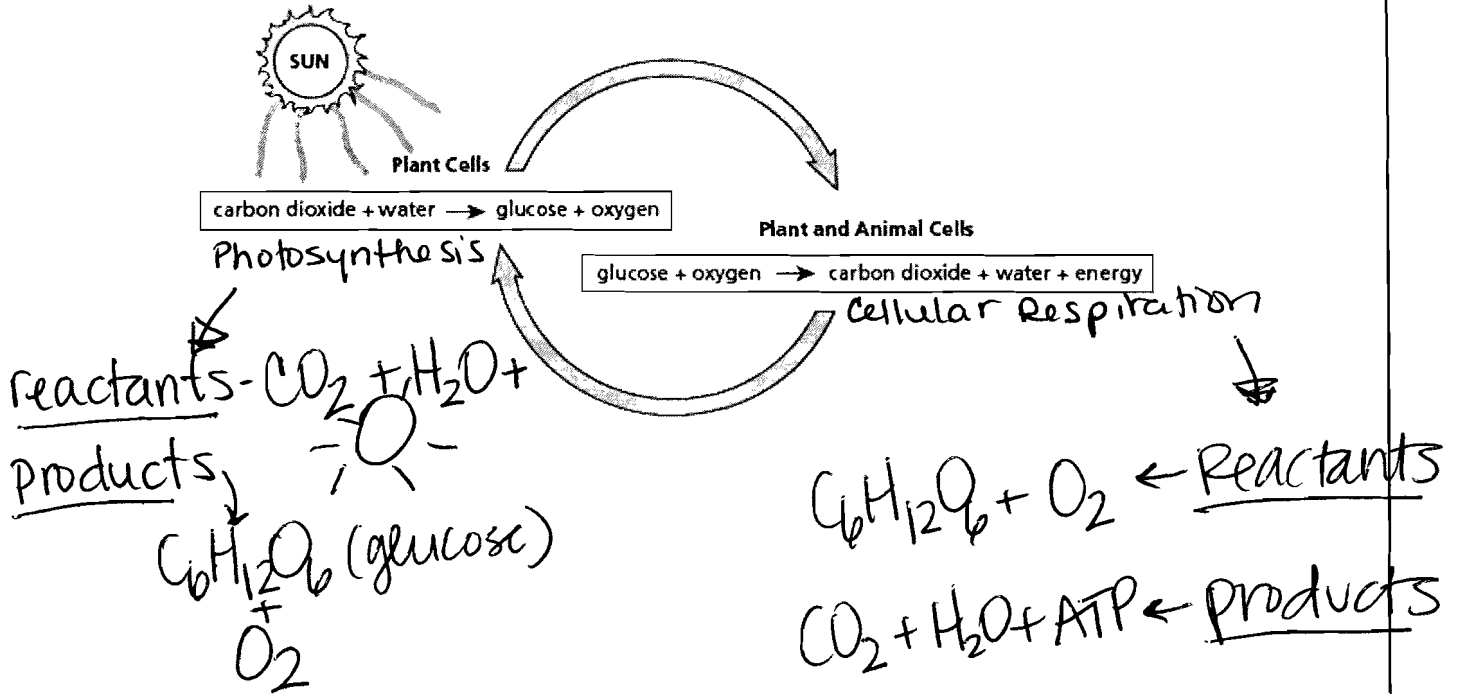
Hyper

~~More~~ solute outside cell

- water moves OUT

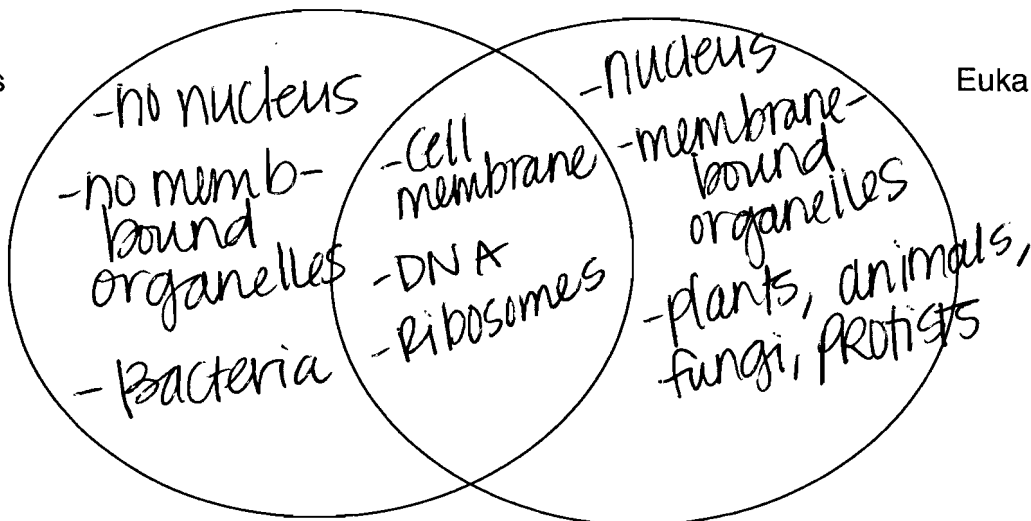
- cell shrinks

Describe photosynthesis and cellular respiration. Include specific ORGANELLES needed by both processes and the different types of cells where they occur. Use the diagram to help you.



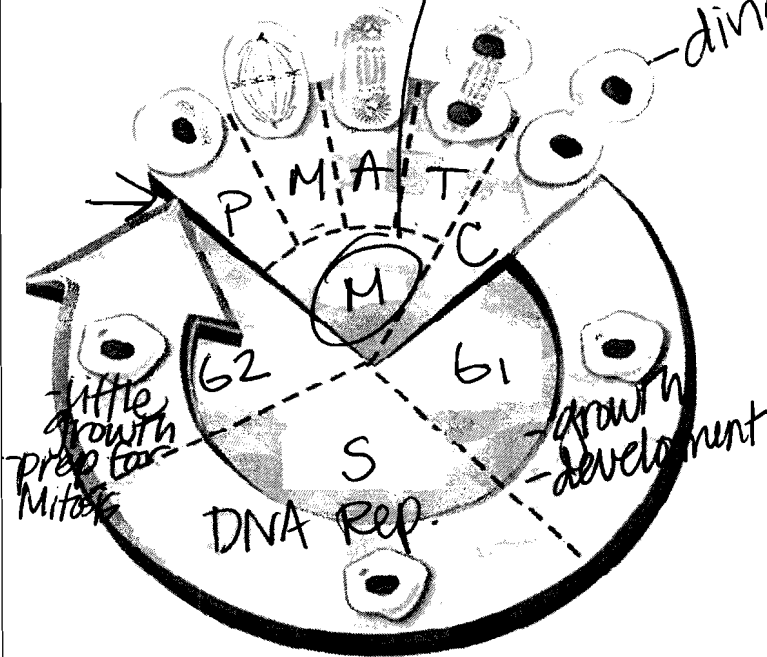
Compare and Contrast Prokaryotic cells and Eukaryotic cells.

Prokaryotes



Eukaryotes

List, Label and DESCRIBE the stages of the Cell Cycle. what is the PURPOSE of the cell cycle?



M phase - divides nucleus
 - divides cytoplasm & organelles

Prophase - DNA in form of chromosomes
 - Nuclear mem. disappears
 - spindles appear

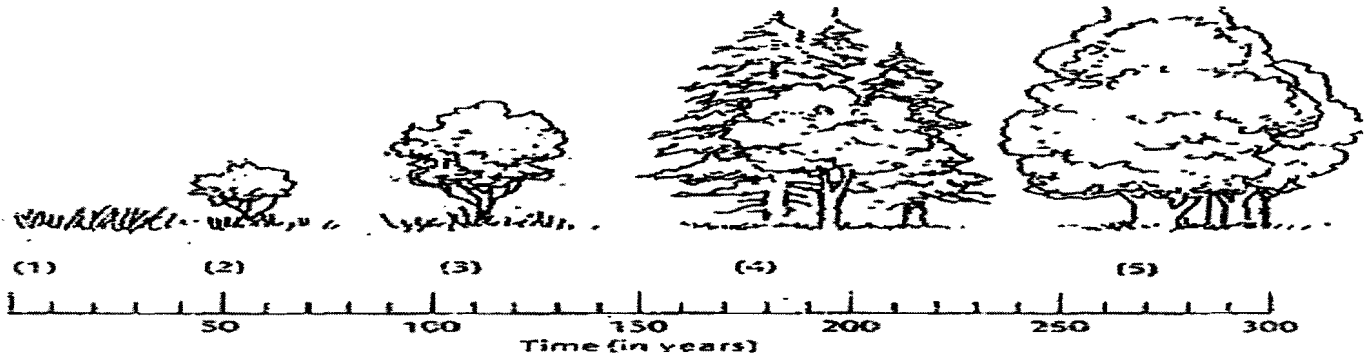
Metaphase - chromosomes line up at equator (middle)

Anaphase - chromosomes pulled apart into chromatids

Telophase - DNA unwinds back to chromatin
 - pinching in begins
 - Nuclear membranes reform
 - 2 complete nuclei
 - spindles disappear

What is cancer? What causes cancer?
 ↳ uncontrolled growth of cells

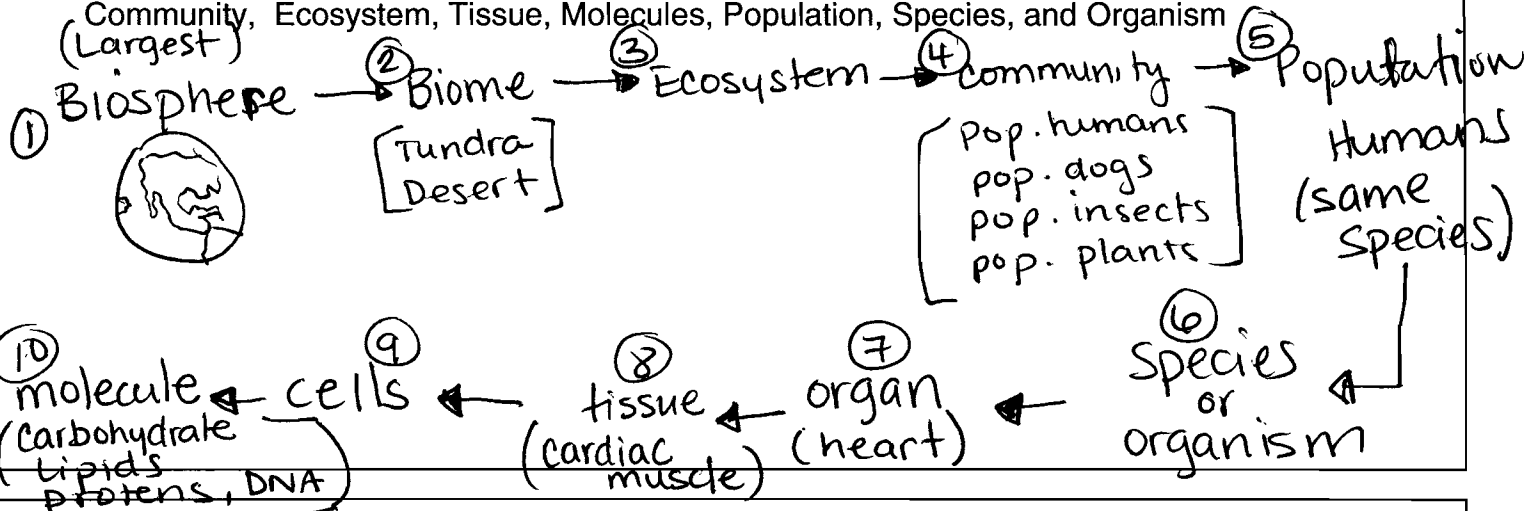
The climax community in the area of Arkansas is an oak-hickory forest. After the ponds are filled in, the area will undergo another series of stages of succession. This is illustrated below.



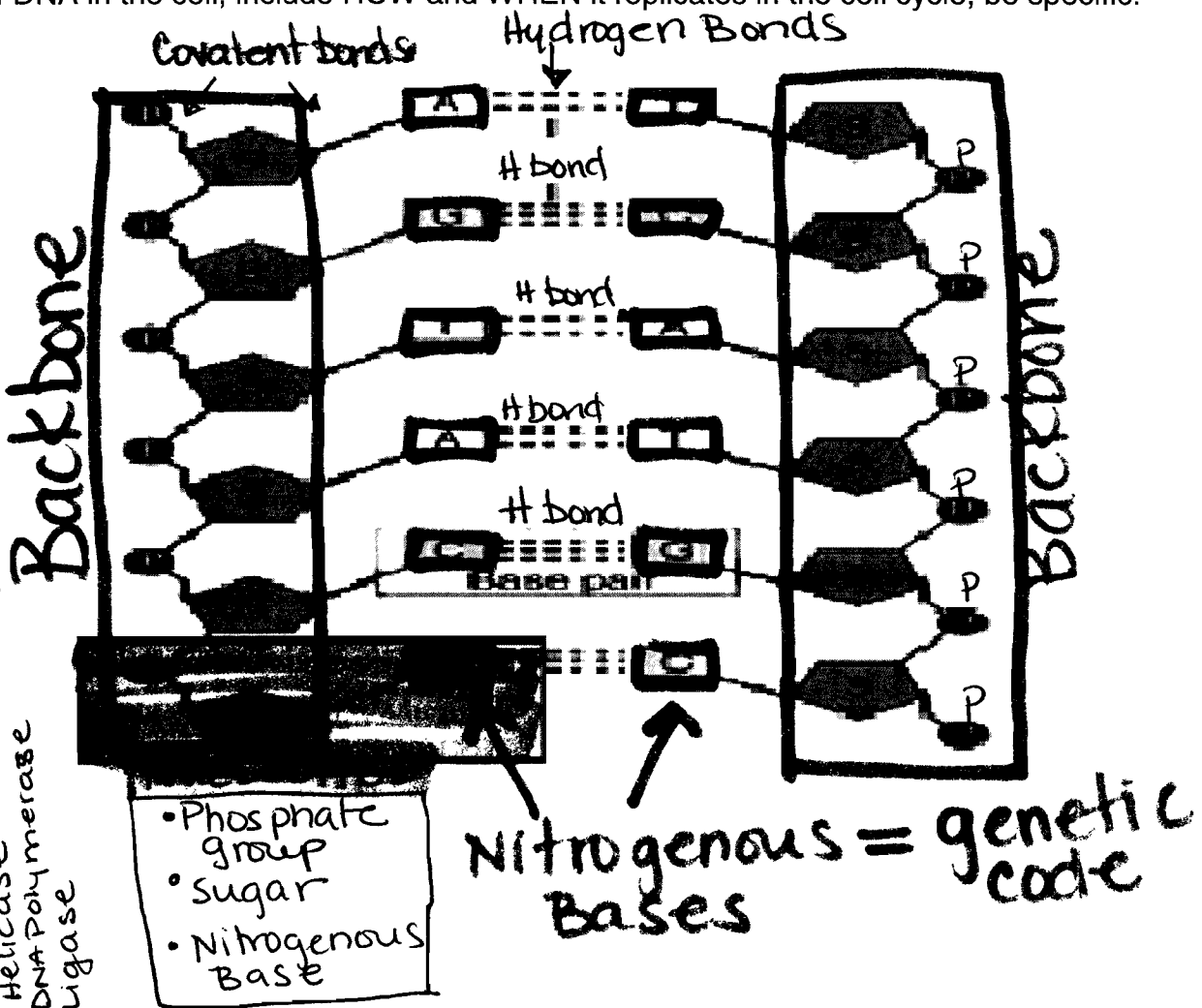
Briefly describe how events and processes that occur during ecological succession can change populations and species diversity.

- environment changes & rebuilds
 - as organisms move in, the diversity increases

Put the following words in from the **largest** to the **smallest**... Biome, Biosphere, Cells, Community, Ecosystem, Tissue, Molecules, Population, Species, and Organism



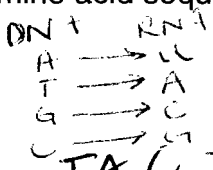
Describe the (1) STRUCTURE including, nucleotide, location of hydrogen bonds and covalent bonds, backbone, Nitrogenous bases, where is the genetic code, and (2) ROLE of DNA in the cell, include HOW and WHEN it replicates in the cell cycle, be specific!



DNA = control ALL cell activities, it has all the instructions for life and it is located in the nucleus.
 • DNA Replication = in synthesis phase (S phase) of cell cycle.

Protein Synthesis:

For each of the following sequences, fill in either the DNA, the mRNA sequence, the rRNA anticodons, or the amino acid sequences that have been left blank. If several sequences might work choose any one.



1. DNA TAC TGA ~~TGC~~ CGACC CCC ATA ATG AAA ~~AAC~~

mRNA AUG ACU AGC UGG GGG UAU UAC UUU UAG
 tRNA UAC UGA UCG ACC CCC AUA AUG AAA AUC
 AA Methionine- ~~Threonine~~ Serine- Tryptophan- Glycine- Tyrosine- Tyrosine- Phenylalanine- stop
 (start)

2. DNA TAC CGC TCC GCC GTC GAC AAT ACC ACT

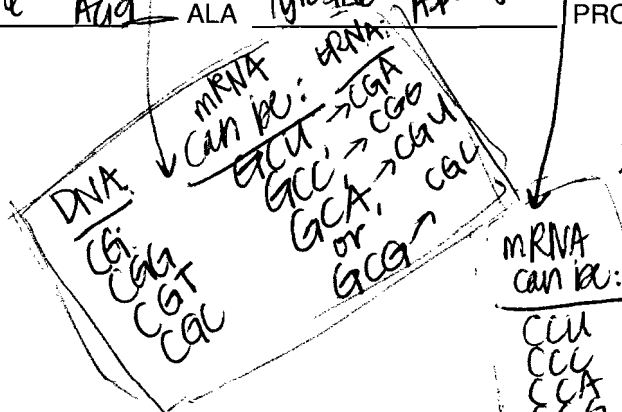
mRNA AUG GCG AGG CGG CAG CUG UUA UGG UGA
 tRNA UAC ~~CGC~~ UCC ACC GUC GAC AAU ACC ACU
 AA Methionine- Marine- Arginine- Arginine- Histidine- Leucine- Leucine- Tryptophan- Stop
 (start)

3. DNA TAC CAC CCC CGT ATG GCT GGG AAT ATC

mRNA AUG GUG GGG GCA UAC CGA CCC UUA UAG
 tRNA UAC CAC CCC CGU AUG GCU GGG AAU AUC
 AA Methionine- Valine- Glycine- Alanine- Tyrosine- Arginine- Proline- Leucine- Stop

4. DNA TAC CTC ACA CTA CGA ATG TTG GGA ~ ATT

mRNA AUG GAG UGU GAU (GCU) UAC AAC CCU ~ UAA
 tRNA UAC CUC ACA CUA CGA AUC UUG GGA ~ AUU
 AA Methionine- ^{Glutamic acid} Cysteine- ^{Aspartic acid} ALA Tyrosine- Asparagine PRO ~ STOP



* you could have just made up your own!!

5. What are the three differences between RNA and DNA?

<u>RNA</u>	<u>DNA</u>
- ribose	- deoxyribose → (sugar)
- single-stranded	- Double-stranded → (shape)
- A, U, C, G	- A, T, C, G → (bases)

7. Where is DNA found in the cell?

Nucleus

Where is RNA found in the cell?

RNA is 1st made in the nucleus, & then it leaves, travels through the cytoplasm, and then finds a ribosome.

8. Name the three types of RNA and what they do.

- ① mRNA - copy of DNA code in form that ribosomes can read (A-U, C-G); message
- ② tRNA - transfers the amino acid to the ribosome, so the anticodon can bind to the codon & release the AA, so it can bond to other AAs.
- ③ rRNA - makes up part of the ribosome; assembles AAs into proteins.

9. Draw an mRNA strand that is complementary to the DNA strand AATTGC.

DNA: AATTGC
mRNA: UUAACG

10. What are the steps of transcription?

- DNA unhinges (unwinds) due to helicase.
- RNA nucleotides find base-pair to DNA strand (A→U, C→G)
- RNA polymerase directs this process & ensures base-pairs are correct
- RNA leaves nucleus
- DNA winds back (ligase)

11. How is RNA Translated and where?

- RNA is translated into proteins w/ the help of the tRNA molecule & rRNA molecules.
 - mRNA codons await the arrival of tRNA molecules that are carrying the amino acids. When the tRNA anticodon links to the mRNA codon the AA is ready to bind to other amino acids.
 - rRNA then assembles these aas into a polypeptide
- TADA! 😊