***Guidelines:**

Create a concept map following the guidelines we used as a class:

1. All terms/concepts/words/phrases should be connected with an arrow that has direction (line segments don't count!)
2. All arrows should have labels (either singular words or more lengthy explanations)

Refer to the following list of questions to guide your concept map creation:

1. What are the key differences between prokaryotic and eukaryotic cells?
2. How does the endosymbiont theory explain the progression from prokaryotic to eukaryotic cells? Make sure your answer includes the evidence.
3. Identify the importance of surface area to volume ratios in cells.
4. Why is compartmentalization important for cells?
5. Describe the nucleus and its contents.
6. What are the components of the endomembrane system?
7. Compare the structure and functions of rough ER and smooth ER.
8. Imagine a protein is to be exported from the cell. Trace the path of the protein through the cell starting with the mRNA in the nucleus.
9. Differentiate between vacuoles and vesicles. What are some roles of vacuoles?
10. Give some similarities and differences between mitochondria and chloroplasts.
11. How does the cytoskeleton contribute to motility and cell structure?
12. How do cilia and flagella bend?
13. Describe the three types of junctions between cells.
14. Molecules move according to their gradient. What does that mean?
15. What is the role of phosphate groups from ATP in the transport of Na/K ions across the membrane? (specifically, what does it do to the shape of the protein pump?)
16. Why is turgor pressure not used in reference to animal cells?
17. Suppose that the concentration of carbon dioxide in the fluid outside a cell became higher than that on the inside. Predict what would happen. What prevents this from happening normally?
18. How is the structure of the phospholipid important for its function?
19. What characteristics of the cell membrane make it selectively permeable?
20. Hormones are chemical messengers that travel in the blood throughout the body. Protein hormones (polar) attach themselves to receptors on the cell surface while lipid hormones (nonpolar) actually enter the cell. Explain this difference.
21. Explain the difference between endo and exocytosis. Why are they considered active transport?
22. Describe three things you could do to increase the rate of diffusion.

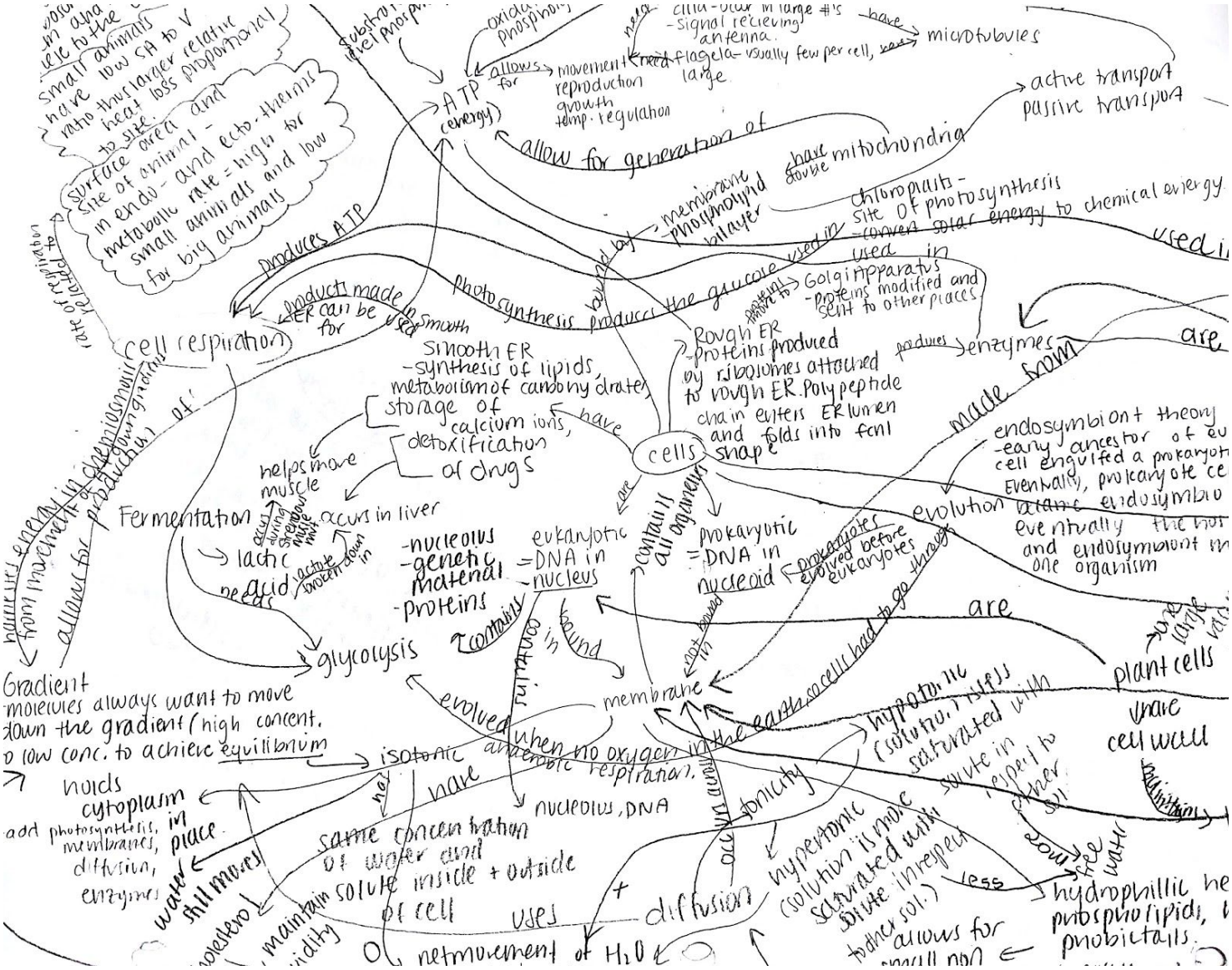
For previous a concept map on Enzymes, refer to the following list of items:

Metabolism
Non-competitive inhibitors
Metabolic pathway
Allosteric regulation
Catabolic pathway
Cooperativity
Anabolic pathway
Feedback inhibition
Kinetic energy
Thermal energy
Potential energy
Chemical energy
Thermodynamics
First law of thermodynamics
Second law of thermodynamics
Free energy
Exergonic reaction
Endergonic reaction
Catalyst
Activation Energy
Substrate
Enzyme-substrate complex
Active site
Induced fit
Cofactors
Coenzymes

Competitive inhibitors Enzyme

Examples of Student work:

Example 1:



Example 2:


Cells, Membranes, and Cellular Transport
Prokaryotic cells
Eukaryotic cells
endosymbiont theory
osmosis and diffusion
occur across
phospholipid bilayer
passive & active transport
ATP synthase
main parts of a cell
nucleus
nuclear envelope → double membrane
nucleolus → production of ribosomes
chromatin → DNA & proteins
ER
smooth: synthesis of lipids, metabolism of carbs, detoxify drugs, store Ca+ ions
rough: ribosomes attached to rough ER
Flagella: for movement (in animal cells)
Mitochondria: "powerhouse of the cell" → where most ATP is produced
cellular respiration: produces ATP which provide
lysosomes digest/hydrolyze macromolecules
phagocytosis (engulf solid material)
enzymes work best in acidic environments in lysosomes
Proteins in membranes
pumps (Na+/K+ pump)
occurs with active transport
passive transport
type: channel
type of
Eukaryotic Cells
explains relationship between eukaryotic and prokaryotic cells
ecology
endosymbiont theory
connects to
evolution
cell resp
when little to no oxygen is present → anaerobic respiration
glycolysis
plant
animal
in plant cells but not in animal cells
in animal cells but not plant cells:
- lysosomes

Example 3:

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