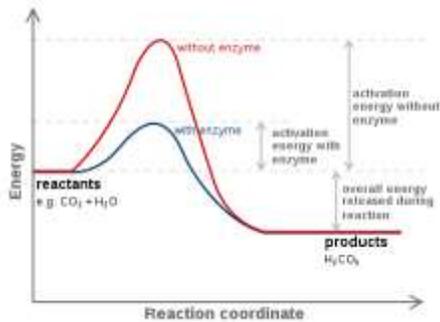


## AP Biology Midterm Study Guide

1. Compare positive and negative feedback. Provide an example for each.
2. List the features that prokaryotic cells have in common with eukaryotic cells.
3. What domains feature prokaryotes?
4. Plant chloroplasts convert energy in sunlight into another form of energy which is \_\_\_\_\_?
5. What is the difference between an isotope and an ion?
6. How many protons and neutrons are found in C-12? C-14?
7. What bond or attraction explains the attraction of water to itself?
8. What is the basic concept that causes Van der Waals interactions?
9. Why bond explains why water can form bonds with many molecules?
10. What is the definition of a reaction that has reached chemical equilibrium?
11. How do buffers work?
12. What is the relationship between water's high specific heat and hydrogen bonding?
13. What is the pH of a solution with a H<sup>+</sup> ion concentration of 0.004M? What is the pH of a solution with an OH<sup>-</sup> concentration of 10<sup>-10</sup> M?
14. Squirrels love to eat seeds. Where did the carbon atoms present in the seeds come from?
15. Describe the effect of water's high surface tension.
16. Why are hydrocarbons insoluble in water?
17. What are enantiomers? What does the effectiveness of one enantiomer and not the other illustrate the theme of structure and function?
18. List properties associated with the functional group -OH
19. Name the 2 functional groups found in amino acids.
20. What do starch and cellulose have in common?
21. Define a polymer and provide 3 examples of polymers.
22. List and define the type of isomer that describes glucose and fructose?
23. Define hydrolysis and dehydration reactions. How many water molecules are needed to completely hydrolyze a polymer that is ten monomers long?
24. What level of protein structure do the alpha helix and beta pleated sheet represent? Which interaction/bonds stabilize them?
25. What factors affect the structure of enzymes?
26. Which organelle/structure is absent in plant cells?
27. Which bonds are created during the formation of the primary structure of a protein?
28. Where would you find large numbers of ribosomes and for what function?
29. Why are there size limits in cells?
30. Which organelle modifies polysaccharides that will be secreted out of the cell?
31. Why isn't the mitochondrion classified as part of the endomembrane system?
32. Gap junctions in animals are most similar to \_\_\_\_\_ in plant cells.
33. Which organelle/structure is involved in detoxification?
34. What is the role of aquaporins?
35. Why is the Na-K pump an electrogenic pump?
36. Why enables membranes in the winter to remain fluid when it's very cold?

37. Define diffusion, facilitated diffusion, active transport.
38. Define hypertonic, hypotonic and isotonic solutions. Be able to analyze a question regarding these terms.
39. What term describes a metabolic pathway where the end product inhibits an earlier step in the pathway?
40. Look at an energy diagram that shows the progress of a reaction vs. the free energy: What is the  $\Delta G$  of the reaction? What would stay the same in an enzyme catalyzed or noncatalyzed reaction?



41. At the end of glycolysis, how many ATP are used and produced per glucose?
42. What is the primary role of oxygen in cell respiration?
43. Write a sequence of events that show the flow of electrons starting with food:
44. In cell respiration, where does the energy for ATP synthesis (in the mitochondria) come from?
45. What happens when a molecule is phosphorylated?
46. Where does glycolysis take place? Citric acid cycle? Oxidative phosphorylation?
47. You used the Jenny Craig diet and lost 5 pounds. How did the fat leave the body?
48. Which are the products of the light reaction that are used in the Calvin cycle?
49. Why is oxygen released in photosynthesis? Where does it come from?
50. What are the main steps that occur in the Calvin cycle?
51. What is happening to the chlorophyll molecules in the light reaction of photosynthesis?
52. Describe how do C4 plants minimize photorespiration?
53. How is the receptor tyrosine kinase activated?
54. How does testosterone function inside the cell?
55. Why are phosphorylation cascades useful in cell signaling?
56. Which type of cell signaling leads to an uneven distribution of ions across the membrane?
57. Describe a pathway using a second messenger.
58. Which steps do mitosis and meiosis have in common?
59. Distinguish between G1, S, and G2 of interphase.
60. How are the offspring of asexual reproduction different from those produced sexually?
61. Know the essential steps of meiosis.
62. What happens when chromosomes crossover?
63. Distinguish between independent assortment and the law of segregation.