**Unit 2 Review**

**Metabolic Processes**

**Chapter 3: Cellular Respiration**

***Section 3.1: Metabolism and Energy***

* What is metabolism? How does it correlate with catabolic and anabolic reactions?
* Types of Energy: kinetic (thermal, movement) vs. potential (bond energy, electrical)
* How does the energy change in an endo- and exothermic reaction?
* Key terms: enthalpy, transition state, activation energy, free energy
* What are the first and second laws of thermodynamics and how do these laws apply to endo- and exothermic reactions?
* What is Gibbs Free energy? What must gibbs free energy, enthalpy, entropy and temperature be in order for a reaction to be spontaneous or non-spontaneous?
* Is the formation of ATP endo- or exothermic? Is the formation of ADP +Pi endo- or exothermic? What happens to the energy in both of these reactions? Why are these reactions considered to be coupled?

**Review Questions: pg. 21 # 3, 4, 6, 7, 8, 0, 13**

***Section 3.2: Aerobic Respiration***

* What is the different between substrate level phosphorylation and oxidative phosphorylation? Which processes in cellular respiration go through substrate level and which go through oxidative?
* What are the net products of the investment and payoff phase in glycolysis? What intermediate leaves glycolysis to enter pyruvate oxidation?
* What three reactions take place in pyruvate oxidation? What are the net products of this process? Where does pyruvate oxidation take place?
* How many carbons are in acetyl coA? How many of these molecules enter the Krebs cycle?
* What are the net products and reactants of the Krebs Cycle? What is the purpose of the Krebs Cycle? Where does it occur?
* What are the reactants and products of the ETC? Where does the ETC occur?
* Explain the process of the ETC in detail.
* Which electron carrier plays a larger contribution to the ATP production?
* How many ATP are made in the ETC?

**Review Questions: pg. # 1,2,4,6,8,10, 14**

***Section 3.3: Anaerobic Respiration***

* What is anaerobic respiration? How does it differ from aerobic respiration?
* Explain the process of ethanol fermentation and lactic acid fermentation

**Review Questions: pg. 137 # 1, 3, 4**

**Chapter 4: Photosynthesis**

***Section 4.1: Light-dependent Reactions***

* What are the general reactants and products of photosynthesis?
* How are electrons able to get to an excited state? What does it mean to say that an electron is in an excited or ground state?
* Explain how the photosystem is able to capture light energy and get electrons to an excited state.
* Describe each step of the Electron Transport System (ETS) of the light dependent reaction. What are the reactants and products? What is the source of energy? What is the final electron acceptor? Where does the b6-f complex pump the protons out to?
* Explain the process of photophosphorylation.
* Compare and contrast cyclic vs. non cyclic photophosphorylation. When does cyclic photophosphorylation occur?

**Review Questions: pg. 165 # 1, 4 & 6**

***Section 4.2: Light-Independent Reaction***

* What are the four main steps of the Calvin Cycle?
* How many CO2 molecules are required to make one glucose molecule? How many CO2 molecules are required to regenerate RuBP?
* What enzyme is responsible for binding RuBP and CO2?
* What are the main products and reactants of the calvin cycle?
* How is the stomata of the leaf able to open and close? At what points of the day will it stay open? Does temperature have an affect on the opening/closing of the stomata? If so, explain why it affects it.
* How are C3 plants still able to produce glucose on very humid days? Is this an efficient process?
* Explain the mechanism used by C4 and CAM plants to produce glucose in their dry climates.

**Review Questions: pg. 171 # 1, 5, 6, 8 -11**



***Unit Review Questions:***

pg. 147 #1-14, 6, 19, 21, 28, 34

pg. 152# 1-10, 23, 25

pg. 179 # 1-7, 9-14, 19, 20, 21 & 26