**Unit 3 - The Energy of Life**

This unit will help you understand how matter and energy flow during life’s processes in order for life to survive. We will learn how food is converted into usable energy (cellular respiration) and how that energy is put to use to in the cell in order to assemble polymers, pump substances across membranes, move, and reproduce. Photosynthesis will be studied to understand how cells can take sunlight and convert that energy into stored energy in the form of glucose.

**You Must Know**

* Examples of endergonic and exergonic reactions
* Examples of catabolic and anabolic reactions
* The key role of ATP in energy coupling reactions
* That enzymes work by lowering the energy of activation in a reaction
* The summary equation of cellular respiration including the source and fate of the reactants and products
* The difference between fermentation and cellular respiration
* The role of glycolysis in oxidizing glucose to two molecules of pyruvate
* How pyruvate is moved from the cytosol into the mitochondria and introduced into the citric acid cycle
* How electrons from NADH and FADH2 are passed to a series of electron acceptors to produce ATP by chemiosmosis
* The roles of the mitochondrial membrane, proton (H+) gradient, and ATP synthase in generating ATP
* The summary equation of photosynthesis including the source and fate of the reactants and products
* How leaf and chloroplast anatomy relate to photosynthesis
* How photosystems convert solar energy to chemical energy
* How linear electron flow in the light reactions results in the formation of ATP, NADPH, and O2
* How the formation of a proton gradient in the light reactions is used to form ATP from ADP + inorganic phosphate by ATP synthase
* How the Calvin cycle uses the energy molecules of the light reactions (ATP and NADPH) to produce carbohydrates (G3P) from CO2

**Grades**

Cellular Respiration Overview Pogil \_\_\_\_ / 10

Glycolysis and Kreb Cycle Pogil \_\_\_\_ / 10

Chapter 8.1-8.3 Reading questions \_\_\_\_ / 8

Chapter 9 Reading questions \_\_\_\_ / 8

Chapter 10 Reading questions \_\_\_\_ / 8

Muscle Lab \_\_\_\_ / 10

Cellular Respiration FRQ \_\_\_\_ / 10

Photosynthesis Lab Poster \_\_\_\_ / 15

Unit Test \_\_\_\_ /

**Schedule**

See the class website for the unit schedule

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