AP Biology
Student Learning Plan
Energy and Metabolism Unit 6 - 14 Days
Math skill – temperature coefficient (respiration), standard error bard (photosynthesis), scatter plot (respiration), box and whisker plot, mean,

Day/Date	Topic/Objectives	Support
Day 1	**Introduction** ☐ Describe two processes autotrophic organisms use to capture free energy ☐ List reactants and products of chemosynthesis and photosynthesis	6.1-6.3
Day 2	**Energy Storing Compounds** ☐ Describe how energy is formed in the bonds of compounds such as ATP ☐ Explain how reactions which decrease entropy are coupled with reactions which decrease entropy in living organisms. ☐ Explain how the formation and breakdown of ATP is coupled with the reactions of photosynthesis and respiration ☐ Describe how ATP is formed by ATPsynthase	6.4-6.5
Day 3	**Photosynthesis Phases** ☐ Explain how captured energy from sunlight is used to fix carbon from carbon dioxide into carbohydrates such as glucose during the processes of photosynthesis	8.1-8.2
Day 4	**Pigments of Photosynthesis** ☐ Explain how the photosystems in the thylakoid membranes harvest light energy ☐ Explain how the structural features of the chloroplast facilitate and isolate the reactions of photosynthesis ☐ Explain how formation of a hydrogen ion gradient is used to produce energy storing compounds during the light dependent reactions of photosynthesis	8.3-8.4

Day 5	**Respiration** ☐ Explain how the energy stored during the light dependent reactions is used to fix carbon dioxide into carbon sugars during the Calvin Cycle.	8.5-8.7
Day 6	**Glycolysis and the Krebs cycle** ☐ Explain how the process of glycolysis uses and forms ATP to form ATP ☐ Describe the fate of the pyruvate produced during glycolysis ☐ Explain the sequence of steps in respiration and how they harvest energy systematically based on available resources ☐ Explain the relationship between photosynthesis and respiration	7.1-7.4
Day 7	**Aerobic Respiration** ☐ Compare and contrast anaerobic and aerobic respiration ☐ Describe the role of oxygen in aerobic respiration ☐ Describe how the structural features of the mitochondrion facilitates and isolates the reactions on cellular respiration ☐ Describe the role and location of electron transport chains	7.3-7.6 lab: daphnia respiration rate and body temperature
Day 8	**Anaerobic Respiration** ☐ What is the role of fermentation in metabolism? ☐ Explain how the interrelated processes of photosynthesis and respiration cycle matter within ecosystems	7.7-7.8
Day 9	**Ecology** ☐ Describe how photosynthesis and respiration are interrelated ☐ Describe how the processes of photosynthesis and Respiration make organic compounds available for biogeochemical cycles ☐ Review the elements necessary for each organic macromolecule and describe how biogeochemical cycles make these elements available	7.9-7.10

Day 10	**Digestion** ☐ Explain how the processes of digestion release energy an matter necessary for the maintenance of life ☐ Describe the role of enzymes in digestion ☐ Explain how enzymes function within a narrow range of conditions	48.1-485
Day 11	**Metabolism** ☐ Explain why living organisms require a constant input of free energy ☐ Explain how living organisms capture, store and use free energy	8.1-8.2
Day 12	**Homeostasis and Body Temperature** ☐ Explain how living organisms employ different strategies regarding maintenance of body temperature. ☐ Describe the energy needs that result from these different strategies of temperature regulation	43.7-43.9
Day 13	☐ **Review**	
Day 14 (Dec 13)	☐ **Test**	