Day 3 Review

Metabolism and Enzymes

What You Must Know:

1. Examples of endergonic and exergonic reactions
2. The key role of ATP in energy coupling
3. That enzymes work by lowering the energy of activation
4. The catalytic cycle of an enzyme that results in the production of a final product
5. Factors that change enzyme shape and how they influence enzyme activity
6. How the shape of enzymes, their active sites, and interaction with specific molecules affect their function
7. How feedback inhibition is used to maintain appropriate levels of enzymes in a pathway
8. Know why certain factors such as pH and temperature affect enzyme function
9. Describe examples of how homeostasis is maintained through molecular concentrations by triggering feedback mechanisms

Cellular Respiration and Fermentation

What You Must Know:

1. The summary equation of cellular respiration including the source and fate of the reactants and products
2. The difference between fermentation and cellular respiration
3. The role of glycolysis in oxidizing glucose to two molecules of pyruvate
4. How pyruvate is moved from the cytosol into the mitochondria and introduced into the citric acid cycle
5. How electrons from NADH and FADH2 are passed to a series of electron acceptors to produce ATP by chemiosmosis
6. The roles of the mitochondrial membrane, proton (H+) gradient, and ATP synthase in generating ATP
7. The difference between substrate-level phosphorylation and oxidative phosphorylation

Photosynthesis

What You Must Know:

1. The summary equation of photosynthesis including the source and fate of the reactants and products
2. How leaf and chloroplast anatomy relate to photosynthesis
3. How photosystems convert solar energy to chemical energy
4. How linear electron flow in the light reactions results in formation ATP, NADPH, and O2
5. How the formation of a proton gradient in the light reactions is used to form ATP from ADP + inorganic phosphate by ATP synthase
6. How the Calvin cycle uses the energy molecules of the light reactions (ATP and NADPH) to produce carbohydrates (G3P) from CO2
7. Predict how changes in the pathways would affect the output of ATP in the light reaction
8. Compare the process of chemiosmosis in the mitochondrion and the chloroplast
9. Explain how the H+ gradient is established in both processes and describe the orientation of the ATP synthase molecules