**AP BIOLOGY (WHEATLEY)**

**BIOCHEMISTRY UNIT GUIDE 2015**

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| **MONDAY** | **TUESDAY** | **WEDNESDAY** | **THURSDAY** | **FRIDAY** |
| 8/24  \*Pop rocks activity | **8/25**  \*Big ideas poster | **8/26**  \*Intro to biochemistry  notes  \*Semester project  introduction –  **DUE 11/20** | **8/27**  \*Intro to biochemistry  notes | **8/28**  \*Lab safety quiz  \*Functional group  practice – **DUE END OF**  **PERIOD** |
| **8/31**  \*Properties of water lab – | **9/1**  \*Properties of water lab –  **DUE END OF PERIOD** | **9/2**  \*Macromolecules jigsaw | **9/3**  **\**Intro to biochemistry***  ***quiz***  \*Macromolecule jigsaw | **9/4**  \*Macromolecule jigsaw  \*Protein folding POGIL |
| **9/7**  **NO SCHOOL** | **9/8**  \*Protein folding POGIL –  **DUE END OF PERIOD**  \*Pre-lab – **DUE 9/8** | **9/9**  \*Macromolecules lab | **9/10**  \*Macromolecules lab –  **DUE 9/11** | **9/11**  \*Intro to metabolism  notes  \*Free energy POGIL |
| **9/14**  \*Free energy POGIL –  **DUE END OF PERIOD** | **9/15**  \*Enzyme notes | **9/16**  \*Paperase lab – **DUE**  **9/17** | **9/17**  \*Enzyme inquiry lab | **9/18**  \*Enzyme inquiry lab |
| **9/21**  \*Enzyme inquiry lab –  **full lab report DUE**  **9/28** | **9/22**  **REVIEW FOR TEST** | **9/23**  **BIOCHEMISTRY TEST** | **9/24**  **TEST CORRECTIONS –**  **DUE 9/28** |  |

Supplemental Resources:

A. Bozeman Science Videos

1. Water: a polar molecule
   1. Biological molecules
   2. Life requires free energy
   3. Enzymes
2. Crash Course Videos
   1. Water: liquid awesome
   2. That’s why carbon is a tramp
   3. Biological molecules: you are what you eat

Reading: Read Chapters 2, 3, 5 and answer the prompts below.

A. Chemical Bonds

2.5 Explain how the electron configuration of an atom influences its chemical behavior.

2.6–2.8 Distinguish between covalent bonds, nonpolar polar covalent bonds, polar   
covalent bonds, hydrogen bonds, and ionic bonds, noting their relative strengths and how and where they form.

2.9 Explain the significance of chemical reactions. Identify the reactants and products of photosynthesis.

B. Water’s Life-Supporting Properties

2.10–2.13 Describe the special properties of water that make it vital to living systems. Explain how these properties are related to hydrogen bonding.

2.10 Define and distinguish between cohesion, adhesion, and surface tension.

2.11 Define and distinguish between heat and temperature. Explain how sweating helps to cool your body.

2.12 Explain why ice floats.

2.13 Define a solute, a solvent, and a solution.

2.14 Explain how acids and bases directly or indirectly affect the hydrogen ion concentration of a solution.

2.14 Explain the basis of the pH scale.

2.14 Explain how buffers function.

2.15 Describe the causes and consequences of acid precipitation and ocean acidification.

2.16 Explain why the search for extraterrestrial life centers on the search for water.

C. Introduction to Organic Compounds

3.1 Explain why carbon is unparalleled in its ability to form large, diverse molecules.

3.1 Define organic compounds, hydrocarbons, a carbon skeleton, and an isomer.

3.2 Describe the properties of and distinguish between the six chemical groups important in the chemistry of life.

3.3 List the four main classes of macromolecules important to life. Explain the relationship between monomers and polymers. Compare the processes of dehydration synthesis and hydrolysis.

D. Carbohydrates

3.4–3.7 Describe the structures, functions, properties, and types of carbohydrate molecules common in the human diet.

3.6 Explain how and why high-fructose corn syrup is produced.

E. Lipids

3.8–3.10 Describe the structures, functions, properties, and types of lipid molecules.

3.10 Describe the health risks associated with the use of anabolic steroids.

F. Proteins

3.11–3.13 Describe the structures, functions, properties, and types of proteins.

3.12 Explain how a protein’s shape determines its functions.

G. Nucleic Acids

3.14–3.15 Compare the structures and functions of DNA and RNA, noting similarities and differences.

3.16 Describe the adaptive advantage of lactose tolerance in people of East African decent.

H. Energy and the Cell

5.10 Define and compare kinetic energy, potential energy, chemical energy, and heat.

5.10 Define the first and second laws of thermodynamics. Explain how these laws of thermodynamics relate to energy use in a cell.

5.11 Define and compare endergonic and exergonic reactions. Explain how cells use cellular respiration and energy coupling to survive.

5.12 Describe the three main types of cellular work.

5.12 Explain how ATP functions as an energy shuttle.

I. How Enzymes Function

5.13 Define activation energy and explain how enzymes speed up chemical   
reactions.

5.14 Describe the structure of an enzyme-substrate interaction.

5.14 Explain how the cellular environment affects enzyme activity.

5.15 Explain how competitive and noncompetitive inhibitors alter an enzyme’s   
activity.

5.15 Describe the process of feedback inhibition.

5.16 Explain how certain drugs, pesticides, and poisons can affect enzymes.