**Pre-AP Biochemistry Test Review**

*Refer to the following questions and vocabulary to help you to review for the test.*

* Required vocabulary: metabolism, catabolism, anabolism, prokaryote, eukaryote, homeostasis, sexual/asexual reproduction, and adaptations, atom, protons, neutrons, electrons, charge, nucleus, elements, polar/polarity, covalent/ionic bonding, hydrogen bond, ion, chemical bond, molecule, compound, atomic number, isotopes, mass number, valence electrons, radioactive isotopes, radioactive decay, hydrolysis, dehydration synthesis, hydroxide (OH-)/ hydrogen ions (H+), acids, bases, buffer, solute, solvent, hydrophobic, hydrophilic, abiogenesis, biogenesis, monomer, polymer, mono-/di-/polysaccharide, glycogen, cellulose, glucose, glycogen, sucrose, chitin, saturated, monounsaturated, polyunsaturated unsaturated, phospholipid, steroids, cholesterol, polypeptide, carboxyl group, R group, dipeptide, peptide bonds, primary structure, secondary structure, tertiary structure, and quaternary structure, denature, catalyst, active site, substrate, reactant, product, enzyme-substrate complex
* What are the characteristics of life?
  + Describe each.
* What is the difference between metabolism, catabolism, and anabolism?
  + How are they similar?
* How does asexual and sexual reproduction differ?
  + How are they similar?
* What is an adaptation?
  + What is its role in improving the survival of an organism?
  + Give an example of an adaptation.
* What is metabolism?
  + What is its function in an organism?
* What is homeostasis?
  + What is its function?
  + Give an example.
* What is the difference between a prokaryote and eukaryote?
  + What is an example of a prokaryote?
  + What is an example of an eukaryote?
  + Which domain(s) could you find prokaryotes? Eukaryotes?
* Draw an atom and label its parts.
  + State the charge of each subatomic particle.
* What are valence electrons?
  + How do they contribute to the chemical properties of an element?
* What is the mass number and atomic number of an element?
  + How are they different?
* What is an element?
  + Give an example.
* What is an isotope?
  + Give an example.
* What is a radioactive isotope?
  + How do they differ from isotopes?
  + What is radioactive decay?
* What are the main types of chemical bonds?
  + What is produced from each type of bond?
* What does it mean when a molecule is said to be “polar”?
* What is the difference between a solute, solvent, and a solution?
* Where can you find a reactant and product in a chemical equation?
* What is the significance of the Miller and Urey experiment? Relate this to abiogenesis and biogenesis.
* What is an organic molecule? What is the most abundant element found in all living organisms?
* What is the relationship between a monomer and polymer?
  + Give an example of each.
* What process joins monomers?
  + What is produced?
* What process breaks a polymer apart?
  + What is produced?
* What is the chemical formula for glucose?
* What is an example of a monosaccharide?
  + Disaccharide?
  + Polysaccharide?
    - What polysaccharide can be found in plants?
    - What polysaccharide can be found in animals?
* Describe the various structures of a protein.
  + What type of bond holds amino acids together?
  + What is the R group?
  + How does the R group determine the type of protein made?
* How does an unsaturated and saturated fat differ?
  + How are they similar?
  + What is an example of each?
* How does monounsaturated and polyunsaturated lipids differ?
* What is a phospholipid?
  + Draw an example.
* How does a triglyceride differ from a phospholipid? Explain 2 ways.
* How does the structure of a phospholipid contribute to the properties of the phospholipid?
  + Which part is hydrophobic?
  + Which part is hydrophilic?

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| **Name of Macromolecule** | **Element**  **composition** | **Functions** | **Monomer** | **Draw an example** | **Examples** |
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* Complete the following table below
* What is the pH scale?
  + Which numbers refer to a solution that is acidic?
  + Which numbers refer to a solution that is basic?
  + Which numbers refer to a solution that is neutral?
  + Give an example of an acidic, basic, or neutral solution.
  + What is a buffer?
    - What is the role of a buffer?
    - Give an example.
  + What is concentration of hydrogen ions (H+) in an acidic, basic, or neutral solution?
  + What is concentration of hydroxide ions (OH-) in an acidic, basic, or neutral solution?
* What happens to chemical bonds in a chemical reaction?
* What is the function of an enzyme?
  + An enzyme is an example of what macromolecule?
  + What word root do most enzymes end with?
  + What is a catalyst?
  + What is activation energy?
    - What is the effect of an enzyme on activation energy?
  + What is the effect of an enzyme on the rate of a product formed?
  + Why are enzymes considered to be very specific?
  + What is a substrate?
  + What is an enzyme-substrate complex?
  + What is a product?
  + Why is the shape of an enzyme or proteins in general important?
  + Draw and label the parts of an enzyme.
  + Describe how an enzyme works.
  + What happens to the rate of an enzyme reaction when:
    - substrate concentration increases and decreases?
    - temperature increases or decreases?
    - enzyme concentration increases or decreases?
  + What happens to an enzyme when exposed to high temperatures and a different pH?
    - Explain why.
  + What does the term, denature, mean?
    - What happens when an enzyme is denatured? Explain.
  + What is an inhibitor?
    - What is its effect on the speed of a chemical reaction? Why?
    - Explain the difference between a competitive and noncompetitive inhibitor.
    - What is the effect of an inhibitor on an enzyme and the rate of a reaction?