

Directions: Since this is not only your summer assignment worksheet, but, your first AP Biology Worksheet, I need to include some details that will not appear on each worksheet after this one.

First, you will always have some type of a chapter homework assignment; it may be questions to answer (as in Chapters 1 and 2 on this page) OR you may be assigned the job of creating an outline for a chapter OR you may be writing notes on a Power Point “notes page”. Sample free response questions will also be included on the worksheet but it will NOT be necessary for you to hand those in. **YOU WILL ONLY NEED TO TURN IN ANY ASSIGNED QUESTIONS OR AN OUTLINE FOR THE HOMEWORK ASSIGNMENT.**

Second, all completed questions or outlines are to be placed in an individual manila folder with your name and block number on the cover. Completed homework assignments are due on the day of the test. Attach a copy of the worksheet to your homework. Homework contributes to **25%** of your nine weeks grade.

For your summer assignment, you need to read Chapters 1 & 2 in the Solomon Biology book and then answer the questions for the two chapters. Be neat and concise with your work and be prepared to discuss Chapter 1 on the first class meeting in September. **DO NOT MARK IN TEXTBOOK.**

\*NOTE: New textbooks will be issued in September; most themes from Chapters 1 & 2 of the new textbook (Biology by Campbell & Reece, 8<sup>th</sup> Edition) are included in this worksheet. Any additional themes in Chapters 1 & 2 not included in this worksheet will be discussed in September.

## Chapter 1: A View of Life – Chapter Questions

1. State the importance of and the potential applications of the following:
  - a. Human Genome Project
  - b. Stem cells
  - c. Cloning
2. Describe how the seven different set of characteristics distinguish the living from the nonliving.
3. Describe some different ways that information may be transmitted within and between individuals.
4. Identify the hierarchy of biological organization and how it changes from the atom to the biosphere.
5. What is systematics and how does it relate to taxonomy?
6. Describe the importance of the work of Carolus Linnaeus in the 18<sup>th</sup> century; give some examples of scientific names.
7. What are the different classification levels, how is one different from another; classify yourself.
8. What are the three new “Domains” and how do they differ from the six kingdoms?
9. What is evolution and why is it considered the greatest unifying theory of biology?
10. What did Charles Darwin base his theory of natural selection on; what have we learned since Darwin’s time?
11. What does the expression “Energy flows and nutrients are recycled” mean?
12. What is the scientific method, how do you develop hypotheses and how does deductive reasoning differ from inductive reasoning?
13. What are some guidelines for a good hypothesis; how can predictions be tested?
14. What is a sampling error and how does it influence scientific investigation?
15. What is the difference between a theory, a scientific principle and a law?

## Chapter 2: Atoms and Molecules: The Chemical Basis of Life – Chapter Questions

1. How might the studies of a biochemist differ from a molecular biologist or an evolutionary biologist?
2. What are atoms and why are they the fundamental particles of elements; how does atomic number differ from atomic mass?
3. What are isotopes, how do they differ from radioisotopes and what is autoradiography; how are radioisotopes used in medicine?
4. How is the chemical behavior of an atom determined; what is the valence shell of an atom?
5. How do compounds differ from molecules; how do empirical, molecular and structural formula differ?
6. In a chemical reaction, how do the reactants differ from the products; what is dynamic equilibrium?
7. What are covalent bonds, describe a simple one; why are some covalent bonds polar and others nonpolar?
8. What is an ion, how do cations differ from anions; describe the ionic bond between sodium and chloride.
9. What is a hydrogen bond and how do they form; why are they essential to water?
10. What is an oxidation-reduction reaction and what does it involve; what does “Leo says Ger” mean?
11. Why is water essential to life, is it polar or nonpolar and how does hydrophilic differ from hydrophobic?
12. Describe the following unique properties of water that makes life possible on Earth:
  - a. Cohesion and adhesion
  - b. Capillary action
  - c. High specific heat
  - d. Freezing
  - e. High heat of vaporization
13. What is ionization, how do acids differ from bases and what is the pH scale; what are buffers and why are they important to you?

### Additional reference book for AP Biology

You need to purchase the AP Biology Cliffs preparation guide by Dr. Phillip E. Pack. Local bookstores such as Barnes & Noble can order this extremely valuable review/reference book. Order early! Cost: circa \$15.00.

Sample Free Response: Possible essay questions for the test for you to analyze. DO NOT HAND IN.

1. Design a controlled experiment to show how an investigator could determine if removing the nucleus from an amoeba could have detrimental effects on that amoeba.
2. Discuss the difference between ionic, covalent, and polar covalent bonds and give examples to demonstrate how one differs from the other.
3. The unique properties (characteristics) of water make life possible on Earth. Select three properties of water and:
  - a) for each property, identify and define the property and explain it in terms of the physical/chemical nature of water.
  - b) for each property, describe one example of how the property affects the functioning of living organisms.

ENJOY YOUR SUMMER!