

Advanced Placement Biology Summer Assignment

Summer 2009

Ms. Malone



Dear AP Biology Student,

According to my class lists you have been scheduled for AP Biology for the 2009-2010 school year. Welcome to my class! The course is very fast-paced and I have very high expectations and no time to waste, therefore, to ensure your success in this program and on the AP exam in Map we need to start right away.

The following is a list of required assignments to do over the summer:

- 1) **Email me** with your email address so that I can create an email groups for our class. This will allow me to contact you throughout the school year with relevant announcements, etc. Simply send me an email stating your name, year in school (junior, senior, etc), and your ideal career path. [Megan. Malone@sdhc.k12.fl.us](mailto:Megan.Malone@sdhc.k12.fl.us)
- 2) Pick up your text books during exam week June 1st through 5th. You may purchase your own used copy on Amazon.com. This allows you to highlight and mark in your book, write notes, etc just as you will do in college with the texts you will have to purchase yourself. Biology, 7th or 8th(AP) Edition (Hardcover) by Neil A. Campbell and Jane B. Reese (Author)
- 3) Check our AP Biology website for updates, information, and resources periodically throughout the summer! www.riverviewhighschool-malonebiology.schools.officelive.com
- 4) Purchase your **Biology Lab Manual for Students (2001)** and **Laboratory Research Notebook (ISBN 0-7167-3900-3)**. You can do this through the recommended websites or bookstores on the syllabus. Amazon.com is always a good option.
- 5) Purchase an AP review guide such as Cliff's, from your local bookstore. Border's on Providence Road has a wide variety of guides. **This is highly recommended but not mandatory.** In the past many students have regretted that they didn't purchase a review book sooner.
- 6) Read chapters 1-5. Answer the following questions as thoroughly as possible, and then define key terms. The work must be completed and will be collected by the 2nd week of class. This is your first grade in AP Biology, no late work will be accepted. Make sure your start off on the right foot. You will have a test on these chapters at the end of the first week of class. You will NOT have time to work on this assignment in class as we will be moving forward from this material from day one. It is in your best interest to have the assignment done by the first day of class.



CHAPTER 1: Introduction, Themes in the Study of Life.

1. Diagram the hierarchy of structural levels in biology.
2. Explain how the properties of life emerge from complex organization.
3. Describe seven emergent properties associated with life.
4. Distinguish between prokaryotic and eukaryotic cells.
5. Explain, in your own words, what is meant by “form fits function”
6. List and distinguish among the five kingdoms of life.
7. Briefly describe how Charles Darwin’s ideas contributed to the conceptual framework of biology.
8. Outline the scientific method.
9. Distinguish between inductive and deductive reasoning.
10. Explain how science and technology are interdependent.

Key Terms: Population, Community, ecosystem, biome, hypothesis, control group, variable, experimental group.

CHAPTER 2: Atoms, Molecules, and Chemical Bonds

11. Define element and compound.
12. State four elements essential to life that make up 96% of living matter.
13. Describe the structure of an atom.
14. Define and distinguish among atomic number, mass number, atomic weight and valence.
15. Explain why radioisotopes are important to biologists.
16. Explain the octet rule.
17. Explain why the noble gases are so unreactive.
18. Distinguish among nonpolar covalent, polar covalent and ionic bonds.
19. Describe the formation of a hydrogen bond and explain how it differs from a covalent or ionic bond.
20. Explain why weak bonds are important to living organisms.
21. Describe the chemical conditions on early Earth and explain how they are different from today.

Key Terms: atom, proton, neutron, electron, hydrogen bond, molecule, ion, cation, anion, isotope, half life.

CHAPTER 3: Water and the Fitness of the Environment

22. Describe how water contributes to the fitness of the environment to support life.
23. Describe the structure and geometry of a water molecule, and explain what properties emerge as a result of this structure.
24. List five characteristics of water that are emergent properties resulting from hydrogen bonding.
25. Describe the biological significance of the cohesiveness of water.
26. Explain how water's high specific heat, high heat of vaporization and expansion upon freezing affect both aquatic and terrestrial ecosystems.
27. Explain how the polarity of water makes it a versatile solvent.
28. Explain the basis for the pH scale.
29. Explain how acids and bases directly or indirectly affect the hydrogen ion concentration of a solution.
30. Using the bicarbonate buffer system as an example, explain how buffers work.

Key Terms: cohesion, surface tension, adhesion, hydrophilic, hydrophobic, heat, temperature, evaporative cooling, solution, solvent, solute.

CHAPTER 4: Carbon and Molecular Diversity

31. Summarize the philosophies of vitalism and mechanism, and explain how they influenced the development of organic chemistry, as well as mainstream biological thought.
32. Explain how carbon's electron configuration determines the kinds and number of bonds carbon will form.
33. Describe how carbon skeletons may vary, and explain how this variation contributes to the diversity and complexity of organic molecules.
34. Distinguish between structural, geometric and stereoisomers.
35. List the major functional groups and what each one stands for.
36. Explain how carbon's electron configuration determines the kinds and number of bonds carbon will form.

Key Terms: organic chemistry, organic molecules, hydrocarbons, isomer, asymmetric carbon.

CHAPTER 5: The Structure and Function of Macromolecules

37. Explain how cells synthesize and break down macromolecules.
38. Describe the structure and function of a carbohydrate, lipid, protein, and nucleic acid and provide examples of each.