AP Biology Contact Information 2016-2017

Instructor Contact Information
Mrs. Christine Villanti
E-mail cvillanti@csh.k12.ny.us
Web Site: CSH home page

Textbook: Biology AP Edition~ Campbell & Reece (9th Edition)

Course Expectations

This is a course designed to prepare students for the College Board Advanced Placement Biology Examination and is based on the curriculum provided by College Board. Students will be provided the opportunity to experience laboratory investigations comparable to an introductory college level biology course, including inquiry based labs, and computerized data acquisition and analysis. The class requires learning at an accelerated pace due to the amount and complexity of required material. Material will be covered through class activities, lectures, discussions and laboratories. A student's success will depend on the time and effort invested into this course.

YOU MUST ADD YOUR EMAIL ADDRESS TO MY SCHOOL WEB PAGE
Be sure to check your email regularly

Thank you,
Ms V

AP Biology Summer Assignment~

Mandatory Assignment 1

Establish contact and join the online forum.

Email ~ Join the email list on my school website, check email often

Mandatory Assignment 1

Below there are 3 AP Biology Essay questions. These questions must be answered throughout the summer and emailed to me by the due date indicated for each question. Please put your name and the essay # in the subject of the email and attaché your essay as a word document.

These essays may require some research on your part but are an important part the AP curriculum.

QUESTION 1 Due 07/8/2016
Please log into WWW.Bozemanscience.com , choose AP Biology from the menu and watch the video titled~ The new AP Biology Exam~ A Users Guide once you have viewed the video-
Please provide and explanation of the AP Biology Exam, including a description of the 4 Big Ideas in AP Bio.

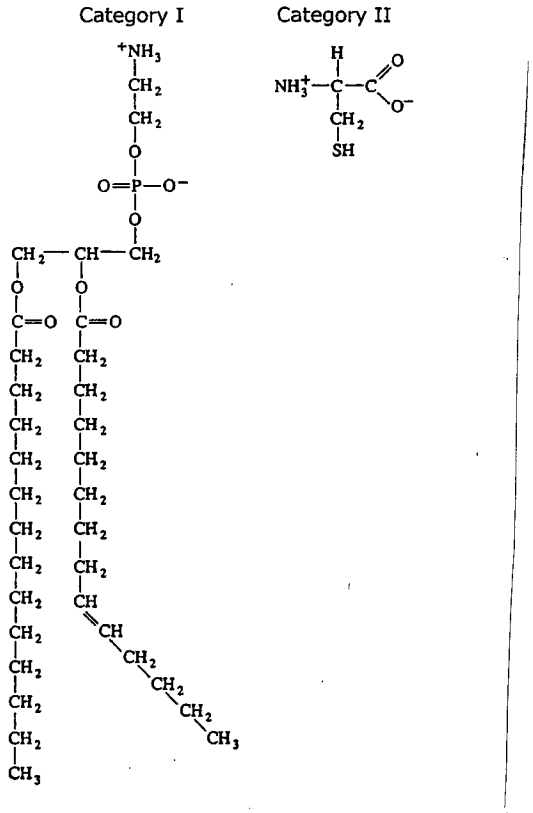
QUESTION 2 Due 07/22/2016
The unique properties if water make life possible on Earth.
Select **three** properties of water and:

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 hoe the property affects the functioning of living organisms.

QUESTION 3 Due 8/5/2016
Carbon is a very important element in living systems

a) Describe the various characteristics of the carbon atom that make possible the building of a variety of biological molecules
b) Explain how reactions involving carbon containing compounds can contribute to the greenhouse effect
c) The following structures are examples of two different categories of biological compounds. Describe how each category of compounds is important to the structure and function of living systems.

Structures for question 3 part c



Mandatory Assignment 2

Complete attached chemistry assignment this assignment is due on the first day of class.

Mandatory Assignment 3

Read textbook chapter 1 and complete Active Reading Guide ,Chapter 1. This outline is due the first day of class.

OPTIONAL ASSIGNMENT~ Extracurricular activity scavenger hunt. Complete the task listed, and provide the appropriate documentation (indicated in parentheses). For every 5 you complete and document successfully, you will get 5 bonus points on your first course exam.

SCAVENGER HUNT

1. See a movie in a theater. Make sure it's good. (stub)
2. Feed ducks on three separate occasions. (pictures)
3. Grow a plant. (living plant must be brought to class on the first day)
4. Go to 2 state parks and take a walk. (photos AND maps)
5. Go see the Blue Whale ant the American Museum of Natural History.(photo and stub)
6. Go to a water based amusement park. (photo and stub)
7. Go to a beach on the north shore AND one on the south shore. Collect sand from each in glass jars. (jars of sand and photo)
8. Catch a Cicada. (molt)
9. Sleep outside, under the stars. (photo)
10. Find a wild fox somewhere on Long Island, or maybe a deer. (photo of animal AND photo of you standing where the animal was)
11. Play the board game Risk or Apples to Apples. (photo)
12. Build your own website. (URL)
13. Make your own clothing. (wear it to school)
14. Identify three species of tree in your neighborhood. (leaves and the genus/species)
15. Hold five earthworms OR two slugs. (photo)

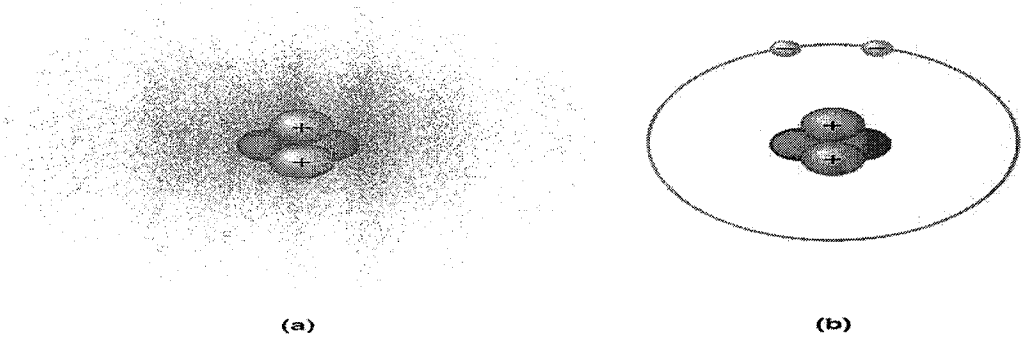
AP Biology Essential Chemistry **Name:** _____

This is a review of basic chemistry – we will not spend any class time on these concepts as they should have been learned in chemistry. Please make sure that you know them and if not, be sure to make the time to learn them. **Complete the following questions. You will hand this in on the first day of school for a homework grade! (There will also be a test on this information the first full week of school)**

1. Contrast the term element with compound.

2. Know the symbols of the following elements and their charge:
   a. Carbon
   b. Hydrogen
   c. Oxygen
   d. Nitrogen
   e. Phosphorus
   f. Sulfur

3. Label the diagram below and define the terms that you label.



(a) (b)

4. Contrast the terms atomic mass and atomic number.

5. What is the difference between the terms atomic mass and atomic weight?

6. What is an isotope and what is "special" about radioactive isotopes?

7. What determines interactions between atoms? Why are valence electrons important?

8. Define the following terms:
    a. Chemical bond
    b. Covalent bond
    c. Single bond
    d. Double bond
    e. Electro negativity
    f. Nonpolar covalent bond
    g. Polar covalent bond

9. What is the difference between a structural and molecular formula?

10. Know both the molecular and structural formula for the following compounds.
    a. Oxygen gas
    b. Carbon dioxide
    c. Glucose
    d. Phosphate
    e. Ammonia
    f. Water (you would be surprised at how many people missed this!!!)

11. How do ionic bonds compare with covalent bonds?

12. Compare and contrast hydrogen bonds and van der Waals interactions.

13. Define a dynamic chemical equilibrium in terms of quantities of reactants and products. This is a critical concept!

14. Why is water considered a polar molecule?

15. For each of the below listed properties of water – briefly define the property and then explain how water's polar nature and polar covalent bonds contribute to the water special property.
    a. Cohesion

    b. Adhesion

    c. Surface tension

    d. High specific heat

    e. Heat of vaporization

    f. Evaporative cooling

16. What is special about water and density?

17. Explain how these properties of water are related to the phenomena described in the statements below. More than one property may be used to explain a given phenomenon.

    a. During the winter, air temperatures in the northern United States can remain below 0°C for months; however, the fish and other animals living in the lakes survive.

    b. Many substances—for example, salt (NaCl) and sucrose—dissolve quickly in water.

    c. When you pour water into a 25-ml graduated cylinder, a meniscus forms at the top of the water column.

    d. Sweating and the evaporation of sweat from the body surface help reduce a human's body temperature.

e. Water drops that fall on a surface tend to form rounded drops or beads.

f. Water drops that fall on your car tend to bead or round up more after you polish (or wax) the car than before you polished it.

g. If you touch the edge of a paper towel to a drop of colored water, the water will move up into (or be absorbed by) the towel.

18. Define the following terms:
   a. Solute

   b. Solvent

   c. Aqueous solution

   d. Hydrophilic

   e. Hydrophobic

   f. Molarity

19. MOLARITY

A. Concentration – *comparison of solute to solvent* *(solute : solvent)*
   a. Concentrated – *large ratio of solute to solvent*
   b. Dilute – *small ratio of solute to solvent*

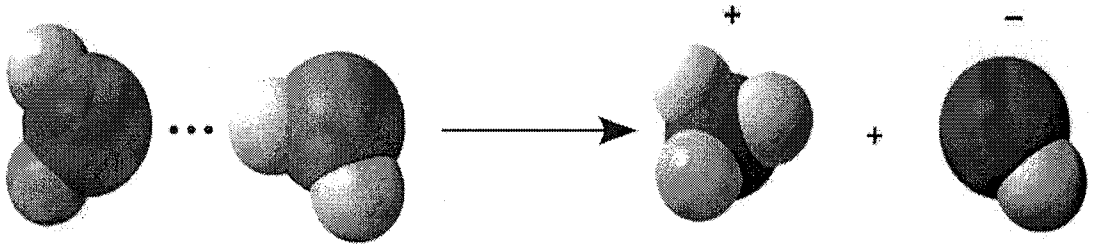
B. Molarity –
   a. Symbol – M
   b. Equation – in reference table $M = \frac{\text{moles of solute}}{\text{L of solution}}$ $M = \frac{\frac{\text{mass}}{\text{molar mass}}}{\text{L of solution}}$

C. Example Problems

1. What is the molarity of a solution formed by mixing 10.0 g of H_2SO_4 with enough water to make 0.100 L of solution?	2. To prepare 10.5 L of a 2.50 M solution of KOH, how many grams of potassium hydroxide must be used?
3. How many moles of LiBr must be added to .650 L of water to make a 2.0 M solution?	4. What is the molarity of the solution produced when 145 g of NaCl is dissolved in sufficient water to prepare 2.75 L of solution?

5. How many grams of KCl are needed to prepare 0.750 L of a 1.50 M solution?	6. What is the molarity of the solution produced when .594 mol of HCl is dissolved in 0.385 L of water?
7. To produce 3.00 L of a 1.90 M solution of sodium hydroxide, how many grams of NaOH must be dissolved?	8. If 8.77 g of KI are dissolved in enough water to make 4.75 L of solution, what is the molarity of the solution?

20. Label the diagram below to demonstrate the dissociation of the water molecule and then relate this diagram to the term pH.



21. What defines an acid and a base?

22. Why are small changes in pH so important in biology?

23. What is a buffer? Give an example on how they would work in a living organism.

24. What is acid precipitation and why is it important to living organisms?

25. Why is organic chemistry so important in the study of biology?

26. What is special about carbon that makes it the central atom in the chemistry of life?

27. Describe and contrast the three types of isomers. Draw a sketch of each

a. Structural –

b. Geometric –

c. Enantiomers –

28. Be familiar with each of the following functional groups – know it's chemical compound and the functional properties

a. Hydroxyl

b. Carbonyl

c. Carboxyl

d. Amino

e. Sulfhydryl

f. Phosphate

Remember macromolecules "the building block of life" from your prior biology class. Review the following about macromolecules are polymers, built from monomers

29. The large molecules of all living things fall into just four main classes. Name them.

30. Circle the three classes that are called macromolecules. Define macromolecule.

31. What is a polymer?

.a monomer?

32. Monomers are connected in what type of reaction? What occurs in this reaction?

33. Large molecules (polymers) are converted to monomers in what type of reaction?

34. The root words of hydrolysis will be used many times to form other words you will learn this year. **I would advise you to be familiar with science root words, it will help you greatly! You can find a list for biology root words online....print it out and study them!**

What does each root word mean?

hydro–

lysis

35. Consider the following reaction:

$$C_6H_{12}O_6 + C_6H_{12}O_6 \rightarrow C_{12}H_{22}O_{11}$$

a.) The equation is not balanced; it is missing a molecule of water. Write it in on the correct side of the equation.

b.) So, what kind of reaction is this?

c.) Is $C_6H_{12}O_6$ (glucose) a monomer, or a polymer?

d.) To summarize, when two monomers are joined, a molecule of _____ is always removed.