AP Biology Summer Assignment

Welcome to the 2016-2017 AP Biology course. There are prerequisite/corequisite courses for this course. Those are Biology (either Honors or On-Level), and Chemistry (either Honors or On-Level). If you are a sophomore student, you are required to have taken and passed Biology, and you are expected to be enrolled in Honors Chemistry, in conjunction with AP Biology. If you are not currently enrolled in Honors Chemistry, you will need to speak with your counselor to take that class during the 2016-2017 school year as well.

The first part of the Summer Assignment is meant to be a motivator for students to open their eyes to their surroundings and to truly learn how Biology is everywhere. The assignment is a type of scavenger hunt that will require students to get outside during one of the most beautiful times of the year. **The documentation for this assignment is due on the first day of school in the Fall and will count as a summative grade.**

AP Biology Standards covered: Science Practice 1: *The student can use representations and models to communicate scientific phenomena and solve scientific problems.* **Science Practice 2:** *The student can use mathematics appropriately.* **Science Practice 3:** *The student can engage in scientific questioning to extend thinking or to guide investigations within the context of the AP course.* **Science Practice 4:** *The student can plan and implement data collection strategies in relation to a particular scientific question.* **Science Practice 5:** *The student can perform data analysis and evaluation of evidence.* **Science Practice 6:** *The student can work with scientific explanations and theories.* **Science Practice 7:** *The student is able to connect and relate knowledge across various scales, concepts and representations in and across domains.*

Chemistry deepens one's understanding of Biology, so it is important that all students come to class with some basic understandings of Chemistry. The AP Biology curriculum is designed so that a student at North Forsyth HS can take Honors Chemistry at the same time and not be behind others who already have taken Chemistry. Also, to ensure that you are as caught up as possible, please complete the following assignment. This can be completed over the summer, or after the start of school. **At the very latest, you will want to have it completed by Fall Break.** The earlier you have this assignment done, the easier your time in AP Biology will be. If you have questions about Chemistry or this packet, please feel free to email me at snelson@forsyth.k12.ga.us

In addition, if this is your first Advanced Placement course, you should look through College Board's website on AP Biology to get a feel for how the course is.
https://apstudent.collegeboard.org/exploreap?affiliateId=apcentral&bannerId=exploreap1

Watch the following two YouTube videos. These are called Crash Courses with Hank Green. Get to know him as we will tune into him quite a bit during the year. These two videos are great chemistry reviews.

http://www.youtube.com/watch?v=HVT3Y3_gHGg&list=PL6C159EF1A62143A2&index=11

http://www.youtube.com/watch?v=QnQe0xW_JY4&list=PL6C159EF1A62143A2&index=8

AP Biology Summer Assignment- PART 1

Scavenger Hunt. Complete the task listed, and provide the appropriate documentation (indicated in parentheses). **You must complete 10 of the following options, documented as listed.** For every additional five that you complete and document successfully, we will give you five bonus points on your first course exam. You must compile all documentation and place it into a scrapbook. This assignment is due on the first day of school and will count as a summative grade!

1. Stay current with Biology! Watch the news/Check the Google News Aggregator/Read a newspaper at least once a week. (copy of article, or log of date/URL and a 1-sentence summary of a news item from each week)
2. See a movie in a theater. Write a 1 page summary on what Biology you saw in the movie. Make sure it's a good one! (stub AND summary)
3. Feed ducks on three separate occasions. (photos)
4. Grow a plant. (time-lapse of its growth)
5. Go to two state parks and take a walk. (photos AND maps)
6. Go to a national park outside of Georgia. (photos AND maps)
7. Go to the Georgia or Tennessee Aquarium. (photo AND stub)
8. Go to the Atlanta Zoo. (photo AND stub)
9. Go to a water-based amusement park. (photo AND stub)
10. Go to a sporting event. (photo AND stub)
11. Go to a beach. Collect sand and a few seashells. (jars of sand, seashells, AND photos)
12. Catch a cicada. (molt)
13. Find a wild animal somewhere in Forsyth County. (photo of animal AND photo of you standing where the animal was)
14. Read The Hot Zone by Richard Preston. Provide a 1 page summary about the book. (summary)
15. Build your own personal website. Discuss your plans for how to be successful in AP Biology. For fun, keep updating throughout the year and pass on the good info. (url)
16. Find 5 geocaches. Be sure to fill out the log when you find each one, and don't take anything unless you plan to trade by placing something else back in the geocache. (photos)
17. Set up a geocaching tournament for you and your friends. (photo and map)
18. Make your own clothing using only natural materials. (wear it to school during the first full week AND it must be a major part of your outfit)
19. Identify three species of tree in your neighborhood. (leaves & genus/species of each)
20. Hold five earthworms OR two slugs. (photo)
21. Go to Fernbank Museum (photo and stub)
22. Fly a drone and survey land around you. (video yourself)
23. Visit the Botanical Gardens in either Atlanta or Athens. (photos)
24. Take a picture of some kind of nature defying the odds in the city of Atlanta. (photo)
25. Fill up a trash bag with litter that you have found. (photos)

AP Biology Essential Chemistry

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 study through them. Please put this all in your AP Biology three ring (1 ½ or 2 in.) binder!

1. Contrast the term element with compound.

2. Know the symbols of the following elements and their charge:

    a. Carbon

    b. Hydrogen

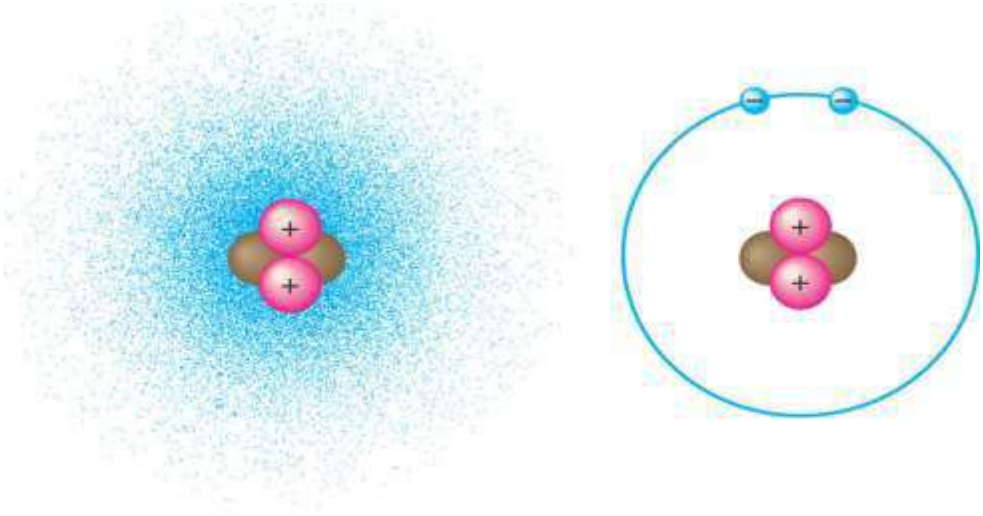
    c. Oxygen

    d. Nitrogen

    e. Phosphorus

    f. Sulfur

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



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. Electronegativity

    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

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 –

a. Concentrated –

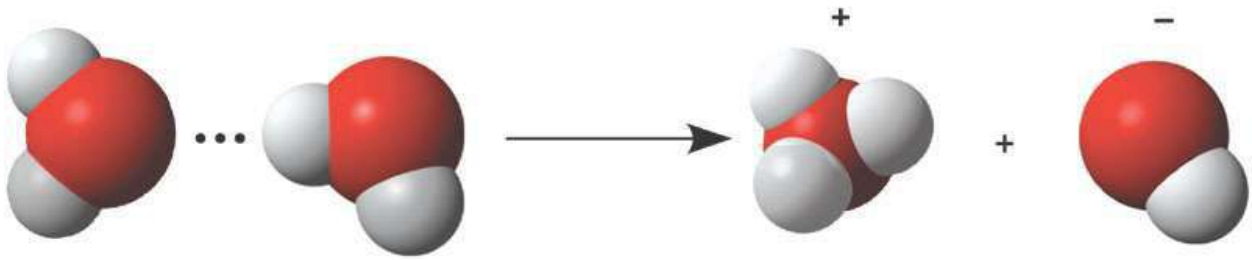
b. Dilute –

B. Molarity –

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