AP Biology Summer Assignment 2009-2010

Welcome to AP Biology

This summer assignment has been designed to give you an introduction into the world of Advanced Placement Biology as well as give you a head-start in preparing for the AP Exam that you will take in May. The more work that you put into this assignment the more that you will get out of it. This assignment is an opportunity to start AP Biology on a positive note. You will be given a test over this material during the first two days of school. Good Luck, have fun, be prepared!

There are two sections to the assignment. Each section must be completed.

You will need to stop by room 218 before or after school to pick up additional materials and your textbook. This should be done between June 2 and the end of school. If you have any questions during the summer, please contact Mrs. Laura Beltz (403-3974<cell>, 721-6299<home>, llbeltz@vbschools.com) or Ms. Ashley Kelley (757) 784-8372 (amkelley@vbschools.com).

Objectives: *Students will be able to:*

- Diagram and Label a cell and its organelles
- Characterize the structure and function of each organelle
- Compare and contrast a typical prokaryotic vs. eukaryotic cell
- Describe a cell membrane and its primary function
- Summarize the major differences between cell types of each kingdom.

Additional Materials: Use the following tools to aid in developing understanding and knowledge of the material. These are usable throughout the school year and will be very valuable resources to get familiar with.

1. Cliffs AP Biology, Phillip Pack ISBN: 978-0764586828 or other AP biology review book.
2. www.biology.earthfathom.com (follow the links on AP Biology)
3. http://www.ibiblio.org/virtualcell/tour/cell/cell.htm

SECTION I – CELL SIMILE

Recommended Reading: The following is a list of highly suggested readings that will help you prepare for the first days of AP Biology. You are able to complete your summer assignment using other resources; however, this unit is designed around the material from the textbook.

- History and Tools- pg. 73-75 (4) and Pg. 75-77 (4) *End at “Cell fractionation)
- Eukaryotic vs. Prokaryotic Cells- Pg. 8 (1) “Organisms have several levels of organization”, Pg. 79-80 (4).

- Cell Membrane and function-Pg. 104-109 (5)
- Structure and function of Organelles-Pg. 80-99 (4)
- Summary-Pg. 100 (4) helpful for project work

Assignments: The following is a list of required products that are due the first day of school. Read each description carefully and complete them fully to earn full credit. This assignment is worth 100 each.

Organelles: Nucleus, nucleolus, chromatin, nuclear envelope, smooth endoplasmic reticulum, rough endoplasmic reticulum, golgi body, central vacuole, lysosomes, peroxisomes, chloroplasts, mitochondria, microfilaments, ribosomes, plasma membrane, cell wall, centrioles, microtubules, cilia, flagellum

1. **Cell Chart:** Create and fill-in a –column chart that lists the 20 required organelles. This chart should be created electronically. Filling in the information can be handwritten, but must be legible for credit. If I can't read it, it is wrong!

   The column titles should be:
   1. Organelle name
   2. Structure
   3. Function
   4. Cell type (prokaryotic or eukaryotic)
   5. Organism cell type (bacteria, plant, animal, fungi, or protista)

Example table:

Organelle Name	Structure	Function	Cell type	Organism type

2. **Cell Simile:** After researching a typical cell and the structure and function of its organelles, create an original cell simile poster (plant or animal). On a poster board or tri-fold, design a visual presentation ot display your simile. You will need the following to earn full credit:

   1. A graphical representation of your simile that is large enough to see (~50-70% of the overall board space). You may choose to draw a picture, make a model, use interesting material however it should be neat, readable, and adequately convey your simile.
   2. A detailed list of all of the organelles of the cell and an explanation of the comparison of how they relate to the simile. Example: The brain is like the nucleus of the cell because it directs the functions of the body like the nucleus directs the functions of the cell.

This must be at an AP level and not something that might have been created during middle school or core biology.

SECTION II - COLLECTION (20 terms to define; 10 specimens to collect)

For this section, you will be collecting specimens and researching information. You will be making both a collection and a booklet in which you will be explaining your specimens and defining all the given terms. Arrange the specimens by **KINGDOMS.** You will be turning in additional information about the 10 specimens that you have in your collection, but you will be tested on ALL TERMS.

You do NOT need to identify the organism that you have collected, but you must apply the term to the specimen. Even though you may work with other students, remember that you are to turn in your own project.

COLLECTION You are to collect and identify 10 of the following items. If you choose, for example, the term "phloem", you must identify what the term means and specifically where it is on your specimen that contains phloem.

EX. *PHLOEM* (Your example could be a maple leaf, so place it with the other plants.)
"PHLOEM - the sugar-carrying tubes found within vascular plants - found within the veins of this leaf"

- **Separate your specimens by the kingdoms** in which they are found (all plants together, etc.).
- Some specimens may be used for more than one item, but all must be from something that you have found in nature.
- DON'T SPEND ANY (or very little) MONEY. Instead, have an idea of what the term means and in what organisms it can be found.
- Take a walk around your yard, neighborhood, and the city.
- Follow the attached "**Collection Rules**" and remember to collect only what you can use (OR SHARE WITH CLASSMATES).

There are several methods of preparing these items for display:
DRYING Spread the plant or item between several sheets of newspaper, place the newspaper beneath several AP Biology-sized books, and **wait a week.** The weight of the books will press out the water and the newspaper will absorb it. After drying, you can surround the leaf with waxed paper (iron it, but put a towel between the iron and the waxed paper), cover it with clear wrap or contact paper, or just tape/glue it onto your display.
ALCOHOL Place the item in a waterproof container and cover it with rubbing alcohol. Expect it to lose color.

Your collection should be easily transportable and it will be something that you will want to keep for the year. It will take me about two months to completely grade all the collections. Rotting specimens will result in a lower grade so please start yours early enough to preserve them. You do NOT need to collect an entire item if you only need a portion of it. (Ex. Only give a portion of a chicken egg if that is the specimen.)

COLLECTION RULES AND REGULATIONS: (Violations will result in lower grades.)

1. Only collect specimens that you can identify or intend to identify. If you are not sure, ***WAIT***. Research and identify it first and then collect. If you want me to help you, bring it up on one of the two indicated help days during the summer.

2. NEVER collect anything ***poisonous or toxic*** to man. You ***CANNOT*** use any harmful material in the project. If you do so, you risk a zero on your project. Be especially aware of POISON IVY. ("Leaves of three, let it be." The poison ivy vine is a hairy vines that grow around trees and along the ground.)

3. Always get ***PERMISSION*** from the owner of a property BEFORE you collect. If a property owner declines to give you permission, ***DO NOT COLLECT THERE***. Some organisms are fragile and are best left undisturbed. Look elsewhere or for another type of specimen. Remember that you are collecting mostly local, indigenous organisms ant that they can be found in many areas. If you are given permission, treat the property with respect. Take only what you and the owner agree that you can. **NEVER** believe anyone who tells you "to take whatever you want." Always let the owner know exactly what you are to collect. Leave the area as you found it.

4. Cut branches with scissors or cutters. ***NEVER*** break off a branch; it damages the plant.

5. Always collect with a partner or a friend. Don't go any place unfamiliar by yourself. Groups of three work the best.

6. Label the specimens on the spot. Take an ample supply of bags and tags to jot down names and notes.

7. ***ASK! ASK! ASK*** Most property owners are proud of their land and they are delighted to give you names, stories, and much, much more. Properly thank those people that help you.

8. ***DO NOT COLLECT ANY LIVE VERTEBRATES***.

9. Sometimes, parts of a specimen are all that you need.

10. ***SHARE*** your knowledge and specimens. This is designed to get you to look around your environment through the eyes of a biologists and ***it can be fun***. Learn now so the class will not be so overwhelming.

11. Turn in your own project. Remember that you may, however, work with a direct partner (someone that you share written information).

SPECIMENS:

- Remember that parts or remains of specimens can be collected.
- You are ***to define all 20 of these terms.***,
- You only need to ***collect 10 of them***.
- Choose the ones that you already know something about.
- Choose ones that you can easily collect.
- Put the number of the term by your specimen.
- SHARE!!

1. C4 plant
2. monocot
3. dicot
4. tap root
5. fibrous root
6. phloem
7. xylem
8. cuticle
9. embryo
10. fern
11. stomata
12. spore
13. carpel
14. dioecious
15. ovule
16. pollination
17. sepal
18. stamen
19. gymnosperm
20. angiosperm

Due Date: This assignment is due on the first day of school (unless otherwise approved). Please have it ready to turn-in and or present to your new classmates. I look forward to seeing the wonderful and creative products that are created. Enjoy and Learn.