

AP Biology Summer Assignment
Maryvale Preparatory Upper School - 2022/2023

Welcome to Advanced Placement Biology! I am excited to have you in my class this year as we explore the world in which we live. This course is designed to provide you with a foundational understanding of the systems and processes universal to life while also providing the opportunity to earn college credit. To make sure we start this year off prepared for success, you are expected to complete a three part summer assignment

Class Materials:

- One quad-ruled (graph paper) composition notebook. This will be your lab notebook for the year.
- Two college-ruled composition books. We will be using one per semester to create BILL (see below)
- Highlighters - pink, blue, and yellow.
- Colored pencils/pens are highly recommended
- AP Biology BIOZONE workbook

Part 1: Introduction Email - Due August 1st, 2022 (Yes, before school starts)

I want to get to know you a little bit before we start this year together. It is important to me that I know the types of things that interest you in science as well as the ways you enjoy learning in order to best be able to assist you in this class. Please write an email answering the following questions. Your email should be written in letter format; do not send me a numbered list with answers.

My email: hullingsh@maryvale.com

1. Your name – first and last. Do you prefer to be called anything else?
2. What grade will you be in during the 2022-2023 school year?
3. What AP classes have you previously taken?
4. What classes will you be taking this school year?
5. What is your favorite hobby or activity
6. What is your favorite candy or snack?
7. Summarize your family in one or two sentences.
8. Will you have a job during the school year? If so, where?
9. In what extracurricular activities will you participate this coming school year
10. Explain in a sentence or two why have you chosen to take AP Biology
11. Do you have any concerns and/or curiosities about taking AP Biology?
12. What are your plans after graduation?
13. What is one thing you would like to know about me? (I will answer in a reply to your email!)

Part 2: Set up your BILL (Biology Interactive Learning Log) for Semester 1!

Your BILL is going to be the most important tool you will have this year. As we go through the year we will be doing more than just taking notes, we will be engaging with the material. Every day in class we will add to our BILL by taking notes, solving practice problems, analyzing data, practicing FRQ and multiple choice and more! By the end of the year you will have created the most important resource for you to study for the AP exam. We will use one composition notebook per semester and you will need to have the first one prepared before the first day of class.

To Do Before School Starts:

- Decorate your cover
 - Your cover should, at minimum, contain your name written neatly and in permanent marker. I encourage you to create a collage or decorate your cover anyway that expresses who you are!
 - When you have completed the cover, seal it with clear packing tape to keep it extra sturdy.
- Number your pages.
 - Skip the first 10 pages in your notebook. We will use these pages for some basic tools and your table of contents.
 - Use pen (pencil will fade) and number pages (both front and back) on the top outside corner.

Bring your BILL with you on the first day of class!

Part 3: Summer Reading and Essay

AP Biology focuses on four big themes in biology. In order to familiarize yourself with these themes and to practice , you will be reading one book and composing a 2-3 page essay describing how each of these themes is portrayed in the book. I am providing a list of 6 books for you to choose from. However, if there is a book that is not on this list that you are interested in reading for your summer assignment, please email me the title of this book by August 1. This essay will be your first test grade and is due **Tuesday, September 6th**.

- *Your Inner Fish* by Neil Shubin
- *The Hot Zone* by Richard Preston
- *Survival of the Sickest* by Sharon Moalem
- *Jurassic Park* by Michael Crichton
- *Spillover* by David Quammen
- *Project Hail Mary* by Andy Weir

Essay Expectations

- Times New Roman 12pt font, 1 in margins, double spaced.
- At least one reference to the text per Big Idea. You may use direct quotes but make sure to identify page numbers.
- Direct quotes should not make up more than 10% of your paper.

Big Ideas (From the AP Bio CED):

BIG IDEA 1: EVOLUTION The process of evolution drives the diversity and unity of life. Evolution is a change in the genetic makeup of a population over time, with natural selection as its major driving mechanism. Darwin's theory, which is supported by evidence from many scientific disciplines, states that inheritable variations occur in individuals in a population. Due to competition for limited resources, individuals with more favorable genetic variations are more likely to survive and produce more offspring, thus passing traits to future generations. A diverse gene pool is vital for the survival of species because environmental conditions change. The process of evolution explains the diversity and unity of life, but an explanation about the origin of life is less clear. In addition to the process of natural selection, naturally occurring catastrophic and human-induced events as well as random environmental changes can result in alteration in the gene pools of populations. Scientific evidence supports that speciation and extinction have occurred throughout Earth's history and that life continues to evolve within a changing environment, thus explaining the diversity of life.

BIG IDEA 2: ENERGETICS Biological systems use energy and molecular building blocks to grow, reproduce, and maintain dynamic homeostasis. Cells and organisms must exchange matter with the environment. Organisms respond to changes in their environment at the molecular, cellular, physiological, and behavioral levels. Living systems require energy and matter to maintain order, grow, and reproduce. Organisms employ various strategies to capture, use, and store energy and other vital resources. Energy deficiencies are not only detrimental to individual organisms but they can cause disruptions at the population and ecosystem levels. Homeostatic mechanisms that are conserved or divergent across related organisms reflect either continuity due to common ancestry or evolutionary change in response to distinct selective pressures.

BIG IDEA 3: INFORMATION STORAGE AND TRANSMISSION Living systems store, retrieve, transmit, and respond to information essential to life processes. Genetic information provides for continuity of life, and, in most cases, this information is passed from parent to offspring via DNA. Non-heritable information transmission influences behavior within and between cells, organisms, and populations. These behaviors are directed by underlying genetic information, and responses to information are vital to natural selection and evolution. Genetic information is a repository of instructions necessary for the survival, growth, and reproduction of the organism. Genetic variation can be advantageous for the long-term survival and evolution of a species.

BIG IDEA 4: SYSTEMS INTERACTIONS Biological systems interact, and these systems and their interactions exhibit complex properties. All biological systems comprise parts that interact with one another. These interactions result in characteristics and emergent properties not found in the individual parts alone. All biological systems from the molecular level to the ecosystem level exhibit properties of biocomplexity and diversity. These two properties provide robustness to biological systems, enabling greater resiliency and flexibility to tolerate and respond to changes in the environment