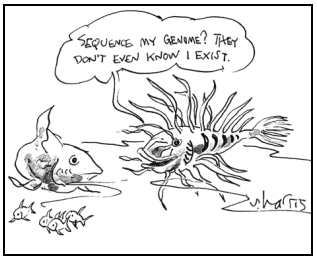
Welcome to AP Biology! ***Summer Assignment***



The AP Biology Curriculum centers around the **4 Big ideas** and **Science Practices** and you will need to not only know these but also understand how they are interconnected.

1. The process of evolution drives the diversity and unity of Life
2. Biological systems utilize free energy and molecular building blocks to grow, to reproduce, and to maintain dynamic homeostasis
3. Living systems store, retrieve, transmit, and respond to information essential to life processes
4. Biological systems interact, and these systems and their interactions possess complex properties

These **4 big ideas** are the framework for the **8 main units** of the course:

AP Biology Overview Video: https://youtu.be/Kuxic6y6pwkn
A great resource to use to review but also give you a good idea of what to expect from this course.

8 main units of the course

1. Chemistry of Life
2. Cell Structure and Function
3. Cellular Energetics
4. Cell Communication and Cell Cycle
5. Heredity
6. Gene Expression and Regulation
7. Natural Selection/Evolution
8. Ecology

The 4 AP Biology Big Ideas

Big Idea 1: *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: *Biological systems utilize free energy and molecular building blocks to grow, to reproduce and to 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: *Living systems store, retrieve, transmit, and respond to information essential to live 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: *Biological systems interact, and these systems and their interactions possess 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. Nothing in our world exists in isolation and even things such as disease and the evolution of disease are more complex than most realize.

Foundational Skills for AP Biology

Science Practices for AP Biology:
A practice is a way to coordinate knowledge and skills to accomplish a goal or task. The science practices enable students to establish lines of evidence and use them to develop and refine testable explanations and predictions of natural phenomena. These science practices capture important aspects of the work that scientists engage in, at the level of competence expected of AP Biology students.

- We will be using these Science Practices throughout the school year in this course.

AP Biology Science Practices:

- **Concept Explanation**
  - ♦ Explain biological concepts, processes, and models presented in written format.
- **Visual Representations**
  - ♦ Analyze visual representations of biological concepts and processes.
- **Questions and Methods**
  - ♦ Determine scientific questions and methods.
- **Representing and Describing Data**
  - ♦ Represent and Describe Data
- **Statistical Tests and Data Analysis**
  - ♦ Perform statistical tests and mathematical calculations to analyze and interpret data.
- **Argumentation**
  - ♦ Develop and justify scientific arguments using evidence.

Assignment: AP Biology Science Practices Graphic Organizer

You have been given a **Packet** that includes Graphic organizers about AP Biology Science Practices. You will use the Google presentations embedded in each section to complete this science practice packet.
These resources will also be linked in your teacher-specific Google Classroom.

The purpose of this assignment is to expose you to the knowledge needed to properly apply the science practices needed throughout the AP Biology course. We will review these organizers during the first week of classes and apply these concepts throughout the year. You will be assessed during the first month of school on these concepts.

Optional Enrichment opportunity: *Summer reading*

- *Survival of the Sickest* by Dr. Sharon Moalem.
  - Check out a DIGITAL FORM of the Use this Sora link to go directly to the book. If you are not signed into ClassLink you will be prompted to do so.
  - Many of the topics discussed in this book will be explored this year.

***For this summer assignment, and all future AP Biology assignments, you **must** abide by the **Academic Integrity Policy** (see last page).*

*A **signed copy** of the **integrity policy** **must be submitted** to your teacher at the beginning of the school year.*

Due Date: 9/4/2026

Academic Integrity Policy

Our school values academic integrity. Honest scholarly investigation is the cornerstone of our community's desire to promote the dignity of individual accomplishment.

Cheating or plagiarism on academic work will result in no credit for the material. Parents will be notified. An academic incident report will be filed with the student's school counselor and dean.

Academic dishonesty at Fairfield Public Schools is defined as, but not limited to:

a. Using or possessing unauthorized notes or electronic devices during a test or quiz.
b. Copying or possessing another student's work during summative assessments such as lab reports, projects, tests or quizzes.
c. Sharing answers during a test or quiz.
d. Giving information to others who have not taken the test or receiving information from those who have.
e. Copying another student's class work or homework or allowing your work to be copied.
f. Plagiarizing another person's work from any resource (periodical, book, the internet, etc.) and submitting it as one's own.
g. Plagiarism by paraphrasing or using parts of another person's work (ideas, text, images, etc.) without citing it as a source.
h. Using an electronic, computer-based, or internet site and/or program translator for the purpose of completing any written or oral class assignment.

LAB REPORT EXPECTATIONS:

All science courses require laboratory work as a part of the curriculum. This often involves students working together to complete the laboratory activity. A written lab report is turned in to the teacher with information regarding the procedure, data, and an analysis/conclusion based on the data gathered during the lab exercise.It is the expectation of the Fairfield Public Schools that ALL of the information included in a student's lab report ***except*** for the procedure and the raw data will be done independently by the student.

The purpose of the lab report is for each student to demonstrate his/her own understanding of the concept(s) used in the lab activity and the report should be treated just as any test or quiz would be.

Students are **NOT** permitted to "work together" on any parts of the lab report beyond the procedure and raw data.

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I have read and agree to abide by this academic integrity policy. _____ (Date)

_____ _____
(Student printed name) (Parent/Guardian printed name)

_____ _____
(Student signature) (Parent/Guardian signature)