# AP Biology Summer Project

Welcome to AP Bio! This is a college-level course intended to be the equivalent of an introductory biology class for science majors. This means two things for you: first, it will be a challenge and a lot of hard work for everyone, even students who pretty easily aced freshman biology, and two, we'll get to do a lot of cool things that we couldn't do in freshman biology. My goal as your guide is to do everything I can to prepare you for the AP test in May, but this class is not just about one exam. This is an opportunity for you to get a taste of the major fields of biology and build a foundation of knowledge and practical skill. I'm excited about what the year holds for us!

Four main themes, called "Big Ideas", form the foundation of the AP Biology curriculum. These ideas will provide the lens through which we view all of the phenomena we will encounter this year. The themes are as follows:

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| **Big Idea 1: Evolution**<br>The process of evolution drives the diversity and unity of life. |
| **Big Idea 2: Energetics**<br>Biological systems use energy and molecular building blocks to grow, reproduce, and maintain dynamic homeostasis. |
| **Big Idea 3: Information Storage and Transmission**<br>Living systems store, retrieve, transmit, and respond to information essential to life processes. |
| **Big Idea 4: Systems Interactions**<br>Biological systems interact, and these systems and their interactions exhibit complex properties. |

*You may find it useful to read the more detailed descriptions of each big idea. They can be found here, on page 24 in the pdf, section 2, entitled "Course Content".

Our summer project is meant to help you hit the ground running when we begin working together next Fall, and to get you in the practice of engaging with the living world in an active way, driven by your own curiosity. ***Please read over this entire document, as well as the linked rubrics, book choices, etc., before beginning, and email me with any questions.*** **ALL THREE TASKS MUST BE SUBMITTED BY FRIDAY, AUGUST 19TH, AT MIDNIGHT.** This is Friday of the first week back to school. Waiting until the end to begin your project is going to make you miserable and stressed, and that's no way to start a new school year, so please start chipping away sooner rather than later! This project will be our first grade, and it's a big one. In addition to priming you for the learning to come, submitting a completed project is a way to start your year off with a bit of a gradebook cushion.

Finally, resting and having fun are as important as anything else you'll do over the break. I hope you have a fantastic time with your family and friends this summer and can't wait to see you in the Fall!

Mrs. Miller
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**Task 1: Read a Book**

The purpose of this task is for you to practice reading about science with a critical eye and to learn more about the natural world and the people exploring it. You'll also in this task start practicing the writing skills you'll draw on in the free response portion of the AP test. To this end, you'll read a nonfiction book on a science topic that interests you and write a report that discusses the key ideas, examines the author's perspective and credentials, and ties what you read to one of our big ideas. You may notice that most of the choices are not strictly about scientific research, but include other things like history, politics, individual life stories and more. This is because science does not happen in a vacuum; to truly understand the power of scientific discovery, we need to view it in the context of the real world.

**Your report will include the following sections:**

- A summary of the major ideas put forth in the book
- A discussion of how the theme(s) of the book tie(s) into one of our AP Bio "big ideas"
- A discussion of the author's background and qualifications, and an examination of the sources cited
- A conclusion that includes your critique of the book and its main ideas

Please see the **attached list** for book choices and review the **attached rubric** before beginning your report. Reviewing the more detailed descriptions of the big ideas linked above may help you decide which concept is most closely tied to your book. I recommend following MLA format, but only require that your report is neat, organized, and easy to read.

*Reminder: This is an individual assignment. Plagiarism will result in a zero, so make sure that you're turning in your own work!*

**Task 2: Have an Experience**

The purpose of this task is for you to experience science outside of the classroom and start looking at the world from a biologist's perspective. Choose ***one*** of the following excursions, collect a few mementos, and write a brief description of how your experience is connected to a "big idea". **The specific locations listed for each type of experience are only ideas - you can visit any place that fits one of the categories and has a clear tie to the living world.** Please note that the submission products for this task differ slightly depending on the experience you choose. It's fine to go along with friends in the class to the same experience, but your submission choices and ½ page written response should be unique to you. Please see the **attached rubric** for this task to be sure you've completed it with excellence before submitting.

1. Go hiking, fishing, or camping

   Collect a **trail map or site brochure** if there is one on offer, or take a selfie with a trailhead sign or map. Take **five selfies** with interesting natural things you encounter. Choose one organism to **photograph and identify** using resources you find on the internet or in the library. Write a **short paragraph** about your chosen organism. Write a **½ page** description of how you recognized one of our big themes during your experience.

- There are too many amazing idea choices in our area to list for this one! I have no doubt that you can find a cool place to visit if you choose this experience.

2. Visit a Science Museum
   Collect a **ticket stub or receipt** from your visit to submit. Take **five selfies** with displays or exhibits that you found most interesting. Choose one exhibit to spend some extra time on, and share a **photo and a short description** of what you learned about it. (One brief paragraph will suffice.) Write a **½ page** description of how you recognized one of our big themes during your experience.
   - The Lawrence Hall of Science (Berkeley)
   - The California Academy of Sciences (San Francisco)
   - The Exploratorium (San Francisco)
   - The Tech Interactive (San Jose)
   - Truhlsen-Marmor Museum of the Eye (San Francisco)

3. Visit a Farm
   Collect a **ticket stub or receipt** from your visit to submit. Take **five selfies** with elements of the farm that you found most interesting. Choose one thing to spend some extra time on, and share a **photo and a short description** of what you learned about it. (One brief paragraph will suffice.) Write a **½ page** description of how you recognized one of our big themes during your experience.
   - Tara Firma Farm (Petaluma)
   - Slide Ranch (Muir Beach)
   - Garden Valley Ranch (Petaluma)
   - Redwood Hill Farm (Sebastopol)
   - McClelland's Dairy (Petaluma)
   - Woolly Egg Ranch (Mill Valley)

4. Visit an Aquarium, Zoo, or Animal Preserve
   Collect a **ticket stub or receipt** from your visit to submit. Take **five selfies** with the animal exhibits that you found most interesting. Choose one animal to spend some extra time on, and share a **photo and a short description** of what you learned about it. (One brief paragraph will suffice.) Write a **½ page** description of how you recognized one of our big themes during your experience.
   - Aquarium of the Bay (San Francisco)
   - Steinhart Aquarium at Cal Academy of Sciences (San Francisco)
   - Monterey Bay Aquarium (Monterey)
   - The Marine Mammal Center (Sausalito)
   - Safari West (Santa Rosa)
   - The Oakland Zoo
   - The San Francisco Zoo

**Task 3: Learn Some New Words**

Biology is an extremely "wordy" science. By the end of this year, you'll have a whole new language in your pocket! To get us started, you'll do a **scavenger hunt** to find items representing **20 terms** from the **attached list**. The purpose of doing it this way instead of just defining a long list of terms is to make a deep connection between each word and its meaning; the 20 words you pick for this task will be burned in your brain forever! Each term entry must include the following:

1. An original photo of the item that includes your proof object (See details below for info on this.)
2. A definition of the term
3. A one-sentence explanation of how the item you've chosen represents the term

Your submission can be in the medium of your choice (Google doc, slideshow, even hardcopy poster or booklet), but must meet the following standards:

1. **Original photos only.** The idea is for you to find examples of these concepts in your real life, not on the internet.
    - To ensure your photos are original, you'll include a ***proof object*** in each. This is a small object that's relatively unique, like a keychain, a little figurine, a piece of jewelry, etc.
    - ***Your completed submission must also include a selfie with you and your proof object.*** I recommend doing this early on, so you don't forget.
2. **Natural organisms only (living or dead).** A real rabbit you photograph outside or in a pet store is a great example of an r-strategist. Your little sister's rabbit stuffy is not.
3. **Your submission must be unique to you.** While there will be some overlap in term choices between students, and it's totally fine to go on a collection trip with some friends, this is not a task that you can divide and conquer.
4. **Be safe and respectful.** No organism should be harmed or removed from its natural habitat in service of your collection. For your own safety, don't touch any unfamiliar plants or animals. Any photos that show violation of these guidelines won't be graded.

Be sure to look over the **attached rubric** before submitting. Happy hunting!