

Welcome to AP Biology! This course is designed to be the equivalent to a two-semester introductory **college** course. It is **extremely** challenging but also **very rewarding!** I really want to start the school year off running, so I am asking you to do some preparation work over the summer.

First: I will use our school email to contact you throughout the school year. **I am asking you to send me (scott.theresa@whrsrd.org) an email from your school account by July 13, 2018.** Easy so far, right? ☺ In the email, please do the following:

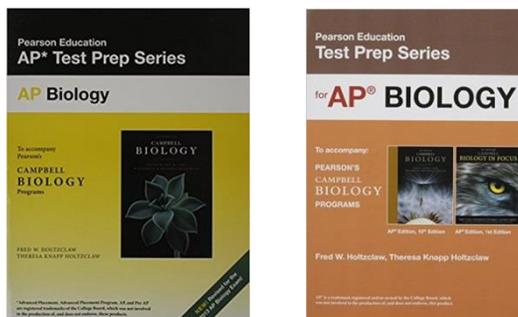
- In the subject line, put: **Your Name-AP Biology** (ex. Charles Darwin -AP Biology)
- In the body of the email, answer the following questions, in numerical order. They do not have to be in complete sentences.

1. Your name – first and last. Name you preferred to be called.
2. Will you be a Sophomore, Junior, or Senior in the 2018-2019 academic year?
3. What AP classes you have previously taken?
4. Have you taken Anatomy & Physiology or will you be taking that course this year?
5. List of AP Classes you will be taking during the 2017-2018 academic year.
6. All-time favorite hobby or activity?
7. Favorite candy or snack.
8. Favorite movie and why.
9. Will you have a job during the school year? If so where?
10. In what clubs and/or extracurricular activities will you participate this coming school year?
11. Explain in a sentence or two why have you chosen to take AP Biology.
12. Do you have any concerns and/or curiosities about taking AP Biology?
13. What are your plans after graduation?
14. If you had one million dollars that you had to give away, what would you do with it?

Second: I need you to register with our AP Biology Schoology Page.

1. Please go to <https://www.schoology.com/> and hover over the “Sign-up” in the upper right hand corner of the page.
2. Click on “Student”.
3. Enter in the access code TZJQT-V3R9W and then follow the instructions for becoming a member of the schoology page.
4. Please do this by JULY 13 as well.

Third: I am going to suggest that you purchase a test prep book. It will help you throughout the year. This link takes you to the one that corresponds to our AP Biology text. This book has great outlines of our chapters, test taking tips, and practice problems. It has gone up in price from \$20 to almost \$50 in the past year. **Below the book on the Amazon site**, there are links to other test prep books that are equally as helpful and less expensive. Again, this certainly isn't mandatory, but many students have found these review books helpful.
http://www.amazon.com/dp/0133458148/ref=pd_lpo_sbs_dp_ss_1?pf_rd_p=1944687622&pf_rd_s=lpo-top-stripe-1&pf_rd_t=201&pf_rd_i=0321698282&pf_rd_m=ATVPDKIKX0DER&pf_rd_r=185D0NGBBGFEZTZMX5PF



Forth: You must complete the summer assignments described on the following pages. These assignments are due **Friday August 31, 2018**. If you have any questions, please email me. I will be checking my email on a regular basis over summer break.

**Thank you for being a dedicated science student! Have a great summer!
I am looking forward to an excellent year!**

Mrs. Scott (scott.theresa@whrsd.org)

AP Biology is a fast-paced course that often requires learning a chapter or two a day from our textbook. To get you thinking about science and our AP curriculum over the summer, your summer assignment will involve reading those science frameworks and **HIGHLIGHTING** those topics **you remember well** from freshman year and **UNDERLINING** those topics **you do not**. This will be **Part 1** of your summer assignment.

Part 2 involves creating a journal of informational podcasts from a great science teacher, Mr. Paul Anderson of Bozeman, Montana. His website is www.bozeman.com. You should bookmark this site, as you will visit it **often** throughout the school year.

Part 3 consists of finding TWO Ted Talks: one that is inspirational in nature and another that interests you and relates to Ecology, our first unit of study.

Do not wait until the end of the summer to start these tasks! Please be sure to adhere to the required formats and remember that **ALL THREE parts of your summer assignment are due on Friday August 31**. The end of this document has a checklist of items to help keep you more organized!

Part 1 of 3: AP Biology Curriculum Connections

The AP Biology Curriculum is focused around 4 Big Ideas:

Big Idea 1: The process of evolution drives the diversity and unity of life.

Big Idea 2: Biological systems utilize free energy and molecular building blocks to grow, reproduce, and to maintain dynamic homeostasis.

Big Idea 3: Living systems restore, retrieve, transmit, and respond to information essential to life processes.

Big Idea 4: Biological systems interact, and these systems and their interactions possess complex properties.

Within each Big Idea there are several Enduring Understandings, which are described further into numerous Essential Knowledge concepts. The new organization of the curriculum provides students explicit benchmarks in the enduring of biology as a systematic science.

1. Look through the 4 BIG IDEAS **at the end of this document**. Please read through all of the Enduring Understandings and Essential Knowledge concepts.
2. **HIGHLIGHT** the concepts that **you remember WELL** from freshman year biology directly on the pages at the end of this packet.
3. **UNDERLINE (in red pen)** the concepts that you **have not heard of before or do not remember well** directly on the pages at the end of this packet.

Part 2 of 3: Creating a BOZEMAN JOURNAL

Visit the site www.bozemanscience.com/ap-biology/ and become familiar with Mr. Paul Anderson. We will be watching his excellent podcasts throughout the year. His website is organized according to the 4 Big Ideas of our curriculum and it has special sections for AP Biology Practices, Labs, and Supplemental Materials. As you are assigned podcasts to watch, you will create a “Bozeman Journal” that, at the end of the year, will be a great study guide to look back on for the AP Exam.

Your task, this summer, is to begin your “Bozeman Journal”. Get a bound composition notebook (pictured below). **Put Your Name, AP Biology, and Bozeman Journal on the FRONT COVER in permanent marker.** In your journal, you should use ONE PAGE for notes on ONE PODCAST. At the TOP of EACH PAGE you should clearly write the EXACT TITLE of the podcast you are taking notes on. Your notes should be what will help you remember the information from the podcast and may include drawings or equations. Over the summer, please watch and take notes on the following podcasts. You will be doing Unit 1 of podcasts over the summer to help get you introduced to the material that we will cover in Unit 1. It will be a good way to review material AND get the Bozeman Journal started without the stress of work from other classes and after school activities. **There are 25 podcasts for you to watch, so please start practicing your TIME MANAGEMENT NOW! This course requires you to be diligent about time management.** Do not wait to do all of these podcasts in one day at the end of August. Choose to do a few each week and space out the work so that it doesn't become overwhelming.



Under AP Biology Practices:

1. Models and Representations
2. Using Mathematics
3. Scientific Questioning
4. Data Collection Strategies
5. Analysis and Evaluation of Evidence
6. Scientific Explanations and Theories
7. Scales, Concepts, and Representations

UNIT 1: Chemistry of Life/Animal Behavior

Ch 39

- 11: Animal Behavior
- 026: Behavior and Natural Selection
- 040: Information Exchange
- Chi-square

Ch 40:

Under Biology

- Niche
- r and k selection

Under AP Biology

- 020: Biotic and abiotic factors
- 050: Populations
- Exponential growth
- Logistic growth

Ch 41:

Under Biology

- Communities
- Population variation
- Ecological succession
- Aposematic coloration

Under AP Biology

- 051: Ecosystem change
- 055: Biodiversity

Ch 42:

Under AP Biology

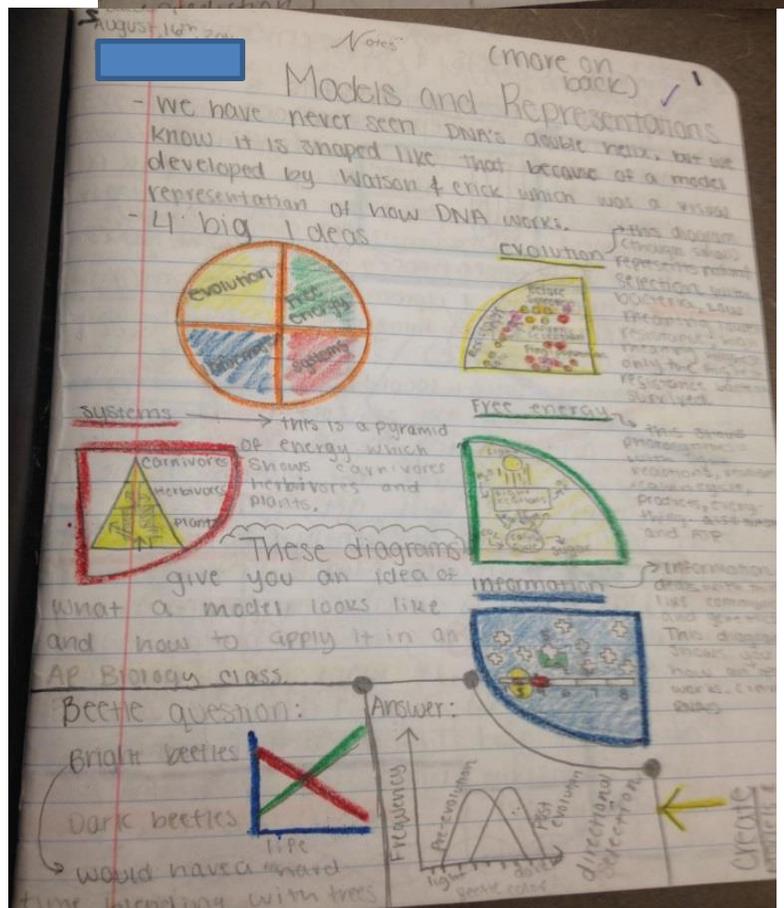
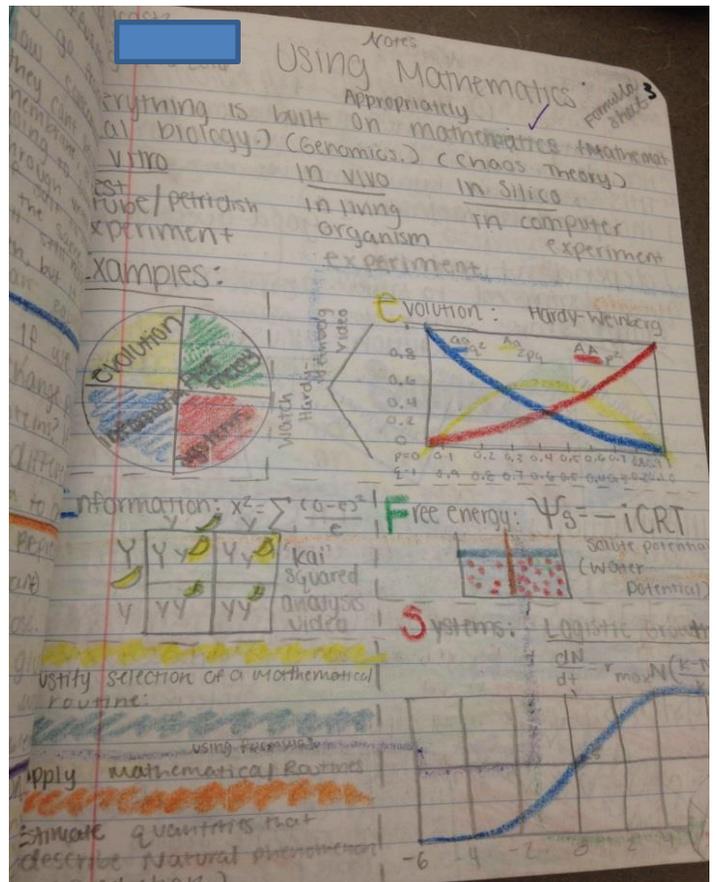
- 014: Environmental Matter Exchange

Ch 43:

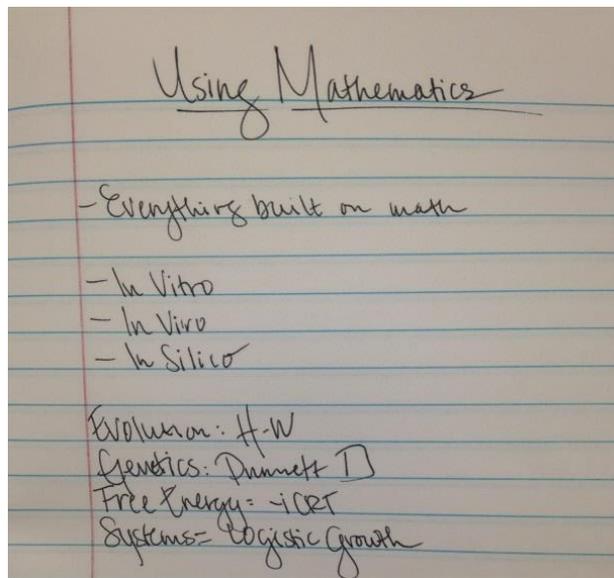
Under Biology

- Greenhouse Effect

Journal Entries should look like this:



NOT like this:



Please keep in mind that this is an AP class and there are *very high* expectations for your work. Take **PRIDE** in your Bozeman Journal. It will be a **STUDY GUIDE** that you create through the entire year to supplement what we are doing in class. Please see the examples above of what your journal should look like and what it should not. These are graded solely on an effort basis and if you want full credit, I expect to see a **GREAT** effort. The Bozeman Journal and your Chapter Reading Guides make up the BULK of your “homework” in this class. You will need to spend quite a bit of time outside of our class meeting time listening about, reading about, and writing about the material that we are working with in class.

Part 3 of 3: Ted Talk

This part of the summer assignment asks you to explore the TED web site (<http://www.ted.com/>) and recommend **TWO** talks for us to watch in class.

One talk must focus on **inspiration**. Imagine that this is something you would watch at the beginning of the school year that would inspire you to work as hard as you can, not just in AP biology, but in all of your classes. This talk does not have to be about science or school- it should be more about motivation and inspiration. One of my favorites (so you cannot choose it) is on GRIT and can be found here:

https://www.ted.com/talks/angela_lee_duckworth_grit_the_power_of_passion_and_perseverance

The other talk must focus on something to do with ECOLOGY, our first unit. It would be a TED TALK that could be shown at some point during unit and could relate to the AP Biology curriculum- especially Big Idea 4. In your paragraph (see below) be sure to explain where you could see this video fitting in during our study of ecology.

You must write at least a paragraph on each of the talks that you have selected. You should include the title and presenter of the talk, summarize the content of the talk, and explain why you chose that particular talk out of the thousands available (what about the talk spoke to or impacted you).

SUMMER ASSIGNMENT CHECKLIST

- Send Mrs. Scott (scott.theresa@whrsd.org) your introductory email by July 13, 2018.
- Sign up for our Schoology Page by July 13 as well.
- Familiarize yourself with the 4 Big Ideas, 17 Enduring Understandings, and 55 Essential Knowledge Concepts.
- Get a bound composition notebook and begin your **Bozeman Journal** as described in **Part 2** of your summer assignment. Be sure to watch all 25 podcasts and make sure that you have **ONE** podcast per page in your journal.
- Come up with and summarize your **TWO** Ted Talks- one inspirational and the other that pertains to Ecology.
- **Purchase a Test Prep Review Book.** This is **OPTIONAL**, but strongly recommended as it is a **GREAT** review and it will be **YOURS** to write in as we go over the material in our text.
- Go swimming and ride a bike.
- Be kind to a stranger.
- See a good movie on a rainy summer day.
- Sleep in *once* in a while (after all, school does start at 7:05...so sleeping until 9 is sleeping in).
- Do some chores around the house *without* being asked.
- Have fun!!
- Get ready for a year full of hard work, stress, learning, cool labs, lots of laughs, and awesome science!



Imagine
With all
YOUR mind.
Believe
With all
YOUR heart.
Achieve
With all
YOUR might.

AP Biology Concepts at a Glance

Big Idea 1: The process of evolution drives the diversity and unity of life.

Enduring understanding 1.A: Change in the genetic makeup of a population over time is evolution.	Essential knowledge 1.A.1: Natural selection is a major mechanism of evolution.
	Essential knowledge 1.A.2: Natural selection acts on phenotypic variations in populations.
	Essential knowledge 1.A.3: Evolutionary change is also driven by random processes.
	Essential knowledge 1.A.4: Biological evolution is supported by scientific evidence from many disciplines, including mathematics.
Enduring understanding 1.B: Organisms are linked by lines of descent from common ancestry.	Essential knowledge 1.B.1: Organisms share many conserved core processes and features that evolved and are widely distributed among organisms today.
	Essential knowledge 1.B.2: Phylogenetic trees and cladograms are graphical representations (models) of evolutionary history that can be tested.
Enduring understanding 1.C: Life continues to evolve within a changing environment.	Essential knowledge 1.C.1: Speciation and extinction have occurred throughout the Earth's history.
	Essential knowledge 1.C.2: Speciation may occur when two populations become reproductively isolated from each other.
	Essential knowledge 1.C.3: Populations of organisms continue to evolve.
Enduring understanding 1.D: The origin of living systems is explained by natural processes.	Essential knowledge 1.D.1: There are several hypotheses about the natural origin of life on Earth, each with supporting scientific evidence.
	Essential knowledge 1.D.2: Scientific evidence from many different disciplines supports models of the origin of life.

Big Idea 2: Biological systems utilize free energy and molecular building blocks to grow, to reproduce and to maintain dynamic homeostasis.

Enduring understanding 2.A: Growth, reproduction and maintenance of the organization of living systems require free energy and matter.	Essential knowledge 2.A.1: All living systems require constant input of free energy.
	Essential knowledge 2.A.2: Organisms capture and store free energy for use in biological processes.
	Essential knowledge 2.A.3: Organisms must exchange matter with the environment to grow, reproduce and maintain organization.
Enduring understanding 2.B: Growth, reproduction and dynamic homeostasis require that cells create and maintain internal environments that are different from their external environments.	Essential knowledge 2.B.1: Cell membranes are selectively permeable due to their structure.
	Essential knowledge 2.B.2: Growth and dynamic homeostasis are maintained by the constant movement of molecules across membranes.
	Essential knowledge 2.B.3: Eukaryotic cells maintain internal membranes that partition the cell into specialized regions.
Enduring understanding 2.C: Organisms use feedback mechanisms to regulate growth and reproduction, and to maintain dynamic homeostasis.	Essential knowledge 2.C.1: Organisms use feedback mechanisms to maintain their internal environments and respond to external environmental changes.
	Essential knowledge 2.C.2: Organisms respond to changes in their external environments.
Enduring understanding 2.D: Growth and dynamic homeostasis of a biological system are influenced by changes in the system's environment.	Essential knowledge 2.D.1: All biological systems from cells and organisms to populations, communities and ecosystems are affected by complex biotic and abiotic interactions involving exchange of matter and free energy.
	Essential knowledge 2.D.2: Homeostatic mechanisms reflect both common ancestry and divergence due to adaptation in different environments.
	Essential knowledge 2.D.3: Biological systems are affected by disruptions to their dynamic homeostasis.
	Essential knowledge 2.D.4: Plants and animals have a variety of chemical defenses against infections that affect dynamic homeostasis.
Enduring understanding 2.E: Many biological processes involved in growth, reproduction and dynamic homeostasis include temporal regulation and coordination.	Essential knowledge 2.E.1: Timing and coordination of specific events are necessary for the normal development of an organism, and these events are regulated by a variety of mechanisms.
	Essential knowledge 2.E.2: Timing and coordination of physiological events are regulated by multiple mechanisms.
	Essential knowledge 2.E.3: Timing and coordination of behavior are regulated by various mechanisms and are important in natural selection.

Big Idea 3: Living systems store, retrieve, transmit and respond to information essential to life processes.

<p>Enduring understanding 3.A: Heritable information provides for continuity of life.</p>	<p>Essential knowledge 3.A.1: DNA, and in some cases RNA, is the primary source of heritable information.</p>
	<p>Essential knowledge 3.A.2: In eukaryotes, heritable information is passed to the next generation via processes that include the cell cycle and mitosis or meiosis plus fertilization.</p>
	<p>Essential knowledge 3.A.3: The chromosomal basis of inheritance provides an understanding of the pattern of passage (transmission) of genes from parent to offspring.</p>
	<p>Essential knowledge 3.A.4: The inheritance pattern of many traits cannot be explained by simple Mendelian genetics.</p>
<p>Enduring understanding 3.B: Expression of genetic information involves cellular and molecular mechanisms.</p>	<p>Essential knowledge 3.B.1: Gene regulation results in differential gene expression, leading to cell specialization.</p>
	<p>Essential knowledge 3.B.2: A variety of intercellular and intracellular signal transmissions mediate gene expression.</p>
<p>Enduring understanding 3.C: The processing of genetic information is imperfect and is a source of genetic variation.</p>	<p>Essential knowledge 3.C.1: Changes in genotype can result in changes in phenotype.</p>
	<p>Essential knowledge 3.C.2: Biological systems have multiple processes that increase genetic variation.</p>
	<p>Essential knowledge 3.C.3: Viral replication results in genetic variation, and viral infection can introduce genetic variation into the hosts.</p>
<p>Enduring understanding 3.D: Cells communicate by generating, transmitting and receiving chemical signals.</p>	<p>Essential knowledge 3.D.1: Cell communication processes share common features that reflect a shared evolutionary history.</p>
	<p>Essential knowledge 3.D.2: Cells communicate with each other through direct contact with other cells or from a distance via chemical signaling.</p>
	<p>Essential knowledge 3.D.3: Signal transduction pathways link signal reception with cellular response.</p>
	<p>Essential knowledge 3.D.4: Changes in signal transduction pathways can alter cellular response.</p>
<p>Enduring understanding 3.E: Transmission of information results in changes within and between biological systems.</p>	<p>Essential knowledge 3.E.1: Individuals can act on information and communicate it to others.</p>
	<p>Essential knowledge 3.E.2: Animals have nervous systems that detect external and internal signals, transmit and integrate information, and produce responses.</p>

Big Idea 4: Biological systems interact, and these systems and their interactions possess complex properties.

<p>Enduring understanding 4.A: Interactions within biological systems lead to complex properties.</p>	<p>Essential knowledge 4.A.1: The subcomponents of biological molecules and their sequence determine the properties of that molecule.</p>
	<p>Essential knowledge 4.A.2: The structure and function of subcellular components, and their interactions, provide essential cellular processes.</p>
	<p>Essential knowledge 4.A.3: Interactions between external stimuli and regulated gene expression result in specialization of cells, tissues and organs.</p>
	<p>Essential knowledge 4.A.4: Organisms exhibit complex properties due to interactions between their constituent parts.</p>
	<p>Essential knowledge 4.A.5: Communities are composed of populations of organisms that interact in complex ways.</p>
	<p>Essential knowledge 4.A.6: Interactions among living systems and with their environment result in the movement of matter and energy.</p>
<p>Enduring understanding 4.B: Competition and cooperation are important aspects of biological systems.</p>	<p>Essential knowledge 4.B.1: Interactions between molecules affect their structure and function.</p>
	<p>Essential knowledge 4.B.2: Cooperative interactions within organisms promote efficiency in the use of energy and matter.</p>
	<p>Essential knowledge 4.B.3: Interactions between and within populations influence patterns of species distribution and abundance.</p>
	<p>Essential knowledge 4.B.4: Distribution of local and global ecosystems changes over time.</p>
<p>Enduring understanding 4.C: Naturally occurring diversity among and between components within biological systems affects interactions with the environment.</p>	<p>Essential knowledge 4.C.1: Variation in molecular units provides cells with a wider range of functions.</p>
	<p>Essential knowledge 4.C.2: Environmental factors influence the expression of the genotype in an organism.</p>
	<p>Essential knowledge 4.C.3: The level of variation in a population affects population dynamics.</p>
	<p>Essential knowledge 4.C.4: The diversity of species within an ecosystem may influence the stability of the ecosystem.</p>