

Congratulations! You have registered for AP Biology for the following school year. You will learn an extensive amount about the living world around you and I am proud of you for signing up for this challenging course. AP biology is a very rigorous course designed to introduce you to one of the most fascinating and useful of all modern sciences. Due to the large amount of material that needs to be covered during the year, a summer reading/research assignment is essential. This summer assignment will take you through many parts of the course and introduce you to many of the topics that we will visit this year. The summer work will be broken up into various parts, make sure to complete all of the summer work and to send in all the parts on the appropriate due dates.

A few notes about the design of the course.

1. We will have approximately 6-7 mandatory labs that will be scheduled after school or Saturday mornings. We have more labs than we can fit into the A/B class schedule so this scheduling is necessary.
2. In order to receive AP credit (college credit) for this class you must take, and pass the AP exam. This exam does cost around 95$, so be aware that the fee for the exam is your responsibility.
3. I use a semi-flipped classroom model. The idea is that you will watch videos of lectures and such at home and spend more time in class working on assignments, activities, and labs. This means you must be self-motivated to stay caught-up on the “lecture” material. I hope that this provides you the opportunities to go through lectures and notes at your own pace and to have time to ask questions in class.

Also, you may want to look into purchasing an AP Biology prep book: Princeton Review, Barron’s, 5 steps to a 5 and Kaplan are all very respected sources. Just make sure to get the most recent edition since the format of the biology exam changed starting with the 2013 exam. Many students find these books extremely helpful.

If you have any questions, please don’t hesitate to send me an email. I will check that often during the summer. I can reply via email or call you if necessary. I look forward to seeing you all in the fall! Finally, sign-up for Remind 101 by texting @cchsapbio to 801-430-9678.

Sincerely, Mr. Smikahl

AP Biology Summer Assignment

Teacher: Mr. Smikahl  kenneth.smikahl@canyonsdistrict.org

The major purpose of this summer assignment is to introduce you to the wide spectrum of modern biology and to familiarize you with the textbook content and other relevant resources that may be used throughout the year. The book contains A LOT of information. We don’t have enough class time to spend on all topics covered in the book therefore there needs to be a summer reading project to cover some topics we might not have enough class time to reach. Don’t overlook the illustrations, charts and graphs they can be very helpful. For this summer assignment, you will be using the book PowerPoint presentations so you don’t have to lug the textbook around with you all summer!

Do a good job on this assignment. The grade can be a big boost to your first quarter grade and it will also be a good review guide for the AP exam next spring. This should also be a good chance for you to brush up on what you learned in a general or honors biology course. A full description, including step by step instructions, for each part of this summer assignment can be found under the “summer” tab on the class website, <http://www.cornercanyonapbiology.weebly.com>

Part # 1 – Student Information Sheet, email me ASAP but no later than – July 1st

Part # 2 – Digital Scavenger Hunt – 40 digital pictures with word and description, Due – August 1st, make a PowerPoint or Prezi. I will post a link to your PowerPoint or Prezi on the class website, <http://www.cornercanyonapbiology.weebly.com>, under the “summer” section. This will give you a chance to enjoy some of your classmates’ assignments as well.

Part # 3 - Review 2 topics of concern from your previous biology class on [www.bozemanscience.com.](http://www.bozemanscience.com)  We will use videos from this site frequently throughout the year. They are very well done and to the point. Email your summary and a link to the video to me. Due – August 5th

Part # 4 – Preview the AP Central Website. <https://apstudent.collegeboard.org/apcourse/ap-biology>

Part # 5 – Gather materials for next year.

Part # 6 – Book Exploration – Due 1st day of class

In the book exploration, all questions must be hand written in your own handwriting. A copy of the questions are available for download on the class website (under the “summer” tab). Download and save the questions, then make spaces between each question so that you have enough room to answer the questions in your own handwriting. Place these pages in the front of your 3-ring binder.

**AP Biology – Student Information Sheet, Part #1**

Email me the questions along with your answers by July 1st.

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Email address: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Why did you sign up to take AP Biology?

What do you hope to accomplish/gain?

What are your personal strengths when it comes to learning new material?

What causes you to struggle in a course?

What is the most effective way for you to prepare for a test?

Was there anything that you liked or disliked about your earlier biology class?

What are you looking forward to the most in AP Biology?

What are you most anxious about in AP Biology?

What are your plans after graduating from high school?

Taking AP Biology is mostly intended for those students that hope to pursue a career in the sciences at college. Do you plan to pursue a science field in college and if so what do you want to study in college and why?

If you don’t plan on pursuing a science degree what degree to you plan on getting in college and how do you think AP Biology will help you in your future?

I find those that do well in AP Biology, and take AP Biology, are those students who love the sciences. What do you love about science?

Don’t worry! There is no right or wrong answer... be honest so that I can figure out the best way to help you next year!

**Digital Scavenger Hunt, Part #2**

Email me your Presentation by August 1.

Listed below is a list of some important terms in the AP Biology curriculum. You must select 40 of these terms to use in your project.

You will need to take an ORIGINAL PICTURE of an example of the term and describe how your image fits the definition of the term and the function or use that item has in nature. It is better to be specific and detailed about your term and associated picture than to give a blanket statement about the term. In order for the picture to an original, you must place an item that you own, like a picture of yourself, cell phone, ring, or your own face, beside the item you are photographing. It should also include the date that the picture was taken. You may choose any of the words below for your 40 pictures. Though some pictures may be applicable to more than one term, use a picture only once in your project. You may turn them in as a PowerPoint Presentation or any other digital presentation tool you may have such as Prezi or Google Docs.

**Examples:**

If the vocabulary word is an internal part to an organism, such as “tendon”, you don’t have to dissect your little brother’s Achilles Tendon and take a picture of it. A photo of his heel, and a description of the function of the tendon in that organism would suffice.

If you choose the term “phloem,” you could submit a photograph you have taken of a plant leaf or a plant stem and then explain what phloem is and specifically where phloem is in your specimen.

**Original pictures only!** You cannot use an image from any publication or the web. You must have taken the photo yourself.

**Natural items only!** Take a walk around your yard, neighborhood, and town.  Don’t spend any money on anything. Research the term and in what organisms it can be found in, and then go out and find one!

Terms:

|  |  |  |  |
| --- | --- | --- | --- |
| Adaptaion of an animal | Adaptation of a plant | Amniotic egg | Abiotic Factor |
| Angiosperm | Anther and Filament | Artificia Selection | Archaea |
| Autotroph | Axon | Behavior in Animals | Biogeochemical Cycle |
| Binary Fission | Biotic Factors | Biological Species Concept | Biotechnology |
| Cellular Respiration | Calvin Cycle | Carbohydrates | Carpels |
| C4 Plant | CAM Plant | Chloroplast/Chlorophyll | Commensalism |
| Competition | Controlled Experiment | Conservation Biology | Convergent Evolution |
| Decomposer/Detritovore | Density Dependent Facors | Density Independent Factors | Diffusion |
| Diploid Chromosome Number | DNA | Ecosystem | Endotherm |
| Enzyme | Eukaryote | Endocrine System | Feedback Inhibition |
| Fermentation | Fitness | Food Web | Gametophyte |
| GMO Genetically Modified Organism | Glucose | Gymnosperm | Haploid chromosome Number |
| Homeostasis | Heterotroph | Immune System | K-strategist |
| Lipid | Logistic Growth | Mutualism | Mutation |
| Mitosis | Monomer | Natural Selection | Nervous System |
| Niche | Osmosis | Parasite | Protist |
| Pollen | Prokaryote | Protein | pH |
| Pharming | Phloem | Photosynthesis | Population |
| Polymer | Qualitative Data | Quantitative Data | Recombination |
| Reproductive isolation | Restoration Ecology | r-strategist | Solution |
| Spore | Sporophyte | Stoma (Stomata) | Signal Transduction Pathway |
| Succession | Surface Tension | Taxis | Territorial Behavior |
| Tissue | Transpiration | Trophic Level | Unicellular Organism |
| Vascular Bundle | Water Potential | Water, Properties of | Xylem |

**2 Topics for Review, Part #3**

Email me your summary by August 5

Pick 2 topics from your previous biology course that you didn’t quite understand or that you struggled with. Go to bozemanscience.com and select AP Biology or Biology. He has very good explanations of all biology topics. This will be a useful resource for you throughout the year. Bookmark his page so you can access it during the school year. Find two videos of the biology material you struggled with last year, watch them, and for each video, answer the following:

Which video did you watch?

Did this help you understand the topic better?

Write a one paragraph explanation about the topic you watched.

**AP Central Website Preview, Part #4**

Email me questions by August 15

You should peruse the AP central website and read the course description to learn about the topics we will cover in AP biology. There is also a description of the format of the AP Biology Exam.

Go to <https://apstudent.collegeboard.org/apcourse/ap-biology>

1. Read over the Full Course Overview. This will introduce the 4 Big Ideas, the Essential Knowledge Statements, and The Scientific Practices you will be learning about next year.

2. Click on AP Biology Course and Exam Description. Here you can preview some information on the format of the AP Exam and some of the questions that have been asked in the past. Email me by August 15th, which types of questions you think you will struggle with on this exam? Which type of questioning is different from those you have seen in the past?

**Gather Course Materials, Part #5**

Have ready for the first day of class.

Please get all the materials you will need for next year ready for the first day of school. Here is what you will need to be successful in our AP Biology class:

1. A 3 inch 3-ringed binder
2. Colored pencils
3. Dividers – summer work, lecture notes, labs, syllabus
4. Not necessary but very helpful – the review guide books such as Princeton review or Kaplan. Some of my students last year really liked the Princeton Review Book. You will get a review book from our textbook author in the fall with your textbook.

**Chapter Explorations, Part 6**

Due first day of class, August 20

Start each new unit on a new page. Place all work in your 3 ring binder. This will make for a nice study guide for the AP Exam. The Questions are available for download on the class website, [www.cornercanyonapbiology.weebly.com](http://www.cornercanyonapbiology.weebly.com) (look under the “Summer” tab. Download the questions, and make spaces between each question so you have enough space to handwrite your answers. Make each bold heading a new page. Punch holes in these sheets and place them in your 3 ringed binder under the heading “Summer Work”.

The assignments in the chapters are not meant to be inclusive of all the major topics that we will discuss in class this year. However, the assignment will give you an overview of the field of biology and your textbook. To access each chapter PowerPoint, click on the “Campbell Biology” tab on the class website, then click on the PowerPoint link.

**Unit 1: Biochemistry**

Ch. 1 - In a nice concise paragraph how would you define life based on the information you read in chapter 1?

Ch. 2 – Pick an element that is found in all living things, and describe the number of protons and electrons it has. Describe what type(s) of bond this element likely makes in living organisms.

Ch. 3 – Use illustrations to describe how the structure of a water molecule allows it to form hydrogen bonds with other water molecules.

Ch. 4 - We are called “carbon based life forms” what about the carbon atom makes it an ideal atom to form the “backbone” or skeleton for most biological compounds?

Ch. 5 Fill in the blanks in the table describing the 4 main groups of organic compounds in living things.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Compound | Carbohydrates | Lipids | Proteins | Nucleic Acids |
| Atoms found in all members of this group |  |  |  | C,H,O,N,P |
| Major purposes |  | Long term energy storage, regulation | Regulation, transport, protection, structural support |  |
| Examples | Sugars, starches, cellulose, chitin |  |  |  |

**Unit 2 – Cells, Cell Transport, and Cellular Communication**

Ch. 6 – Describe the similarities and differences between prokaryotic and eukaryotic cells. Then, select 3 eukaryotic cell organelles that you think you will enjoy studying. For each one, draw and explain the function of this organelle and tell what you find most interesting about it.

Ch. 7- Describe the differences between passive and active transport. For each of these types of cell transport, describe several different examples.

Ch. 11 – List and define the three basic parts of a signal transduction pathway.

**Unit 3 – Cellular Energetics**

Ch. 8 – What is metabolism? Describe how ATP and enzymes are related to metabolism.

Ch. 9 – In your own words, describe the major purpose of cellular respiration. Also, find a website that describes a lab activity that could be used to study the rate of cellular respiration. Select a site and an activity that is something that you understand and that would be appropriate for high school or younger students. Briefly describe the activity and be sure to include the website address in your answer.

Ch. 10 – Describe the importance of photosynthesis to life on Earth. Draw a diagram depicting the Light Reactions of Photosynthesis.

**Unit 4 – Genetics, DNA Replication, and Protein Synthesis**

Ch. 12/13– Describe how cancer and the cell cycle are related.  Compare and contrast Mitosis and meiosis. What is the main purpose of crossing over and independent assortment? What is apoptosis? Give an example of its use in humans.

Ch. 14/15 – Review Genetics vocabulary, answer the following questions.

Dihybrid cross two parents both heterozygous for two different traits. What are the chances their baby will be recessive for both traits?

What is gene linkage? And how does this disprove some of Mendel’s (Father of Genetics) research?

Ch. 16 /17- (you should know DNA, RNA, Replication, Transcription, Translation) if you didn’t understand these topics read these chapters and go to Bozemanscience.com and watch his videos on these topics.

**Unit 5 – Molecular Biology**

Ch. 18 – What is gene expression? (This is a major concept in AP Biology)

How do prokaryotes regulate gene expression? Draw a picture of an operon. How is eukaryotic gene transcription regulated? How is eukaryotic gene expression regulated after transcription? (Summarize, we will cover details later.

Ch. 20 - This chapter describes a number of research techniques that are used to study genetics and DNA. Describe ONE of these techniques and describe what types of things we can learn from using this technique.

**Unit 6 - Evolution**

Ch. 22 - This is the introductory chapter for the evolution unit. Look through the topics covered in this chapter and describe the ones that you think will be most interesting to study. Explain your choices.

Ch. 23 – What 5 conditions must be met for a species to be in genetic equilibrium?

Ch. 24 – How do new species arise?

Reproductive isolation is one of the major processes that keeps species separate from each other. Distinguish between pre- zygotic and post-zygotic barriers that contribute to reproductive isolation and provide an example of each.

Ch. 25- Describe how scientists think the first eukaryotic cells were formed (endosymbiosis theory)

Ch. 26 – What is phylogeny? How does phylogeny related to classification?

**Unit 7 – Animal Systems and Behaviors**

Ch. 40 – Briefly describe and give an example of negative feedback and positive feedback.

Ch. 43, 45, and 48 – Peruse through these chapters on the immune system, endocrine system, and nervous system.

For each chapter, briefly describe the purposes and major structures of the body systems featured.

**Unit 8 - Plant Functions and Reproduction**

Ch. 35 – Briefly describe the role of transpiration in plants. What are the effects of humidity, wind, and temperature on transpiration?

Ch. 38 – Describe the concept of Double Fertilization in angiosperms. What structure do angiosperms have that other plants lack?

**Unit 9 – Ecology**

Ch. 52-56

Ecology is the study of interactions between organisms and the environment. These interactions are critical to keeping us alive. Look through each chapter and list the single section within each chapter that you think is the most important concept in the chapter (for each chapter, write the chapter and the section number. (i.e. 55.3)