

# AP BIOLOGY

Congratulations! You have registered for AP Biology for the following school year. I am excited about the number of people requesting this class next year. This class promises to be a great one and you will learn an extensive amount 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 textbook 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 hand in all the parts on the appropriate due dates.

Your attendance at the formal introduction meeting is **mandatory**, as it shows me and administration that you want to take this class. Failure to attend the meeting may result in your deregistration from the class.

The purpose of this meeting is to discuss the following:

1. You will receive your summer assignment. All AP classes require summer work and I want to make sure you understand the importance of this work, as failing to thoroughly complete it will result in your dismissal from this class.
2. To discuss the after school component of this class. This class requires that you stay after school for **9<sup>th</sup> period each Wednesday**. This is a mandatory lab and athletics, work, or any other commitment may not take precedence.
3. In order to receive AP credit for this class you **must take the AP exam**. This exam does cost around 90\$, so be aware that the fee for the exam is your responsibility.
4. I want to give you a brief overview of all the wonderful things you will learn next year.
5. Who will benefit the most from taking AP biology?

Also, you should 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 at least the 2017-2018 addition or the most recent edition since the biology exam has changed. Many students find these books extremely helpful.

If you have any questions prior to the end of the school year, please stop in and see me in room 116.

Looking forward to seeing you all soon.

Sincerely,

MR. DAGOUNIS

## AP Biology Summer Assignment

Teacher: Mr. Dagounis [ddagounis@rpsd.org](mailto:ddagounis@rpsd.org)

Summer Assignments: Start the summer assignments early and do not try to do the whole project at one time.

I absolutely **do NOT** want to see identical work from any students!

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.

Do a good job on these assignments. 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. The textbook is big and heavy. It is a very well written book, though, and the students who read carefully can and do learn quite a bit. Don't overlook the illustration, charts and graphs they are very helpful. (The AP Exam is HUGE on Reading, interpreting graphs and Data!)

Part # 1 – Digital Scavenger Hunt – 30 digital pictures with word and description, Due – **August 1st**, make a **PowerPoint or better yet create a video!** Email me your final copy to [ddagounis@rpsd.org](mailto:ddagounis@rpsd.org), if your file is too big to be emailed, save your google documents or office 365 and then send me a link so that I can access your presentation. **NO excuses for NOT** having your presentation posted by August 1<sup>st</sup>. Your username is your email address you signed up with and your own password.

Part # 2 – While you are conducting your digital scavenger hunt, search for something observable that you can collect data, create graphs, and analyze that data.

Bozeman Science Data collection Strategies

<http://www.bozemanscience.com/apb-practice-4-data-collection-strategies>

Part # 3- **Bozemanbiology**, bookmark this link. <http://www.bozemanscience.com/ap-biology/>

Videos- AP Biology –

Watch the following Videos – Take notes on Each section/ my suggestion use the Educational Resources as a guideline or just answer those questions that are there. (I'm not assigning them, these questions would be a tremendous help

### **Big Idea 1: Evolution**

001-Natural Selection

003- Genetic Drift

005 – Essential Characteristics of Life

006- Phylogenetic

010 – Abiogenesis

**Big Idea 2: Free Energy**

012 – Life Requires Free energy

013 –Photosynthesis and Respiration

016 – Transport across Cell membranes

018 Positive and Negative Feedback loops

025 Development: Timing and Coordination

**Big idea 3: Information**

027 DNA and RNA part 1

027 DNA and RNA part 2

028 Cell Cycle, Mitosis/Meiosis

032 Signal Transmission

038 Signal Transduction in Pathways

041- The nervous system

**Big Ideas 4: Systems**

048- Enzymes

Pick 3 Bozeman Videos Not on the list above about topics you learned in Biology but you didn't really understand- and take notes.

**If you are coming from a CP Biology Class- you will be a disadvantage to those coming from an Honors class, you might want to Review Multiple Videos!! Definitely review – Ap Biology Practice videos!**

**This will be due the First Day of School**

Part # 4 – Gather materials for next year.

Part # 5 – Book Exploration – **Due first day of school**

In the book exploration, all questions must be hand written in your own handwriting. This ensures that you did all the work on your own. A copy of the questions are available for download on the class website, download and save the questions and make spaces between each question so that you have enough room to answer the questions in your own handwriting. (If you need more space add it on the back). Punch holes in these pages and place them in the front of your 3-ring binder under the heading summer work).

### **Digital Scavenger Hunt**

#### **Part #1**

Listed below is over one hundred important terms in the AP Biology curriculum. You must select **30** of these terms to use in your summer work. Due August 1<sup>st</sup> submitted to [ddagounis@rpsd.org](mailto:ddagounis@rpsd.org). If your attachment is too large to send via email, send me a link to your office 365 document so I may access your work.

You will need to take an **ORIGINAL PICTURE** of an example of the vocabulary word and describe how your image fits the definition of the vocabulary 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 be original, you must place an item that you own like a picture of yourself, cell phone, ring, or your own face beside that of the picture. 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 Power Point Presentation, video blog would be great! Record yourself explaining the item you found! or any other digital presentation tool you may have such as Prezi.

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 what the tendon does would suffice, but you must apply the term to the specimen you find and briefly explain in your document how this specimen represents the term.

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 in your document 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:** Research what the term means and in what organisms it can be found and then go out and find one!

Again **don't spend any money**- use your cell phone camera, camera or borrow someone's.

Terms:

- |                                   |                                      |                                   |                                     |
|-----------------------------------|--------------------------------------|-----------------------------------|-------------------------------------|
| 1. adaptation of a animal         | 2. Adaptation of a plant             | 3. abscisic acid                  | 4. actin                            |
| 5. amniotic egg                   | 6. amylase                           | 7. angiosperm                     | 8. animal that has a segmented body |
| 9. annelid                        | 10. anther & filament                | 11. arthropod                     | 12. archaeobacteria                 |
| 13. autotrophs                    | 14. auxin producing area of a plant  | 15. basidiomycete                 | 16. batesian mimicry                |
| 17. biological magnification      | 18. bryophyte                        | 19. C 4 plant                     | 20. Calvin cycle                    |
| 21. carbohydrate-fibrous          | 22. cambium                          | 23. cellulose                     | 24. chitin                          |
| 25. chlorophyta                   | 26. cnidarian                        | 27. coelomate                     | 28. conifer leaf                    |
| 29. commensalism                  | 30. connective tissue                | 31. cuticle layer of a plant      | 32. deciduous leaf                  |
| 33. deutersome                    | 34. dicot plant with flower          | 35. diploid chromosome number     | 36. echinoderm                      |
| 37. ectotherm(ic)                 | 38. endosperm                        | 39. endotherm(ic)                 | 40. enzyme                          |
| 41. epithelial tissue             | 42. ethylene                         | 43. eubacteria                    | 44. eukaryote                       |
| 45. exoskeleton                   | 46. fermentation                     | 47. flower ovary                  | 48. frond                           |
| 49. fruit-dry with seed           | 50. fruit-fleshy with seed           | 51. gametophyte                   | 52. gastropod                       |
| 53. genetically modified organism | 54. gibberellins                     | 55. glycogen                      | 56. gymnosperm cone                 |
| 57. haploid chromosome number     | 58. heartwood                        | 59. hermaphrodite                 | 60. insect                          |
| 61. K-strategist                  | 62. keratin                          | 63. leaf-gymnosperm               | 64. Lepidoptera                     |
| 65. lichen                        | 66. lignin                           | 67. lipid used for energy storage | 68. littoral zone organism          |
| 69. long-day plant                | 70. meristem                         | 71. modified leaf of a plant      | 72. modified root of a plant        |
| 73. modified stem of a plant      | 74. monocot plant with flower & leaf | 75. muscle fiber-striated         | 76. mutualism                       |
| 77. mycelium                      | 78. mycorrhizae                      | 79. myosin                        | 80. nematode                        |
| 81. niche                         | 82. nymph stage of an insect         | 83. parasite                      | 84. parenchyma cells                |
| 85. protist                       | 86. pine cone                        | 87. platyhelminthes               | 88. pollen                          |

89. pollinator	90. porifera	91. prokaryote	92. protein-fibrous
93. protein-globular	94. protosome	95. pteridophyte	96. r-strategist
97. radial symmetry	98. rhizome	99. scale from an animal with two chamber heart	100. spore
101. Taxis			
102. Unicellular organism	103. vascular plant tissue	104. xerophytes	105. xylem

## Part #2 Simple Research/Data collection/Charting/Analyzing

*Example: I observe mushrooms growing in my backyard.*

*5 mushrooms in the morning, 10 the next morning, 14 the next morning.* –Make a chart/graph

I check the same patch of mushrooms during the afternoon and evening of each night and there isn't any mushrooms growing. –Make sure this information is charted as well

Gather information on conditions as well, (chartable) Temperature, humidity, rain etc.

Afterwards, analyze all your data, what does your data say?

(Charts and graphs is data, it is not analyzed data).

## Part # 3 Watch Bozeman Videos

Watch the Video and Take notes/ Notice at the bottom of each video is a link to **EDUCATIONAL RESOURCES**- THIS IS A GOOD WAY TO DIRECT YOUR NOTE TAKING FOR THESE VIDEOS!

DUE THE FIRST DAY BACK TO SCHOOL!

**Chapter explorations/Bozeman Video** – This information would be a good guideline for your Bozeman Video Notes!! You do not need to answer the following questions but exploring these chapters and using them as a guide for your Bozeman video Notes would be a huge benefit to you!

### Unit 1: the science of life and its chemical basis

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

Ch. 2 – Use illustrations to describe how the structure of a water molecule allows it to form hydrogen bonds with other water molecules.

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

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

Ch. 5 – 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. 6- Describe the differences between passive and active transport. For each of these types of cell transport, describe several different examples.

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

### Cellular Respiration and Photosynthesis

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 Reaction of Photosynthesis.

Ch. 11 – 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. (Might need to use the internet to answer this question)

## Genetics

Ch. 12 – 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?

What are the effects of genes outside the nucleus?

## DNA

Ch. 13 and 14- (you should know DNA, RNA, Replication, Transcription, Translation) if you didn't understand these topics read these chapters and go to Bozemanbiology on youtube and watch his video's.

Ch. 16 – What is gene expression? **(This is a major concept in AP Biology)**

How do viruses regulate their gene expression?

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?

Ch. 18- 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.

## Evolution

Ch. 21- This is the introductory chapter for this 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. 22 – What is phylogeny?

How does phylogeny related to classification?



Ch. 23 – 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.

### **The Evolution of diversity**

Ch. 26- Describe how scientists think the first eukaryotic cells were formed (endosymbiosis theory)

Prokaryotes can have both harmful and helpful impacts on humans. List and describe 2 harmful and 2 helpful impacts.

Ch. 27- Protists are the most nutritionally diverse of all eukaryotic organisms. Describe some of the methods by which different protists get their food.

Ch. 28-29 Members of the plant kingdom range from very simple to very complex organisms. Order these groups of plants from simplest to most complex and give a brief description of each group as well as at least one example of each group: angiosperm, bryophyte, gymnosperm, pterophyte.

Ch. 30 Fungi are heterotrophs that feed by absorption and they are very important to humans. Name and describe 2 types of pathogenic fungi and 2 beneficial uses of fungi.

Ch. 32- What is a protostome?

Ch. 33- What is a deuterostome?

### **Ch. 34-39 Plant form and function**

Look through these 6 chapters and find TWO sections (i.e. Section 35.2) that you think you will enjoy studying. Briefly describe this section and explain why it appeals to you. You only need to find 2 within the 6 chapters. Not 2 per chapter.

### **Chapters 40-53 Animals: form and function**

Look through these chapters (during the year, we will cover some parts of all of these chapters but not all) Select 2 chapters that you think you will most enjoy studying. For each chapter, briefly describe the purposes and major structures of the body systems featured. Also, describe what about these particular chapters appeals to you.

### **Ch. 54-59 Ecology**

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)

## The Big Ideas in Biology

AP central has recently revamped the AP Biology curriculum and exam. They have broken it up into “Big Ideas”, listed below. You have just finished looking through your entire book. For each of the big ideas listed, think about what they mean, and then look through your book to find chapters that you think are related to the big ideas. Under each big idea, list each chapter that you think contains topics that exemplify that big idea. Write a specific justification for why you think these particular chapters should be included under that big idea. You do NOT need to write a justification for each individual chapter, but summarize why you chose that group of chapters and cite a few specific examples. You may find a chapter goes with more than one big idea. Reading chapter 1 will give you a good feel from some of these topics.

Big Idea 1: The diversity and unity of life can be explained by the process of evolution.

Big Idea 2: Biological systems use energy and molecular building blocks to grow, reproduce, and maintain homeostasis (regulation).

Big idea 3: Living systems sense, retrieve, transmit, and respond to information critical to life processes.

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

## Part # 4

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)
5. AP Central -Go to <http://apcentral.collegeboard.com>

Under AP courses and exam on the left choose course home pages.

Go to biology home page

Read over the course description

Under AP courses and exams on the left choose exam questions.

Go to biology

Here you can review some information on the types of question on the exams and some of the questions that have been asked in the past.

