AP Biology Summer Assignment

Welcome! *Congratulations on deciding to take AP Biology! The two main goals of AP Biology are to help you develop a conceptual framework for modern biology and to gain a deeper appreciation of science as a process. Because of the rapid pace of discovery in the life sciences our primary emphasis is on developing an understanding of unifying concepts that connect the major topics of biology. Please do not become overwhelmed with your summer assignment and do not let it keep you from taking the class! Do one thing at a time and check it off as you go!*

ASSIGNMENT 1 **Daily Grade, Due BEFORE the first day of school**

Introduction letter

I would love to get to know a little about who you are! For your first assignment, send me an email telling me a little about yourself. It's that easy! This will also be your first grade…if only all of the grades were this easy! Remember to use proper email etiquette. I will reply so you have an electronic record that the first part of your assignment was received. I will be checking my email most of the summer so if you have any problems with the other parts of the assignment, please contact me through email as well. Here is what I would like you to email me at **raschenbeck@bellvilleisd.org** before the end of this summer:

Subject Line: AP Biology 2018-2019

Body:

1. Your full name (& what you like to be called if different from your first name), grade & stuff about you!
2. What do you like to do (hobbies, sports, music, interests, etc.)?
3. What extracurricular activities are you involved in?
4. Do you have a job or plan on getting a job next year? What kind?
5. What are your personal strengths when it comes to learning new material?
6. What causes you to struggle in a course?
7. Did you take Pre- Biology?
8. Who was your biology teacher?
9. Was there anything that you liked or disliked about your earlier biology class?
10. How many AP classes have you taken so far? How many have you passed with a 3 or higher?
11. How many AP classes are you taking this year (please list)?
12. Have you or will you be taking anatomy and physiology?
13. What are you looking forward to the most in AP Biology?
14. What are you most anxious about in AP Biology?
15. Why are you taking AP Biology? What do you hope to accomplish/gain?
16. What potential career would you like to pursue?

ASSIGNMENT 2 **Daily Grade, Complete BEFORE the first day of school**

Join Remind101

When I need to send out fast class information quickly or send out reminders I use Remind101. It will send you automatic text messages from me. You can also ask questions through this app.

remind

Sign up for important updates from Mrs. Aschenbeck.

Get information for **Bellville High School** right on your phone—not on handouts.

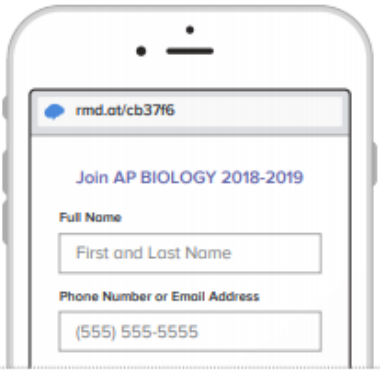
Pick a way to receive messages for **AP BIOLOGY 2018-2019**:

A **If you have a smartphone, get push notifications.**

On your iPhone or Android phone, open your web browser and go to the following link:

rmd.at/cb37f6

Follow the instructions to sign up for Remind. You'll be prompted to download the mobile app.



B **If you don't have a smartphone, get text notifications.**

Text the message @cb37f6 to the number 81010.

If you're having trouble with 81010, try texting @cb37f6 to (832) 772-6628.

** Standard text message rates apply.*

Don't have a mobile phone? Go to rmd.at/cb37f6 on a desktop computer to sign up for email notifications.

ASSIGNEMENT 3 **Daily Grade, Complete BEFORE the first day of school**

Access Your Online Textbook and Bookmark Websites

Go to the following websites and bookmark them. We will be using these sites all year long and it would be a great idea to glance through them this summer.

Bookmark: www.masteringbiology.com. We will use this website for some homework assignments, textbook access over the summer, and several interactive tutorials. Follow the instructions below for creating an account to gain access.

1. Go to www.pearsonschool.com/access
2. Enter the first 6 letters of the student access code: **SSNAST**
3. Click on Covered Titles.
4. Select *AP Edition* Campbell Biology, 10th ed. from the Science Menu
5. Click on Student Registration Link
6. Accept terms.
7. Create a Pearson account. I suggest using your email as your username.
8. Type in the full access code: **SSNAST-TREAD-SYNCH-ISSUE-SWASH-NINES**
9. You have been provided a course **ID: MBASCHENBECK67613**
10. Once your account has been created, you will go directly to www.masteringbiology.com to log in.

Bookmark: http://www.bozemanscience.com/ap-biology/. This website has many useful videos that we will use often.

ASSIGNMENT 4 **Minor Grade, Due by the 1st day of school**

Review Questions

Your assignment is to complete the questions "Questions that every AP Biology student should be able to answer **BEFORE** their first day of class." You will have access to the online textbook. You may use other resources to help you review the material and answer the questions. There is a tremendous amount of material that must be covered during the year and there is not enough time to reteach or review important foundational content from freshman biology. Therefore, it is imperative that you review this information before the start of class. An **AP Biology Pretest** that will count as one of your major grades for the six weeks will be given over the material on **Wednesday, September 5th**.

ASSIGNMENT 5 **Due by the first day of school**

Get your supplies for AP Biology Class

Get yourself ready for class! Below is the list of supplies that you will need for class.

1. TWO 2" inch binders with clear cover for title page (one for each semester)
2. 3-Subject Plastic Cover Mead 5-Star Spiral Notebook
3. Blue/Black pens and Red Pen (for corrections)
4. Colored pencils or markers that will not bleed through pages of notebook (OPTIONAL: I will have classroom sets but some students prefer to have their own)
5. TWO packs of 8 dividers for your binders (one for each semester)
6. ONE roll of paper towels – Will be used during various labs and activities for clean-up
7. ONE bottle of Clorox wipes – Will be used for messy labs and lab sanitation

ASSIGNMENT 6 **Major Grade, Due by Sunday, September 16th**

Biological Collection Slide Presentation

For this assignment, you will "collect" 25 photographic examples of biological terms/concepts and create a slide presentation. Select any of the items from the Biological Collection Word List to include in your slides presentation. This will introduce you not only to the language of biology, but also emphasize that biology is something that's DONE not just memorized. **Your slide presentation must be shared to raschenbeck@bellvillebrahmas.org by 11:59 pm on Sunday, September 16th. A hardcopy of your Photo Collection Table of Contents may be handed to me in person on Monday, September 17th at the beginning of class. Do not forget to print out a photo of you with your proof object and turn it in with your table of contents.**

Directions for the Biological Collection Photo Slide Presentation:

1. "Collect" an item by taking a picture of it. Define, in your own words, the biological term/concept. Also within a couple of statements, explain how the picture represents the term or concept. Use the Biological Collection List on to select terms/concepts for your slide show.
2. Upload the photo, definition, and explanation to a slide presentation that you create for the class.
3. Be creative. If you choose an item that is internal to a plant or animal, like phloem, you could submit a photograph of the whole organism or a close up of one part, and then explain on the slide what phloem is and specifically where phloem is in the specimen.
4. Use original photos ONLY. You cannot use an image from any publication or from the internet. You must take the photo yourself. You must prove that the photo is your work by having a "proof object" in the picture that represents you. This could be a key chain, pen, bracelet, small toy, etc. Submit a picture of you with your proof object when you hand in your table of contents.
5. You should only use natural items. Take a walk in your neighborhood, go to the zoo, go for a hike in the woods, etc. Humans are natural items and may be used, but only for a few entries.
6. Each concept should have a different picture. Do NOT use the same picture for more than one term.
7. This is an individual project. While brainstorming, discussing, and even going on collecting adventures together is welcome, your items and photos are to be unique. With 100 concept choices, probability says there is a very slim chance that any two students will have the same items chosen from their list.
8. Be careful and respectful! Never touch plants or animals you are unfamiliar with. Don't kill or hurt any organisms. Don't remove any organisms from the natural environment.

Rubric for Biological Collection Slide Presentation			
Points	Biological Collection Photo Slide (per photo)	Points	Table of Contents*
1	Original photo on slide	3	Slide presentation shared with teacher
1	Biological term/concept identified	2	Picture of you with your proof object
1	Biological term/concept defined in own words	10	Each biological term/concept listed in the order it appears in the slide show
2	2 Biological term/concept and photo relationship explained fully	10	Slides are easy to follow and neatly presented
**** Points in this selection are awarded in an all or none format. If the guideline is not fully met, no points will be awarded.***			

Your slide show is worth a maximum of 150 points {125 points for your photo collection (5 points for each photo entry) and 25 points for a completed Slide Presentation Table of Contents (handwritten and submitted in person)}

****See the following page for Biological Collection Word List****

Biological Collection Word List

1. Adaptation of an animal
2. Adaptation of a plant
3. Altruistic behavior
4. Amniotic egg
5. Anabolic
6. Analogous structures
7. Animal that has a segmented body
8. Anther and filament of stamen
9. Aposematic Coloration
10. Archaebacteria
11. Asexual reproduction
12. ATP
13. Autotroph
14. Auxin producing area of a plant
15. Basidiomycete
16. Batesian mimicry
17. Bilateral symmetry
18. Biological magnification
19. C3 Plant
20. C4 Plant
21. CAM Plant
22. Calvin Cycle
23. Cambium
24. Catabolic
Cellular respiration
25. Coevolution
26. Commensalism
27. Community
28. Connective tissue
29. Cuticle layer of a plant
30. Detritivore
31. Dominant vs. recessive phenotype
32. Ectotherm
33. Endosperm
34. Endotherm
35. Enzyme
36. Epithelial tissue
37. Ethylene
38. Eubacteria
39. Eukaryote
40. Exoskeleton
41. Fermentation
42. Flower ovary
43. Frond
44. Gametophyte
45. Genetic variation within a population
46. Genetically modified organism
47. Gibberellins
48. Glycogen
49. Gymnosperm cone – male or female
50. Gymnosperm leaf
51. Habitat
52. Hermaphrodite
53. Heterotrophy
54. Homeostasis
55. Homologous structures
56. Hydrophilic
57. Hydrophobic
58. Introduced species
59. Keystone species
60. Krebs cycle
61. K-strategist
62. Lichen
63. Lipid used for energy storage
64. Littoral zone organism
65. Long-day plant
66. Mating behavior (be careful and keep appropriate!!!)
67. Meristem
68. Modified leaf of a plant
69. Modified root of a plant
70. Modified stem of a plant
71. Morphology
72. Mullerian mimicry
73. Mutualism
74. Mycelium
75. Mycorrhizae
76. Niche
77. Parasitism
78. Parenchyma cells
79. Phenotype
80. Phloem
81. Pollen
82. Pollinator
83. Population
84. Predation
85. Prokaryote
86. R-strategist
87. Radial symmetry (animal)
88. Redox reaction
89. Rhizome
90. Seed dispersal (animal, wind, water)
91. Spore
92. Sporophyte
93. Stigma and style of carpel
94. Succession
95. Taxis
96. Territorial behavior
97. Tropism
98. Unicellular organism
99. Vestigial structures
100. Xylem

Biological Collection Table of Contents **Name:**_____

Slide Show shared to *raschenbeck@bellvillebrahmas.org* ☐

Your photo with proof object submitted via hardcopy ☐

Photo Order	Biological Terms/Concepts	Comments	Points Earned
1			
2			
3			
4			
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Example Entries for your Biological Collection

****Please note the following just an example and by no means is it the only way to present your information. Be creative! Make sure you read the rubric carefully and make sure you have met all of the criteria for your presentation.***

Notice the Texas A&M button in the pictures below. This is this a proof object and is used to demonstrate that the photographs in the slide entries are indeed my originals. **Make sure you have proof object in each of your photos. You are also required to take a picture of yourself with your proof object. You will NOT receive credit for any entries that do not contain your proof object and you will not receive credit for your project if you do not include a picture of yourself with your proof object.**

1. Autotroph

This is a picture of lantana. Lantana is an autotroph. An autotroph is an organism that can produce its own food either by photosynthesis or chemosynthesis. An autotroph takes inorganic substances and produces organic substances that can later be broken down for energy.

2. Adaptation of a Plant

This is a picture of water lilies. A water lily is an aquatic plant that has special adaptations that allows it to live in the water. They have broad flat leaves that allow them to float on top of the water so they can capture sunlight. It lacks deep anchoring roots because they are not necessary for water transport or anchoring the plant in the soil. The bowl shaped flowers also stay above water for easier pollination. All of these adaptations allow the water lily to survive in its environment.

I know it seems like you have a lot to do this summer! Make sure you check off the easy ones first and allow adequate time to complete your review questions and get a head start on your photo collection. I recommend that you think about the 25 terms you want to do for your collection, research them, and then set out to find examples to take pictures of. It's a good idea to keep your proof object handy so when an opportunity arises to take a picture of something, you have it with you. Waiting to get started on this during school is not a good idea!

If you do not have access to the internet, the public library has internet access. Use your resources! Also, if finances are an issue, please communicate that to me so I can help you get the supplies you need. Please, please, please email me or ask questions through Remind101 if you need any assistance. I'm just a few clicks away! Please note, I will only respond to my bellvilleisd.org email because my bellvillebrahmas.org account is only used for sharing projects and other documents. I can't wait to get to know you (or learn something new about you) by reading your introductory emails and I look forward to having you in my class in the fall!

Mrs. Aschenbeck
raschenbeck@bellvilleisd.org

AP Biology Summer Assignment Checklist

Assignment	Due Date	Complete (✓)
1. Introduction Email	Before the 1st day of school	
2. Join Remind101	Before the 1st day of school	
3. Online Textbook and Bookmark Websites	Before the 1st day of school	
4. Review Questions	By the 1st day of school	
5. Buy Your Supplies	Before the 1st day of school	
6. Photo Collection	By 11:59 pm on Sunday, September 16th	

Questions that every AP Biology student should be able to answer **BEFORE** their first day of class

Modified from Mr. Monden, Arcadia High School

Review the information and answer the questions before the first day of class. Use your Campbell e-text or review the biology videos at www.bozemanscience.com to help you.

The Nature of Life/Biochemistry

Chapter 1

1. What is the Scientific Procedure?
2. What is a controlled experiment? What does this allow scientists to test?
3. In science, what is a hypothesis? A theory? A law?

Chapters 2-3

4. What are the four major macromolecule groups? What are the examples of each?
5. What property of water prevents Earth from becoming a frozen planet?

Chapter 4

6. What is an enzyme?
7. What do enzymes do?
8. How do enzymes work? Why are enzymes important?
9. What factors affect the rate of enzymes?

Supplemental Chemistry

Balancing Equations

1. Why is it significant to not change the subscript of a molecule?
2. Balance $CH_4 + O_2 \rightarrow CO_2 + H_2O$.
3. What is the only number that can be altered when balancing equations?

Molecule Conversion

4. 1 mole= _____ molecules?
5. Convert 0.200 molecules of H_2SO_4 into grams, then into moles.
6. Convert 102.8g of water into molecules.

Physical/Chemical Changes

7. List five physical changes.
8. What is water vapor?
9. What are five signs of chemical change?

Acids/Bases and pH

10. A hydrogen bond is located between which two atoms? Does it need to be an oxygen?
11. What is a solution with a pH lower than 7 called? What are two things that this means?
12. What is a solution with a pH higher than 7 called? What are two things that this means?
13. Something with a pH of 6.7 has what concentration of hydroxide ions?

Cell Biology

Chapters 6

1. Describe the differences between eukaryotic and prokaryotic cells.
2. List all the major organelles found in a typical cell and define what roll each serves.

Chapter 7

3. What is diffusion and how does it work in regards to transport across a cell membrane?
4. What are the differences between active and passive transport?

Chapter 9

5. What type of reaction is cellular respiration and why?
6. What are the steps of cellular respiration and where does each of them take place?
7. During the ETC, where are H^+ ions pumped into?

Chapter 10

8. What are the two parts of photosynthesis and where do they take place?
9. During which part of photosynthesis is the sugar glucose produced?
10. How does CO_2 enter the plant?

Chapter 12&13

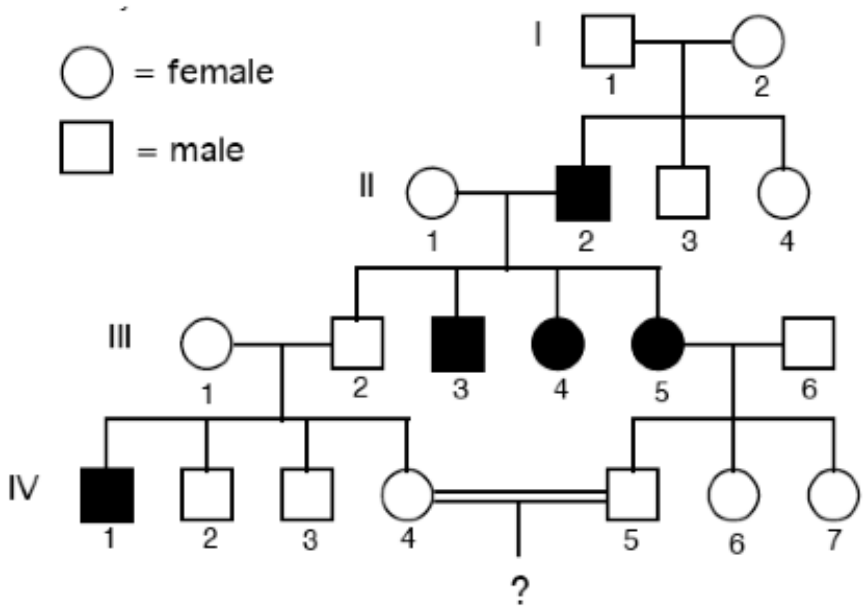
11. What are the main phases of the cell cycle and what occurs during each phase?
12. What are the stages, in order, of mitosis?
13. What are the stages, in order, of meiosis?
14. What are the major differences between mitosis and meiosis?
15. What is crossing over and how does it lead to genetic diversity?
16. Describe the differences between oogenesis and spermatogenesis.

Mendelian Genetics, Molecular Biology, and Biotechnology

Chapter 14 & 15

1. What does the Principal of Dominance state? What does the Principle of Independent Assortment state?

2. If you cross a homozygous tall pea plant with a short one, what is the probability that an F_1 plant will be tall? What if you cross a heterozygous tall pea plant with a short one? What if you cross two heterozygous tall pea plants?
3. What is crossing over? When does crossing over typically occur?
4. What is a karyotype and what does it show?



5. Colored in boxes represent the trait of Autism. What does the pedigree tell us about Autism? Is it recessive or dominant? How do you know?
6. What is the probability that the bottom 2 people (4 and 5) have a child with the trait?
7. Is the trait X-linked, Y-linked, autosomal or mitochondrial? How do you know?

<u>Chapter 16</u>

8. What are the base pairs in DNA?
9. What is replication?
10. What is a DNA Replication Fork?
11. What is the leading strand and lagging strand?

<u>Chapter 17</u>

12. What are the differences between DNA & RNA?
13. What is the "central dogma"?
14. What Transcription? Translation? How are these terms related to each other? What happens during these processes?
15. What is the difference between mRNA and preRNA?
16. Why is it possible to have multiple codons code for the same amino acid?
17. What is a mutation? What are the different types of mutations that can occur?

Chapter 20

18. What is DNA Electrophoresis and how does it work?
19. What are two specific uses of a DNA Fingerprint?
20. What is a restriction enzyme and how does it work?
21. What is Genetic Engineering and what are 3 modern everyday uses of it?
22. What is a Vector and how do they work?
23. What is Gene Therapy?

Human Physiology

Subtopic: Nervous System, Immune System

Chapter 43

1. What is a pathogen?
2. There are three lines of defense for the Human Immune System; List and describe the purpose of each.
3. How does HIV affect the Human Immune System?
4. What is the difference between B-cells and T-Cells?
5. How does memory work in the immune system?

Chapter 49

6. Organize the following into a flowchart or mindmap using connective words: Central, Peripheral, Somatic, Autonomic, Reflex, Motor, Sensory, Parasympathetic, Sympathetic, Fight or Flight, and Rest & Digest.
7. What are the four major parts of the central nervous system? What are they responsible for?
8. List out the different senses and describe the pathway of information.
9. Describe the firing of a neuron. What direction does it go in? How is it triggered?
10. In discussing the senses, what are the different types of signals that one can receive from the outside? What types of cells can receive those? Where are they located on our bodies?

Evolution

Chapter 22-25

1. What is the Theory of Evolution by Natural Selection?
2. What does the phrase 'survival of the fittest' mean?
3. Define and relate the following terms: Fitness, Adaptation, Evolution, & Gene Pool.
4. How do scientists determine which organisms the fossils come from?
5. What are the evidences for evolution?
6. What is genetic drift? What are two types of genetic drift? What types of populations are more susceptible to genetic drift?
7. What does the fossil record show?
8. Why isn't the fossil record complete?
9. What is adaptive radiation and how is it related to evolution?
10. What are the 5 factors that can cause evolution? How are they different if they cause genetic equilibrium?
11. What are the different types of isolation that can occur in populations? How do they work?

Ecology

Chapters 52-54

1. Can minor changes in a food web cause huge repercussions for an ecosystem?
2. How do the biotic and abiotic factors of an ecosystem interact for energy flow?
3. What are the Cycles of Matter and how do they effect the health of an ecosystem?
4. What is species diversity?
5. What is K-selection and r-selection? Give an example of a K-selected and r-selected organism.
6. Explain what a carrying capacity is.
7. What does biodiversity do to the ecosystem?
8. What is symbiosis? Name and describe the three types and provide an example of each.
9. What are some factors that affect population dynamics?
10. What is a population made of?
11. What is a keystone species and how can its removal affect other populations?