

AP Biology Summer Homework
2015

Hello and welcome to AP Biology! This course is designed to be the equivalent of a two- semester introductory biology course usually taken in the first year of college. It will be a rewarding experience but IT WILL BE DIFFICULT! There will be a great deal of independent work. The most important qualities you must possess and utilize to be successful are diligence and organization (especially your time!). You will be well prepared for the AP Biology Exam in May if you thoroughly do the work asked of you. REMEMBER: Conceptualize don't memorize!

There are 4 Big Idea Units:

- Unit 1 – Evolution
- Unit 2 – Cellular Processes: Energy and Communication
- Unit 3 – Genetics and Information Transfer
- Unit 4 – Interactions

There are due dates set for each of the 4 sections that must not be missed. Any work not submitted on time will not count toward your total Summer Homework Points.

No excuses, No matter what! So HEY! Why not just get it done ASAP?

If you have ***any*** questions regarding any part of the summer assignment, do not hesitate to e-mail!

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There are FOUR parts to your summer assignment:

Part 1 - Due Tuesday 6/2! *Student Information Email Essay* –We are going to spend a lot of time together next year, so it is best if I get a head start at learning a bit about you!

Send me an email to the address above. Be sure to use AP Bio Essay and your name in the subject line.

You ***MUST*** include:

- Your name and grade level
- Why did you take AP Biology?
- What are your personal strengths when it comes to learning new material?
- What causes you to struggle in a course?
- What are your plans after graduating high school?
- How does the college you plan to attend use the AP test score (research this! You might be surprised!)
- How many AP courses are you enrolled in? (Please list)
- What do you like to do? (hobbies, sports, music, interests, etc)
- Tell me what is important to you (friends, family, pets etc)

- What do your parents do for a living?
- What are you looking forward to most about AP Biology?
- What are you most anxious about in AP Biology?

Make sure the email you mail this from is one you check regularly since this will be the main form of communication between us all summer long. I will email you back a confirmation that I received it.

Part 2

Digital Scavenger Hunt – this part will hopefully be a lot of fun and get you out and about looking at the living world around you.

1. Select 30 terms from the list provided.

- 15 terms are Due Saturday, July 25th and
- 15 ADDITIONAL terms Due Saturday, August 15th.

Define all 30 of these terms in an e-mail to me. It will probably be easiest to do this as a Microsoft Word file attachment. **Do NOT use Zip Files!**

The Subject of the e-mail must be: “AP Biology Digital Scavenger Hunt: <Insert Your Name Here>” (Do not include the quote marks or the brackets, just the words)

Plan ahead! ***it is not my problem if I can't open your file.*** You will NOT earn points!!! I will email you a confirmation that I have received each part of your homework. If you sent it and I did not contact you, DO NOT RESEND! Send me an email asking if I have received it. I am sometimes in an area that does not get internet. I may only check once a night.

2. “Collect” 30 items from the list of terms below.

When I say “collect”, I mean you should collect that item by finding it and taking a photograph (digital or paper printed) of that item. You are not allowed to damage or destroy anything you “collect”. Respect nature! You will upload your photographs with corresponding explanations to me via email. You do not need to find the exact item on the list!

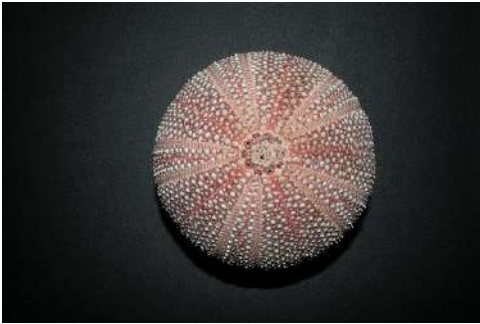
EXAMPLES:

- If it is an internal part to an organism such as “tendon”, you don’t have to dissect out 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.

- Also, take a look at the example of “Radial Symmetry” that I provided.

TAKE A LOOK! THIS IS YOUR FORMAT! PHOTO AND DEFINITION TOGETHER!! IT MUST BE THIS FORMAT FOR CREDIT!

Radial Symmetry



- The body organization of lower invertebrates in which the body parts are arranged around a central axis, like the spokes on a wheel. There is no left or right side to the animal, however it usually has a top (dorsal) and a bottom (ventral). This is a picture of a sea urchin shell, which also display radial symmetry.

3. ORIGINAL PHOTOS ONLY:

You can't use an image from any publication or the Web. You must have taken the photograph yourself. You must place YOUR STUDENT ID in EACH photo to prove you took the picture! If this is not there, you will not receive credit.

4. NATURAL ITEMS ONLY:

Some specimens may be used for more than one item, but all must be from something that you have found in nature. 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.

5. TEAM WORK:

You may work with other students in the class to complete this project, but **each student must turn in his or her own project with a unique set of terms chosen.** There are 132 choices... probability says there is a very small chance that any two students will have most of the same 30 terms chosen.

- | | |
|----------------------------|------------------------|
| 1. adaptation of an animal | 4. actin |
| 2. adaptation of a plant | 5. altruistic behavior |
| 3. adhesion and cohesion | 6. amniotic egg |

7. amylase
8. analogous structures
9. angiosperm
10. animal that has a segmented body
11. annelid
12. anther & filament of stamen
13. aposematic coloring
14. arthropod
15. artificial selection
16. archaeobacteria
17. ATP
18. autotroph
19. auxin producing area of a plant
20. basidiomycete
21. Batesian mimicry
22. bilateral symmetry
23. biological magnification
24. bottleneck effect
25. bryophyte
26. C₃ plant
27. C₄ plant
28. Calvin cycle
29. carbohydrate – fibrous
30. cambium
31. cellular respiration
32. cephalization
33. cellulose
34. chitin
35. coevolution
36. cnidarian
37. coelomate
38. conifer leaf
39. countercurrent exchange
40. commensalism
41. connective tissue
42. cuticle layer of a plant
43. deciduous leaf
44. detritovore
45. deuterostome
46. dicot plant with flower & leaf
47. diploid chromosome number
48. dominant vs. recessive phenotype
49. echinoderm
50. ectotherm
51. endosperm
52. endotherm
53. enzyme
54. epithelial tissue
55. ethylene
56. eubacteria
57. eukaryote
58. exoskeleton
59. fermentation
60. flower ovary
61. frond
62. fruit – dry with seed
63. fruit – fleshy with seed
64. gametophyte
65. genetic variation within a population
66. gastropod
67. genetically modified organism
68. gibberellins
69. glycogen
70. gymnosperm cone
71. histamine
72. homeostasis
73. homologous structures
74. insect
75. introduced species
76. K-strategist
77. Krebs cycle
78. Keystone species
79. Keratin
80. lepidoptera
81. lichen
82. lignin
83. lipid used for energy storage
84. littoral zone organism
85. long-day plant
86. meristem
87. modified leaf of a plant
88. modified root of a plant
89. modified stem of a plant

- | | |
|--------------------------------------|---|
| 90. monocot plant with flower & leaf | 112. r-strategist |
| 91. Mullerian mimicry | 113. redox reaction |
| 92. muscle fiber – striated | 114. rhizome |
| 93. mutualism | 115. ruminant |
| 94. mycelium | 116. sarcomere |
| 95. mycorrhizae | 117. seed dispersal (animal wind water) |
| 96. myosin | 118. spore |
| 97. negative feedback | 119. sporophyte |
| 98. niche | 120. stem – herbaceous |
| 99. nymph stage of an insect | 121. stem – woody |
| 100. parasite | 122. stigma & style of carpel |
| 101. parenchyma cells | 123. succession |
| 102. phloem | 124. taxis |
| 103. pine cone – female | 125. territorial behavior |
| 104. pine cone - male | 126. tropism |
| 105. pollen | 127. turgor pressure |
| 106. pollinator | 128. unicellular organism |
| 107. population | 129. vascular plant tissue |
| 108. porifera | 130. vestigial structures |
| 109. prokaryote | 131. xerophyte |
| 110. protein – fibrous | 132. xylem |
| 111. protein – globular | |

Part 3 - Macromolecule Web Quest - Due Date: First day of Class (Bring it with you)– AP Biology covers a lot of material, and you will be responsible for learning how to process and understand that material effectively. This web quest will require internet access. If you don't have a computer or internet available to you at home get creative use a friends or even the public library.

Section 1: Macromolecules Tutorial

Here you will click through a series of four tutorials about the four major types of macromolecules. Use the website listed below to answer the following questions.

A. Open the website:

<http://bcs.whfreeman.com/thelifewire/content/chp03/0302002.html>

B. Start by reading the introduction.

1. What are the four main types of **macromolecules**?

2. What is a **polymer**?
3. List the **monomers** that are linked together to form each of the following macromolecules:
 Proteins _____

Carbohydrates _____

Nucleic acids _____

C. Click on the tab at the top of the page called Animations.

☑ Click the box labeled “step-through”

☑ Click on “CARBOHYDRATES” first.

There are 6 separate pages for the carbohydrate module.

After you read each page, click “continue”, and then “play” to watch the animation.

1. _____ is a hexose, a sugar composed of _____ carbon atoms, usually in _____ form.
2. How many **glucose monomers** are there in a single starch molecule?

3. Glucose molecules can be added to starch by a _____ reaction, where two molecules _____ bond together and release a _____ molecule.
4. Which is more highly branched, **Amylose** (plant starch) or **Glycogen** (in animal livers and fat)?
5. _____ are hydrolyzed (broken apart) to form glucose, and glucose is then further broken down to release _____.

D. Click on “Options”.

Click on “LIPIDS”.

There are 7 separate pages for the lipid module. After you read each page, click “continue”, and then “play” to watch the animation.

1. What is a **triglyceride** composed of?
2. Why is **Palmitic acid** called a saturated fatty acid?
3. What makes **oleic acid** a monounsaturated fatty acid?
4. How many **double bonds** are there in a polyunsaturated fatty acid?
5. Why are **polyunsaturated fatty acids** often liquid at room temperature?
6. Compare the shape of the carbon chain in a saturated fatty acid, a monounsaturated fatty acid, and a polyunsaturated fatty acid. Draw a rough sketch of the three chains below.

Saturated

Monounsaturated

Polyunsaturated

E. Click on “Options” at the bottom of the page.

Click on “Proteins”. ☑

There are 6 separate pages for the proteins module. After you read each page, click “continue”, and then “play” to watch the animation.

1. Proteins are chains of _____ linked by _____.
2. The 20 different amino acids used to make all proteins differ only in their _____.
3. A protein’s amino acid sequence determines its _____ and _____.
4. What is collagen?

F. Click on “Options” at the bottom of the page.

Click on “Nucleic Acids”

There are 6 separate pages for the nucleic acids module. After you read each page, click “continue”, and then “play” to watch the animation.

1. What are the two types of nucleic acids? _____ and _____
2. What do nucleic acids have the ability to do within the cell?
3. When two strands of DNA pair by hydrogen bonding, the base _____ always pairs with _____, and _____ always pairs with _____.
4. Draw a rough sketch of the three parts of a nucleotide below.
 1. _____
 2. _____
 3. _____
5. In DNA, base pairing occurs only between a _____ and a _____.
6. Fill in the table below with the appropriate names of the nitrogen bases:

DNA Complimentary Base Pairs	
Purine	Pyrimidine

G. Click on the tab at the top of the page called Conclusion.

Read the conclusion.

1. A macromolecule’s structure is intimately connected to its _____.
2. List one function of each macromolecule below:
Nucleic Acid _____
Carbohydrate _____
Protein _____

Section 2: Macromolecules in 3D

Here you will browse through several 3D images of different macromolecules. Study the images to find features that you learned about in the previous tutorial.

A. Visit the website <http://www.nyu.edu/pages/mathmol/library/life/>

B. Click on the link called Sugar Molecules

☒ Browse through the different 3D images of carbohydrate molecules. In order to view an image, always click on the small link Gif above the picture. DO NOT click VRML or PBD.

C. Click on the link called Lipids at the bottom of the screen.

Browse through the different 3D images of lipid molecules.

In order to view an image, always click on the small link Gif above the picture AND the small link Info above the picture to learn more about the molecule.

1. Categorize the different lipid molecules as saturated, monounsaturated or polyunsaturated.
2. How could you tell from viewing the 3D images?

D. Click on the link called Amino Acids at the bottom of the screen. These are the small building blocks of proteins!

☒ Browse through the different 3D images of amino acids.

In order to view an image, always click on the small link Gif above the picture AND the small link Info above the picture to learn more about the molecule.

E. Click on the link called Nucleotides at the bottom of the screen.

☒ Browse through the different 3D images of Nucleotides and Nucleic acids. BE SURE TO CLICK ON THE DNA MOLECULE!

In order to view an image, always click on the small link Gif above the picture AND the small link Info above the picture to learn more about the molecule.

Nice! You are done! Remember the concepts! You will need them later!

Part 4 – The Blog! Due by First Day of School! – Go to My page on the School Wire website and log in. Click on the Blog. Respond to the blog post. These are easy point and make sure you earn them with a well thought out response! DO NOT PLAGERIZE! It is pretty obvious when you all have answers with the same exact words!