

2020 AP BIOLOGY SUMMER WORK

HELLO MY AP BIOLOGY STUDENT!

As you know, AP Biology is a rigorous course consisting of two semesters in the year that are equivalent and in some cases, can be more rigorous than the first year biology courses at the collegiate level. This summer work was designed to get you started on the content material prior to starting the course in the fall. Please read this document closely and meet all of the deadlines and requirements for the work.

This project: The first 25 words of vocabulary photography component, analysis of two scientific studies, data practice, word parts, and scavenger hunt will count as a TEST GRADE during your first nine weeks of the course. No late summer work will be accepted!!! If it is not turned in on the first full day of school you will receive a ZERO for your first test grade.

Please keep in mind that this test is the one you have the MOST control over whether you do well . . . or not.

Part 1: Vocabulary Photography Component

Listed below is over one hundred important terms in the AP Biology curriculum. You must select 50 of these terms to use in your summer work. The first 25 will be due on the first full day of class and the second 25 will be due approximately two weeks from the first day of class - the official due date will be announced in class.

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 of that item in nature. 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 in the picture. It should also include the date that the picture was taken. You may choose any of the words below for your 50 pictures. You may turn them in as a PowerPoint presentation or in a scrapbook form, but NOT just pasted in a notebook. Again, each picture needs to be original and dated. It must also include a description of how the image fits the definition.

Reminders: original picture (dated)

Defined word

Function or use in nature as it applies to the picture

AP BIOLOGY COLLECTION

TERMS

1. adaptation of an 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 of stamen
11. arthropod
12. archaebacteria
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. deuterostome
34. dicot plant with flower & leaf
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. phloem
86. pine cone - female
87. platyhelminthes
88. pollen
89. pollinator
90. porifera
91. prokaryote
92. protein - fibrous
93. protein - globular

94. protostome
95. pteridophyte
96. *r*-strategist
97. radial symmetry
98. rhizome
99. scale from animal with two-chambered heart
100. spore
101. sporophyte
102. stem - herbaceous
103. stem - woody
104. stigma & style of carpel
105. tendril of a plant
106. thorn of a plant
107. unicellular organism
108. vascular plant tissue
109. xerophytes
110. xylem

Part 2: AP BIOLOGY Analyze Scientific Studies in the Field of Biology

This assignment consists of reading and analyzing two scientific studies related to AP Biology. You must find one study that is about each BIG IDEA that will be discussed in AP biology this year. The 4 Big Ideas are:

- 🎬 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, to reproduce and to maintain dynamic homeostasis.
- 🎬 Big Idea 3: Living systems store, 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.

Studies can be taken from journals, magazines, newspapers, or the internet. All sources must be current (2017 to 2019). Be sure you pick a study that includes DATA. In addition to reading the studies the following items are to be completed:

1. A copy of the article is to be turned in. Articles must include the name of the source, the author(s) and the date. For example, when collecting an article from a newspaper, clip the article including the name and date of the newspaper. Copies can be made from journals and magazines. Do not clip pages from journals that are not your own.
2. For each article do the following
 - a) circle or highlight vocabulary/unfamiliar science terms in each study
 - b) identify the part (THE BIG IDEA) of AP Biology to which the study relates.
 - c) summarize the study **in your own words** and explain its importance (or unimportance)

d) include a description of your reaction to the study

PRODUCT ORGANIZATION AND POINTS SCORED

1. Your name, date, period, and teacher's name must be displayed on the front of the each analysis. The product must be typed.
2. Each study is to be analyzed as described in a) - d) listed above.

DUE DATE(S):

Two of the four current events will be due the first full day of school. The next two will be due approximately two weeks later. My suggestion is to work ahead!! Get as many completed, or at least started, during the summer as possible so you don't get behind during the first few weeks of school.

Part 3: Graphing and Data skills practice

Math and Statistics for AP Biology - Research the answer to the following questions

1. In designing an experiment or other scientific study, why do scientists need to sample from a population rather than using an entire population?

2. Suppose you are designing an experiment to test the effects of nicotine on the heart rate of rats. What are the disadvantages of having too small a sample size (i.e., testing on too few rats)? What are the disadvantages of having too large a sample size (i.e., testing on too many rats)?

3. Explain the difference between discrete variables and continuous variables. Give an example of each.

Graphing Practice

INTRODUCTION

Graphing is an important procedure used by scientists to display the data that is collected during a controlled experiment. Line graphs must be constructed correctly to accurately portray the data collected. Many times the wrong construction of a graph detracts from the acceptance of an individual's hypothesis

A graph contains five major parts:

- a. Title
- b. The independent variable
- c. The dependent variable
- d. The scales for each variable
- e. A legend

🎬 The **TITLE**: depicts what the graph is about. By reading the title, the reader should get an idea about the graph. It should be a concise statement placed above the graph.

🎬 The **INDEPENDENT VARIABLE**: is the variable that can be controlled by the experimenter. It usually includes time (dates, minutes, hours, etc.), depth (feet, meters), and temperature (Celsius). This variable is placed on the X axis (horizontal axis).

🎬 The **DEPENDENT VARIABLE**: is the variable that is directly affected by the independent variable. It is the result of what happens because of the independent variable. Example: How many oxygen bubbles are produced by a plant located five meters below the surface of the water? The oxygen bubbles are dependent on the depth of the water. This variable is placed on the Y-axis or vertical axis.

🎬 The **SCALES** for each Variable: In constructing a graph one needs to know where to plot the points representing the data. In order to do this a scale must be employed to include all the data points. This must also take up a conservative amount of space. It is not suggested to have a run on scale making the graph too hard to manage. The scales should start with 0 and climb based on intervals such as: multiples of 2, 5, 10, 20, 25, 50, or 100. The scale of numbers will be dictated by your data values.

🎬 The **LEGEND**: is a short descriptive narrative concerning the graph's data. It should be short and concise and placed under the graph.

Important Definitions:

■ The MEAN for a group of variables: To determine the mean for a group of variables, divide the sum of the variables by the total number of variables to get an average.

■ The MEDIAN for a group of variables: To determine median or "middle" for an even number of values, put the values in ascending order and take the average of the two middle values. e.g. 2, 3, 4, 5, 9, 10

Add 4+5 (2 middle values) and divide by 2 to get 4.5

■ The MODE for a group of variables: The mode for a group of values is the number that occurs most frequently. e.g. 2, 5, 8, 2, 6, 11 - the number 2 is the mode because it occurred most often (twice)

****There will be a graphing quiz within the first week of school****

Name: _____ Date: _____

Part 4: WORD PARTS!!

You may type this or you may write directly on this sheet. Even though you may be able to use an example word in more than one space, use each example word only once.

Meaning

Example Word

1. Hydro-

Definition of example word:

2. Hyper-

Definition of example word:

3. Hypo-

Definition of example word:

4. Iso-

Definition of example word:

5. Bio-

Definition of example word:

6. -ology

Definition of example word:

7. A-

Definition of example word:

8. bi-

Definition of example word:

Meaning

Example Word

9. di-

Definition of example word:

10. mono-

Definition of example word:

11. poly-

Definition of example word:

12. endo-

Definition of example word:

13. exo-

Definition of example word:

14. hetero-

Definition of example word:

15. homo-

Definition of example word:

16. -therm

Definition of example word:

17. -lysis

Definition of example word:

Meaning

Example Word

18. -phage

Definition of example word:

19. -vore

Definition of example word:

20. eu-

Definition of example word:

21. pro-

Definition of example word:

22. amphi-

Definition of example word:

23. -troph

Definition of example word:

24. photo-

Definition of example word:

25. chloro-

Definition of example word:

26. Cephalo-

Definition of example word:

Meaning

Example Word

27. Ecto -

Definition of example word:

28. Meso -

Definition of example word:

29. Helio -

Definition of example word:

30. pseudo -

Definition of example word:

31. -ase

Definition of example word:

32. -saccharide

Definition of example word:

33. Tri-

Definition of example word:

34. Derm-

Definition of example word:

Part 5: Scavenger Hunt Items. This section of the packet may be completed in any form you wish (power point, typed, handwritten, or a combination). Please make sure to number and label each task as you complete it.

1. Scientific name of 2 fish species considered aquatic nuisance species in Florida;
2. URL Link to Biology related virtual lab (make it something you would WANT to actually do in class)
3. A microscopic image of the following bacteria: *Salmonella*, *Micrococcus luteus*, *Spirillum volutans*, *Helicobacter pylori*, *Clostridium tetani*, *Treponema pallidum*, *Klebsiella pneumoniae*
4. Link to a podcast that focuses on a biology related topic include a paragraph (approx. 5 sentences) personal reflection
5. Define Enzyme. Identify 5 Enzymes and their function(s).
6. Find a picture of James Watson and Francis Crick by their model of a double helix. Cite the source.
7. Hand Sketch a prokaryote and an animal cell and identify organelles present in each
8. Search the internet and find a neat microscopic image of red blood cells, sperm cells, nerve cells, osteocytes, cardiomyocyte cells, and adipose cells. Be sure each image is labeled. Cite the source.
9. A microscopic image taken from a Fluorescence Microscope, Scanning Electron Microscope (SEM), Transmission Electron Microscope (TEM), and label the specimen being observed.
10. Find the names and chemical structures of the 20 essential amino acids that are used to synthesize proteins
11. Copy and paste the link of a college lecture notes on DNA replication.

12. A photo of a cell experiencing hypotonic, hypertonic and isotonic conditions, label each. Cite the source
13. A diagram showing the general pathways of viral infection; be sure to show lytic and lysogenic infections.
14. Diagram of the visible light spectrum with the measurements in nanometers. Cite the source
15. A detailed illustration of the Calvin Cycle. Cite the source
16. A detailed illustration of the glycolysis. Cite the source
17. A detailed illustration of the Krebs cycle. Cite the source
18. A detailed illustration of the electron transport chain. Cite the source
19. A food made from lactic acid fermentation
20. Find an enzyme lab that could be used in a Biology lesson.
21. A picture showing a normal human karyotype, Monosomy X (Turner's syndrome), and a trisomy X karyotype disorder. Cite the source
22. Phylogenetic tree of life which represents the branching of all kingdoms of life relating to a common ancestor. Cite the source

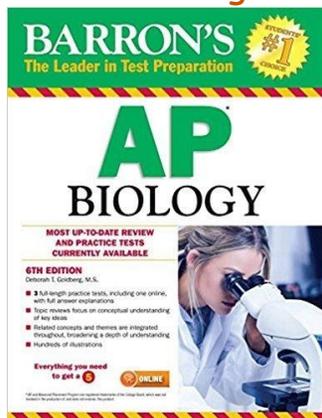
Other Important information:

Supplies needed for class: You will need a folder of some sort to keep supplements and graded papers. You will also need: highlighters, pens, paper, pencils, and a stylus for the iPad is **HIGHLY** suggested.

In addition to the text given to you in class, you will need the following

Barron's AP Biology, 6th Edition

by [Deborah T. Goldberg M.S.](#) (Author)



ISBN-13: 978-1438008684

ISBN-10: 1438008686

*At my last search, the 6th edition was the most recent edition. **However, if you find that there is a more recent edition (7th edition), purchase it instead.** You can purchase the book through Amazon, Half.com or at Barnes and Noble.

Contact Information:

If you need me over the summer, you may text or call my cell at 772-528-0674. Just be sure to tell me who you are in your text or voicemail. You can also email me. My personal email is ufbec@aol.com and my school email is rdempsey@johncarrollhigh.com