

# AP BIOLOGY SUMMER ASSIGNMENT 2019-2020

Welcome to the world of Advanced Placement Biology! The attached summer assignment is required for all AP Biology students for the 2019-2020 school year.

DO THESE THINGS FIRST!

- 1) **Sign up for my Remind.com**
- 2) **SHSAPBio** to receive messages about class  
by sending a text to: **81010** with the message: **@apbiowitch**
- 3) **Join my Schoology.**  
Keep an eye on your Remind for an invite with the course code for Schoology.



**You are required to do 3 things before school starts in September:**

**Part 1 – Biology Scavenger hunt OR Vocabulary Flash Cards– 100 pts**

**Part 2 – Root word investigation – 50 pts**

**Part 3 - Video Learning- Bozeman AP Biology – 50 pts**

You will be graded for this assignment

By completing the assignment you will get an understanding of The AP biology course and have some basics to succeed in class

**The assignments are due NO LATER than the second day of class, if not submitted earlier.** Note that the summer assignment will be your first grade for the class

- 1) If you do not do the summer assignment, you will start behind in the course.
- 2) Don't get overwhelmed. Plan out when you will do it. Have your list of terms ready to take a quick picture when you see something

## **The AP Biology course.**

The AP Biology course is rigorous. It is a college level course. Expect to do homework every night. You will get out what you put in to the course.

The text we use is Campbell Biology 11<sup>th</sup> edition. During the year we will complete the 8 required AP labs as well as many additional activities. You will gain practice in writing AP Free Response Questions, and in answering AP level multiple choice questions.

If you have questions about this assignment, or to send me completed sections, you may contact me via remind.com for a quick response or you can email me at [meghanmartin@learn.salemk12.org](mailto:meghanmartin@learn.salemk12.org) if you are not in a hurry for the response as I will only be checking this email occasionally over the summer. Don't wait until the week before school to find out what you need to do!

Have a great summer!

Mrs. Meghan Martin  
Science Department Head Teacher  
Salem High School

## **Part I: Biology Term Scavenger Hunt - 100 pts**

For this part of your summer assignment, you will be familiarizing yourself with science terms that we will be using at different points throughout the year and finding them in a practical situation

➤ **Select and "collect" 25 words/terms from the list** (On Next Page)

When I say "collect", I mean you should collect that item by finding it and taking a **photograph**. You will make a digital "collection", along with corresponding explanations. Use google slides to create a slide show with pictures pasted in along with identification and description for each. If you do not have computer access, I will accept an actual photo album to physically turn in. You can have more than one item on a page.

**You do not need to find the exact item on the list, say for example, if it is an internal part to an organism, but you must apply the term to the specimen you find and explain in your finished project how this specimen represents the term.**

- **EXAMPLE:** Pholem - Phloem is part of the vascular bundle of a land dwelling plant that brings sugars created by photosynthesis in the leaves to the rest of the plant to provide energy. The picture is of a four-leaf clover with phloem inside the stem. The clover is cut, so the sugars that are normally brought to the roots cannot go there any more though sugars are still flowing from the leaves until flower dies.



➤ **ORIGINAL PHOTOS ONLY:**

You cannot use an image from any publication or the Web. You must have taken the photograph yourself. You have to prove this by placing a small item (stuffed animal, a button, toy car, etc.) in all of your photographs that only you could have added each time. You could also make a small sign of your name that will be in each photo/drawing. You can even have yourself in the picture.

- **EXAMPLE:** In the photo of the four leaf clover you can see my wedding band.

➤ **NATURAL ITEMS ONLY:**

Specimens may be used for only one item/word, and all must be from something that you have found in nature that is or once was alive. Ex. You can not use your little sister's stuffed pony for a picture of a mammal. Take a walk around your yard, neighborhood, and town or even the beach. Go to a store that has living things, like home depot (plants) or PetSmart (animals) **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.

Be sure to include a description of the term and how it relates to the Photograph

## **Biology Scavenger Hunt list.**

**You must photograph at least 25 of the terms below as well as identify and describe each**

**Make 1 slide for each item**

*Each photo is 2 pts and each description is 2 points for a total of 100 pts*

1. adaptation of an animal
2. adaptation of a plant
3. abscisic acid
4. actin
5. amniotic egg
6. amylase
7. angiosperm
8. animal with segmented body
9. annelid
10. anther & filament of stamen
11. arthropod
12. archaeobacterial
13. autotroph
14. auxin
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. chlorophyte
26. chrysalis
27. cnidarian
28. coelomate
29. coniferous tree
30. commensalism
31. connective tissue
32. cuticle layer of a plant
33. deciduous tree
34. deuterostome
35. dicot plant
36. diploid chromosomes
37. echinoderm
38. ectotherm
39. endosperm
40. endotherm
41. enzyme
42. epithelial tissue
43. ethylene
44. eubacteria
45. eukaryote
46. exoskeleton
47. fermentation
48. flower ovary
49. frond
50. fruit – dry for dispersal
51. fruit – edible for dispersal
52. gametophyte
53. gastropod
54. genetically modified organism
55. gibberellins
56. glycogen
57. gymnosperm
58. haploid chromosome
59. heartwood
60. hermaphrodite
61. hormone
62. insect
63. K-strategist
64. Keratin
65. larvae
66. Lepidoptera
67. Lichen
68. Lignin
69. lipid
70. littoral zone organism
71. long-day plant
72. meristem
73. modified leaf of a plant
74. modified root of a plant
75. modified stem of a plant
76. modified ovipositor of animal
77. monocot plant
78. muscle fiber – striated
79. mutualism
80. mycelium
81. mycorrhizae
82. myosin
83. nematode
84. niche
85. nymph stage of an insect
86. parasite
87. parenchyma cells
88. phloem
89. pine cone – female
90. Platyhelminthes
91. Pollen
92. Pollinator
93. Porifera
94. Prokaryote
95. protein – fibrous
96. protein – globular
97. protostome
98. pteridophyte
99. r-strategist
100. radial symmetry
101. rhizome
102. two-chambered heart
103. spore
104. sporophyte
105. stem – herbaceous
106. stem – woody
107. stigma & style of carpel
108. tendril of a plant
109. thorn of a plant
110. unicellular organism
111. vascular plant tissue
112. xerophyte
113. xylem

## **Part I – Alternative to Scavenger Hunt: Vocabulary Flash cards –**

Choose 25 words from the vocabulary list below. You will create a vocabulary card for each word selected. Each side of the card is worth 2 points, for a total of 100 points.

- Front of card
  - Draw a picture that represents the selected word. The picture should be colored.
  - No words should appear on the front of the card.
- Back of card
  - List the vocabulary word
  - List one or two “linking words” or phrases (what is a more simplistic or more concrete way to describe the chosen vocabulary word?)
  - Define each word

Vocabulary cards should be put into a ziplock bag with your name on it.

### **Vocabulary Flash Cards**

Homeostasis

Capsid

DNA

RNA

Cytokinesis

Chromosome

Mitosis

Biomolecules

Carbohydrates

Lipids

Proteins

Nucleic Acids

Replication

Codons

Mutations

Genotype

Phenotype

Adaptation

Natural Selection

Biodiversity

Diversity

Xylem

Phloem

Stoma

Guard cells

Primary succession

Secondary succession

Predation

Parasitism

Commensalism

Mutualism

Trophic levels

Prokaryote

Eukaryote

Organelles

Genetic code

Genetic drift

Gene flow

Endosymbiosis

Taxonomy

Binomial nomenclature

Dichotomous key

Photosynthesis

Cellular Respiration

Enzymes

Catalyst

Substrate

Activation energy

Internal feedback

Limiting factor

**Part II – Root word investigation – Research each root word write definition - 50 pts**

The main reason students find it difficult to understand science is because of all the hard to write, spell and read words. Actually, scientific vocabulary is a mix of small words that are linked together to have different meanings. If you learn the meanings of the little words, you'll find scientific vocabulary much easier to understand. Find the mean to the following Greek/Latin root words.

Word	Meaning
a- / an-	
meso-	
leuco-	
aero-	
anti-	
amphi-	
aqua- / hydro-	
arthro-	
auto-	
bi- / di-	
bio-	
cephal-	
chloro-	
chromo-	
-cide	
cyto-	
derm-	
haplo-	
ecto- / exo-	
endo-	
epi-	
gastro-	
-genesis	
herba-	
hetero-	
homo-	
ov-	
kary-	
neuro-	
soma-	
saccharo-	
primi-/ archea-	
-phyll	

Word	Meaning
hemo-	
hyper-	
hypo-	
intra-	
-itis	
lateral	
-logy	
-lysis	
-meter	
mono-	
morph-	
micro-	
macro-	
multi- / poly-	
-path / -pathy	
-ped /-pod	
phago-	
-phobia	
-philia	
proto-	
photo-	
pseudo-	
-stasis	
sub-	
sym- / -syn	
-synthesis	
-taxis	
-troph	
-tropism	
-therm	
tri-	
zoo-, -zoa	
zyg- / -zygous	

## **Using Root words to define unknown words**

Once you have completed the above root word table, use it to develop a SIMPLE definition, **in your own words**, for each of the following terms:

1. Hydrology \_\_\_\_\_

2. Cytolysis \_\_\_\_\_

3. Protozoa \_\_\_\_\_

4. Epidermis \_\_\_\_\_

5. Spermatogenesis \_\_\_\_\_

6. exoskeleton \_\_\_\_\_

7. Abiotic \_\_\_\_\_

8. Pathogen \_\_\_\_\_

9. pseudopod \_\_\_\_\_

10. Hemophilia \_\_\_\_\_

11. Endocytosis \_\_\_\_\_

12. herbicide \_\_\_\_\_

13. Anaerobic \_\_\_\_\_

14. Bilateral \_\_\_\_\_

15. autotroph \_\_\_\_\_

16. Monosaccharide \_\_\_\_\_

17. Arthropod \_\_\_\_\_

18. Polymorphic \_\_\_\_\_

19. Hypothermia \_\_\_\_\_

20. Biogenesis \_\_\_\_\_

You will have a QUIZ on these words and the above root words on the first day of class and a TEST on them the second day of class

## **Part III: Video learning Bozeman Science - 50 Pts total**

You will learn about 3 key practices to succeed in AP biology by watching a video and answering questions about each. We will be using a lot of videos for Bozeman science this year as homework so this will give you a good introduction to the Host Mr. Anderson and the videos. Each video is about 10 minutes but allow yourself 30 minutes each to pause video and answer questions

Each video centers on the **4 Big Ideas of AP biology**:

### **Big Idea 1: EVOLUTION**

The process of evolution drives the diversity and unity of life.

### **Big Idea 2: Cellular Processes: ENERGY and Communication**

Biological systems utilize free energy and molecular building blocks to grow, to reproduce, and to maintain dynamic homeostasis.

### **Big Idea 3: Genetics and INFORMATION Transfer**

Living systems store, retrieve, transmit, and respond to information essential to life processes.

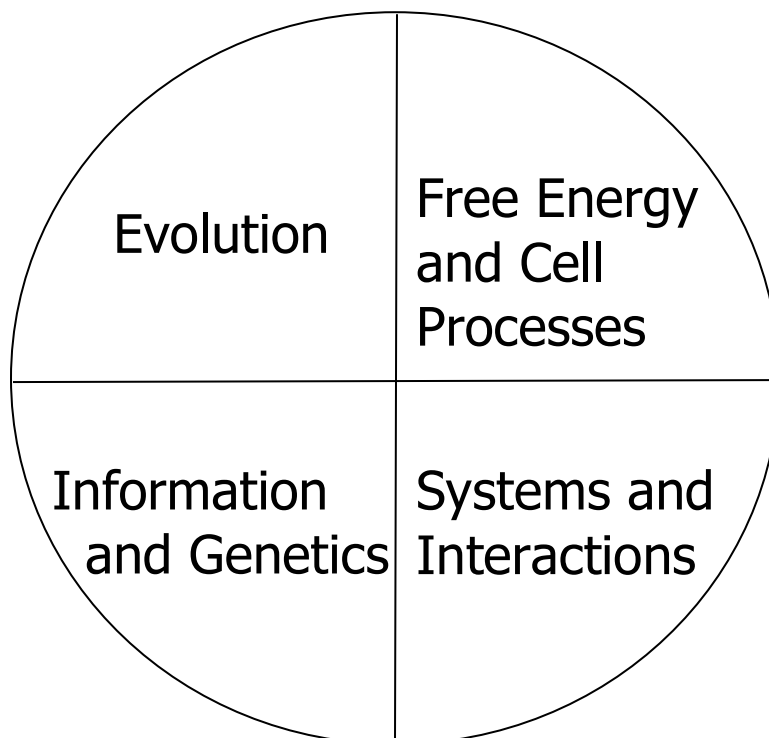
### **Big Idea 4: Interactions of SYSTEMS**

Biological systems interact, and these systems and their interactions possess complex properties.

The 3 videos are as follows: Each work sheet has a specific link, but you can access them all if you google: < Bozeman AP biology> and choose first link. They will all be listed

- 1) Video 1 – Using Models – 20 pts
- 2) Video 2 – Using Mathematics – 20 pts
- 3) Video 3 – Scientific Questioning – 10 pts

Note. There are 7 Intro AP practice videos by Bozeman science, You can do more for extra credit



## AP Biology Practice 1 – Models and Representations Video Review – 20 pts

Video - [www.bozemanscience.com/apb-practice-1-models-representations](http://www.bozemanscience.com/apb-practice-1-models-representations)

- A) What is a model?.....A visual representation of \_\_\_\_\_
- B) A \_\_\_\_\_ of how it works is a "Conceptual Model".
- C) What are the **four Big Ideas** we will be discussing in AP Biology? List below along with associated example:
- 1) \_\_\_\_\_ - example shows natural \_\_\_\_\_
  - 2) \_\_\_\_\_ - example:
  - 3) \_\_\_\_\_ - genetics and cell
  - 4) \_\_\_\_\_ - pyramid of
- D) What are the **5 things** you will need to be able to do using models and visual representations? List below and then answer [Please keep in mind, some of the examples that he uses may be unknown to you at this time, focus on the "practice" not the content.]
- 1) \_\_\_\_\_
    - i. Relating to beetles, draw/label the final graph he created below:
  
    - ii. Why do you think there were fewer light colored beetles when the trees became darker?
    - iii.
  - 2) \_\_\_\_\_ What was is going to move in his example? \_\_\_\_\_
  - 3) \_\_\_\_\_ They will give you a model and then \_\_\_\_\_ based on that. ...
  - 4) \_\_\_\_\_ Means that you are \_\_\_\_\_ your knowledge to a visual representation
  - 5) \_\_\_\_\_ Asking you to \_\_\_\_\_ the knowledge that you have.
- E) Models allow us to make \_\_\_\_\_ of a \_\_\_\_\_ model.
- F) What is the most famous model of all? \_\_\_\_\_ That was created by \_\_\_\_\_



## AP Biology Practice 2 – Using Mathematics Video Review Sheet – 20 pts

[www.bozemanscience.com/apb-practice-2-using-mathematics](http://www.bozemanscience.com/apb-practice-2-using-mathematics)

- A) All sciences have what at their core? \_\_\_\_\_
- B) What is “Mathematical Biology” driven by:
- 1) \_\_\_\_\_: sequencing DNA – what is the trend? \_\_\_\_\_
  - 2) \_\_\_\_\_ Theory: being used to predict \_\_\_\_\_ Rule of \_\_\_\_\_
  - 3) Computing \_\_\_\_\_: computers are getting
  - 4) Laboratory experiments in silico:
    - a) In vitro: \_\_\_\_\_
    - b) In vivo: \_\_\_\_\_
    - c) In silico: simulating \_\_\_\_\_
- C) **Four equations in the four big ideas:** You want to be familiar with these
- 1) Evolution:
  - 2) Information:
  - 3) Free energy:
  - 4) Systems:
- D) Understandings in Using Mathematics:
- 1) \_\_\_\_\_ the \_\_\_\_\_ of a Mathematical Routine: Pause video, try and do it and then check it. If you can no do, just take notes (CALCULATOR REQUIRED)
  - 2) Apply \_\_\_\_\_ Routines: Again, try this problem. You can do this one based on common sense! (CALCULATOR REQUIRED)
  - 3) \_\_\_\_\_ quantities that \_\_\_\_\_ natural phenomena.
    - a) Estimate which way water will go in each.
    - b) Potatoes: you can do this, just use graph. Potatoes have \_\_\_\_\_M Sucrose

## **AP Biology Practice 3 – Scientific Questioning Video Review Sheet – 10 pts**

[www.bozemanscience.com/apb-practice-3-scientific-questioning](http://www.bozemanscience.com/apb-practice-3-scientific-questioning)

1. I should be able to ask you, "How do we...."
2. Students should be able to answer, "This is how...."
3. What is a good example of how you ask questions all the time?
4. What is the problem with:
  - a. Smallest bird question?
  - b. Universe question?
  - c. Genetically modified food question?
5. Why is the plant growth question more scientific?...but what is a problem with it too?
6. Why is the CO<sub>2</sub> question a good scientific question?
7. A good question is going to lead to: (2x)
8. What are the three things you have to be able to do during the practice of "Scientific Questioning"?
9. Write out one of the three questions he "posed" concerning the phylogenetic tree. (You are just asking, not answering.)
10. When you "refine" a question, you are taking it to another \_\_\_\_\_
11. What is the third part of scientific questioning?
12. What can you then do if you are good at scientific questioning?