

AP Biology Summer Assignment

Welcome to AP Biology! This class is highly intensive, with a lot of material that needs to be covered. The course is designed to cover two semesters (different classes) of college biology in one year. Please be aware that part of taking this class is commitment to being present and on time, on task and hard working. The class will only meet for one semester so we will be working in a partially “flipped” classroom setting where you will be responsible for looking over power points and viewing videos at home to prepare for in class discussions and activities. Although it sounds like a huge commitment, **we will have a lot of fun**. I look forward to working with each one of you this coming school year.

Below you will find a couple of assignments to work on over the summer before coming back to school in the fall. I know the idea of a summer assignment is the last thing you want to think about, but I think you will find these assignments to be beneficial to you when we meet up for the start of school. Please make sure you take note of the due dates of each of the assignments as they are due at different times.

Assignment #1: Root words – due Friday August 2nd(or 2nd day of class)

Many people see learning Biology as learning another language due to the high volume of vocabulary we cover. This next assignment will help you with all of the terminology by learning the root words that make up your vocab words. Write the definition of each root word in the following table. Use any resources you have available to you.

Root	Definition	Root	Definition	Root	Definition
A-, an-		Dis-		Mort-	
Ab-		Du-, duo		Morph-	
Ac-		Ect-		Multi-	
Ad-		En-		Neo-	
-al		-en		Non-	
Alb		End-, ent-		-oid	
Allo		-eous		Pan-	
Amph-, amb-		Eu-		Permea-	
An-		Extra-		Phag-	
Ante-		Ex-		Pheno-	
Anti-		-gen, -gine		Photo-	
Aqu-		-gene, gene-		Poly-	
Archaeo-		-gony		Por-	
-ase		Herb-		Port-	
Auto-		Hetero-		Pre-	
Bene-		Homo-		Pro-	
Bi-		Hydr-		Proto-	
Bio-, bi-		Hypo-		Pseud-	
Carb-		Hyper-		Saccharo-	
Chem-		-ine		Scope	
Chlor-		Inter-		Semi-	
Chrom-, -chrome		Iso-		Strat-	
-cide		-it is		Sub-	
Co-		-less		Super-	
Con-		Lip-		Sym-, syn-	
Contra-		-logy		-taxis	
-cycle, cyci-		Macr-		Therm-	
di-		Micro-		Trans-	
Dia-		Mono-		Troph-	

Assignment #4 – Chemistry Review – due Monday August 5th (or 3rd day of class)

Chemistry is a pre-requisite for taking AP Biology and an understanding of basic chemistry concepts is imperative to understanding certain biological concepts. The following is a list of terms for you to define and a set of questions to answer. Use any resources you have to complete the assignment. We will not spend much time going over these concepts in class as you should already have an understanding of them, but the information will be on the unit 1 test.

Vocab terms:

Matter	Valence electrons	Acid
Inorganic	Orbital	Base
Atom	Octet rule	Hydrogen ion
Element	Half-life	Hydroxide ion
Atomic nucleus	Radioactive tracer	pH
Proton	Ion	Buffer
Neutron	Dissociation	Nonpolar covalent bond
Atomic number	Ionic bond	Polar covalent bond
Mass number (atomic weight)	Valence	Ionic bond
Isotope	Ionization	Anion
Electron	Molecule	Cation
Bound water	Molecular formula	Hydrogen bond
Surface Tension	Structural formula	Hydrophobic
Capillary action	Compound	Hydrophobic interactions
Specific heat	Solvent	Hydration
Freezing point of water	Solute	Hydrophilic
Heat of vaporization	Aqueous solution	

QUESTIONS

1. Describe atomic structure using the terms proton, neutron, electron, mass number and orbital. Indicate what is meant by electrons in an "excited state" and those in a "ground state"
2. Explain what an isotope is and give two important physical properties of isotopes that make them useful in biological research. Define half-life.
3. Using diagrams, explain what an ion is, and how it forms. Describe an ionic bond.
4. Explain what is meant by pH. Give the name of materials that resist a change in pH.
5. Describe a covalent bond and tell how it differs from an ionic bond. Relate the structure of an atom to its chemical properties and to the type of chemical bond it forms.
6. Explain the important role of weak chemical bonds in the organization of living things.
7. Describe the special physical properties of water. Draw two water molecules in a way that illustrates a hydrogen bond, explain why water is a good solvent, and show the basis for the high surface tension of water.
8. How do the unique chemical and physical properties of water make life on earth possible?
9. Indicate why oxygen and carbon dioxide are basic to life, and name the principle source of each of these molecules.
10. How do mixtures, compounds, and molecules differ from each other?
11. What is the difference between a polar and nonpolar covalent bond?
12. What properties of water make it an essential component of living material?
13. Why are buffers important to living things? Explain how a buffer system works.
14. Explain why isotopes are important in biochemical research?

Assignment #5: Biology Scavenger Hunt and Photo Album – due Friday August 9th (or 7th day of class)

For this assignment, you are going to create a photo album containing 35 photographic examples of biological terms/concepts. This can either be a virtual photo album in the form of a blog, a google doc or a power point (saved to google drive and shared with kellapbio@gmail.com) or a physical photo album that you bring into class. This photo album will not only introduce you to the language of biology, but it will also emphasize the importance that biology is something that's *done*, not just memorized.

To create your photo album:

1. Choose 35 terms from the list below. You are welcome to work with other members of our AP Biology class, but each person's list should be unique. With almost 100 terms to choose from, having unique photo lists should not be an issue.
2. Collect your photos by taking a picture in nature either of the term itself or something that represents that term. For example phloem is found within a plant's stem so it would be hard to take a picture of the phloem itself, but you could take a picture of the stem and explain how it represents phloem (you cannot use this example in your album now, sorry ☺).
3. If making a physical album, print out your pictures. If making a virtual album, upload them for your presentation.
4. For each picture, you must include a definition of the term and a statement explaining how the picture represents the term or concept.
5. Use must use original photos – no photos from the internet. To ensure this happens, you need to include something of yours in **every** photo – this could be a keychain, a ring, a stuffed animal, etc... The very first picture in your album should be of you and your personal item to show that you took the pictures.
6. You are to use natural items. Take a walk in your neighborhood, go to the zoo, go to a park, hit up a nature trail, etc... Be creative in your collection – have fun obtaining your picture collection.
7. Be careful – never touch plants or animals you are not familiar with. Don't kill or harm any organisms. Don't remove any organisms from their natural environment.

This project is out of 105 points – 3 points for each entry (1 each for the photo, the definition and your explanation) – and will be your first test grade for the class.

Biology Scavenger Hunt Term/concept list – choose only 35

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