

Wissahickon AP Biology Summer Assignment 2024-25

Our knowledge of the biological world is rapidly expanding. For many years, with each new and exciting discovery, more and more content was added to the AP Biology curriculum, resulting in a course that was “a mile wide and an inch deep”. In other words, the sheer number of topics that had to be covered in a typical school year was far too great to have any sort of meaningful conversation about them. In 2013, the College Board unveiled a redesigned course that shifted the focus away from memorizing a laundry list of facts to engaging students in seven scientific practices that would prepare them with the critical thinking skills necessary to understand the ever-growing field of biology in their future undergraduate courses and beyond. In 2019, the College Board revised the curriculum again to narrow down the content into 8 commonly taught units:

Unit 1: Chemistry of Life

Unit 2: Cell Structure and Function

Unit 3: Cellular Energetics

Unit 4: Cell Cycle

Unit 5: Heredity

Unit 6: Gene Expression and Regulation

Unit 7: Natural Selection

Unit 8: Ecology

WANT A TEXTBOOK OVER THE SUMMER? Although the textbook is not necessary for the summer assignment, if you would like to check out a hard copy of the AP Bio textbook, please stop by D23 to sign one out. OR, you may access the textbook online throughout the summer, please email mashdale@wsdweb.org for a code.

The first part of your summer assignment is to familiarize yourself with these seven practices by watching Bozeman Science videos (a fantastic resource for AP science students that we will be utilizing throughout the year) and completing the corresponding video worksheets. Please **print and handwrite** these worksheets and **be ready to turn them in on the first day of class**. It will take you about an hour to watch all seven videos.

Science Practice 1: The student can use representations and models to communicate scientific phenomena and solve scientific problems.

Video: https://www.youtube.com/watch?v=v5Nemz_cVew

Worksheet: <https://tinyurl.com/y95q5ajp>

Science Practice 2: The student can use mathematics appropriately.

Video: <https://www.youtube.com/watch?v=jgqYlSKoXak>

Worksheet: <https://tinyurl.com/yaqqtqqk>

Science Practice 3: The student can engage in scientific questioning to extend thinking or to guide investigations within the context of the AP course.

Video: <https://www.youtube.com/watch?v=2zB272Ak63A>

Worksheet: <https://tinyurl.com/yc2g4qrc>

Science Practice 4: The student can plan and implement data collection strategies appropriate to a particular scientific question.

Video: <https://www.youtube.com/watch?v=AzTXnne40wU>

Worksheet: <https://tinyurl.com/ybolylz3>

Science Practice 5: The student can perform data analysis and evaluation of evidence.

Video: <https://www.youtube.com/watch?v=0JqukouOtZA>

Worksheet: <https://tinyurl.com/ybskzttts>

Science Practice 6: The student can work with scientific explanations and theories.

Video: <https://www.youtube.com/watch?v=3gK1xWNM7kk>

Worksheet: <https://tinyurl.com/yaosxsgp>

Science Practice 7: The student is able to connect and relate knowledge across various scales, concepts and representations in and across domains.

Video: <https://www.youtube.com/watch?v=7l4bcs49JP8>

Worksheet: <https://tinyurl.com/y8q8bxqk>

While the emphasis of this course will be on developing the seven skills above, a solid foundation of content knowledge is still necessary in order to be successful. AP Biology is designed to be the equivalent of a two semester introductory college-level course. As such, the responsibility for mastering the content falls largely on YOU. We will explore topics you learned in your previous biology classes in more depth and cover new topics such as cell communication and body systems. The curriculum is centered around four big ideas:

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.

It is expected that you already have a working knowledge of basic biology from your previous classes. We do not have the time to reteach these basic concepts during the school year.

Therefore, your second assignment is **review any terms on the list below** that you may have forgotten from last year or perhaps never learned. You may use your textbook (see online textbook access instructions below), notes from previous classes, or the Internet to teach yourself. It is up to you to determine how you will review and how much time you will spend on this assignment. However, it is recommended that you spread your studying out over the summer and review a little bit every couple of days rather than cramming the night before school starts. It is proven that you will retain information better this way. You should **be prepared to take a quiz** within the **first week of school** on this content (not the first day – we aren't THAT mean). If you are unprepared and score poorly on the quiz, you may have additional remediation assignments that you will have to complete.

NOTE: You should have a **general understanding** of each term. Do not stress out yourself over details.

1. abiotic
2. active transport
3. adenosine triphosphate (ATP)
4. adhesion
5. allele
6. analogous structure
7. aquatic
8. artificial selection
9. asexual reproduction
10. biology
11. biome
12. biosphere
13. biotechnology
14. biotic
15. carbohydrate
16. carnivore
17. carrier (transport) proteins
18. catalyst
19. cell
20. cell cycle
21. cellular respiration
22. chlorophyll
23. chloroplast
24. chromosomal mutation
25. chromosomes
26. cloning
27. co-dominance
28. cohesion
29. commensalism
30. community (ecological)
31. competition
32. concentration gradient
33. consumer (ecological)
34. crossing-over
35. cytokinesis
36. decomposer
37. deoxyribonucleic acid (DNA)
38. diffusion
39. DNA mutation
40. DNA replication
41. dominant inheritance
42. ecology
43. ecosystem
44. embryology
45. endemic species
46. endocytosis
47. endoplasmic reticulum (ER)
48. endosymbiosis
49. energy pyramid
50. enzyme

51. eukaryote
52. evolution
53. exocytosis
54. extinction
55. extracellular
56. facilitated diffusion
57. food chain
58. food web
59. fossils
60. founder effect
61. frame-shift mutation
62. gamete
63. gene
64. gene recombination
65. gene splicing
66. gene therapy
67. genetic drift
68. genetic engineering
69. genetically modified organism (GMO)
70. genotype
71. Golgi apparatus
72. gradualism
73. habitat
74. herbivore
75. homeostasis
76. homologous structure
77. impermeable
78. incomplete dominance
79. inheritance
80. interphase
81. intracellular
82. isolating mechanisms
83. limiting factor
84. lipids
85. macromolecule
86. meiosis
87. migration
88. mitochondrion
89. mitosis
90. monomer
91. multicellular
92. multiple alleles
93. mutualism
94. natural selection
95. niche
96. nondisjunction
97. nonnative species
98. nucleic acid
99. nucleus
100. omnivore
101. organ
102. organ system
103. organelle
104. organic molecule
105. organism
106. osmosis
107. parasitism
108. passive transport
109. pH
110. phenotype
111. photosynthesis
112. plasma membrane
113. point mutation
114. polygenic
115. polymer
116. population
117. population dynamics
118. predation
119. predator
120. prey
121. producer (ecological)
122. prokaryote
123. protein
124. protein synthesis
125. pumps (ion or molecule)
126. punctuated equilibrium
127. recessive inheritance
128. ribosome
129. selective breeding
130. semiconservative replication
131. sex-linked trait
132. sexual reproduction
133. speciation
134. species
135. succession
136. symbiotic relationship
137. terrestrial
138. tissue
139. transcription
140. translation
141. translocation
142. trophic level
143. unicellular
144. vestigial structure

I am looking forward to a great school year! AP Biology will be a challenging but rewarding experience for you. Don't forget to take some time this summer to relax and recharge! See you in August!

Mr. Ashdale