



**AP Biology**  
**Summer Assignment**  
**School Year 2019-2020**

Objective of the summer assignment:

The Summer Assignment is designed to prepare students for the AP Biology course and to introduce students to some of the topics that will be covered in class; to build on students' readiness in foundational skills and knowledge; and to create and enhance enthusiasm and interest in science.

Resources/Materials necessary for the summer assignment:

A book of the students choosing related to science. Materials appropriate for the students choice of project – a minimum of paper and pencil.

Estimated length of time to complete:

The assignment should take approximately 10 hour to complete, the time will vary depending on the book and project the student chooses.

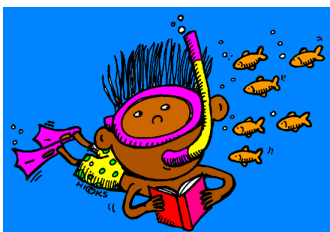
Grade:

The Assignment will count as a 100 point homework grade for the first marking period.

Due Date:

The projects are due on September 5<sup>th</sup>/6<sup>th</sup>, 2019 the forth class meeting of the school year.

Questions? Contact: Mrs. Anne-Marie Hanapole Email: [ahanapole@fcps.edu](mailto:ahanapole@fcps.edu)



# AP Biology Summer Assignment 2019-20

## Welcome to AP Biology!

The AP Biology course is designed to be the equivalent of a two-semester college introductory biology course with lab, usually taken by biology majors during their first year. Topics covered in the course include Molecules and Cells, Heredity and Evolution, and Organisms and Populations. The course is designed to prepare students for the A.P. Biology Exam in May, and it is expected that students enrolled in A.P. Biology will take the exam in May.

The Summer Assignment is designed to prepare students for the AP Biology course and to introduce students to some of the topics that will be covered in class.

In addition to the Summer Assignments, Students should review what they learned in their previous Biology and Chemistry Courses.

## Required Assignment

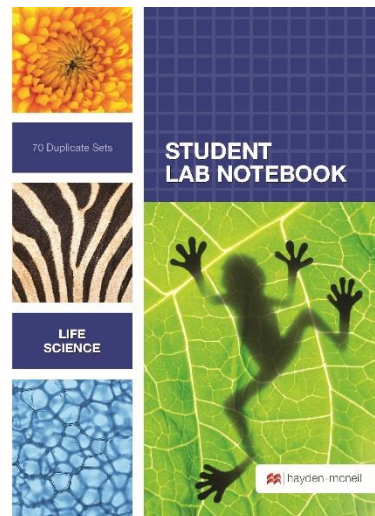
1. Choose a book from the List of Book Choices
2. Read the book of choice.
3. Choose a project idea from the list of Project Choices (pick one project idea .... not one from each category)
4. Complete the Project.
5. Project Assignments are Due: **September 5<sup>th</sup>/6<sup>th</sup>, 2019**

⇒ This assignment will count as a 100 point Homework/Classwork grade for the first marking period.

## Required Materials for the Course

The following is a list of items students will need to acquire for the course in the fall.

- Three ring binder with loose leaf notebook paper.
- Black or Blue Pens & Pencils.
- **Laboratory Notebook:** 70 or 100 page carbonless copy quad laboratory notebook (Notebooks may purchase in class during the first week of school – details will be given in the fall)
- **Recommended Materials:** Calculator, Colored Pencils, and a Test Prep Study Guide



## List of Book Choices:

1. *The Machinery of Life* by David S. Goodsell
2. *Every Living Thing* (2008) Man's Obsessive Quest to Catalog Life, from Nanobacteria to New Monkeys by Rob R. Dunn
3. *March of the microbes sighting the unseen* by John L. Ingraham
4. *Why We Get Sick: The New Science of Darwinian Medicine* by George C. Williams Randolph M. Nesse
5. *The Epigenetics Revolution: How Modern Biology is Rewriting Our Understanding of Genetics, Disease, and Inheritance* by Nessa Carey
6. *Microcosm* (2008) E. coli and the New Science of Life by Carl Zimmer
7. *The Undead: Organ Harvesting, the Ice-Water Test, Beating-Heart Cadavers-- How Medicine Is Blurring the Line Between Life and Death* by Dick Teresi
8. *Biography of a Germ* (2000) by Arno Karlen
9. *What a Plant Knows* (2012) A Field Guide to the Senses by Daniel Chamovitz
10. *Life Ascending* (2009) The Ten Great Inventions of Evolution by Nick Lane
11. *Remarkable Creatures Epic Adventures in the Search for the Origins of Species* by Sean B. Carroll
12. *Into The Jungle: Great Adventures in the Search for Evolution* by Carroll, Sean B.
13. *The Cobra Event* (1997) by Richard Preston
14. *The Demon in the Freezer* (2002) A True Story by Richard Preston
15. *Only a Theory: Evolution and the Battle for America's Soul* by Kenneth R. Miller
16. *Survival of the Sickest* (2007) A Medical Maverick Discovers Why We Need Disease by Sharon Moalem , Jonathan Prince
17. *Abraham Lincoln's DNA* (2000) and Other Adventures in Genetics by Philip Reilly
18. *Genome*(1999) The Autobiography of a Species in 23 Chapters by Matt Ridley
19. *The Hot Zone* (1999) A Terrifying True Story by Richard Preston
20. *Finding Darwin's God* (1999) A Scientist's Search for Common Ground Between God and Evolution by Kenneth R. Miller
21. *Stiff* (2003) The Curious Lives of Human Cadavers by Mary Roach
22. *Gulp* by Mary Roach
23. *The care of handling roses with thorns* by Margaret Dilloway
24. *The Accidental Mind* (2007) How Brain Evolution Has Given Us Love, Memory, Dreams, and God by David J. Linden
25. *The Immortal Life of Henrietta Lacks* (2010) by Rebecca Skloot
26. *Hot, Flat, and Crowded* (2008) Why We Need a Green Revolution—and How it Can Renew America by Thomas L. Friedman
27. *Tears of the Cheetah: The Genetic Secrets of Our Animal Ancestors* (2003) by Stephen J. O'Brien
28. *The Man Who Mistook His Wife for a Hat* (1985) And Other Clinical Tales by Oliver Sacks
29. *Time, Love, Memory: A Great Biologist and His Quest for the Origins of Behavior* (1999) by Jonathan Weiner
30. *Why Evolution Is True* (2009) by Jerry A. Coyne
31. *The Beak of the Finch* (1994) A Story of Evolution in Our Time by Jonathan Weiner
32. *The Naked Ape* (1967) A Zoologist's Study of the Human Animal by Desmond Morris
33. *Your Inner Fish* (2008) A Journey into the 3.5-Billion-Year History of the Human Body by Neil Shubin
34. *The Making of the Fittest* (2007) DNA and the Ultimate Forensic Record of Evolution by Sean B. Carroll
35. *Why Zebras Don't Get Ulcers* by Robert Sapolsky
36. *The Panda's Thumb: More Reflections of Natural History* by Stephen J. Gould
37. *The Cartoon Guide to the Environment* by Larry Gonick and Alice Outwater
38. *The Cartoon Guide to Genetics* by Larry Gonick & Mark Wheelis
39. *Pandora's Lab* by Paul A. Offit, MD
40. *The Vaccine Race* by Meredith Wademan
41. *Not a Scientist* How politicians make misconceptions and statements not based on facts. By Dave Levitan
42. *Rigor mortis* - sloppy science vs good data and experiments By Richard Harris
43. *The Diversity of Life* by E.O. Wilson,
44. *Life Unfolding* by Tim Davies,
45. *What Evolution Is* by Ernst Mayr
46. *The 13th Element* by John Emsley,
47. *Botany of Desire* by Michael Pollan
48. *The Omnivore's Dilemma* by Michael Pollan
49. *The Violinist's Thumb* by Sam Kean
50. *Charles and Emma: The Darwins' Leap of Faith* by Deborah Heiligman
51. *10% Human: How Your Body's Microbes Hold the Key to Health and Happiness* by Alanna Collen

52. [Napoleon's Buttons: How 17 Molecules Changed History](#) by Penny Le Couteur and Jay Burreson/Invention
53. [Deep: Freediving, Renegade Science, and What the Ocean Tells Us About Ourselves](#) by James Nestor
54. [Good Germs, Bad Germs: Health and Survival in a Bacterial World](#) by Jessica Snyder Sachs
55. [The Tale of the Dueling Neurosurgeons](#) by Sam Kean
56. [Soonish: Ten Emerging Technologies That'll Improve and/or Ruin Everything](#) by Kelly Weinersmith and Zach Weinersmith
57. [Frankenstein's Cat: Cuddling Up to Biotech's Brave New Beasts](#) by Emily Anthes
58. [The Vital Question](#) by Nick Lane
59. [Life's Ratchet](#) by Hoffman
60. [Spillover](#) by David Quammen
61. [Radium girls](#) by Carl Zimmer
62. [Parasite Rex: Inside the Bizarre World of Nature's Most Dangerous Creatures](#) by Carl Zimmer
63. [The Gene: An Intimate History](#) by Siddhartha Mukherjee
64. [Bonk](#) by Mary Roach
65. [Packing for Mars](#) by Mary Roach
66. [Grunt](#) by Mary Roach
67. [Lab Girl](#) by Hope Jahren
68. [Rabid: A Cultural History of the World's Most Diabolical Virus](#) by Bill Wasik and Monica Murphy
69. [The American Plague: The Untold Story of Yellow Fever, The Epidemic That Shaped Our History](#) by Molly Caldwell Crosby
70. [The Forever Fix](#) by Ricki Lewis
71. [The Origins of Virtue: Human Instincts and the Evolution of Cooperation](#) by Matt Ridley
72. [The Blind Watchmaker: Why the Evidence of Evolution Reveals a Universe without Design](#) by Richard Dawkins
73. [The Language of Life: DNA and the Revolution in Personalized Medicine](#) by Francis S Collins
74. [A Crack in Creation: Gene Editing and the Unthinkable Power to Control Evolution](#) by Jennifer A. Doudna and Samuel H. Sternberg
75. [The Third Chimpanzee: The Evolution and Future of the Human Animal](#) by Jared M. Diamond
76. [Wild Trees](#) by Richard Preston
77. [Banana: The Fate of the Fruit That Changed the World](#) by Dan Koepfel
78. [The Teenage Brain: A Neuroscientist's Survival Guide](#) by Frances E Jensen and Amy Ellis Nutt
79. [Inheritance: How Our Genes Change Our Lives--and Our Lives Change Our Genes](#) by Sharon Moalem MD PhD
80. [Cheating Death: The Doctors and Medical Miracles that Are Saving Lives Against All Odds](#) by Sanjay Gupta
81. [Teaming with Microbes: The Organic Gardener's Guide to the Soil Food Web](#) by Jeff Lowenfels and Wayne Lewis
82. [To Know a Fly](#) by Vincent Dethier
83. [The Sports Gene](#) by David Epstein.
84. [Song of the Dodo](#) David Quammen.
85. [Weaponized Lies: How to Think Critically in the Post-Truth Era](#) by Daniel J. Levitin
86. [Adventures of a Female Medical Detective](#) by Mary Guinan, MD, PhD,
87. [This is your brain on parasites](#) by Kathleen McAuliffe.
88. [Mean Genes: From Sex to Money to Food Taming Our Primal Instincts](#) by Terry Burnham and Jay Phelan
89. [The Parrot's Lament: And Other True Tales of Animal Intrigue, Intelligence, and Ingenuity](#) by Eugene Linden
90. [Coming of Age With Elephants: A Memoir](#) by Joyce Poole
91. [The Wild Trees: A Story of Passion and Daring](#) by Richard Preston
92. [The 7 Daughters of Eve](#) by Brian Sykes
93. [Life Unfolding](#) by Tim Davies
94. [What Evolution Is](#) by Ernst Mayr
95. [The Human Age: The World Shaped by Us](#) by Diane Ackerman
96. [The Trout Pool Paradox: the American Lives of Three Rivers](#) by George Black
97. [Coal Wars: the Future of Energy and the Fate of the Planet](#) by Richard Martin
98. [Endangered Economies: How the Neglect of Nature Threatens Our Prosperity](#) by Geoffrey Heal
99. [Fukushima: The Story of a Nuclear Disaster](#) by David Lochbaum
100. [Atomic Accidents: A History of Nuclear Meltdowns and Accidents from the Ozark Mountains to Fukushima](#) by James Mahaffey
101. [Modified: GMOs and the Threat to Our Food, Our Land, Our Future](#) by Caitlin Shetterly
102. [Next Tsunami: Living on a Restless Coast](#) by Bonnie Henderson
103. [Firestorm: How Wildfires Will Shape Our Future](#) by Edward Struzik
104. [You Are Here: Exposing the Vital Link What We Do and What that Does to Our Planet](#) by Thomas Kostigen
105. [Garbage Land: On the Secret Trail of Trash](#) by Elizabeth Royte
106. [Climate of Hope: How Cities, Businesses and Citizens Can Save the Planet](#) by Michael Bloom
107. [Junk Raft: An Ocean Voyage and a Rising Tide of Activism to Fight Plastic Pollution](#) by Marcus Eriksen
108. [Atmosphere of hope: searching for the solutions to the climate crisis](#) by Tim Flannery
109. [Weather makers: how man is changing the climate and what it means for life on earth](#) by Tim Flannery
110. [From the bottom up: one man's crusade to clean America's rivers](#) by Chad Pregracke
111. [The Great quake: how the biggest earthquake in North America changed our understanding of the planet](#) by Henry Fountain
112. [Supercontinent: ten billion years in the life of our planet](#) by Ted Nield

113. The water will come: rising seas, sinking cities and the remaking of the civilized world by Jeff Goodell
114. World Is Blue: how our fate and the ocean's are one by Sylvia A Earle
115. The Ocean of life: the fate of man and the sea by Callum Roberts
116. An Ocean of air: why the wind blows and other mysteries of the atmosphere by Gabrielle Walker
117. Eating the Sun: how plants power the planet by Oliver Morton
118. The Ends of the world: volcanic eruptions, lethal oceans, and our quest to understand Earth's past mass extinctions by Peter Brannen
119. No turning back: the life and death of animal species by Richard Ellis
120. The death and life of the Great Lakes by Dan Egan
121. Aliens among us: how invasive species are transforming the planet – and ourselves by Leslie Anthony
122. Planet of microbes: the perils and potential of Earth's essential life forms by Ted Anton
123. The Hidden life of trees: what they feel, how they communicate: discoveries from a secret world by Peter Wohlleben
124. How to clone a mammoth: the science of de-extinction by Beth Shapiro
125. America's snake: the rise and fall of the timber rattlesnake by Ted Levin
126. Coyote America: a natural and supernatural history by Dan Flores
127. In the wake of the Exxon Valdez: the devastating impact of the Alaska oil spill by Art Davidson
128. Cat wars: the devastating consequences of a cuddly killer by Peter P. Marra [director of Smithsonian Migratory Bird Center] and Chris Santella
129. A hole in the wind : a climate scientist's bicycle journey across the United States by David M. Goodrich
130. The great transition: shifting from fossil fuels to solar and wind energy (Lester Brown, Earth Policy Institute)
131. Life on the brink: environmentalists confront overpopulation (Philip Cafaro)
132. The Emperor of All Maladies: a biography of cancer by Siddhartha Mukherjee
133. Balance: a dizzying journey through the science of our most delicate sense by Carol Svec
134. The New Wild: Why Invasive Species Will Be Nature's Salvation by Fred Pearce
135. We Are Our Brains: A Neurobiography of the Brain, from the Womb to Alzheimer's by D.F. Swaab
136. Polio: An American Story by David M. Oshinsky
137. Other.... Students may choose another grade level appropriate biology related book of interest.

Choices 95-136 above are available for check out in the Fairfax High School library.

Additional titles can be found at the following College Board web-site:

AP Biology "Great Books" List <http://apcentral.collegeboard.com/apc/members/features/28371.html>

### **Project Choices:**

***(Choose and complete one of the following project ideas .... not one from each category)***

#### **Construction/Artistic Presentation**

1. Create a sculpture of a character. Use any combination of soap, wood, clay, sticks, wire, stones, old toy pieces, or any other object. Write an explanation of how this character fits into the book.
2. Make several sketches of some of the scenes in the book, label and explain them.
3. Construct a diorama (three-dimensional scene which includes models of people, buildings, plants, and animals) of one of the main events of the book. Include a written description of the scene.
4. Write a FULL (physical, emotional, relational) description of three of the characters in the book. Draw a portrait to accompany each description.
5. After reading a book of history or historical fiction, make an illustrated timeline showing events of the story and draw a map showing the location(s) where the story took place.
6. Do a collage/poster showing pictures or 3-d items that related to the book, and then write a sentence or two beside each one to show its significance.
7. Make a mobile about the story.
8. Make a sketch or painting a favorite part of the book--don't copy an already existing illustration.
9. Make a flow chart of all the events in the book.
10. Make a poster advertising your book so someone else will want to read it.
11. Design and Create a Facebook page for a main character in the book.

12. Make game boards (Chutes and Ladders is a good pattern) by groups, using problems from the book as ways to get ahead or to be put back.
13. Make a life-sized stand-up character of one of the people in the book. On the back list the characteristics of the person.
14. If the story of your book takes place in another country, prepare a travel brochure using pictures you have found or drawn.

#### **Creative Writing**

15. Rewrite the story for younger children in picture book form.
16. Imagine that you are the author of the book you have just read. Suddenly the book becomes a best seller. Write a letter to a movie producer trying to get that person interested in making your book into a movie. Explain why the story, characters, conflicts, etc., would make a good film. Suggest a filming location and the actors to play the various roles. (Note: You may only use books which have not already been made into movies)
17. Write a diary that one of the story's main characters might have kept before, during, or after the book's events. Remember that the character's thoughts and feelings are very important in a diary.
18. Write a letter (10-sentence minimum) to the main character of your book asking questions, protesting a situation, and/or making a complaint and/or a suggestion. This must be done in the correct letter format.
19. Write a letter to the author of the book.
20. Write an ad for a dating service for one of the characters.

#### **General Writing**

21. Interview a character from your book. Write at least ten questions that will give the character the opportunity to discuss his/her thoughts and feelings about his/her role in the story. However you choose to present your interview is up to you.
22. Write a book review as it would be done for a newspaper. (Be sure you read a few before writing your own.)
23. Write a feature article (with a headline) that tells the story of the book as it might be found on the front page of a newspaper in the town where the story takes place.
24. Read two books on the same subject and compare and contrast them.
25. Read a book that has been made into a movie. (Caution: it must have been a book FIRST. Books written from screenplays are not acceptable.) Write an essay comparing the movie version with the book.
26. Write about what you learned from the story.
27. Compare and contrast two characters in the story.
28. Write a feature article (with a headline) that tells the story of the book as it might be found on the front page of a newspaper in the town where the story takes place.
29. Do some research on a topic brought up; in your book and write a paper about what you have learned.
30. Write a multiple choice quiz of the book with at least ten questions.

#### **Presentation**

31. Video tape yourself giving a "sales talk" as if you were presenting it to clerks in a bookstore and you want them to push this book.
32. Construct puppets and video tape yourself presenting a show of one or more interesting parts of the book.
33. Read the same book as one of your friends. The two of you make a video of MASTERPIECE BOOK REVIEW, a program which reviews books and interviews authors. (You can even have audience participation!)
34. Write and videotape a performance of an original song that tells the story of the book.
35. Be a TV or radio reporter, and record yourself giving a report of a scene from the book as if it is happening "live".

***If you have any questions, please either see me before the end of the year or email me over the summer.  
I look forward to working with you next year!***

Mrs. Hanapole  
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