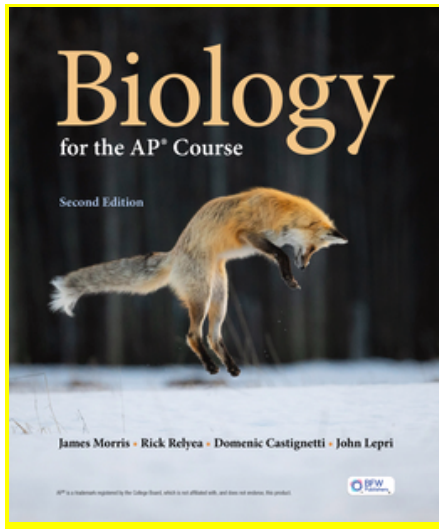


## AP BIOLOGY SUMMER ASSIGNMENT 2026

Welcome to a rewarding but challenging course. This class is fast paced and intensive, but you will be prepared for college biology with a solid foundation, critical thinking skills and the ability to articulate your knowledge. In order for next year to be as successful as possible, AP Biology requires (as does most things in a life) some preparation. This summer you will have several assignments which will allow you to start next year with confidence. [ctaylor@columbushs.com](mailto:ctaylor@columbushs.com)

\*\*\*All files are named: last name first name period # (number) date of submission assignment name (Ex: Garcia,Juan P4 August 19 Survival of the Sickest) (-10 points from incorrect file name)

### **Part one - Due August 17, 2026**



### **Unit 0: Foundations**

- a. Module 1: Four Core Concepts of Biology
  - b. Module 2: Scientific Inquiry
  - c. Module 3: Visual Representations
  - d. Tutorial 1: Graphing
- a. **Module 01:** Introduction - **Read** the module; **answer** the sets of **concept check questions (01.1, 01.2, 01.3 and 01.4)** -page 6, 7 and 8 - (handwritten in notability); - page 9 **answer the Module 01-AP practice questions Section 1: Multiple-Choice Questions (only put question number and letter A - you don't have to rewrite the question or**

answer) and **Section 2: Free-Response Questions - ALL ANSWERS ARE TO BE HANDWRITTEN IN NOTABILITY-no AI answers allowed** - no exceptions

b. **Module 02:** Read the module; answer the concept check (5 sets) questions (handwritten in notability) pages 14, 17, 20, 21 and 22; answer the “Your Turn” at the end of both **Analyzing Statistics and and Data red box problems page 17**; and answer the “Your Turn” at the end of both **Analyzing Statistics and and Data red box problems page 20** - answer the **Module 02-AP practice questions on pages 24 and 25 Section 1: Multiple-Choice Questions (only put question number and letter A - you don’t have to rewrite the question or answer)** and **Section 2: Free-Response Questions - ALL ANSWERS ARE TO BE HANDWRITTEN IN NOTABILITY-no AI answers allowed** - no exceptions

c. **Module 03:** Read the module; answer the concept check (4 sets) questions (handwritten in notability) pages 29, 31, 32 and 34; - page 36 and 37 answer the **Module 03-AP practice questions Section 1: Multiple-Choice Questions (only put question number and letter A - you don’t have to rewrite the question or answer)** and **Section 2: Free-Response Questions - ALL ANSWERS ARE TO BE HANDWRITTEN IN NOTABILITY-no AI answers allowed** - no exceptions

d. **Tutorial 1: Statistics -Page 38 - Read and review the types of graphs-** on page 45 the “Practice” -answer questions 1, 2, 3, 4 & 5 - make sure you label the section and the number for each question - **Multiple-Choice Questions (only put question number and letter A - you don’t have to rewrite the question or answer) ANSWERS ARE TO BE HANDWRITTEN IN NOTABILITY-no AI answers allowed** - no exceptions

## Unit 1: Chemistry of Life

- a. Read the entire unit
- b. Tutorial 2: Statistics

a. **Module 1.1:** Introduction - Read the module; answer the sets of concept check questions (1.1, 1.2, 1.3 and 1.4) -pages 53, 59, 62 and 65 - (handwritten in notability); - page 68 and 69 answer the **Module 1-AP practice questions Section 1: Multiple-Choice Questions (only put question number and letter A - you don’t have to rewrite the question or answer)** and **Section 2: Free-Response Questions - ALL ANSWERS ARE TO BE HANDWRITTEN IN NOTABILITY-no AI answers allowed** - no exceptions

b. **Tutorial 2: Statistics -Page 122 - Read and review-** on pages 122-127, complete the “Practice” -answer questions 1, 2, 3, 4 & 5 - make sure you label the section and the number for each question -**Multiple-Choice Questions (only put question number and letter A - you don’t have to rewrite the question or answer) ANSWERS ARE TO BE HANDWRITTEN IN NOTABILITY-no AI answers allowed** - no exceptions

**\*\*file name: last name, first name, period #, date of submission, specific textbook assignment**

## Part Two: **Due August 17, 2026**

You need to read [\*Survival of the sickest – the surprising connections between disease and longevity\*](#) by Dr. Sharon Moalem with Jonathan Prince and complete the discussion questions (**complete sentences essay style**). You will need to purchase this book or get it from a student who had AP Biology last year. **Due August 17, 2026 to OnCampus Bulletin board for the class- no AI answers allowed**

**\*\*\*Due August 17, 2026\*\*\***

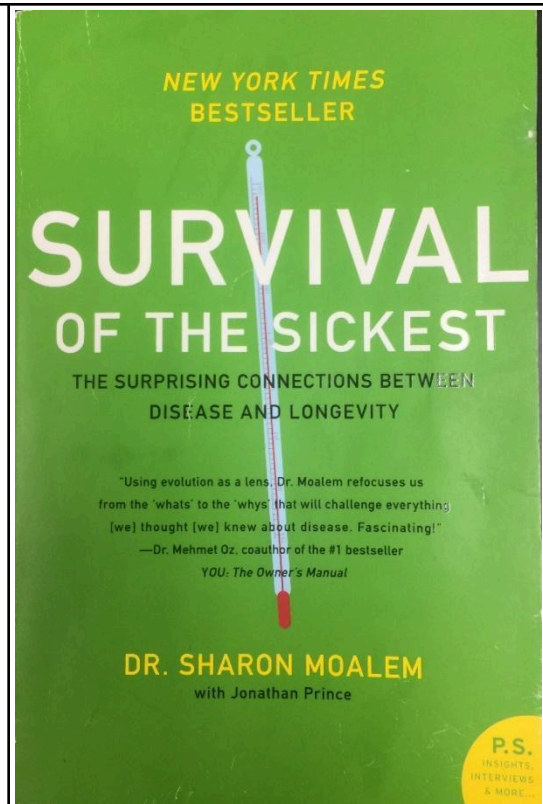
One of the **four big ideas** for AP Biology is Evolution. This is an interesting read about connections with disease and genetic codes.

“Every adaptation is a compromise of sorts, an improvement in some circumstances, a liability in others” - Dr. Sharon Moalem

With this in mind – take notes as you are reading. Tie in the specific example to evolution – make the connection. These notes will help you during the course as each of these topics resurface during the school year.

Also try to **connect each scenario to the 4 big ideas:**

1. **The process of evolution drives the diversity and unity of life.**
2. **Biological systems utilize free energy and molecular building blocks to grow, to reproduce and to maintain dynamic homeostasis.**
3. **Living systems store, retrieve, transmit and respond to information essential to life processes.**
4. **Biological systems interact, and these systems and their interactions possess complex properties.**



**DISCUSSION QUESTIONS – answer in complete sentences essay style - label, —**  
**remember connect to a big idea above - File name: last name, first name, period #,**  
**date of submission, Survival -no AI answers allowed**

1. **What** does quasi-living organisms mean?
2. **Cystic fibrosis** affects which body system how? It helps prevent \_\_\_?
3. **Sickle Cell Anemia** - **What** type of mutation causes sickle cell anemia and what/how does it provide a resistance to a common mosquito borne illness?
4. **Ashkenazi Jewish** populations are linked to which genetic disorder? by **which** enzyme deficiency? **What** was the proposed evolutionary advantage of this mutation?
5. **Thrifty gene**- **What** is it and **what** is the potential disadvantage.

6. **Hemochromatosis** - **What** are the symptoms and evolutionary advantages?
7. **Why** would you take a drug that is guaranteed to kill you in 40 years?
8. **Compare and contrast** too much iron vs. too little (hint: think about oxygen levels)
9. **Where** is the body most vulnerable to infection?
10. **Describe** the body's "arsenal of natural defenses" against the cold?
11. **Describe** the connection between *Rana sylvatica* and diabetes.
12. **What** is the "acute phase response"?
13. **Describe** bubonic plague – its history, bacterium responsible, location in the body, degree of contagion, fatality rates, cultural advantages, who was/is most vulnerable?
14. **Compare and contrast** Ebola virus to bubonic plague.
15. **What** are microphages? **What** is the advantage to having iron vs. lacking iron?
16. **Describe** the history of the barber's pole as it relates to today's surgeons.
17. By **what mechanisms/ processes** does glucose **provide fuel** to the brain? **What** are manufactured proteins? **Where** in the body is it stored? **What** is insulin? **Where** in the body is it made?
18. **What** are the Younger Dryas? **When** did it occur?
19. **What** is non-shivering thermogenesis?
20. **How** do animals adapt to extreme cold?
21. **Describe** the connection between (a) tanning bed/birth defects (b) sunglasses/sunburn (c) hypertension/slave trade (d) Asian flush/drinking water (e) skull shape/climate (f) body hair/malaria
22. **How** does vitamin D help growth of bones in children and maintain strong bones in adults? **What** diseases are associated with insufficient levels of vitamin D? **What** action did we take in the last century to combat one of these diseases? **What** role might vitamin D have played in skin color?
23. **What** is ApoE4? **What** does ApoE4 do and how have different populations adapted? **Compare and contrast** the advantages and disadvantages between the populations.
24. **What** is special about the genetic markers of the Cohanim? **Do** the phenotypes **match** these genotypes?
25. **Describe** the connection between (a) European clover/Australian sheep breeding crisis of the 1940s (b) Capsaicin/birds and mammals (c). Malaria/air conditioning (d) Favism/fava beans

26. **What** is the gene CYP2D6? **Compare** the effect of different percentages of this gene in human populations with different ethnicities.
27. **Discuss** gene CCR5-Δ32 and its implications?
28. **Compare and contrast** why in Western tradition we have four basic tastes – sweet, salty, sour and bitter. Think about the historical reasons we developed these tastes and why today it might be a disadvantage. Give at least 3 specific examples.
29. **List and explain** at least **3 benefits** of plant toxins.
30. Foreign invaders such as parasites, viruses and other diseases have evolved mechanisms to spread from host to host – **describe** 3 parasites, the disease they are associated with and their method of host manipulation to spread.
31. **What** is the Weissman barrier? **Make connections** between the following sets of terms (a) transposons/viruses/evolution (b) sunspots/flu epidemics
32. **Make connections** between the following sets of terms (a) vitamin supplement/agouti mice (b) snakes/long-tailed lizards (c) Barker Hypothesis/fathers who smoke (d) smoking grandmothers/asthmatic children and (e) Betel nut chewing/cancer
33. **Make connections** between the following sets of terms (a) Progeria/lamina A (b) Hayflick limit/ telomeres (c) Cancer cells/ stem cells (d) size/ life expectancy and (e) risky child birth/ birth grains and bipedalism
34. **Identify** the 5 lines of cancer defense.
35. **Define epigenetics** (break down the prefix and root word) and **explain** how fat yellow mice gave birth to thin brown mice???? and offspring with significantly lower rates of cancer and diabetes??? **How did** epigenetics unlock the mystery of thin coated voles and sociable locusts?
36. **Define methylation.** Compare and contrast addition of methyl markers vs removal of methyl markers.
37. **What** is “hygiene hypothesis” (allergies/autoimmune diseases) and **what** is the connection to Crohn’s disease?

**\*\*\* label, label, label - complete sentences – essay style answers**  
**(complete sentences paragraph style) – will be turned in to your OnCampus account**  
**the first day of school – please have it in a PDF format ready to be submitted.**  
**\*\*file name: last name, first name, period #, date of submission, specific textbook**  
**assignment**