Welcome to AP Biology! This course is designed to be the equivalent of a two-semester introductory biology course usually taken in the first year of college. In other words, it’s a little like drinking from a fire hose. It will be a rewarding experience, but as with most things that are, it will also be very challenging. Before you do anything else please join our Schoology group using join code: PXWD-FB5F-586JF!

One thing you may notice is that this summer assignment has the option of not being started until school starts! I know that last spring was very challenging with e-learning and this summer may present some challenges to you as well, so I want to be mindful and respectful of that. You may choose to do this assignment in the summer and submit it through Schoology as soon as your class is live OR you may start it when school begins. Either way the book portion will be due the first day of class after Labor Day. You will turn the text in in class and the assignment to Schoology. Please try to have your supplies by the first real week of school as you will need them.

Throughout the course, you will become familiar with major recurring ideas that persist throughout all topics and material as deemed necessary by the college board.

The Four Big Ideas of AP Biology

| 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, & 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. |

Additionally, the college board has further broken down these ideas into the units below:

The Eight Units of AP Biology

1. Chemistry of Life – Carbon & Biochemistry
2. Cell Structure and Function – Cell Anatomy, Physiology & Communication
3. Cellular Energetics – Photosynthesis & Respiration
4. Cell Cycle – Mitosis/Meiosis & Cancer
5. Heredity – Mendelian & Molecular Genetics
6. Gene Expression and Gene Regulation
7. Evolution / Natural Selection

To successfully complete the course and meet all the required objectives, you will need to do independent work on your own at home. It will not replace classroom instruction or labs. During the school year, you will be reading chapters in the book and taking some of your own notes to supplement notes taken in class. You will also check out other resources and links I may give to you in class or on Schoology, Edpuzzle or Mastering Biology-they will help your understanding of the topic. It is necessary that you do this throughout the year. The summer assignment is designed to prepare you for topics in AP Biology-evolution; scientific methodology; the chemistry and energy of life; and macromolecules and disease as well as disease vectors. As you work on the and find that you have questions, you may contact me through email cris.robson@asd20.org. My school email goes directly to my phone so I will answer promptly, unless I am on top of a mountain with no signal.

Please complete the assignment attached to this sheet. All work will be collected the first day of class after Labor Day. You will have the ability to discuss and review the material, ask questions, clarify confusion or express concerns with me before the due date. Your understanding of the material will be assessed. I read every word you write (if you do not believe this ask former students.) Do not attempted to copy work from someone else. I will notice and it will be apparent on the assessment. If you have any questions, feel free to email me at cris.robson@asd20.org.
PART I Reading

This is not a textbook reading! Many times, throughout the year, we can learn about science in various books and journal articles that offer different perspectives and reveal new information that is not provided for in your textbook.

Your task: Read the book “Survival of the Sickest” by Sharon Moalem. On sites like Amazon, you may be able to find used copies of this book. I saw the hardcopy for sale today for $1.70 and the paperback for $2.00 on Amazon. It is important that you have a physical copy so that you can annotate it. If you hate writing in your books you may also use sticky notes to annotate.

As you read each chapter, there are questions for you to answer in the Reading Guide (see below). You will also need to choose your favorite chapter and complete a book card as part of the second part of your assignment. I could not think of a more relevant book for us to start the year with in light of the current pandemic!

As you read the book, please ANNOTATE it!
You can use sticky notes for your annotations if you hate writing in your book. (Turn in a physical copy of the text the day after the assignment is due.)

For each chapter:

1. Annotate the book as you read it that might be helpful to “jog” your memory when we discuss the different chapters at different points during the school year. Remember you can use sticky notes if you hate writing in your books. You should also think about what topics we might cover in class and information mentioned in the text.

2. Answer the discussion questions below:

   DISCUSSION QUESTIONS

   Answers must be written in complete sentences and must be in Times New Roman 12-point font.

Part 1: Reading Guide for Survival of the Sickest

Part 2: Chapter Book Card

You must choose one chapter that stood out to you in the book and fill in the four sections on the book card. Those sections include:

- Summary of the chapter
- Scientific Vocabulary found in the chapter and a definition (you cannot leave this section blank)
- Historical Connection of disease to modern day
- Illustration that summarizes the chapter – your illustration must accurately portray the main theme/idea in the chapter.
Reading Guide - Survival of the Sickest

Introduction

1. What is the "big" question the book will attempt to answer?

Chapter I - “Ironing It Out”

2. Identify and describe at least five ways in which iron impacts life.

3. In the context of this chapter, explain the author's reference to Bruce Lee and to the barber pole.

Chapter II - “A Spoonful of Sugar Helps the Temperature Go Down”

4. Distinguish between each of the three types of diabetes.

5. What did the ice cores of 1989 reveal about the Younger Dryas?

6. Describe the body's "arsenal of natural defenses" against cold.

7. Describe the connection between Rana sylvatica and diabetes.

8. In Chapters 1 and 2 several inherited disorders were discussed. Create and complete a chart with the following information: Disease/Disorder, Symptoms, Evolutionary Advantage

Chapter III - “The Cholesterol Also Rises”

9. Why do we need Vitamin D? Cholesterol? Folic acid?

10. Briefly describe the connection between each of the following pairs of concepts:
    a. tanning beds/ birth defects
    b. sunglasses/ sunburn
    c. hypertension/ slave trade
    d. Asian flush/drinking water
    e. skull shape/ climate
    f. body hair/ malaria
11. What's so fishy about the Inuits' skin color?

12. Explain the good and the bad of ApoE4.

**Chapter IV - “Hey, Bud, Can You do Me a Fava?”**

13. What is G6PO? Explain the role of G6PO.

14. Briefly describe the connection between each of the following pairs of concepts:
   a. European clover/Australian sheep breeding crisis of the 1940s
   b. Capsaisin/ birds and mammals
   c. Malaria/ air conditioning
   d. Favism/ fava beans

15. Explain the following statement found on page 87: "Life is such a compromise."

**Chapter V - "Of Microbes and Men"**

16. Identify 3 ways in which microbes/parasites move from host to host.

17. For each pathway listed in question #2, explain the relationship of the mode of transmission to the virulence of the invader.

18. What is our advantage in the survive-and-produce race?

**Chapter VI - "Jump Into the Pool"**

19. Briefly discuss the following terms/scientists:
   a. Jenner
   b. vaccine
   c. Antibodies
   d. B-cells
   e. "junk DNA"
   f. Lamarck
   g. McClintock
   h. Retroviruses
20. What is the Weissman barrier?

21. Make connections between the following sets of terms:
   a. transposons/viruses/evolution
   b. sunspots/flu epidemics

22. Humans have about 25,000 genes and more than a million different antibodies. How is this possible?

23. What is a persisting virus?

Chapter VII - “Methyl Madness: Road to the Final Phenotype”

24. 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
   e. Betel nut chewing/ cancer

25. Epigenesis may be partially responsible for the childhood epidemic of obesity. Explain this.

26. "Good times mean more boys. Tough times mean more girls." Explain this quote.

Chapter VIII - "That's Life: Why You and Your iPod Must Die"

27. Make connections between the following terms:
   a. Progeria/ lamina A
   b. Hayflick limit/ telomeres
   c. Cancer cells/ stem cells
   d. Size/ life expectancy
   e. Risky childbirth/ big brains and bipedalism
28. Explain the author's iPod and aging analogy.

29. Identify the 5 lines of cancer defense.

30. What are the two accomplishments of biogenic obsolescence?

31. Compare and contrast the Savanna and aquatic ape hypotheses.

**Conclusion**

32. The author hopes that you will come away from this book with an appreciation of three things:
   a. Life is in a constant state of creation
   b. Nothing in our world exists in isolation
   c. Our relationship with disease is often much more complex than we may have previously realized.
   d. Please add one of your own takeaways from this novel:

33. "Nothing in biology makes sense except in the light of evolution." How does the book, Survival of the Sickest, support this quote by Theodosius Dobzhansky, a noted evolutionary biologist?
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<th>Brief summary of the chapter you chose:</th>
<th>Historical Connection of Disease to Modern Day</th>
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<th>Science Related Vocabulary and definition (you MUST have words here)</th>
<th>Picture summary of selected chapter</th>
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Completion Date: Read the book throughout the summer or August, whichever works best for you! Complete the discussion questions after you finish each chapter. You should have the book read and discussion questions completed by the first class after Labor Day.

PART II AP Biology Supplies

Please use the summer as your opportunity to get your supplies for AP Biology early. Come in prepared on Day 1 as we will hit the ground running. All supplies are due the first day of real class.

Materials

1. 3-ring class notebook (1 inch) for handouts, class notes, reading guides etc.

2. A small amount of lined loose leaf paper

3. Dark Blue or black pens, highlighters and #2 pencils to be brought to class EVERY day. Colored pencils would be VERY helpful too!

4. A scientific or graphing calculator. https://apstudent.collegeboard.org/apcourse/ap-biology/calculator-policy Note: You will not be able to use your own calculator on my exams, but you will be allowed to use it on the AP exam.

6. Some students elect to purchase their own textbook. We will be using the 1st edition of Campbell Biology In Focus. You can find this on Amazon: http://www.amazon.com/Campbell-Biology-Focus-Lisa-Urry/dp/0321813804 This book is expensive, but having your own copy will allow you to annotate it etc. It will not hurt you to have your own copy of the text when you go on to take more bio in college!

7. I strongly recommend purchasing the associated study guide: http://www.amazon.com/gp/product/0321864999/ref=pd_lpo_sbs_dp_ss_3?pf_rd_p=1944687602&pf_rd_s=lpo-top-stripe-1&pf_rd_t=201&pf_rd_i=0321813804&pf_rd_m=ATVPDKIKX0DER&pf_rd_r=19HM8A2HJPV97ZFV389W This is not required but it will help you a great deal throughout the year.

Any questions?
Email Mrs. Robson!! cris.robson@asd20.org

This year is going to be very fun, rewarding & challenging! I cannot wait for us to start our class together!! 😊