2025-2026 **AP BIOLOGY SUMMER ASSIGNMENT**

Welcome to AP Biology! This is a college level course; it will be rigorous and demand your time both in and out of the classroom. All students enrolled in the course are required to take the AP exam in May in order to receive the weighted grade. Your work for this course will begin during the summer to ensure that everyone starts the class with the same prerequisite knowledge. It is recommended that you not wait until the end of the summer to start this assignment. Start early so that you can enjoy your summer. This will be **due by the FRIDAY August 15, 2025 by 11:59pm.**

Assignment #1:

1. Sign up for Google classroom.
   - Class code: *qtadgc3h*
   - Post your introduction on the class comments page.
   - Have you chosen a *major* for college yet? If so, what?
   - Find and post an inspiring quote written by a scientist about science, discovery, mystery, beauty of nature, etc.

2. Safety Contract. Please read and sign and upload the contract (posted on Google classroom)

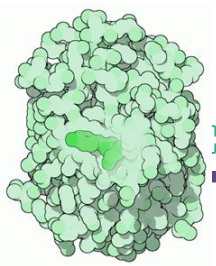
Assignment # 2:

1. Familiarize with college board AP Biology by checking the following link: https://apstudents.collegeboard.org/courses/ap-biology
2. Answer the following questions:
   - What are the skills you will learn in this course?
   - How many units?
   - When is the exam?
   - What is the exam format?

Assignment # 3:

1. Graphing and Data Skills Practice Packet
   - The new A.P. Biology curriculum stresses the importance of being able to analyze and graph data.
   - Go to the following website and watch the video and then answer the following questions: *http://www.bozemanscience.com/beginners-guide-to-graphing-data*
   - Please answer in complete sentences and be descriptive. You may need to use the internet to look up the answer to some of the questions.
   - Follow the link and watch the video:
   - Please write the question and the answer.

      a. Why do we use graphs?



b. What are the 5 major types of graphs?

c. Did you get all the types of graphs correct on his quiz?

d. If not, which one(s) did you get wrong?

e. How are graphs used by scientists?

e. What is a line graph?

f. What is it used for?

g. What is a scatter plot?

h. When would we use a scatter plot?

i. What is an independent variable?

j. Which axis is it on?

k. What is a dependent variable?

l. Which axis is it on?

m. What is a bar graph?

n. When would we use a bar graph?

o. What does an individual bar represent?

p. What is the definition of mean, median, and mode?

q. What is a histogram?

r. When would we use a histogram?

s. What is a pie chart?

t. When would we use a pie chart?

u. How can one set of data be placed in several different types of graphs?

v. What are the 5 important things that must be included on a graph? Please provide an explanation of each item or their significance to the graph.

x. On the example student graph he shows you, list at least 5 errors on the graph and explain how they can be corrected.

2. Next go to the following website, and as you watch the video answer the following questions. *http://www.bozemanscience.com/graphing-data-by-hand*
   Questions to answer:
   a. Explain why the independent variable is the fertilizer. (You may need to refer back to your definition of independent variable from the first video questions).

   b. Explain why the dependent variable is the plant growth. (You may need to refer back to your definition of dependent variable from the first video questions).

   c. Why did he decide to create a scatter plot graph?

   d. Why did he place the fertilizer amount on the x –axis?

   e. Why did he place the plant growth on the y-axis?

   f. After placing the graph title and titles of the x-axis and y-axis on the graph, what is the next step?

   g. Why does using the entire graph paper make the graph better and easier to read?

   h. Why do you never extend your best fit line past your last data plot?

3. Experimental Design:
   - ❖ Some of the components expected for Experimental Design in AP Biology will be new to you.
   - ❖ It is of the utmost importance that you have an understanding of these concepts as you begin the course.
   - ❖ Each video is only about 4 minutes long and can be found on YouTube under "Experimental Design for Biologists"
   - ❖ Watch the following videos and answer the following:
   - ❖ **Video #1: Experimental Design System Validation (4:05)**

a. What question does Dr. Johnson wants to answer with his experiment?

b. The feline assistant mentions "advanced work" that the professor must have done in preparation for the experiment. What six things did the assistant mention that the professor needed to consider?

c. Why does the video say that it is important to validate the experimental system?

d. If validation is not performed, what could result?

❖ **Video # 2: Experimental Design Negative Controls (4:51)**

a. Again, what question is being posed by Dr. Johnson?

b. What hypothesis does Dr. Johnson propose?

c. What does the assistant say is wrong with sharing the hypothesis with the study participants?

d. The professor claims that coffee causes high blood pressure after the participants drank two cups of coffee. What other two things does the assistant think could have explained the increase in blood pressure besides the coffee?

e. This video talks about negative controls. What does it say the negative control allows for?

f. What is the consequence of not having a negative control?

g. Why must one of the control groups in this experiment drink decaffeinated coffee instead of water?

h. Why does another control group drink water?

i. A proper set of negative controls is critical to determine what?

❖ **Video #3: Experimental Design Positive Controls (4:41)**

a. According to the video, what is the purpose of using a positive control?

b. What two positive control groups are added to the experiment?

c. Is an experiment successful based on results matching original predictions? If not, explain what makes an experiment successful.

Recommendations:

"Nothing in Biology Makes Sense Except in the Light of Evolution"
Evolutionary Biologist, Theodosius Dobzhansky

The process of evolution drives the diversity and unity of life. It is also one of the 5 big ideas that are a fundamental component of AP Biology. While evolution itself is not an overly complicated idea, there are numerous misconceptions that have persisted since its inception. While we will cover a unit on evolution in this course, it is important to already have a firm understanding of the topic, free of distortions.

Can you confidently answer the following WITHOUT having to look it up?

1. What is evolution?
2. What is natural selection?
3. Which species is "most evolved"?
4. Did humans evolve from monkeys?
5. True or False: Evolution begins with the "big bang".
6. True or False: Scientific theories are supported by evidence.

If you weren't able to answer the above questions correctly without looking up the answers, then I highly recommend purchasing either the book or audio disk below and read/listen to it this summer.

a. Evolution: The Triumph of an Idea by Carl Zimmer
b. ISBN-10 : 0061138401
c. ISBN-13 : 978-0061138409
d. Link to purchase book on Amazon
   https://www.amazon.com/Evolution-Triumph-Idea-Carl-Zimmer/dp/0061138401