Summer Assignment: AP Biology

Teacher: Mrs. Heather Hill. (Will I have an email for them if they need help?)

Background: To learn and understand the ever growing field of biology, we shift the focus away from memorizing a laundry list of facts to engaging in seven scientific practices. By the end of the course work, you should feel prepared to critically think about the world around you and how biology comes down to better understanding yourself. The units we will cover include: Chemistry of Life, Cell Structure and Function, Cellular Energetics, Cell Cycle, Heredity, Gene Expression and Regulation, Natural Selection, and Ecology. We will also work to understand four large concepts: 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. Your summer assignment is designed as a sampler of the different units. This early exposure will ensure you are not behind on the first day of school. Instead, this will be a helpful tool to not only feel prepared but succeed in our class. **Please print and hand write all answers. If you are unsure on how to spell something, use spell check. Be ready to turn them in on the first day of class.**

Advice: It is recommended to 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 (Kornell, 2009). You should **be prepared to take a quiz** within the **first week of school** on this content (not the first day – I am not THAT mean). If you are unprepared and score poorly on the quiz, you may have additional remediation assignments you will have to complete.

Assignment: You will have different parts to complete. When you turn in the assignment, you will have things printed, with your handwriting, in order. For instance, Part A Science Practice 1 Worksheet should be the first page of the assignment. Don't forget, this is due on the first day of school. **Tuesday, August 15, 2023**

Part A: Students will familiarize themselves with these seven scientific practices, as provided by the College Board.

Procedure: Watch Bozeman Science videos (a fantastic resource for AP science students), and complete the corresponding worksheets. It will take you about an hour to watch all seven videos.

Grading: Worksheets will be graded as a whole using the rubric below for a total of 7 points possible.

0 Points **No Evidence**	**4 Points** **Partial Mastery**	**6 Points** **Proficient**	**7 Points** **Advanced**
-Student did not complete work -Student's work has plagiarism issues	-Student's work is missing information or contains the wrong information	-Student's work is complete, but lacks in-depth answers -Student's work has minor mistakes	Student's work shows mastery of knowledge by providing thoughtful, in-depth answers

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/ybskztts

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

Part B: *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, students will complete a review of terms because information might have been forgotten or never learned.

Procedure: Use the provided resources to complete the vocabulary review.Time is dependent on your answers, but I estimate 2 minutes per term. The worksheet is provided. You will want to print it out. You could use the worksheet to see the terms then create a flashcard version. Term on the front, everything else on the back.

Grading: Vocabulary will be graded as a whole for a total of 20 points possible.

0 Points **No Evidence**	**12 Points** **Partial Mastery**	**17 Points** **Proficient**	**20 Points** **Advanced**
-Student did not complete work -Student's work has plagiarism issues	Student's work has some missing information or contains the wrong information	-Student's work is complete, but lacks in-depth answers -Student's work has minor mistakes	Student's work shows mastery of knowledge by providing thoughtful, in-depth answers

Resources:

- https://www.ck12.org/c/biology/ (textbook)
- https://www.khanacademy.org/science/ap-biology (text and videos)
- http://www.bozemanscience.com/ap-biology (videos)
- https://www.youtube.com/user/AmoebaSisters (videos)
- https://www.youtube.com/playlist?list=PL3EED4C1D684D3ADF (videos)

Assignment: https://tinyurl.com/bde5amx9

Part C: Students can plan and implement data collection strategies appropriate to a particular scientific question. To communicate findings, a lab report will be created.

Procedure: You will design a hypothetical experiment to test a scientific claim. You will be assigned a claim based on the **first initial of your first name**. Your lab report must have the following sections: Problem, Hypothesis, Variables, Procedure, Data (you will not have actual data to include), Results. Please use the example and resources I provided for you. Your lab report needs to follow the same format.

Grading: Lab report will be graded as a whole for a total of 18 points possible.

Report Section	0 Points No Evidence	1 point Partial Mastery	2 points Proficient	3 points Advanced
Problem	-Did not complete work. -There are plagiarism issues.	Did not write a scientific claim in question format.	Used a different scientific claim in question format.	Used the assigned claim in a question format.
Hypothesis	-Did not complete work. -There are plagiarism issues.	-Did not write the hypothesis using the if, then format. -Incorrectly placed the IV, DV.	Used the if, then format, but it is not clear enough to be testable.	There is a specific, testable prediction in the if, then format.
Variables	-Did not complete work. -There are plagiarism issues.	Variables are incorrectly identified	Correctly identified the IV and DV	Correctly identified the IV, DV, and included controls
Procedure	-Did not complete work. -There are plagiarism issues.	A list was used, but someone recreating the experiment is going to have to assume several things to try and recreate it.	Numbered list using complete sentences. The procedure is lacking specifics making it hard to recreate it perfectly. Materials (if appropriate) are vague, so someone cannot accurately recreate the experiment.	Numbered list using complete sentences. Anyone would be able to follow the procedure to recreate the experiment. Materials such as quantity and brand are included (if appropriate).
Data	-Did not complete work. -There are plagiarism issues.	-Data section only includes a table or graph -Data section is complete but their are major errors	Data table and graph has minor error(s) with headings or variables.	Data section was created with the correct labeling in terms of headings and variables.
Results	-Did not complete work. -There are plagiarism issues.	-The answer to the hypothesis is there, but it is confusing to understand. -Not written in a CER format	Someone can read the section and learn the answer to the hypothesis. It follows the CER format.	Someone can read the section and learn the answer to the hypothesis. Section is in-depth and educationally valuable in CER format.

First Name Initial	Scientific Claim
A	An apple a day keeps the doctor away.
B - C	Eating chocolate causes you to have acne.
D - E	Swimming immediately after eating will give you cramps.
F - G	Eating carrots will improve eyesight.
H - J	Going outside with wet hair will make you catch a cold.
K - L	Shaving makes hair grow back faster.
M	Drinking coffee will stunt a child's growth.
N - O	Not eating when you have a fever will make you get better faster.
P - R	Break a mirror and you will have seven years of bad luck.
S	Blowing out all the candles on your birthday cake in one breath will cause you to get your birthday wish.
T - V	The full moon makes people restless.
W - Z	Reading in dim light damages a person's eyes.

Assignment: https://tinyurl.com/yc3fax64

Resources:

- Khan Academy variable practice https://tinyurl.com/32sbv6ub
- Variable and hypothesis review https://www.youtube.com/watch?v=nqj0rJEf3Ew
- CER format https://www.youtube.com/watch?v=5KKsLuRPsvU
- Lab format https://tinyurl.com/5sh9rwcw