AP Biology Summer Assignment

Arcadia High School

Summer 2016 for All Students Entering in 2016-2017

(Referenced from Tamalpais High School's Website)

Description of Assignment: Hi there! Welcome to AP Biology! This assignment is designed to activate your mind, introduce you to part of our curriculum, and to see what you are made of. Here are the activities:

1 PLANT EXPERIMENT LAB

- · Adopting a seed packet, planting the seeds, growing the plants and caring for them.
- · Using the seeds above, writing, executing and presenting your results for the Inquiry Lab: Introduction to Experimental Design.
- · As support, there are three PowerPoints (listed below) that will help you know what we want, and what we expect.
- · Deadline: You should have everything ready to go the day you return so we can give you some comments on how to adjust things or to make things better. Final deadline will be as your personal AP BIO teacher determines when you join their particular class.

2 LETTER OF INTRODUCTION

Emailing your teacher a Letter of Introduction (once you find out who this is during August).

• Deadline: This should be done BEFORE the first day we meet you.

3. VIDEO AND STUDY GUIDE

Watching the series of videos to make sure you are covered with baseline knowledge for next year. (I hope you kept your general biology notes!) You may use the guiding questions to explore areas to test yourself.

Located here: Click me!

Some teachers may collect these on the first day, and others issue a quiz or a test based on the questions. It is up to you to decide whether you need to review them or not based on how well you know the material. Essential Knowledge Targets: What should you get out of this at a bare minimum?

- · How do living organisms reproduce, grow, and develop?
- · How do living organisms respond to the environment?
- · How do specialized parts of living organisms allow them to survive?
- · How are scientific investigations conducted?
- · How is scientific evidence used to develop productions, ideas and theories?

The Purpose of the Assignment is:

- · To give your teacher a chance to know your character before school begins.
- · To expose students to material/concepts/skills which are required in the curriculum.
- · To lessen the impact of AP biology's level on the student arriving from General Biology, and to give all students equal access to success in a class normally offered to college-level students.
- · To provide care for a living organism.

1. DESIGN, EXECUTE AND PRESENT AN EXPERIMENT ON THE PLANTS YOU GREW FROM SEEDS – 45 POINTS

Where: Folder or lab book (your choice)

Due Date: First Day of School

Presentation format (TBA by your instructor on the first day of school): Due date, per your instructor.

AP Biology: Introduction to Experimental Design and Characteristics of Life

Possible questions to consider:

- · How do phototropism, gravitropism, OR thigmotropism affect plant growth? (Go ahead and look these words up, then choose ONE.)
- · What are the effects of type/amount of fertilizer or type/amount of compost on plant growth?
- · What factors affect seed germination?
- · What are the structures of plants and how do they affect their growth?

This is your opportunity to show us what you know, and what you are made of. Show your creativity and your attention to detail. Choose a question that will hold your interest. During the summer, grow your seeds, record your data in a folder, and take pictures of your plants as they grow (include a coin or ruler for scale in your photos, and you should be seen in your photos with your plants).

For some guidance on structure of writing a formal lab, you may consult the 'How to write a Lab Report Monden-Style' on Mr. Monden's fusion web page for format. (Look in the AP Biology Summer Assignment Folder.) You will use this format often in AP Biology to present your lab results but keep in mind that your instructor may end up changing the details a little. The question is up to you to invent and the experiment is yours to create, design, and carry out. As a guiding principle for you SUPER students...ask yourself if anyone has ever carried out this particular assignment before. Good luck!

Some Guiding PowerPoints that we made to help you: (These may later become videos.)

- · How to Write a Lab Report
- · How to Make a Hypothesis
- · How to design an AP Level Experiment

Lab Experiment Report Scoring Rubric

Score	Component	Advanced (5)	Proficient (3)	Needs Improvement (1)
	Question	 Narrowly focused and suggests how an answer might be investigated Is answerable Original and Creative Reason for experiment is clear and rational 	 Focused and suggestion for investigation needs work Is answerable Has been done before, but not often Reason for experiment is clear 	 Vague and unable to be investigated Not answerable Done every year, or is of 7th grade life-science level Reason for experiment is unclear or irrational
	Identificatio n of Variables	 Correctly identifies specific and measureable variables (independent and dependent) Identifies constant variables 	 Identifies measured and tested variables Problem with how dependent and independent variables are linked Identifies constant variables 	Variables and constants are incomplete and/or inaccurate
	Hypothesis	 Testable Clearly stated in "If…and…then…because" format. Specifically predicts relationships between dependent and independent variables Will lead to a great experiment 	 Testable Clearly stated in "Ifthen" format Predicts the influence of one variable on another Will lead to a decent experiment, but might present some problems 	 Not Testable Poorly stated regardless of format Does not directly mention the variables Will not lead to an experiment
	Experiment Setup	 Gradation is well laid out Sample size is large enough for the experiment Includes ALL data subjects, not just the data that supports the hypothesis Setup is clear almost flawless 	 Gradation is apparent Sample size is within acceptable size parameters Includes MOST of the data subjects needed Setup construction has left room for errors 	 No Gradation seen Sample size is too small to get useful data Does not include the data subjects required Setup does not work
	Materials	DetailedVertical List Format (columns)	 Most materials are listed and appropriate (forgot a few key materials) List format 	Incomplete/inappropriateNot in list format
	Procedure	 Vertical List format Accurate Complete Easy to follow Reproducible by another person Includes diagrams to clarify procedures 	 Step by step procedure Generally complete Minor errors/omissions make it difficult to follow or repeat. 	 Difficult to follow steps Major omissions/errors Not reproducible by another person Not in list format
	Data Tables	 Contains accurate, precise, raw data and summary data Data reported in correct SI units with descriptive title(s) Includes pictures with student 	 Contains accurate data Most units are labeled or implied Minor errors No Title Pictures without student 	 Contains inaccurate/vague data Confusing or incomplete Missing units or title No pictures or pictures are not useful

Graphs	 Well organized easy to read graphs, charts and/or figures Descriptive title Appropriate labeling (keys, axes, etc) Graph paper/Computer used 	 Well organized easy to read graph and/or figures Descriptive title Minor errors in use of units, labeling, keys, or axes. 	 Graphs, charts, and/or figures presented in a confusing or sloppy fashion Major errors with graphing
Analysis	 Patterns of data identified and discussed Sources of error (uncontrollable error found in your design vs. human error) identified and explained Appropriate recommendations made to eliminate errors Clear and efficient manner is used to express data 	 Patterns of data identified Sources of error identified Some recommendations made to try an eliminate errors Data is expressed in a rambling manner 	 Failed attempt to identify patterns of data Weak attempt to identify sources of error No recommendations to eliminate errors Data is not expressed well
Conclusion	 Scientifically valid and logical Well supported by data collected Responds to experimental question Clearly addresses the stated hypothesis Real world application (global & professional - practical or useful) Vocabulary usage is appropriate for AP level 	 Scientifically valid and logical Supported by data collected Attempts to address experimental question Attempts to address the stated hypothesis Attempt to apply to a real world scenario 	 Incomplete or illogical Does not address question Does not address hypothesis
References used	 All references used (includes: seed packets, on-line sources, and people involved) MLA format used (<u>easybib.com</u>) 	References usedNot in MLA format	References not used
Presentation	 Slides are legible and clearly understood Spelling/grammar are at AP level Slides are formatted well Background noise is minimal Slides not read off of Presentation no longer than 5 minutes Students are clearly understood (clear audio) Includes pictures of experiment and the student 	 Slides are clear, but contain unneeded information Some spelling/grammar errors Slides are not well formatted Background noise distracting from student Slides are referenced often Presentation goes a minute over time limit Student has some difficulty speaking 	 Slides are not clear Many spelling/grammar errors Slides have messy formatting Background noise prevents listener from hearing student Slides are directly read from Presentation goes way over time limit Student is not understandable

Adapted from Brad Williamson's lab poster rubric. (http://www.nabt.org/blog/2010/05/04/mini-posters-authentic-peer-review-in-the-classroom

THE LIST OF FORBIDDEN TOPICS

Do not do an experiment where you can expect to harm your plant. Avoid using 'amount of water, sunlight' or anything you expect a general biology student to have already done.

Ex: Do not 'water' plants with salt water, milk, orange juice, soda, etc. that have been proven over and over again to not be beneficial to plants.

2. LETTER OF INTRODUCTION

Due Date: Second Day of School (20 points)

Letter of Introduction: We are going to spend a lot of time together next year, so we would like to get a head start on learning a bit about you. Also, we will use the Internet and the Web next year for this course, so let's get you used to communicating with me via email. Your first digital assignment is to successfully send your instructor a formal email.

Draft an email to me following these rules:

- · Use clearly written, full sentences. Do not abbreviate words like you are on texting with a friend. Use spell check! This is a professional communication like you would have with a college professor, so let's practice for your rapidly-nearing future!
- · Address it to your teacher. Emails can be found at the <u>district's website</u>.
- · Make the Subject: 'AP Biology: Introduction to (YOUR NAME)'
- · Begin the email with a formal salutation, like "Dear Ms., Mr."
- · Now introduce yourself:
 - What do you like to do? How would you characterize yourself?
 - Do you have a job or other significant time commitments outside of academics?
 - Was there anything that you liked about your earlier science classes?
 - What are you looking forward to the most in AP Biology?
 - What are you most anxious or worried about in AP Biology?
 - Is there anything significant that may affect your learning that I should know about before-hand that you aren't comfortable sharing with the class?
- · End the email with a formal closing and add your name.

3. WATCH VIDEOS AND COMPLETE VIDEO GUIDES

Points to be determined! Due Date: First Day of School

Before you start this assignment, please know that the reason we are creating this particular exercise is to make sure that you all know your general biology material BEFORE you step foot into our class. We do not have time (as you will soon discover) to reteach the basic ideas during the scope of the class. Therefore, it is up to you to explore the world of general biology, know it very well, and be able to discuss it on the first day. Do NOT wait until the last moment to complete this portion of the assignment as you may discover that you do not have enough time.

While one does not need to watch videos to get this done, it is nevertheless still expected of you, even if you had a 'bad' biology instructor, or a 'bad' experience at another school. No excuses from this point on! Please watch these videos and fill out the questionnaire by yourself to see what YOUR personal profile is.

- 1. Please visit http://www.bozemanscience.com/
- 2. Be able to answer all questions found here. (<u>Located here</u>) Do not answer the questions with short, cute answers like 'yes' or 'no', but be able to elaborate

on them and the reasoning behind the answers 'yes, because...' or 'no, that is impossible because...'

- 3. You will watch 'sets' of videos to assist you on a need-be basis.
- 4. The ones associated with AP-Biology (Ecology) (AP Biology Level)
- 5. The ones associated with AP Biology (Biochemistry) (AP Biology Level)
- 6. The ones associated with general chemistry.
- 7. AP Biology is a course designed for students who have completed one year of general high school biology AND one year of general high school chemistry.

Completing these will better prepare you for what lies ahead.

8. All of the ones associated with general biology (click on the general biology link...there are a lot of videos, but watch the ones that you need to have a solid

background for AP Biology.) THESE ARE BY FAR THE MOST IMPORTANT VIDEOS TO WATCH.

9. You are all expected to know your basic biology on all of the topics covered in general biology.

Biology Subject	Chapters in the General Biology Text	Biology Subject	Chapters in the General Biology Text
Scientific Method	1	Evolution	15-17
Cell Biology/Energy Transfer	7-11	Immune System	40 (19 to supplement)
Biochemistry	2	Nervous System	35
Genetics	11, 12, 14 (13 to supplement)	Ecology	3-5 (6 to supplement)

OK That's it! Good luck and email me if you have any questions. I will respond within a week to questions if asked before the 6th of August, after which my schedule gets very busy and I cannot guarantee a response. So, get started early!