AP BIOLOGY SUMMER ASSIGNMENT 2018-2019

Mrs. Stone

AP Biology Summer Assignment 2018-2019
Mrs. Stone kstone@ccslancers.com

Congratulations on deciding to take on the challenge of an Advanced Placement Course. AP Biology is a vigorous, yet manageable and rewarding class. To meet the demands of the curriculum it is necessary for you to complete some work before you come back in August.

Please pay attention – there are several parts with different due dates! I did give you a checklist at end of this packet so you can pace yourself and keep track of what is due when. Please feel free to email me anytime with questions. You may also check out a textbook from me before you leave for the Summer on a first come first serve basis.

Assignment 1: Introduction Letter due on Friday July 13, 2018 by 11:55pm.
First, I would like to know a little about who you are so your first assignment is to send me an email. Yes, your first AP Biology grade will be sending me an email…if only all the grades were this easy ☺
Subject Line: AP Biology 2018, Your Name
Body: Your full name (& nickname that you go by if you have one)

- What are your parent's names? What are your parent's emails and cell phone numbers?
- What other science classes have you taken? Or be taking at the same time?
- Was there anything that you liked or disliked about your earlier science classes?
- Do you have a job or plan on getting a job next year? What kind?
- What are your personal strengths when it comes to learning new material?
- What causes you to struggle in a course?
- What is the most effective way for you to prepare for a test?
- How many AP classes have you taken so far? How many have you passed with a 3 or higher?
- How many AP classes are you taking this year (please list)?
- Have you or will you be taking anatomy and physiology?
- What are you looking forward to the most in AP Biology?
- What are you most anxious about in AP Biology?
- Why are you taking AP Biology? What do you hope to accomplish/gain?

Don't worry! There is no right or wrong answer….be honest so that I can figure out the best way to help you next year! ☺

Assignment #2 Chemistry Review due August 8, 2018

To jump into Biochemistry, you will need to review the following chemistry concepts:

Chemistry Review:

1. Compare the term element with compound.

2. Know the symbols of the following elements and their charge:

    a. Carbon:

    b. Hydrogen:

    c. Oxygen:

    d. Nitrogen:

    e. Phosphorus:

    f. Sulfur:

3. Contrast the terms atomic mass and atomic number.

4. What determines interactions between atoms? Why are valence electrons important?

6. Define the following terms:

 a. Chemical bond

b. Covalent bond

c. Nonpolar covalent bond

d. Polar covalent bond

7. Know both the molecular formula and the structural formula for the following compounds:

a. Oxygen gas

b. Carbon dioxide

c. Glucose

d. Nitrogen gas

e. Ammonia

f. Water (you would be surprised at how many people miss this!!!)

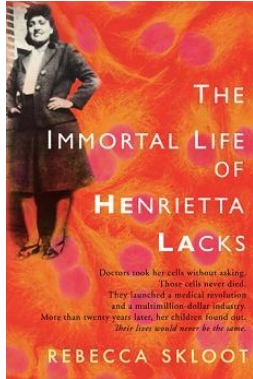8. How do ionic bonds compare with covalent bonds?

9. What are hydrogen bonds?

10. Define the following terms:

a. Solute

b. Solvent

c. Aqueous solution

d. Hydrophilic

e. Hydrophobic

f. Molarity

11. What defines an acid and a base? What is pH?

12. What is special about carbon that makes it the central atom in the chemistry of life?

Assignment # 3 Independent Reading: The Immortal Life of Henrietta Lacks by Rebecca Skloot - due by August 8, 2018. This book is available in your local library or on Amazon.com.   Read this book this summer and come in prepared for a discussion AND quiz on August 8, 2018. Take notes as you read – so you can review it again before school starts. Here are some things to keep in mind as you read the book.

- Pay attention to the main characters in the book. Henrietta Lacks, Dr. George Gey, Dr. Cohen, David Lacks, Deborah and the author Rebecca Skloot.

- Be able to explain the following terminology used in the book: Nuremburg code, Cancer, HeLa cells, Syphilis, Informed consent, and other biological references in the book.

- What can you tell me about the author? What was the authors interest in this story?

- What significant contributions did HeLa cells make to medical science?

- What changes in medical research on humans did this story cause?

- Henrietta Lacks is considered the most important woman in science. Do you agree or disagree?

- Please note that you will fail the quiz if only read the Cliff notes version. Read the book.

- We will have a brief discussion before the quiz.

Notes:

Assignment #4 Graphing and Data skills practice - due August 8, 2018.

Math and Statistics for AP Biology - Research the answer to the following questions

1. In designing an experiment or other scientific study, why do scientists need to sample from a population rather than using an entire population?

2. Suppose you are designing an experiment to test the effects of nicotine on the heart rate of rats. What are the disadvantages of having too small a sample size (i.e., testing on too few rats)? What are the disadvantages of having too large a sample size (i.e., testing on too many rats)?

3. Explain the difference between discrete variables and continuous variables. Give an example of each.

4. Explain the difference between quantitative and categorical variables. Give an example of each.

5. What is a null hypothesis?

6. What are some steps that scientists can take in designing an experiment to avoid false negatives?

INTRODUCTION

Graphing is an important procedure used by scientists to display the data that is collected during a controlled experiment. **Line graphs** must be constructed correctly to accurately portray the data collected. Many times, the wrong construction of a graph detracts from the acceptance of an individual's hypothesis

A graph contains five major parts:

   a. **Title**
   b. **The independent variable**
   c. **The dependent variable**
   d. **The scales for each variable**
   e. **A legend**

- The **TITLE**: depicts what the graph is about. By reading the title, the reader should get an idea about the graph. It should be a concise statement placed above the graph.
- The **INDEPENDENT VARIABLE**: is the variable that can be controlled by the experimenter. It usually includes time (dates, minutes, hours, etc.), depth (feet, meters), and temperature (Celsius). This variable is placed on the X axis (horizontal axis).
- The **DEPENDENT VARIABLE**: is the variable that is directly affected by the independent variable. It is the result of what happens because of the independent variable. Example: How many oxygen bubbles are produced by a plant located five meters below the surface of the water? The oxygen bubbles are dependent on the depth of the water. This variable is placed on the Y-axis or vertical axis.
- The **SCALES** for each Variable: In constructing a graph one needs to know where to plot the points representing the data. In order to do this a scale must be employed to include all the data points. This must also take up a conservative amount of space. It is not suggested to have a run on scale making the graph too hard to manage. The scales should start with 0 and climb based on intervals such as: multiples of 2, 5, 10, 20, 25, 50, or 100. The scale of numbers will be dictated by your data values.

- The **LEGEND**: is a short descriptive narrative concerning the graph's data. It should be short and concise and placed under the graph.
- The **MEAN** for a group of variables: To determine the mean for a group of variables, divide the sum of the variables by the total number of variables to get an average.
- The **MEDIAN** for a group of variables: To determine median or "middle" for an even number of values, put the values in ascending order and take the average of the two middle values. e.g.   2, 3, 4, 5, 9, 10 Add 4+5 (2 middle values) and divide by 2 to get 4.5
- The **MODE** for a group of variables: The mode for a group of values is the number that occurs most frequently. e.g.   2, 5, 8, 2, 6, 11   The number 2 is the mode because it occurred most often (twice)

Problem A:

Using the following data, answer the questions below and then construct a line graph.

| Depth in meters	Number of Bubbles / minute Plant A	Number of Bubbles / minute Plant B
2	29	21
5	36	27
10	45	40
16	32	50
25	20	34
30	10	20

1. What is the dependent variable and why?

2. What is the independent variable and why?

3. What title would you give the graph?

4. What are the mean, median, and mode of all 3 columns of data?

a). Depth :   Mean_____Median_____Mode_____

b). Bubble Plant A.:   Mean _____Median_____Mode_____

c). Bubbles Plant B: Mean _____Median_____Mode_____

Title: _____
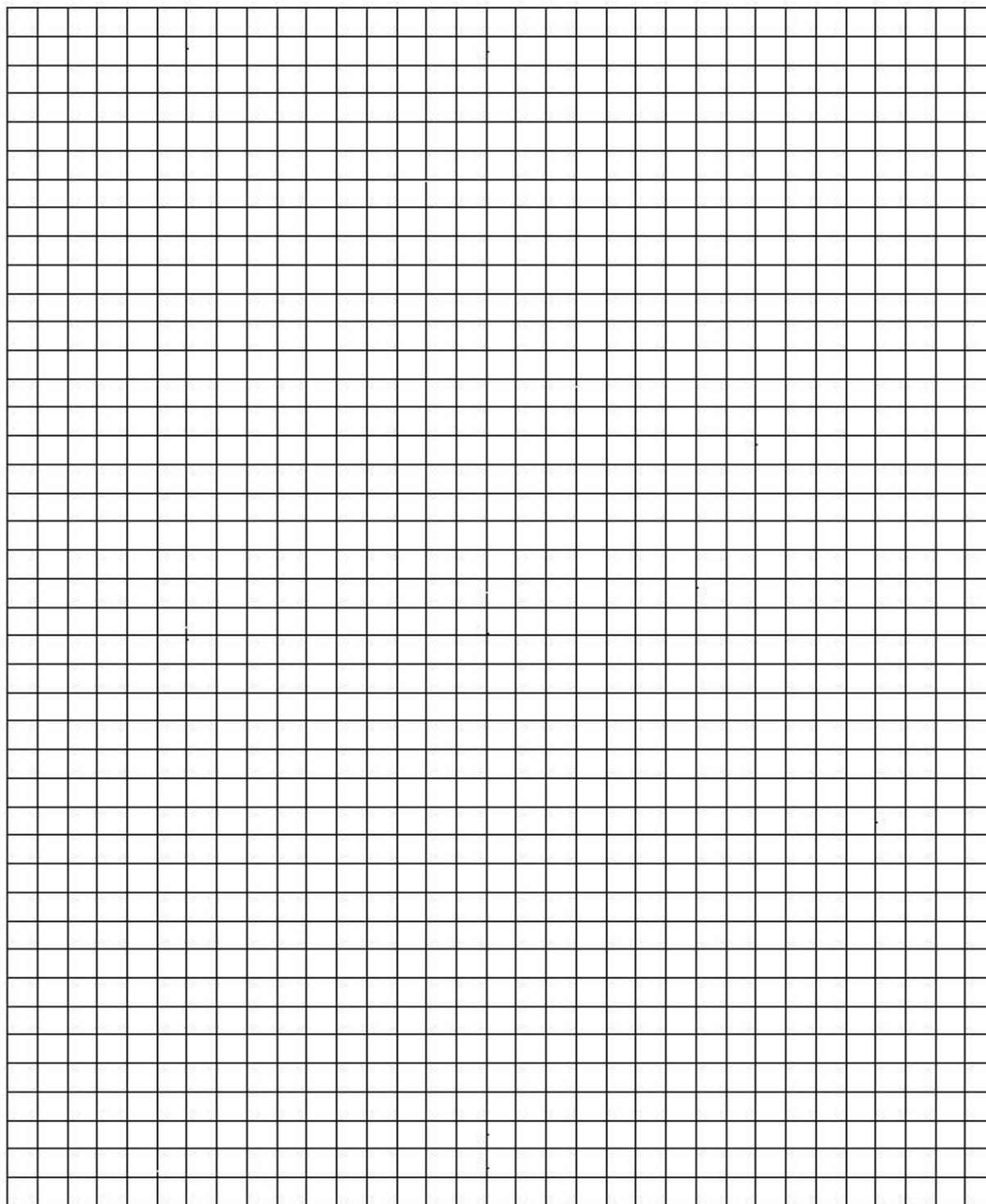
LEGEND:

Problem B:

Diabetes is a disease affecting the insulin producing glands of the pancreas. If there is not enough insulin being produced by these cells, the amount of glucose in the blood will remain high. A blood glucose level above 140 for an extended period of time is not considered normal. This disease, if not brought under control, can lead to severe complications and even death.

Answer the following questions concerning the data below and then graph it.

Time After Eating hours	Glucose ml / Liter of Blood Person A	Glucose ml / Liter of Blood Person B
0.5	170	180
1	155	195
1.5	140	230
2	135	245
2.5	140	235
3	135	225
4	130	200

1. What is the dependent variable and why?

2. What is the independent variable and why?

3. What title would you give the graph?

4. Which, if any, of the above individuals (A or B) has diabetes?

5. What data do you have to support your hypothesis?

6. If the time period were extended to 6 hours, what would the expected blood glucose level for Person B?

Title: _____
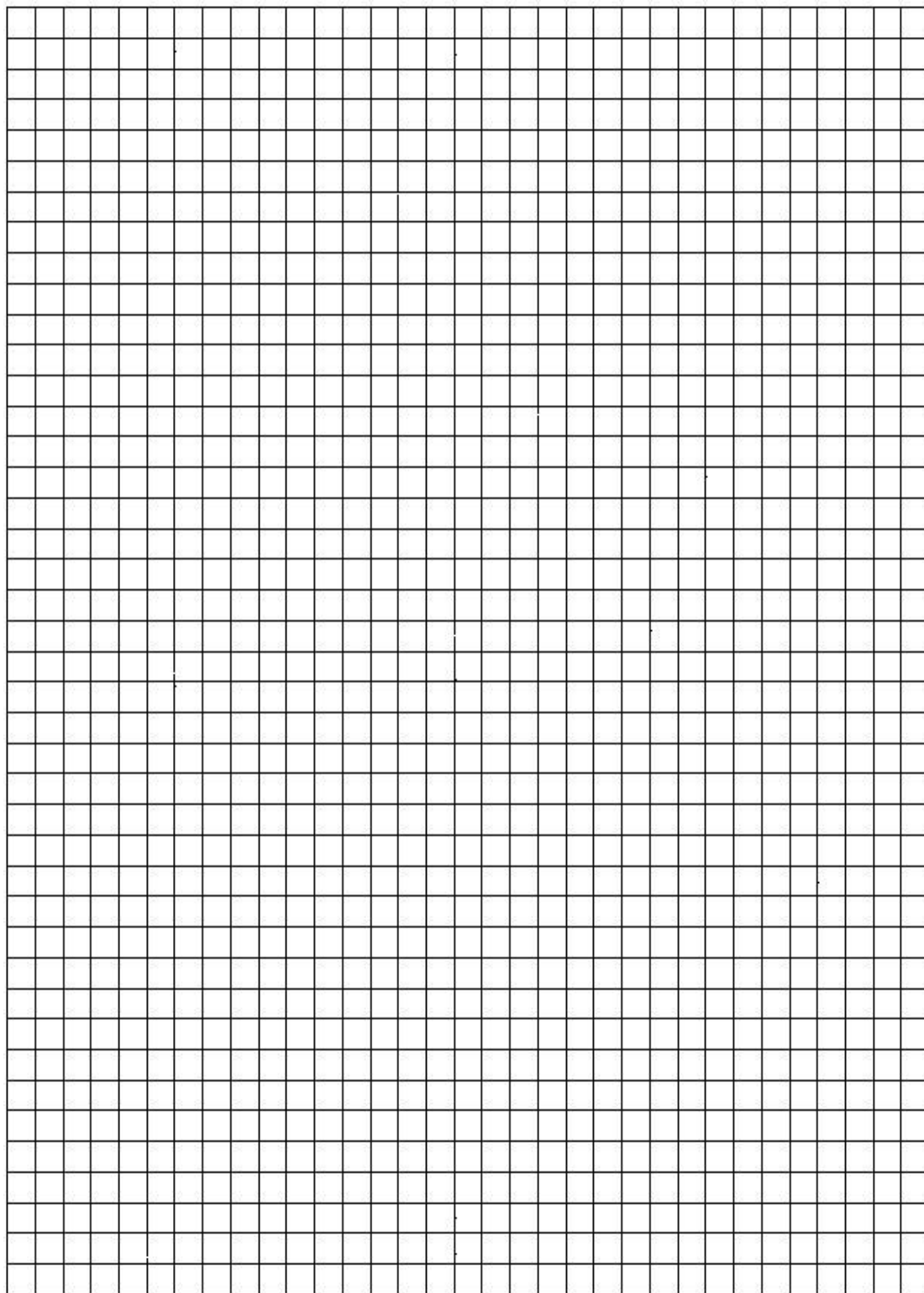
LEGEND:

Problem C

A researcher interested in the disappearance of fallen leaves in a deciduous forest carried out a field experiment that lasted nearly a year. She collected all the leaves from 100 plots scattered throughout the forest. She measured the amount of leaves present in November, May and August. The percentages reflect the number of leaves found, using the November values as 100 percent.

Table 2

Collection Date	Ash	Beech	Elm	Hazel	Oak	Willow
November	4271g 100%	3220g 100%	3481g 100%	1723g 100%	5317g 100%	3430g 100%
May	2431g 57%	3190g 91%	1739g %	501g %	4401g 83%	1201g 35%
August	1376g 32%	2285g 71%	35g %	62g %	1759g 33%	4g 0.1%

Complete the table by calculating the missing percentages

**Construct a line graph for the ash and elm leaves**
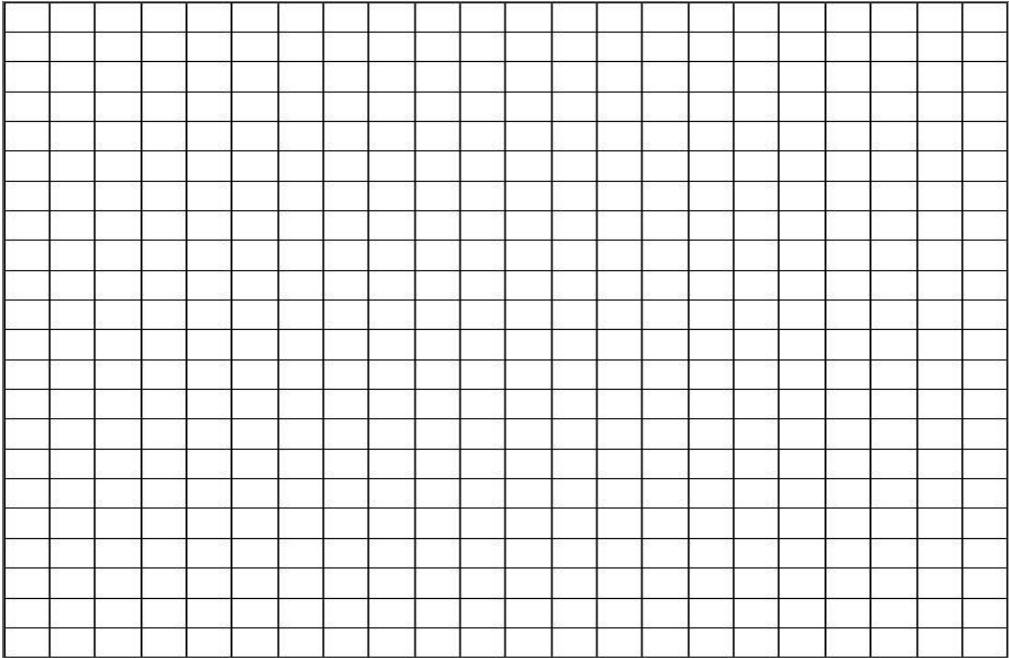
Problem D: A species of insect has been accidentally introduced from Asia into the US. The success of this organism depends on its ability to find a suitable habitat. The larval stage is very sensitive to changes in temperature, humidity and light intensity. Expose to situations outside the tolerance limits results in a high mortality(death) rate. Study the data table below.

Table 3

Temp. (oC)	Mortality (%)	Relative Humidity (%)	Mortality (%)	Light intensity (fc)	Mortality (%)
15	100	100	80	300	0
16	80	90	10	400	0
17	30	80	0	600	10
18	10	70	0	800	15
19	0	60	0	1000	20
20	0	50	50	1200	20
21	0	40	70	1400	90
22	0	30	90	1600	95
23	20	20	100	1800	100
24	80	10	100	2000	100
25	100	0	100		

On the graphs, plot line graphs for the effects of temperature and humidity of mortality rates.
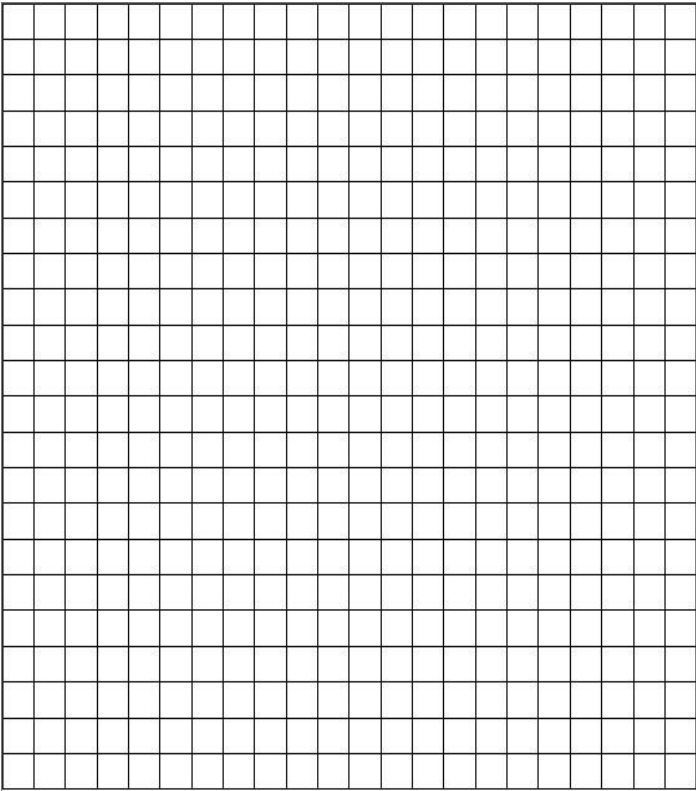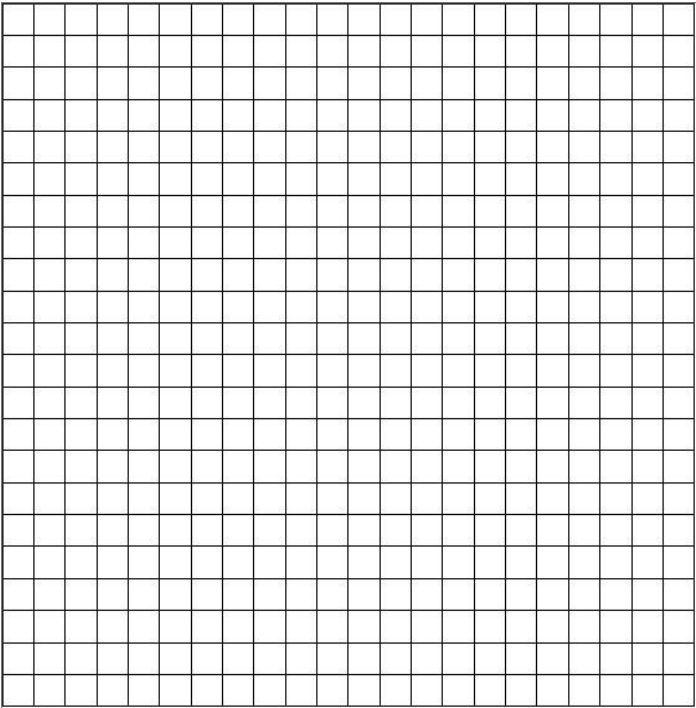
Mandatory Assignment 5: Study these word part and meanings. Quiz first week of school.

Word Part	Word Part Meaning	Word Part Example	Meaning of Example
a-, an-, non-, un-	Without, Not	Aphotic, Anaerobic, Nonrenewable,	*Without* light, *Without* air or oxygen, *Not* able to replenish naturally
homeo-	Similar	Homeostasis	Maintaining *similar* conditions within a certain range
-stasis, -stat,	Equilibrium	Homeostasis	Unchanging chemical conditions in healthy organisms
-logy, -ology	Study or Science of	Mycology, Virology, Biology,	*Study* of Fungi, *Study* of Viruses, Study of Life
bio-, vita-	Life	Biotic, Vitamin	Living, Organic molecules necessary for *life*
-sphere	Ball, globe	Biosphere	Where *life* exists on earth
meta-	Change	Metamorphosis	*Change* in shape
semi-, hemi-	Partially, One-Half	Semipermeable, Hemisphere	Partially allows some, but not all things through, *One-half* a sphere (ball-shape)
multi, myria, poly-	Many	Multicellular, Myriapod, Polysaccharide	Organism made of *many* cells, Organism w/*many* feet, *Many* monosaccharides
auto-	Self	Autotroph	*Self*-feeder (can make their own energy, usually by photosynthesis)
detritus-	Debris, garbage	Detritivore	Any organism that feeds on *detritus*, or garbage
herb-, -phyte	Plant	Herbivore, Epiphyte	*Plant* eater, Atop a *plant*
carn-	Meat, Flesh	Carnivore	*Meat*-eater
omni-, toti-	All	Omnivore, Totipotent	Eats *all* – plants & animals, *All*-important cell (zygote) – becomes *all* cells
therm	Heat	Thermophile, Thermometer	Bacteria that live in *hot* areas, *Heat* measuring instrument

AP BIOLOGY Summer Assignment Overview Checklist

Task #	Due Date	Task Description	Objective	Check it off when complete
1	July 13, 2018 by 11:55pm	*Mandatory Assignment 1: Letter of introduction email sent to* kstone@ccslancers.com	So I can begin to get to know you as a student and can start praying for you.	
2	First day of class August 8, 2018	*Mandatory Assignment 2: Biology and Chemistry review. We will take a quiz sometime during the first week of school.*	To review some chemistry concepts you should already be familiar with	
3	First day of class August 8, 2018	**Mandatory Assignment 3 – Read Henrietta Lacks** **Be ready for a 15-20 question quiz.**	To begin to understand biological concepts (cancer, HeLa cells, biomedical ethics) in the real world.	
4	First Day of School, August 8, 2018	**Mandatory Assignment 4 Graphing and Data skills practice** Graphing Packet	To offer additional practice and tutorial on Scientific thinking and Statistical Analysis in Biology	
5	First week of school, TBA	**Mandatory Assignment 5** **Study the first 15 Biology word parts. Quiz during the first week of school.**	This will be helpful to be able to understand the huge amount of vocabulary in Biology.	

My email address is kstone@ccslancers.com if you have any questions about the summer assignment you can get in touch with me through email. I may not respond right away, but I will respond. HAVE AN AWESOME SUMMER! Look forward to seeing you in August!

Mrs. Stone