

AP Biology Summer Assignments 2018 - Mrs. Kimbal

Welcome to AP Biology! The course is very fast-paced and I have very high expectations for your success. To prepare us to work through the 1,248 pages in 57 chapters, the following are your required summer assignments. Please e-mail any questions you may have: mary.kimbal@polk-fl.net (Note: You may need to wait a few days for an answer as I will only be checking it about once a week.)

Although AP Biology is a huge commitment, **we will have a lot of fun**. I look forward to working with each one of you next year! Here are a few items of interest before you get started on the summer assignment. I know the words “summer assignment” tends to send chills down any high school student’s spine, but I think that you will find that this assignment will be very beneficial to you as we start the school year in the fall and even a little fun!

The summer assignment has been designed for several purposes:

- To get you to think & keep your mind sharp during the long summer months
- To help you improve your statistics skills
- To introduce you to major concepts from AP Biology
- To open your view to see the biology that surrounds you every day

You have 4 assignments- instructions & details are in this packet

1. Letter of Introduction & Sign Up for Remind
2. Graphing & Data Skills Practice
3. Ecology Unit Concepts
4. Optional Scavenger Hunt



Supply List

Use the summer to get your supplies for AP Biology early! Come prepared on Day 1.

- **3-ring notebook**- 1.5 inches for handouts, notes, etc. (Bring 1st day to set up notebook)
- **Tab dividers** (to separate units of study so you will need approx. 10)
- **Bound notebook of graph paper**
- Blue or black **pens and pencils** to bring to class every day
- **Alternate ink color**, highlighters, or colored pencils to use with notes & activities



ASSIGNMENT #1: Letter of Introduction – due June 25th (as B-day gifts for Mrs. Kimbal ☺)

Your first assignment is to successfully send an e-mail to your AP Biology teacher- Mrs. Kimbal. Since we will be working hard & spending a lot of time together next year, I'd like to have the opportunity to learn a bit about you. This is also an opportunity for you to practice communicating with your instructor through e-mail on a collegiate, professional level.

Draft an e-mail following these rules:

1. Use clearly written, **full sentences**. Do not abbreviate words, as though you are texting a friend. Use **spell check!**
2. Address it to my school address: mary.kimbal@polk-fl.net
3. Make the **Subject: AP Bio: Introduction to <Insert YOUR name here>** (Do not include the <> brackets!)
4. Begin the e-mail with a **formal salutation to me**, like “Dear Mrs. Kimbal,”
5. Now introduce yourself & tell me a little bit about yourself.

Some suggestions to get you started...

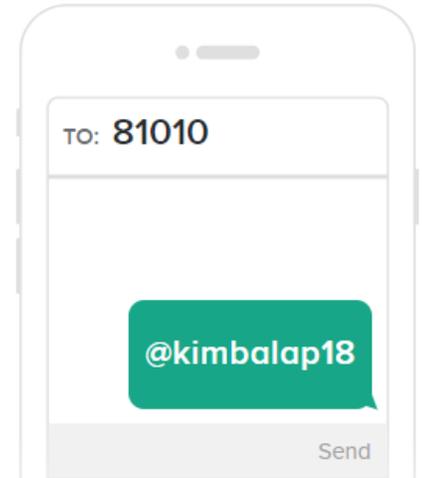
- What do you like to do (hobbies, sports, music, interests, etc.)?
- Do you have a job? How much do you usually work during the school week?
- Tell me a little bit about your family. (Mom? Dad? Guardian? Siblings? Pets?) What do your parents do?
- What do you want to do for your career? Which colleges have you chosen to apply to?
- What was the last book you read for fun?



- Was there anything that you especially liked about your earlier biology class or other science classes?
 - What are you looking forward to the most in AP Biology?
 - What are you most anxious about in AP Biology?
 - What other AP classes or dual enrollment classes are you taking this coming school year?
6. End the e-mail with a **formal closing**: “Cordially,” “Sincerely,” “Warm regards” etc. and add your name as if you signed a letter.

Sign Up For Remind

I will send out reminders and quick information via Remind so make sure that you are signed up. Text **@kimbalap18 to 81010** to register.



Assignment #2: Graphing & Data Skills Practice

Complete the data analysis and graphing packet attached and have it ready to turn in on DAY ONE of the school year. The AP biology curriculum stresses the importance of being able to analyze and graph data. So we will begin our year with a tutorial on data analysis graphing, and statistical analysis tools that you will use throughout your AP biology year.

The graphing and analysis practice are at the end of the packet 😊.

Assignment #3: Ecology Overview

Use the free online textbook, OpenStax, found at <https://cnx.org/contents/bDluMp-w@7.1:RGrYIrtQ@8/The-Scope-of-Ecology> to answer the following questions. After reading the chapters listed below, you should be able to answer the following. Write your answers on a separate sheet of paper to be turned in the first day of school.

Ch. 35

1. Define ecology
2. Define each layer in a stratified aquatic biome: photic zone, aphotic zone, benthic zone, abyssal zone.
3. Define the following characteristics of lakes: thermal stratification, thermocline, seasonal turnover.
4. Know the characteristics of the major aquatic biomes: lakes, wetlands, streams, rivers, estuaries, intertidal biomes, oceanic pelagic biomes, coral reefs, and marine benthic biomes.
5. Know the characteristics of the major terrestrial biomes: tropical rainforest, desert, savanna, chaparral, temperate grassland, coniferous forest, temperate broadleaf forest, and tundra.

Ch. 36

1. Explain the meaning of each of the following terms in the logistic model of population growth:
 - a. r_{\max}
 - b. $K-N$
 - c. $(K-N)/K$
2. Distinguish between r-selected populations and K-selected population
3. Explain how density-dependent and density-independent factors may affect population growth.
4. Explain, with examples, how biotic and abiotic factors may work together to control a population's growth.
5. State the competitive exclusion principle.
6. Define ecological niche and restate the competitive exclusion principle using the niche concept.
7. Distinguish between fundamental and realized niche.
8. Give specific examples of adaptations of predators and prey.
9. Explain how cryptic coloration and aposematic coloration may aid an animal in avoiding predators.
10. Distinguish between Batesian mimicry and Mullerian mimicry.

11. Explain how dominant and keystone species exert strong control on community structure. Describe an example of each.
12. Distinguish between primary and secondary succession.
13. Define behavior.
14. Define a fixed action pattern and give an example.
15. Distinguish between kinesis and taxis.
16. Distinguish between kin selection and reciprocal altruism.
17. Define altruistic behavior, providing examples.

Ch. 37

1. Describe the fundamental relationship between autotrophs and heterotrophs.
2. Explain how the first and second laws of thermodynamics apply to ecosystems.
3. Explain how decomposition connects all trophic levels in an ecosystem.
4. Define and compare gross primary production and net primary production.
5. Explain why toxic compounds usually have the greatest effect on top-level carnivores.
6. Explain why nutrients are said to cycle rather than flow within ecosystems.
7. Name the main processes driving the water cycle.
8. Name the major reservoirs of carbon.
9. Describe the nitrogen cycle and explain the importance of nitrogen fixation to all living organisms. Name three other key bacterial processes in the nitrogen cycle.
10. Describe how agricultural practices can interfere with nitrogen cycling.
11. Describe the causes and consequences of acid precipitation.
12. Describe how increased atmospheric concentrations of carbon dioxide are changing Earth's heat budget.

Assignment #4: Optional Scavenger Hunt

Extracurricular activity scavenger hunt. Complete the task listed, and provide the appropriate documentation (indicated in parentheses). **For every five that you complete and document successfully, you will earn five extra credit points.** You must compile this in a folder or notebook. Number the pages with the scavenger hunt task you are completing.

1. Watch the news/Check the Google News Aggregator/Read a newspaper at least once a week. (copy of article, or log of date/URL and a 1-sentence summary of a news item from each week)
2. See a movie in a theater. Make sure it's a good one. (stub)
3. Feed ducks on three separate occasions. (photos)
4. Grow a plant. (**living** plant brought to class on day 1)
5. Go to two state parks and take a walk. (photos AND maps)
6. Go to the Zoo. (photo AND stub)
7. By walking around your yard and/or neighborhood find an example of each of these different plants: a gymnosperm, angiosperm, and a succulent (take a selfie with each)
8. Go to a water-based amusement park. (photo AND stub)
9. Go to the beach. Collect sand in a container. (container of sand AND photos)
10. Catch a cicada. (molt)
11. Sleep outside, under the stars. (photo)
12. Find an animal in the wild (no dangerous ones!). (photo of animal AND photo of you standing where the animal was)

13. Read more than one book. (list, photos, AND 3 sentence summaries)
14. Play the board game “Settlers of Catan” or “Risk” or the card game “Apples to Apples” (photo)
15. Fly a kite (photo)
16. Build your own personal website. (url)
17. Set up a geocaching tournament for you and your friends. (photo and map)
18. Make your own clothing. (wear it to school)
19. Identify three species of tree in your neighborhood. (leaves & genus/species of each).
20. Hold five earthworms OR two slugs. (photo)

Graphing Practice



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)

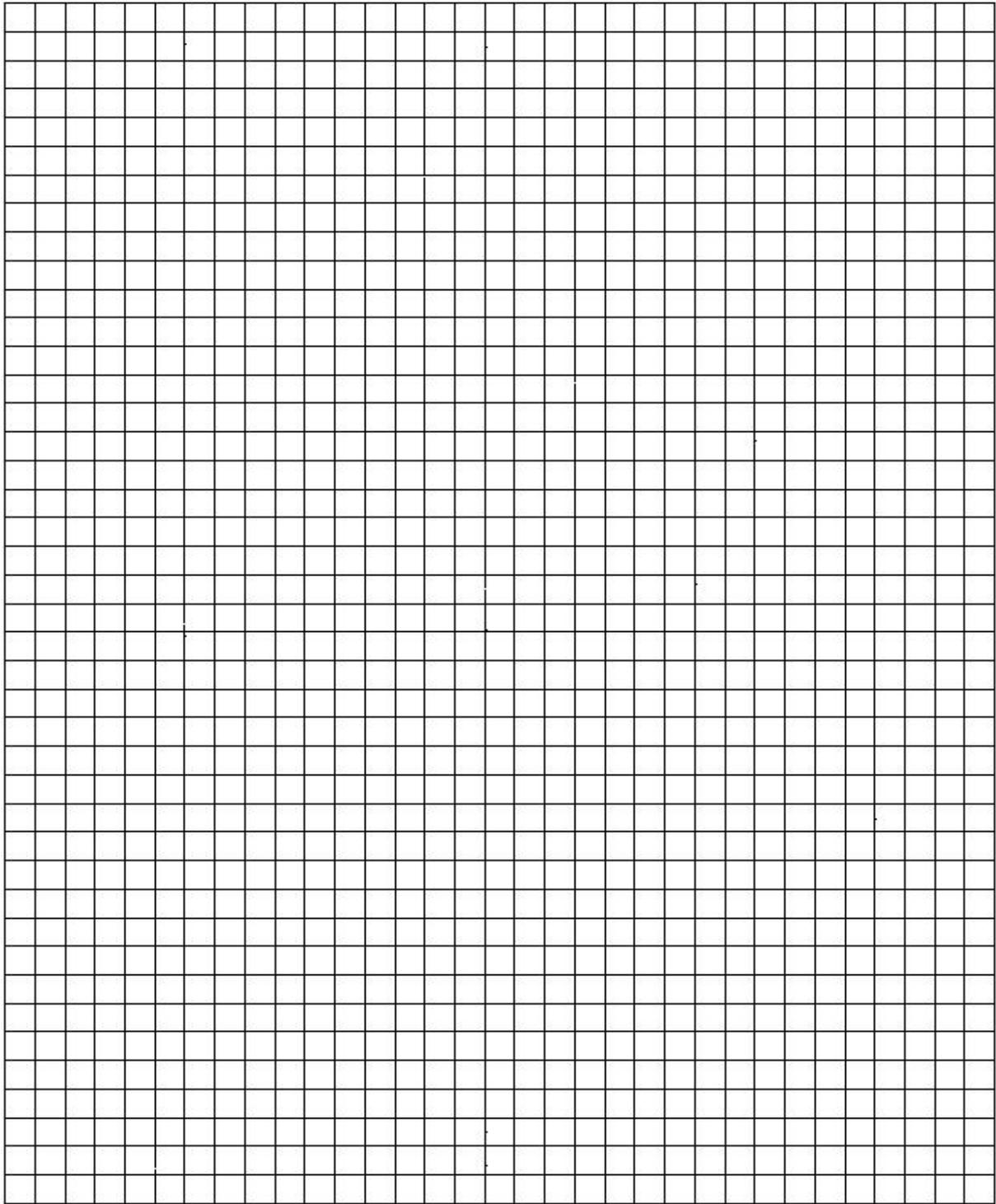
Problem A:

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:

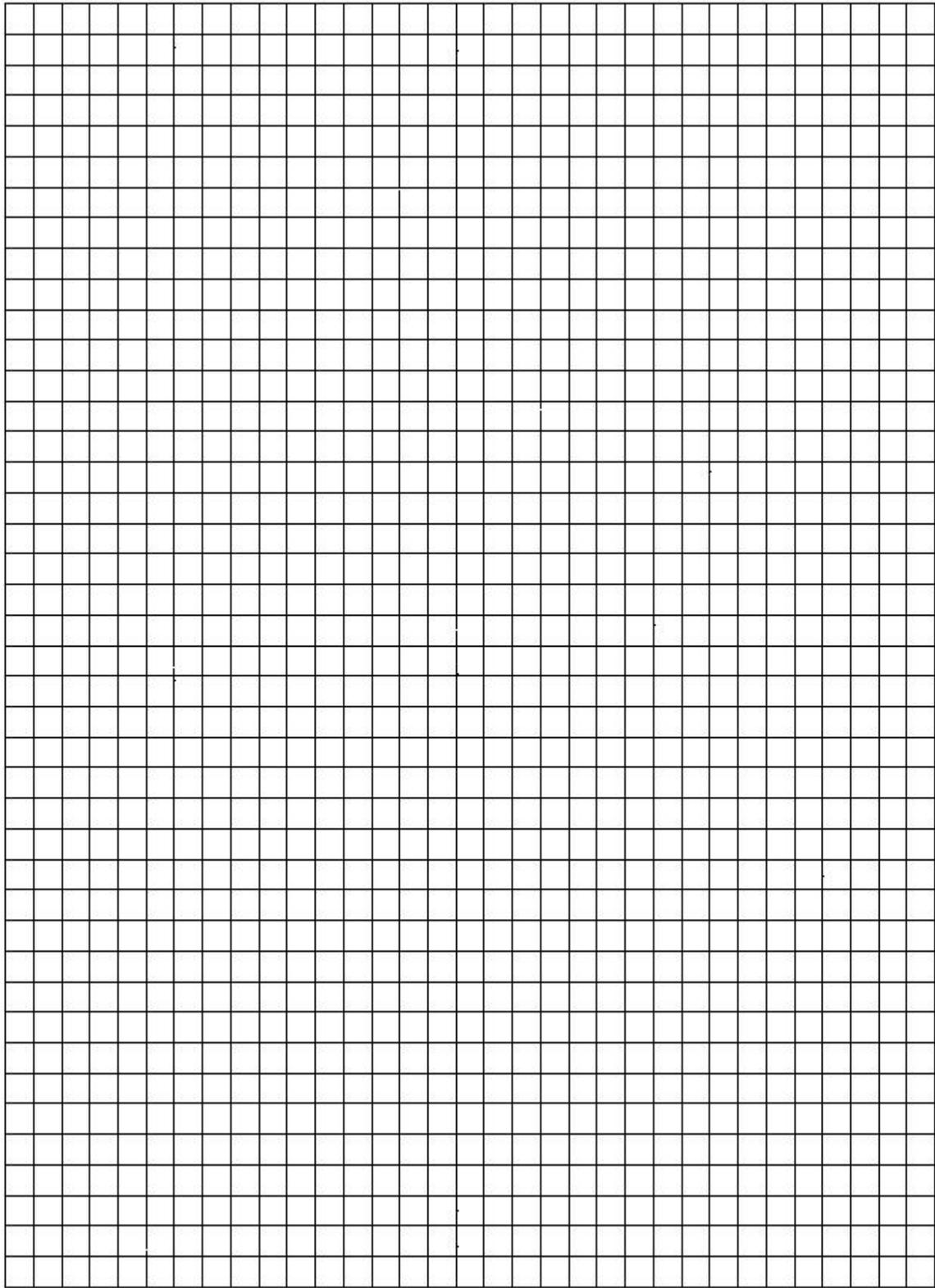
Diabetes is a disease affecting the insulin producing glands of the pancreas. If there is not enough insulin being produced by these cells, the amount of glucose in the blood will remain high. A blood glucose level above 140 for an extended period of time is not considered normal. This disease, if not 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:

