Welcome to Knoke's AP Biology!

The purpose of this summer assignment is to review skills that we will be using throughout the course and to preview content we will be learning this year. ***The assignment itself is optional.*** This is to give you an idea of the type of information that you will be assessed on the first week of class. Completing the assignment in its entirety will result in a major grade equal to a quiz in the gradebook.

There will be a quiz on the material the second day of class.

Please feel free to email me with any questions you may have, I will respond as soon as I can but please know that I am not checking my email every day.

Looking forward to class next year!
- Mrs. Knoke
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Part 1: Graphing Review and Practice

Graphing is an important procedure used by scientists to display the data that is collected during a controlled experiment. When a graph is put together incorrectly, it detracts the reader from understanding what you are trying to present. Most graphs have 5 major parts:

1. Title
2. Independent Variable (X-axis)
3. Dependent Variable (Y-axis)
4. Scale for each variable
5. Legend (or Key)

A. **Title:** Depicts what the graph is about. The Title gives the reader an understanding about the graph. A good title is closer to a sentence than a phrase and is usually found at the top of the graph.

B. **Independent Variable:** Variable controlled by the experimenter. The variable that "I" am testing. (I for Independent). Common independent variables include: time, generations, measurements (length, distance), and temperature. This variable goes on the X-axis.

C. **Dependent Variable:** Variable that is affected by the independent variable; what the experimenter measures. Example: How many oxygen bubbles will depend on the depth of the water. This variable goes on the Y-axis.

D. **Scale:** Before you can plot your data points, you must figure out how much each box on your graph paper is worth. Scale doesn't' always have to start at zero, but I must be consistent. If you start off making each box worth 5 cm, each subsequent box must also be 5 cm. Always make sure your scale is labeled with what it is and what the units are.

E. **Legend:** A short description about the graph's data. Most often used to show what different patterns or colors stand for on your graph.

Rules and Tips for Graphing:

1. Always use a pencil to draw your graph. It's easier to fix mistakes (Or use Excel!).
2. Always draw lines with a ruler. Do not freehand. Use at least half of your paper for the graph.
3. Make sure Independent Variable is on the X-axis and Dependent Variable is on the Y-axis.
4. Include all parts:
    a. Title
    b. Axis Labels WITH Units
    c. Legend
5. If you are graphing multiple subjects, use different colored or patterned lines and explain what they are in the legend.
6. Choose an appropriate graph to explain your data. Examples:
    a. LINE: Measuring a change in something over time
    b. BAR: Comparing individuals to each other with only one data point.
    c. PIE: Show percentages that add up to 100%.

<u>When do I use a line graph versus a bar graph</u>?

Continuous variables are those that have an unlimited number of values between points. Line graphs are used to represent continuous data. For instance, time is a continuous variable over which things such as growth will vary. Although the units on the axis can be minutes, hours, days, months, or even years, values can be placed in between any two values. Amount of fertilizer can also be a continuous variable. Although the intervals labeled on the x-axis are 0, 200, 400, 600, 800, and 1000 (g/100 m2), many other values can be listed between each two intervals.

In a line graph, data are plotted as separate points on the axes, and the points are connected to each other. Notice in Figure 2.7 that when there is more than one set of data on a graph, it is necessary to provide a key indicating which line corresponds to which data set.

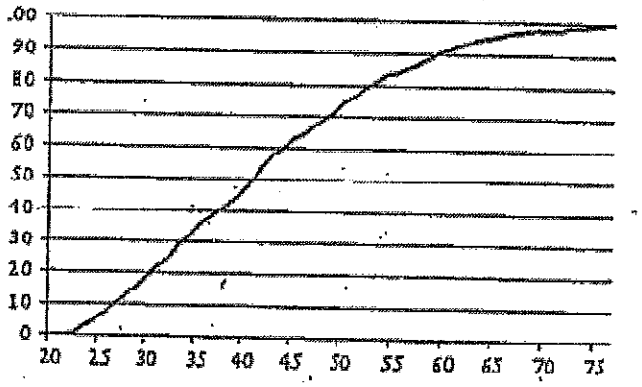
Discrete variables, on the other hand, have a limited number of possible values, and no values can fall between them. For example, the type of fertilizer is a discrete variable: There are a certain number of types which are distinct from each other. If fertilizer type is the independent variable displayed on the x-axis, there is no continuity between the values.

Bar graphs, as shown in Figure 2.8, are used to display discrete data.

1. For each of the following independent variables, indicate whether a line graph or bar graph would be most appropriate.

Time	_____	Height	_____
Fish Species	_____	Car brand	_____
Age	_____	Month	_____
Speed	_____	Subject	_____
Country	_____	Distance	_____

2. The graph below is not a good graph. What parts are missing?



3. Experiment #1: Use the following data to create an appropriate graph and answer the questions. (graph paper on next page).

Depth (meters)	Bubbles per minute Plant A	Bubbles per minute Plant B
2	29	21
5	36	27
10	45	40
16	32	50
25	20	34
30	10	20

a) What is the dependent variable?

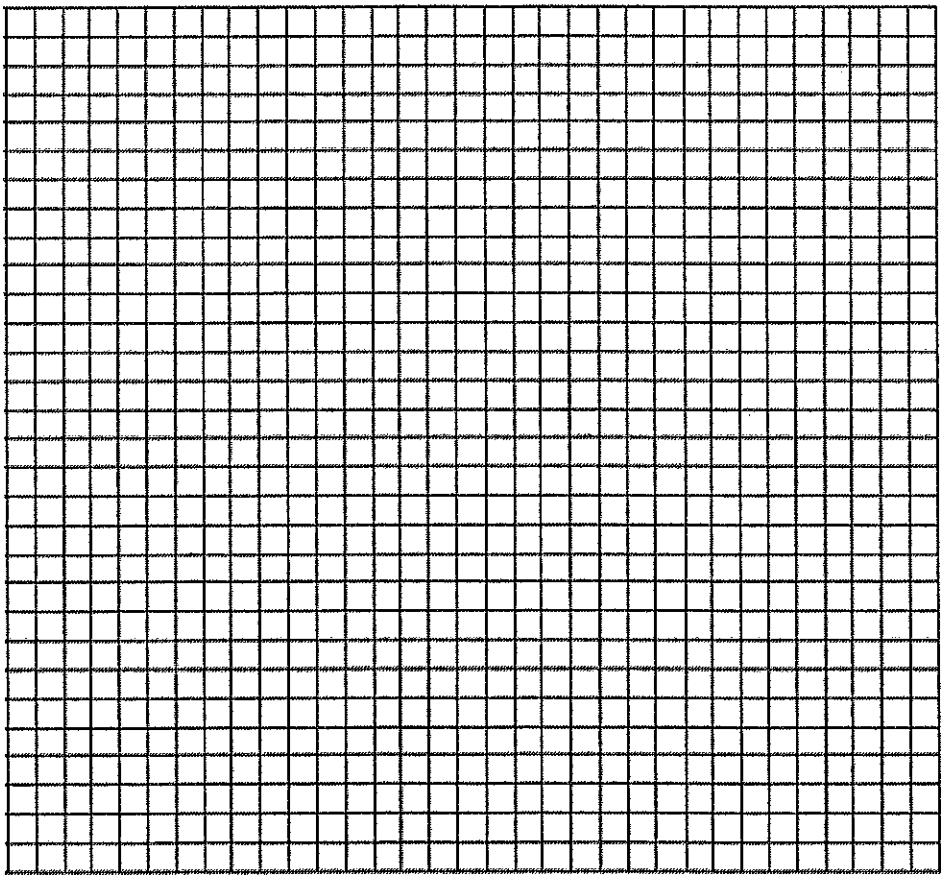
b) What is the independent variable?

c) What type of graph would be best for this data? Why?

d) What will you label the X-axis with?

e) What will you label the Y-axis with?

f) Graph the data on the grid below.



4.

Experiment 2: Use the following data to create an appropriate graph and answer the questions.

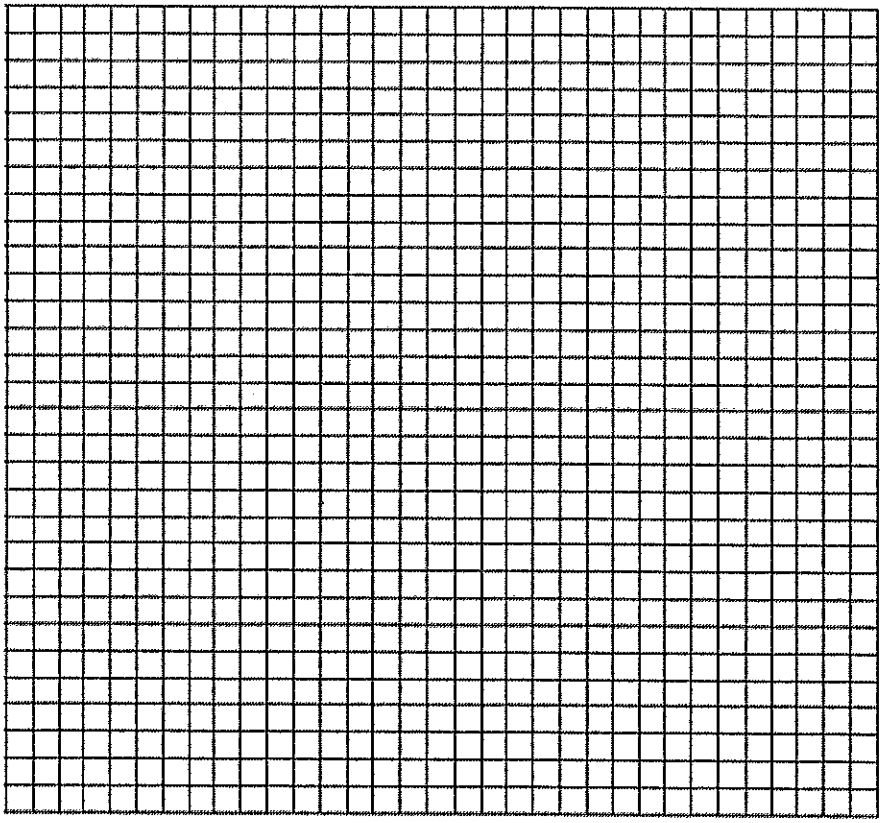
Time after eating (Hours)	Glucose in mg/dL Person A	Glucose in mg/dL Person B
0.5	170	180
1	155	195
1.5	140	230
2	135	245
2.5	140	235
3	135	225
4	130	200

a) What is the dependent variable?

b) What is the independent variable?

c) What type of graph would be best for this data? Why?

d) Graph the data on the grid below.

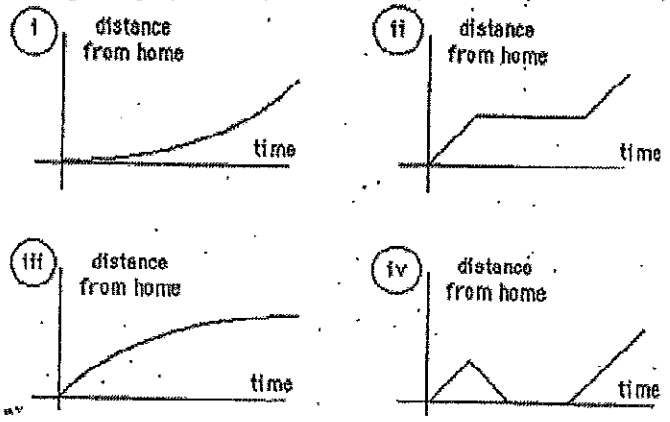


e) Which individual would you potentially diagnose as diabetic?

f) What evidence do you have that supports your answer?

5.

In addition to being able to draw a graph based on data collected, you will also need to interpret data given to you in graph form. Answer the following questions based on the graphs presented. NOTE: Most of these are NOT examples of great graphs, they are for interpretation practice only.



Identify the graph that matches each of the following stories:

_____I had just left home when I realized I had forgotten my books so I went back to pick them up.

_____Things went fine until I had a flat tire.

_____I started out calmly, but sped up when I realized I was going to be late.

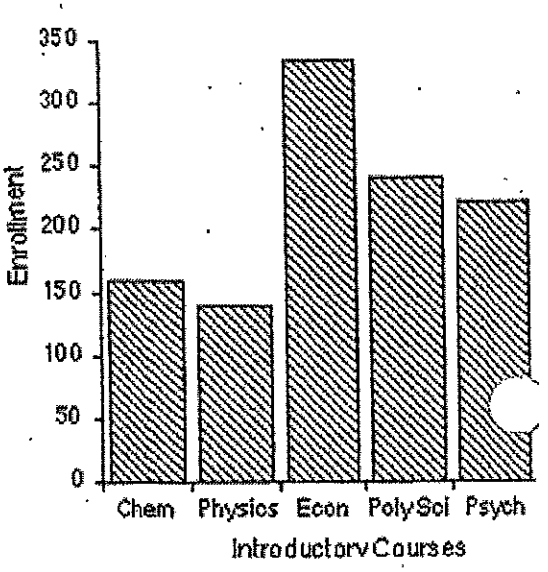
6. The bar graph to the right represents the declared majors of freshman enrolling at a university. Answer the following questions:

31. What is the total freshman enrollment of the college?

32. What percent of the students are majoring in physics?

33. How many students are majoring in economics?

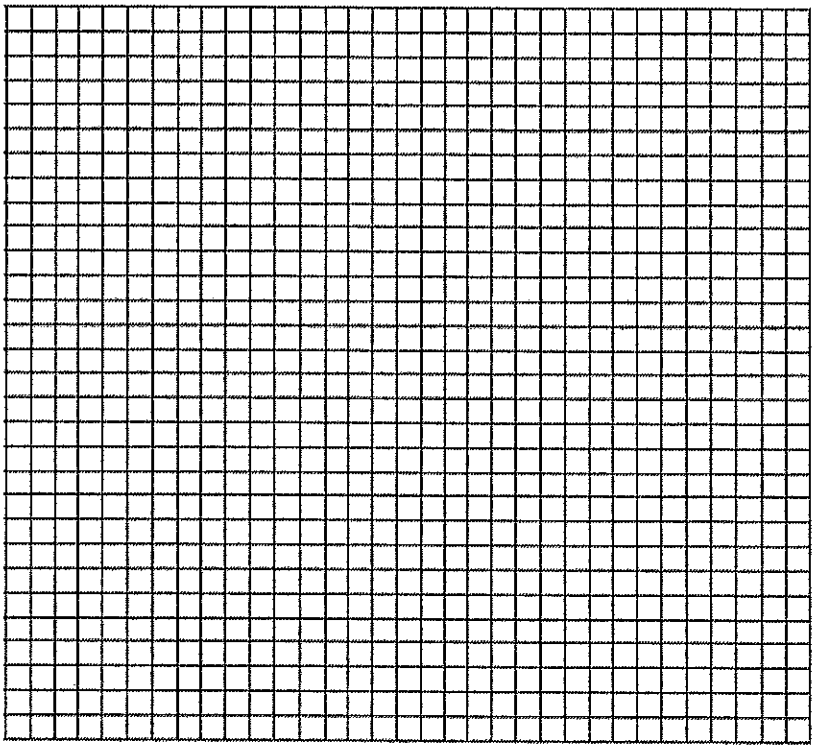
34. How many more students major in poly sci than in psych?



7.

11. After an outbreak of influenza, a student gathered data on the number of students who became ill, until she became sick on the 14th day of her study. The information she gathered is shown below. Create a line graph of the data below.

Date (Feb., 1996)	Number of ill Students
1	12
2	18
3	30
4	49
5	115
6	127
7	125
8	107
9	108
10	115
11	117
12	95
13	60
14	52



a) On what day were most students ill?

b) During which period of time did the most students become ill?

c) What was the greatest number of students who were ill on any one day?

d) Estimate the total number of students who were ill on the 15th day.

Part 2: The AP Biology Exam

Use the College Board's AP Biology website (google it) to answer the following questions about the AP exam.

1. What is the date and time for this year's exam?

2. How long is the exam?

3. Section 1 is a multiple choice section. How many questions are there? How long is this section? What % of your score comes from section 1?

4. Section 2 is a free response (FRQ) section. How long is this section? What % of your score comes from section 2? How many FRQs are there? For each FRQ type (long and short, what sort of questions are students asked?

5. What are the 6 "Science Practices" covered in AP Biology?

6. List and (briefly) describe the 4 "Big Ideas" in AP Biology.

Part 3: AP Biology Units

There are 8 units we will cover throughout the year, each unit is broken down into *Topics*. Every topic has *Learning Objectives*, which are further detailed by the *Essential Knowledge.* Review the units, topics, and learning objectives in the Course Exam Description (CED).

Complete the table below:

Unit #	Unit Title	Unit Topics	% AP Exam Weighting
1			
2			
3			
4			
5			
6			
7			
8			