Clearview Regional High School District
2018 Summer Assignment Coversheet

Course:	**AP Environmental Science**
Teacher(s):	**Maureen Huhman**
Due Date:	**Monday 9/10/18**
Purpose of Assignment:	**1. Meet rigorous demands associated with advanced courses, preparation time and testing dates** **2. Provide foundation and preparation for course,** **3. Measure, maintain and sharpen skills necessary for AP Environmental.**
Description of Assignment:	**Students will be completing the following:** **1. AP Environmental Science Math Prep questions and uploading it to Google classroom assignments.** **2. AP Environmental Science Graph Prep questions and uploading it to Google classroom assignments.** **3. Reading Chapters 1,2,20 and answering the reading questions in the following packet and uploading it to Google classroom assignments.** **The answers can be typed into a word or google document or written on the attached packet and pictures taken or the document scanned in and uploaded.**
NJ Student Learning Standards:	• **HS-ESS3-1. Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.**
Grading/Use of Assignment: Category/Weight for Q1:	• **All assignments will be graded together and will have a weight of five daily assessments.**
Specific Expectations:	**Students will be expected to apply the information throughout the year in the other chapters to be covered. After a review of the material students will have to answer end of chapter textbook questions and there will be a unit test on chapters 1,2, and 20. There will also be a quiz on the math and graph portion of the summer work after the answers have been discussed.**
Where to Locate Assignment:	**1. Summer packet distributed to students at the end of the school year via Google Classroom and email. "Summer work for Mrs. Huhman AP Environmental Science 2018-2019"- if you cannot get into the group please email Mrs. Huhman at huhmanma@clearviewregional.edu**

	3. Clearview's website will have the summer packet posted.
Teacher Contact Information:	**Mrs. Maureen Huhman** **huhmanma@clearviewregional.edu**
Additional Help/ Resource(s):	**1. AP Environmental Textbook packet (Friedland and Relyea)- on Google Classroom** **2. Google classroom Summer work for Mrs. Huhman AP Environmental Science 2018-2019**

Checklist:

Part I (in this packet- 3 daily assessment grades- one for each chapter- about ½ hour-1 hour for each chapter)

□ **Chapter 1 Reading Questions**

□ **Chapter 2 Reading Questions**

□ **Chapter 20 Reading Questions**

Part II (in this packet- 1 daily assessment grade- about ½ hour)

□ **AP Environmental Science Math Prep**

Part III (in this packet- 1 daily assessment grade- about ½ hour)

□ **AP Environmental Science Graph Prep**

Part I- AP Environmental Science Math Prep

You will be quizzed on this material after we return to school and discuss our answers.

This year in APES you will hear the two words most dreaded by high school students…NO CALCULATORS! That's right, you cannot use a calculator on the AP Environmental Science exam. Since the regular tests you will take are meant to help prepare you for the APES exam, you will not be able to use calculators on regular tests all year either. The good news is that most calculations on the tests and exams are written to be fairly easy calculations and to come out in whole numbers or to only a few decimal places. The challenge is in setting up the problems correctly and knowing enough basic math to solve the problems. With practice, you will be a math expert by the time the exam rolls around. So bid your calculator a fond farewell, tuck it away so you won't be tempted, and start sharpening your math skills!

Reminders

1. Write out all your work, even if it's something really simple. This is required on the APES exam so it will be required on all your assignments, labs, quizzes, and tests as well.
2. Include units in each step. Your answers always need units and it's easier to keep track of them if you write them in every step.
3. Check your work. Go back through each step to make sure you didn't make any mistakes in your calculations. Also check to see if your answer makes sense. For example, a person probably will not eat 13 million pounds of meat in a year. If you get an answer that seems unlikely, it probably is. Go back and check your work.

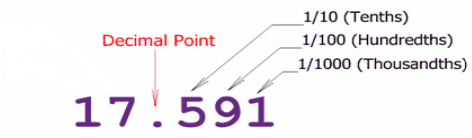
Directions

Read each section below for review. Look over the examples and use them for help on the practice problems. When you get to the practice problems, write out all your work and be sure to include units on each step. Check your work.

Decimals

The basics

Decimals are used to show fractional numbers. The first number behind the decimal is the tenths place, the next is the hundredths place, the next is the thousandths place. Anything beyond that should be changed into scientific notation (which is addressed in another section.)



Adding or Subtracting Decimals

To add or subtract decimals, make sure you line up the decimals and then fill in any extra spots with zeros. Add or subtract just like usual. Be sure to put a decimal in the answer that is lined up with the ones in the problem.

```
123.0000
  0.0079
+43.5000
166.5079
```

```
 27.583
- 0.200
 27.383
```

Multiplying Decimals

Line up the numbers just as you would if there were no decimals. DO NOT line up the decimals. Write the decimals in the numbers but then ignore them while you are solving the multiplication problem just as you would if there were no decimals at all. After you have your answer, count up all the numbers behind the decimal point(s). Count the same number of places over in your answer and write in the decimal.

3.77 x 2.8 = ?

```
   3.77  (2 decimal places)
x   2.8  (1 decimal place)
  3016
 +754
10.556  (3 decimal places)
```

Dividing Decimals

Scenario One: If the divisor (the number after the / or before the ⟌) does not have a decimal, set up the problems just like a regular division problem. Solve the problem just like a regular division problem. When you have your answer, put a decimal in the same place as the decimal in the dividend.

```
     424.9
38 ) 16146.2
     152
     ---
      94
      76
     ---
     186
     152
     ---
     342
     342
     ---
       0
```

Scenario Two: If the divisor does have a decimal, make it a whole number before you start. Move the decimal to the end of the number, then move the decimal in the dividend the same number of places.

3.8 ⟌ 1614.62

Then solve the problem just like a regular division problem. Put the decimal above the decimal in the dividend. (See Scenario One problem).

Averages

To find an average, add all the quantities given and divide the total by the number of quantities.

Example: Find the average of 10, 20, 35, 45, and 105.

Step 1: Add all the quantities. 10 + 20 + 35 + 45 + 105 = 215

Step 2: Divide the total by the number of given quantities. 215 / 5 = 43

Percentages

Introduction: Percents show fractions or decimals with a denominator of 100. Always move the decimal TWO places to the right go from a decimal to a percentage or TWO places to the left to go from a percent to a decimal.

Examples: .85 = 85%. .008 = .8%

Finding the Percent of a Given Number

To find the percent of a given number, change the percent to a decimal and MULTIPLY.

Example: 30% of 400

Step 1: 30% = .30

Step 2: 400 x .30 =12000

Step 3: Count the digits behind the decimal in the problem and add decimal to the answer.

120.00

Finding the Percentage of a Number

To find what percentage one number is of another, divide the first number by the second, then convert the decimal answer to a percentage.

Example: What percentage is 12 of 25?

Step 1: 12/25 = .48

Step 2: .48 = 48% (12 is 48% of 25)

Finding Percentage Increase or Decrease

To find a percentage increase or decrease, first find the percent change, then add or subtract the change to the original number.

Example: Kindles have dropped in price 18% from $139. What is the new price of a Kindle?

Step 1: $139 x .18 = $25

Step 2: $139 - $25 = $114

Finding a Total Value

To find a total value, given a percentage of the value, DIVIDE the given number by the given percentage.

Example: If taxes on a new car are 8% and the taxes add up to $1600, how much is the new car?

Step 1: 8% = .08 *Step 2:* $1600 / .08 = $160,000 / 8 = $20,000

(*Remember when the divisor has a decimal, move it to the end to make a whole number and move the decimal in the dividend the same number of places. .08 becomes 8, 1600 becomes 16000.)*

Finding Percent Change ****** REALLY IMPORTANT ON AP EXAM!!!!**

To calculate the percentage increase or decrease:
First: *work out the difference (increase) between the two numbers you are comparing.*
Increase = New Number - Original Number
Then: *divide the increase by the original number and multiply the answer by 100.*
% increase = Increase ÷ Original Number × 100.
If your answer is a negative number then this is a percentage decrease.
Example: In January Dylan worked a total of 35 hours, in February he worked 45.5 hours – by what percentage did Dylan's working hours increase in February?

To tackle this problem first we calculate the difference in hours between the new and old numbers. 45.5 - 35 hours = 10.5 hours. We can see that Dylan worked 10.5 hours more in February than he did in January – this is his **increase**. To work out the increase as a percentage it is now necessary to divide the increase by the original (January) number:

10.5 ÷ 35 = 0.3

Finally, to get the percentage we multiply the answer by 100. This simply means moving the decimal place two columns to the right. **0.3 × 100 = 30**

Dylan therefore worked 30% more hours in February than he did in January.

Metric Units

Kilo-, centi-, and milli- are the most frequently used prefixes of the metric system. You need to be able to go from one to another without a calculator. You can remember the order of the prefixes by using the following sentence: *King Henry Died By Drinking Chocolate Milk*. Since the multiples and divisions of the base units are all factors of ten, it is easy to convert from one to another.

Factor	Prefix	Symbol	Examples
10^9	giga	G	1 Gm = 1 gigameter = 10^9 m 1 Gb = 1 gigabyte = 10^9 bytes
10^6	mega	M	1 Mm = 1 megameter = 10^6 m 1 Mb = 1 megabyte = 10^6 bytes
10^3	kilo	K	1 Km = 1 kilometer = 10^3 m 1 Kg = 1 kilogram = 10^3 g
10^{-1}	deci	d	1 dm = 1 decimeter = 0.1 m
10^{-2}	centi	c	1 cm = 1 centimeter = 0.01 m
10^{-3}	milli	m	1 mg = 1 milligram = 0.001 g 1 ms = 1 millisecond = 0.001 s
10^{-6}	micro	μ	1 μm =1 micrometer = 10^{-6} m 1μs = 1 microsecond = 10^{-6} s
10^{-9}	nano	n	1 ns = 1 nanosecond= 10^{-9} s
10^{-12}	pico	p	1 pg = 1 picogram = 10^{-12} g

It is best to use dimensional analysis to solve problems in AP Environmental Science.

Here is an example:

To perform dimensional analysis, you must use a **conversion factor**. A conversion factor is a fraction that always equals 1. For example, 1 kilometer equals 1000 meters. So the fraction 1 kilometer / 1000 meters equals 1. so does the fraction 1000 meters / 1 kilometer . The top number in a fraction is called the numerator. The bottom number in a fraction is called the denominator. In a conversion fraction the numerator always equals the denominator so that the fraction always equals 1.

Let's see how dimensional analysis works. Suppose you are told to convert 2500 grams to kilograms. This means that grams are your given unit and you must express your answer in kilograms. The conversion factor that you choose must contain a relationship between grams and kilgrams that has a value of 1. You have two possible choices:

$$\frac{1000\ grams}{1\ kilogram} = 1 \quad or \quad \frac{1\ kilogram}{1000\ gram} = 1$$

To convert one metric unit to another, you must multiply the given value times the conversion factor. Remember, multiplying a number by 1 does not change the value of the number. So multiplying by a conversion factor just changes the units.

Now, which conversion factor should you use to change 2500 grams into kilograms? Since you are going to multiply by the conversion factor, you want the unit to be converted to cancel out during the multiplication. This is exactly what will happen if the denominator of the conversion factor has the same units as the value you wish to convert. Since you are converting grams into kilograms, the denominator of the conversion factor must be in grams and the numerator in kilograms. The first step in dimensional analysis, then, is to write out the value given, the correct conversion factor, and a multiplication symbol between them.

$$2500\ grams \times \frac{1\ kilogram}{1000\ grams}$$

The next step is to cancel out the same units.

$$\cancel{2500\ grams} \times \frac{1\ kilogram}{\cancel{1000\ grams}}$$

The last step is to multiply.

$$2500 \times \frac{1\ kilogram}{1000} = \frac{2500\ kilograms}{1000}$$

$$\frac{2500\ kilograms}{1000} = 2.5\ kilograms$$

http://www.mlms.loganschools.org/~mlowe/lowehome/scibertext/MetricSystemConversion.htm

Scientific Notation

Introduction:

Scientific notation is a shorthand way to express large or tiny numbers. Since you will need to do calculations throughout the year WITHOUT A CALCULATOR, we will consider anything over 1000 to be a large number. Writing these numbers in scientific notation will help you do your calculations much quicker and easier and will help prevent mistakes in conversions from one unit to another. Like the metric system, scientific notation is based on factors of 10. A large number written in scientific notation looks like this:

$$1.23 \times 10^{11}$$

The number before the x (1.23) is called the coefficient. The coefficient must be greater than 1 and less than 10. The number after the x is the base number and is always 10. The number in superscript (11) is the exponent.

Writing Numbers in Scientific Notation

To write a large number in scientific notation, put a decimal after the first digit. Count the number of digits after the decimal you just wrote in. This will be the exponent. Drop any zeros so that the coefficient contains as few digits as possible.

Example: 123,000,000,000

Step 1: Place a decimal after the first digit. 1.23000000000

Step 2: Count the digits after the decimal…there are 11.

Step 3: Drop the zeros and write in the exponent. 1.23×10^{11}

Writing tiny numbers in scientific notation is similar. The only difference is the decimal is moved to the left and the exponent is a negative. A tiny number written in scientific notation looks like this:

$$4.26 \times 10^{-8}$$

To write a tiny number in scientific notation, move the decimal after the first digit that is not a zero. Count the number of digits before the decimal you just wrote in. This will be the exponent as a negative. Drop any zeros before or after the decimal.

Example: .0000000426

Step 1: 00000004.26

Step 2: Count the digits before the decimal…there are 8.

Step 3: Drop the zeros and write in the exponent as a negative. 4.26×10^{-8}

Adding and Subtracting Numbers in Scientific Notation

To add or subtract two numbers with exponents, the exponents must be the same. You can do this by moving the decimal one way or another to get the exponents the same. Once the exponents are the same, add (if it's an addition problem) or subtract (if it's a subtraction problem) the coefficients just as you would any regular addition problem (review the previous section about decimals if you need to). The exponent will stay the same. Make sure your answer has only one digit before the decimal – you may need to change the exponent of the answer.

Example: $1.35 \times 10^{6} + 3.72 \times 10^{5} = ?$

Step 1: Make sure both exponents are the same. It's usually easier to go with the larger exponent so you don't have to change the exponent in your answer, so let's make both exponents 6 for this problem.

$$3.72 \times 10^{5} = .372 \times 10^{6}$$

Step 2: Add the coefficients just as you would regular decimals. Remember to line up the decimals.

$$\begin{array}{r} 1.35 \\ \underline{0.372} \\ 1.722 \end{array}$$

Step 3: Write your answer including the exponent, which is the same as what you started with.

1.722×10^6

Multiplying and Dividing Numbers in Scientific Notation

To multiply exponents, multiply the coefficients just as you would regular decimals. Then add the exponents to each other. The exponents DO NOT have to be the same.

Example: $1.35 \times 10^6 \quad * 3.72 \times 10^5 = ?$

Step 1: Multiply the coefficients:

```
  1.35
x 3.72
  270
 9450
40500

50220
```

Answer: 5.0220 (remember to move the decimal over the same number of spots as the numbers you are multiplying)

Step 2: Add the exponents:

5 + 6 = 11

Step 3: Write your final answer:

5.022×10^{11}

To divide exponents, divide the coefficients just as you would regular decimals, then subtract the exponents. In some cases, you may end up with a negative exponent.

Example: 5.635 x 103 / 2.45 x 106 = ?

Step 1: Divide the coefficients:

5.635 / 3.45 = 2.3

Step 2: Subtract the exponents.

3 – 6 = -3

Step 3: Write your final answer.

2.3×10^{-3}

Dimensional Analysis

Introduction

Dimensional analysis is a way to convert a quantity given in one unit to an equal quantity of another unit by lining up all the known values and multiplying. It is sometimes called factor-labeling. The best way to start a factor-labeling problem is by using what you already know. In some cases you may use more steps than a classmate to find the same answer, but it doesn't matter. Use what you know, even if the problem goes all the way across the page!

In a dimensional analysis problem, start with your given value and unit and then work toward your desired unit by writing equal values side by side. Remember you want to cancel each of the

intermediate units. To cancel a unit on the top part of the problem, you have to get the unit on the bottom. Likewise, to cancel a unit that appears on the bottom part of the problem, you have to write it in on the top.

Once you have the problem written out, multiply across the top and bottom and then divide the top by the bottom.

Example: 3 years = ? seconds

Step 1: Start with the value and unit you are given. There may or may not be a number on the bottom.

$$\frac{3 \text{ years}}{} =$$

Step 2: Start writing in all the values you know, making sure you can cancel top and bottom.

Since you have years on top right now, you need to put years on the bottom in the next segment. Keep going, canceling units as you go, until you end up with the unit you want (in this case seconds) on the top.

$$\frac{3 \text{ years} \mid 365 \text{ days} \mid 24 \text{ hours} \mid 60 \text{ min} \mid 6 \text{ s}}{\mid 1 \text{ yr} \mid 1 \text{ day} \mid 1 \text{ hour} \mid 1 \text{ min}} =$$

Step 3: Multiply all the values across the top. Write in scientific notation if it's a large number. Write units on your answer.

$3 * 365 * 24 * 60 * 60 = 9.46 \times 10^7$ seconds

Step 4: Multiply all the values across the bottom. Write in scientific notation if it's a large number.

Write units on your answer if there are any. In this case everything was cancelled so there are no units.

$1 * 1 * 1 * 1 = 1$

Step 5: Divide the top number by the bottom number. Remember to include units.

9.46×10^7 seconds / $1 = 9.46 \times 10^7$ seconds

Step 6: Review your answer to see if it makes sense. 9.46×10^7 is a really big number. Does it make sense for there to be a lot of seconds in three years? YES! If you had gotten a tiny number, then you would need to go back and check for mistakes.

In lots of APES problems, you will need to convert both the top and bottom unit. Don't panic! Just convert the top one first and then the bottom.

Example: 50 miles per hour = ? feet per second

Step 1: Start with the value and units you are given. In this case there is a unit on top and on bottom.

$$\frac{50 \text{ miles} \mid}{1 \text{ h}}$$

Step 2: Convert miles to feet first.

$$\frac{50 \text{ miles} \mid 5280 \text{ miles}}{1 \text{ h} \mid 1 \text{ mi}}$$

Step 3: Continue the problem by converting hours to seconds.

$$\frac{50 \text{ miles}}{1 \text{ h}} \mid \frac{5280 \text{ feet}}{1 \text{ mi}} \mid \frac{1 \text{h}}{60 \text{ min}} \mid \frac{1 \text{ min}}{60 \text{ sec}}$$

Step 4: Multiply across the top and bottom. Divide the top by the bottom. Be sure to include units on each step. Use scientific notation for large numbers.

$$50 * 5280 \text{ feet} * 1 * 1 = 264000 \text{ feet}$$
$$1 * 1 * 60 * 60 \text{ seconds} = 3600 \text{ seconds}$$

$$264000 \text{ feet} / 3600 \text{ seconds} = 73.33 \text{ feet/second}$$

Part II: AP Environmental Science Graph Prep

Making Graphs

Variables and Constants

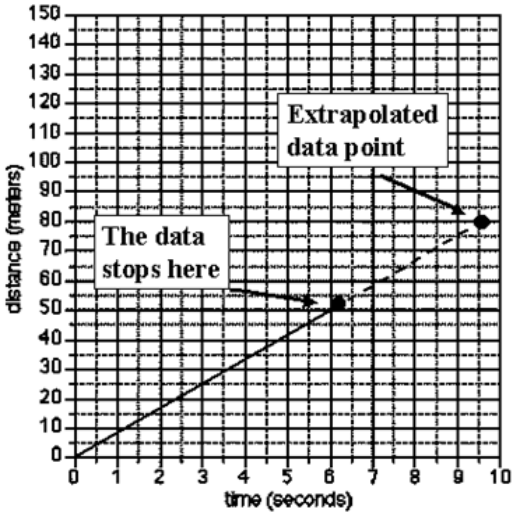
The characteristic or element that remains the same is called a constant. Example: the number of donuts in a dozen is always 12. So, the **number** of donuts in a dozen is a constant.

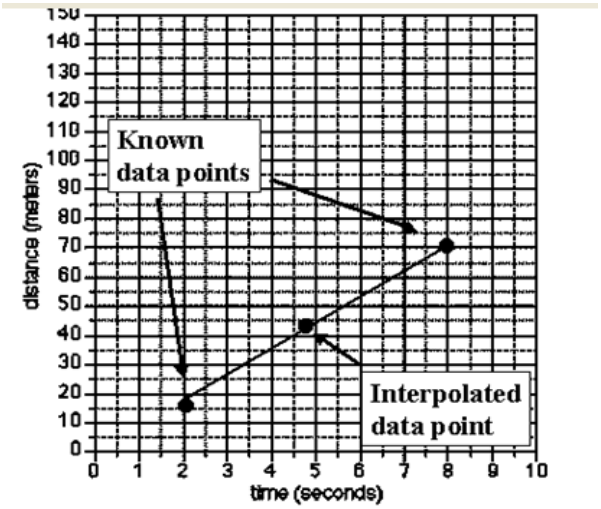
Other these values can vary (Example: the price of a dozen donuts can change from $2.50 to $3.00). We call these characteristics or elements *variables.* Variable is the term for any characteristic or element that changes. You should be able to determine which characteristics or elements are constants and which are variables.

Graphs are a useful tool in science. The visual characteristics of a graph make trends in data easy to see. One of the most valuable uses for graphs is to "predict" data that is not measured on the graph.

Extrapolate: extending the graph, along the same slope, above or below measured data.

Interpolate: predicting data between two measured points on the graph.





Steps in creating graphs:

1. Identify the variables

    a. Independent Variable - (the variable controlled by the experimenter)
        - Goes on the X axis (horizontal)
        - Should be on the left side of a data table.
    b. Dependent Variable -(the variable that changes with the independent variable)
        - Goes on the Y axis (vertical)
        - Should be on the right side of a data table.
2. Subtract the lowest data value from the highest data value to determine the variable range.
    - Do each variable separately.
3. Determine a scale (The numerical value for each square), that best fit s the range of each variable.
    - Spread the graph to use MOST of the available space.
4. Number and label each axis.
5. Plot the data points.
    a. Plot each data value on the graph with a dot.
    b. You can put the data number by the dot, if it does not clutter your graph.
6. Draw the graph.
    a. Draw a curve or a line that best fit s the data points.
        - Most graphs of experimental data are not drawn as "connect-the-dots".
7. Title the graph.
    - Your title should clearly tell what the graph is about.
8. If your graph has more than one set of data, provide a "key" to identify the different lines.

PART I MATH PRACTICE: Remember to show all your work, include units if given, and NO CALCULATORS! Use scientific notation when appropriate.

Conversions:
1 square mile = 640 acres
1 hectare (Ha) = 2.47 acres
1 kw-hr = 3,413 BTUs
1 barrel of oil = 59 Liters
1 metric ton = 1000 kg

1. 1.678 + 2.456 =

2. 45.937 – 13.43 =

3. 28.4 x 9.78 =

4. 64.5 / 5 =

5. Find the average of the following numbers: 4.56, .0078, 23.45, and .9872

6. Thirteen percent of a 12,000 acre forest is being logged. How many acres will be logged?

7. 14,000 acres of a 40,000 acre forest burned in a forest fire. What percentage of the forest was damaged?

8. 14000 millimeters = ? meters (use dimensional analysis)

9. 6544 liters = ? milliliters (use dimensional analysis)

Write the following numbers in scientific notation:

10. 145,000,000,000

11. 13 million

12. 0.000348

13. 135 trillion

Complete the following calculations using scientific notation:

14. three hundred thousand plus forty-seven thousand

15. 13 million minus 11 thousand

16. three million times eighteen thousand

17. one thousandth of seven thousand

18. eight ten-thousandths of thirty-five million

19. The Greenland Ice Sheet contains 2,850,000 cubic kilometers of ice. It is melting at a rate of .006% per year. How many cubic kilometers are lost each year?

20. 235 acres, or 15%, of a forest is being logged. How large is the forest?

21. In a small oak tree, the biomass of insects makes up 3000 kilograms. This is 4% of the total biomass of the tree. What is the total biomass of the tree?

22. In March there was 85 mm of rain. In April there was 68 mm. What is the percentage change?

23. The 2 AM temperature in the Mojave desert was recorded as 6°F. The 2 PM temperature on the same day was 114°F What was the percentage change from 2 AM to 2 PM?

24. 1.35 kilometers per second = ? kilometers per hour

25. A 340 million square mile forest is how many hectares?

26. Fifty eight thousand kilograms of solid waste is equivalent to how many metric tons?

Part II Graph Practice

The following questions are to help you practice reading information shown on a graph.

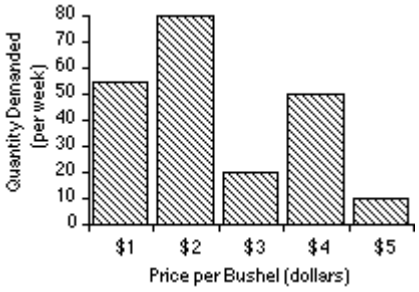
1. The graph at the right represents the typical day of a teenager. Answer these questions:

   a. What percent of the day is spent watching TV?

   b. How many hours are spent sleeping?

   c. What two activities take up 50% of the day?

2. Answer these questions about the graph at the right:

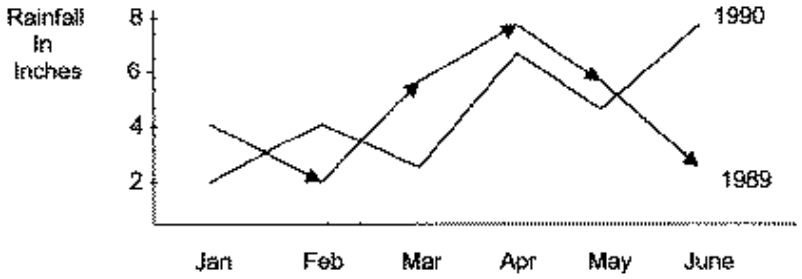


   a. What is the dependent variable on this graph?

   b. Does the price per bushel always increase with demand?

   c. What is the demand when the price is 5$ per bushel?

3. Answer these questions about the graph below:



   a. How much more rain fell in Feb of 1990 than in Feb of 1989?

   b. Which year had the most rainfall?

   c. What is the wettest month on the graph?

Practice Making Graphs:

Use the following steps to create graphs and answer questions for each of the problems below.

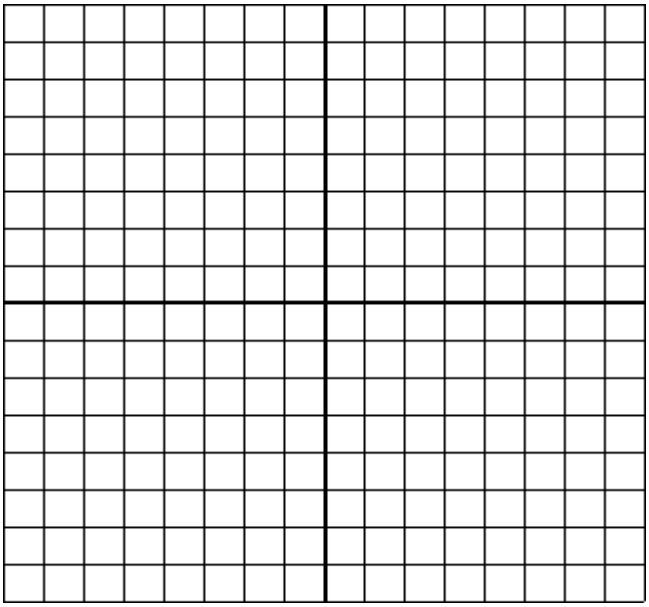
i. *Identify the variables. The independent variable is controlled by the experimenter. The dependent variable changes as the independent variable changes. The independent variable will go on the X axis and the dependent on the Y axis.*
ii. *Determine the variable range. Subtract the lowest data value from the highest data value.*
iii. *Determine the scale of the graph. The graph should use as much of the available space as possible. Each line of the scale must go up in equal increments. For example, you can go 0, 5, 10, 15, 20, etc. but you cannot go 1, 3, 9, 34, 50, etc. Increments of 1, 2, 5, 10, or 100 are commonly used but you should use what works best for the given data.*
iv. *Number and label each axis.*
v. *Plot the data. If there are multiple sets of data on one graph, use a different color for each.*
vi. *Draw a smooth, best-fit line for each data set.*
vii. *Title the graph. Titles should explain exactly what the graph is showing and are sometimes long. Don't be afraid of a long title!*
viii. *Create a key to the graph if there is more than one set of data.*

<u>Problem 1</u>

Age of the tree in	**Average thickness of the annual rings in cm.**	**Average thickness of the annual rings in cm.**
10	2.0	2.2
20	2.2	2.5
30	3.5	3.6
35	3.0	3.8
50	4.5	4.0
60	4.3	4.5

The thickness of the annual rings indicate what type of environmental situation was occurring at the time of its development. A thin ring, usually indicates a rough period of development. Lack of water, forest fires, or a major insect infestation. On the other hand, a thick ring indicates just the opposite.

A. Make a line graph of the data:



B. What is the independent variable?

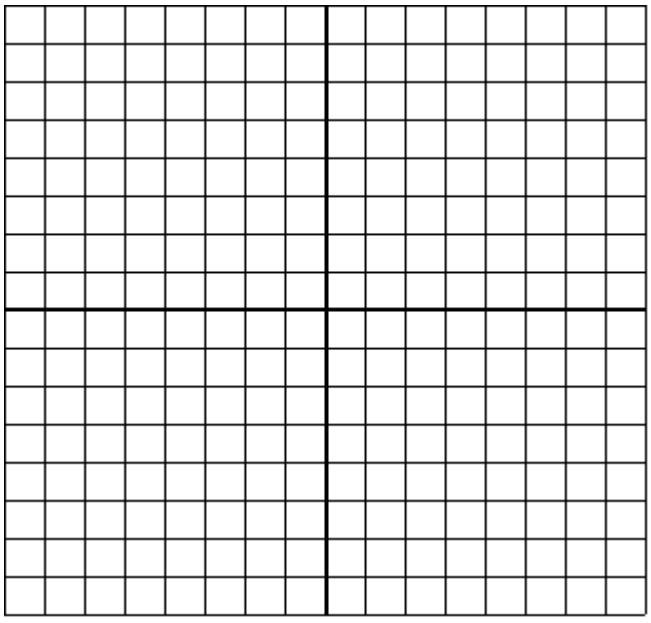
C. What was the average thickness of the annual rings of 40 year old trees in Forest A?

D. Based on this data, what can you conclude about Forest A and Forest B?

Problem 2

pH of water	Number of tadpoles
8.0	45
7.5	69
7.0	78
6.5	88
6.0	43
5.5	23

A. Make a line graph of the data.



B. What is the dependent variable?

C. What is the independent variable?

D. What is the average pH in this experiment?

E. What is the average number of tadpoles per sample?

F. What is the optimum water pH for tadpole development?

G. Between what two pH readings is there the greatest change in tadpole number?

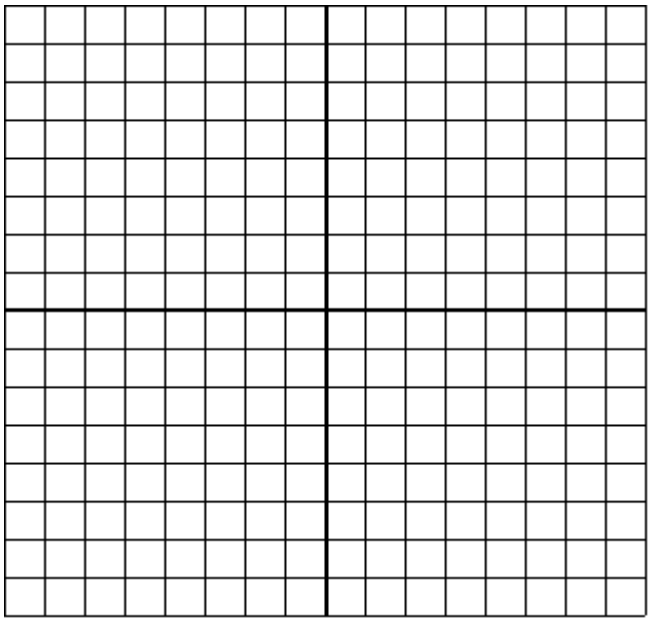
H. How many tadpoles would you expect to find in water with a pH reading of 5.0?

Problem 3

Water Temperature in ^{o}C	Number of developing clams
15	75
20	90
25	120
30	140
35	75
40	40
45	15
50	0

A clam farmer has been keeping records of the water temperature and the number of clams developing from fertilized eggs. The data is recorded above.

A. Make a line graph of the data.



B. What is the dependent variable?

C. What is the independent variable?

D. What is the optimum temperature for clam development?

PART III Reading Questions

This will be one daily assessment grade for each chapter for a total of three daily assessment grades.

Chapter 1 – Reading Questions

1. What is the importance of studying *systems* in environmental science? Why can't we just study isolated events or isolated individuals?

2. Tool use and social cooperation have allowed humans to alter their environment enormously. How would these traits help *Homo Sapiens* in these scenarios:

    a. Hunting in 10,000 BC?

    b. Surviving in very cold climates today?

    c. Responding to the discovery a huge asteroid that will crash in to the Earth in a few years?

3. So far in history, technological development has led to both increased human well-being and increased environmental disruption. Why has this been the case?

4. For each of the following environmental indicators, explain which direction it is trending and why it important to measure that indicator:

    a. Biodiversity

    b. Food Production

    c. Global Surface Temp & Atmospheric CO_2 concentration

    d. Human Population

    e. Resource Depletion

5. What are the goals of the environmental justice movement, and why are the relevant to sustainability?

Chapter 20 – Reading Questions

19. In a market economy, how are scarce resources distributed to satisfy unlimited wants?

20. What are externalities, and why are they typically not reflected in the price of a good or service?

21. How are the wealth and productivity of a nation usually measured, and what other factors must be considered when evaluating the well-being of a nation's people?

22. What characteristics must a sustainable economic system have? How does our current system compare?

23. What are the 3 major environmental worldviews, and what does each prioritize?

    1.

    2.

    3.

24. Provide the full name of each of the following major world and national organizations that affect environmental quality, and describe the priorities of each:
    UNEP –

    World Bank –

    WHO –

    UNDP –

    EPA –

    OSHA –

    DOE –

25. What is meant by finding solutions that meet the "triple bottom line"?

26. Two major challenges for our time are reducing poverty and protecting the environment. Can they both be accomplished? Or must progress towards one goal always go along with setbacks in the other?

Chapter 2 – Reading Questions

1. What is an environmental system? Name some examples.

2. What are the largest systems in the Mono Lake ecosystem? What are some examples of smaller systems within that system?

3. How is half-life important in the field of environmental science?

4. Why is water being a good solvent important for organisms? Seawater? Toxins?

5. A pH lower than 7 is _____, wherease a pH higher than 7 is _____.

6. The pH scale is logarithmic. What does that mean about the hydrogen ion concentration if you move from a pH of 6 to a pH of 7?

7. Water in equilibrium with Earth's atmosphere typically has a pH of 5.65- why?

8. What is the equation for energy?

9. What is the equation for power?

10. How are energy and power different?

11. Give an example that describes the first law of thermodynamics.

12. Give an example that describes the second law of thermodynamics.