AP Environmental Science Summer Assignment

Welcome to AP Environmental Science! I am so excited to have you, and hope you are looking forward to the course! This summer assignment is to help us review concepts and practices that we should already be familiar with, as we will be building on that foundation.

Part I: MATH

APES involves simple math calculations. You will need to be familiar with important formulas, metric conversions and data analysis. You may use calculators on the AP exam (graphing, scientific, four-function etc)
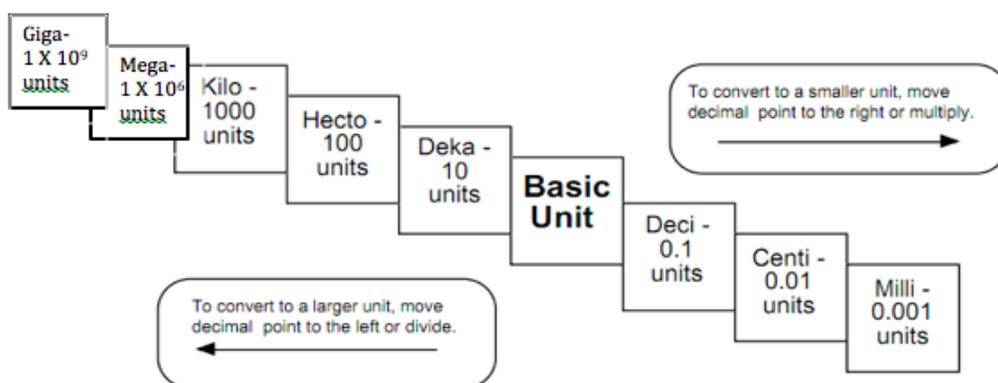
Calculations:
Averages, percentages and percent change, metric Units, scientific notation, dimensional analysis (factor-label method)

Important:
1. Show all of your work, including units. *No credit will be given on the APES exam without calculation set-ups and units*, so it will be required on all your assignments, labs, quizzes, and tests as well!

2. 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.

Metric Units: YOU MUST MEMORIZE THE METRIC CONVERSION CHART

Kilo-, centi-, and milli- are the most frequently used prefixes of the metric system. You can remember the order of the prefixes by using the following sentence: *Good Man King Henry Died By Drinking Chocolate Milk*. The metric system is based on powers of 10, so all units from the base unit can be converted by moving the decimal

Percent Change = $\frac{|\text{New} - \text{Original}|}{\text{Original}} \times 100$

Calculations: SHOW ALL WORK AND INCLUDE UNITS IN EACH STEP AND ANSWER

1) If you scored a 1090 on your first PSAT and 1210 on your second PSAT. What was your percent improvement?

2) If one termite can destroy 1.2mg of wood per day, how many kilograms of wood can 10 termites destroy in 1 week?

3) What is 70% of 640?

4) 400 kilograms to milligrams

5) 7 watts to Gigawatts

6) 600 mm to cm

7) 25 centigrams to kilograms

8) 10 Megameters to millimeters

Write the following in scientific notation

9) 394 billion

10) 0.000070202

Complete the following calculations

11) $4.2 \times 10^5 + 5.05 \times 10^9$

12) $2 \times 10^5 \times 5.05 \times 10^9$

13) If I can run 6km in 24 minutes, how many cm can I run in 5 hours?

Fourteen percent of a 55,000 acre forest is destroyed by the invasive pine weevil

14) How many acres of the forest were not destroyed?

15) How many acres of the forest were destroyed?

16) If termites destroyed 42 acres of forest in 2015 and 65 acres of forest in 2016, what was the percent increase in forest destruction?

17) A pesticide was sprayed on a portion of a forest. The pesticide killed 25,000 termites. This is 71% of the local termite population. What is the total termite population?

For questions 18-22, use the following statement along with your knowledge of the scientific method and the graph below

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

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

18) What is the dependent variable?

19) What is the independent variable?

20) What is the optimum (best) temperature for clam development?

21) What is the average temperature in this experiment?

22) Make a line graph of the data.

Part II: Chemistry

Memorize these chemical formulas and names. Making index cards or a quizlet would be helpful!

CO_2 carbon dioxide

CO carbon monoxide

H_2CO_3 carbonic acid

$C_6H_{12}O_6$ glucose

CH_4 methane

$CaCO_3$ calcium carbonate

H_2 hydrogen gas

H_2O water

N_2 nitrogen gas

NO nitric oxide

NO_2 nitrogen dioxide

N_2O nitrous oxide

NO_2^- nitrite ion

NO_3^- nitrate ion

NH_3 ammonia

NH_4^+ ammonium ion

O_2 atmospheric oxygen

O_3 ozone

P phosphorus

PO_4^{-3} phosphate ion

S sulfur

SO_2 sulfur dioxide

SO_3^{-2} sulfite ion

SO_4^{-2} sulfate ion

H_2S hydrogen sulfide

Cl chlorine

K potassium

Mg magnesium

Ca calcium

NaCl sodium chloride

Fe iron

Zn zinc

Pb lead

Hg mercury

Al aluminum

As arsenic

Rn radon

U uranium

Part III. Review Concepts

Although APES focuses on environmental issues and solutions, the backbone of the course is a culmination of biological, chemical and geological science concepts. The following are topics you have learned over the past 3 years in each of those courses. **Give a brief overview of each, using your own words! Include any important vocabulary terms. It may be helpful to add diagrams or pictures. Remember, this assignment is for YOU and your preparedness, you will get out of it what you put in!**

1. The water cycle
2. Trophic levels and energy flow
3. Food chains and food webs
4. Ecological succession
5. Carrying capacity
6. Plate tectonics
7. Earth's atmosphere
8. Solar radiation and Earth's seasons
9. The Greenhouse Effect
10. Half-life (nuclear decay)