AP Environmental Science
Summer Assignment 2018-2019

Instructor: Mrs. Pasnik

Directions:
This assignment will be due on *first day of school*. All assignments should be completed via Google docs**.**

No late assignments will be accepted.

This assignment will be counted as a major assignment in the first quarter.

Readings Summer Assignment Part 1

1. Read the essay "Tragedy of the Commons" by Garrett Hardin. Here is a link:
   http://pages.mtu.edu/~asmayer/rural_sustain/governance/Hardin%201968.pdf

 When you have completed the reading, please respond to the following in complete sentences. I expect at least a few sentences in response to each subsection:

   a. What is Garrett Hardin's central idea in this essay?
   b. Do you personally agree with Hardin's central idea?
   c. Is the "Tragedy of the Commons" unavoidable?
   d. Identify one "commons" in your own life (at school, home, work) and explain how it is (or is not) being managed wisely to avoid the situation described in the essay.

2. Read. At some point over the summer, identify an environmentally themed article that interests you. Please provide an MLA citation for the source. I do not need a <u>hard copy</u> of the article. Please "aim high" in selecting this item. For example, *The New York Times* and *The Wall Street Journal* are generally written at a more appropriate level of depth and detail than some other sources, such as tabloid newspapers and most websites.
 Summarize the article and write why you choose this specific article.   These articles will be shared out verbally during the first day of class.   Be prepared to share the summary of your article.

Law Review Summer Assignment Part 2

Directions: Find the information below for each of the laws and/or treaties listed in the table below. Create a table for yourself in google docs or google sheets. This should be notes on each of the laws or treaties-not a long summary.

You will be quizzed on these laws throughout the school year so coming into the course with these already done will be VERY helpful.

Include the following information:
a) Draft Year, International or National
b) Description of Function; Environmental Issues Affected
c) Agency/Group Responsible for Regulation and Enforcement (i.e. United Nations, Department of Interior, EPA, etc.)

Clean Air Act	Food, Drug, and Cosmetics Acts	Occupational Safety and Health Act
Clean Water Acts	Hardrock Mining and Reclamation	Ocean Dumping Ban Act
Comprehensive Environmental Response, Compensation Liability Act	Kyoto Protocol	Oil Pollution Act
Consumer Product Safety Act	Law of the Sea Convention	Oil Spill Prevention and Liability Act
Convention on International Trade in Endangered Species	Marine Mammal Protection Act	Pollution Prevention Act
Emergency Planning & Community Right-To-Know Act	Marine Plastic Pollution Research and Control Act	Resource Conservation and Recovery Act
Endangered Species Act	Migratory Bird Hunting Stamp Act	Safe Drinking Water Act
Energy Policy Act	Montreal Protocol	Soil and Water Conservation Act
Federal Food, Drug, and Cosmetic Act	National Energy Act	Solid Waste Disposal Act
Federal Insecticide, Fungicide and Rodenticide Act	National Environmental Policy Act	Surface Mining Control and Reclamation Act
Federal Water Pollution Control Act	National Park Act	Toxic Substances Control Act
Fish and Wildlife Conservation Act	National Wildlife Refuge System Act	Wild and Scenic Rivers Act
Food Quality Protection Act	Nuclear Waste Policy Act	Wilderness Act

Prerequisite knowledge and skills
Part 3 (does not need be handed in)

You are expected to enter the course with a good understanding of basic scientific and mathematical concepts and skills as well as strong, reading, and writing skills.

You are not required to complete this or hand this (Part 3) in to your teacher. You should be prepared to take a <u>quiz</u> on these skills and concepts during the first week of school. If that means completing this assignment and then checking with your teacher about any of the information before a quiz takes place, that is your responsibility. This is an AP level course and you are required to put in the effort it requires.

Prerequisite Basic Scientific Concepts:
You should be familiar with the following terms/concepts from Biology, Chemistry, and Earth Science:

Organic vs. Inorganic

Natural vs. Synthetic

Kinetic vs. Potential Energy

Radioactive decay

Half life

Law of Conservation of Matter

1st Law of Thermodynamics

2nd Law of Thermodynamics

Entropy

Organism

Species

Population

Community

Ecosystem

Producers/Autotrophs

Consumers/Heterotrophs

Decomposers

Photosynthesis (reactants and products)

Cellular Respiration (reactants and products)

Aerobic vs. Anaerobic

Adaptation

Mutation

Gene Trait

Chromosome

Gene pool

Natural Selection

Biodiversity

Extinction

Plate Tectonics

Weathering

Climate Change

Rocks vs. Minerals

Climate vs. Weather

You should know the full name of each of these chemical abbreviations: CO_2, CO, $C_6H_{12}O_6$, CH_4, H_2, H_2O, N_2, NO_X, NO_3^-, NH_3, O_2, O_3, P, PO_4^{3-}, S, SO_2, Cl_2, K, $NaCl$, Pb, Hg, Rn, U

Prerequisite Basic Mathematical Skills

Percentage

$$17\% = 17/100 = .17$$

- Remember that "percent" literally means divided by 100.
- Percentage is a measure of the part of the whole. Or part divided by whole.
- 15 million is what percentage of the US population? 15 million / 300 million = .05 = 5%
- What is 20% of this $15 bill so that I can give a good tip? $15 x .20 = $15 x 20/100 = $3

Rates

$$\frac{Rise}{Run} = \frac{Y_2\text{-}Y_1}{X_2\text{-}X_1} \qquad slope = \frac{change}{time} \qquad y=mx+b \qquad \frac{dX}{dt}$$

- All of the above are ways to look at rates. The second equation is the easiest way to calculate a rate, especially from looking at a graph. Rates will often be written using the word "per" followed by a unit of time, such as cases per year, grams per minute or mile per hour. The word per means to divide, so miles per gallon is actually the number miles driven divided by one gallon. Rates are calculating how much an amount changes in a given amount of time.

Scientific Notation

$$Thousand = 10^3 = 1,000$$

$$Million = 10^6 = 1,000,000 \text{ (people in the US)}$$

$$Billion = 10^9 = 1,000,000,000 \text{ (people on Earth)}$$

$$Trillion = 10^{12} = 1,000,000,000,000 \text{ (National debt)}$$

- When using very large numbers, scientific method is often easiest to manipulate. For example, the US population is 300 million people or $300 x 10^6$ or $3 x 10^8$
- When adding or subtracting, exponents must be the same. Add the numbers in front of the ten and keep the exponent the same.
- When multiplying or dividing, multiply or divide the number in front of the ten and add the exponents if multiplying or subtract the exponents if dividing

Ex. $9 x 10^6 / 3 x 10^2 = (9/3) x 10^{(6-2)} = 3 x 10^4$

Dimensional Analysis
You should be able to convert any unit into any other unit accurately if given the conversion factor. Online tutorials are available:
http://www.chem.tamu.edu/class/fyp/mathrev/mr-da.html
http://www.chemprofessor.com/dimension_text.htm

Prefixes

m (milli)	=1/1000	$=10^{-3}$
c (cent)	=1/100	$=10^{-2}$
k (kilo)	=1000	$=10^{3}$
M (mega)	=1,000,000	$=10^{6}$
G (giga)	=1,000,000,000	$=10^{9}$
T (tera)	=1,000,000,000,000	$=10^{12}$

Sample (easy) Math Problems

Be sure you are able to complete the following types of problems.

1) What is one million times one thousand? Show your work in scientific notation. Give the answer in scientific notation and in words.

2) A population of deer had 200 individuals. If the population grows by 15% in one year, how many deer will there be the next year?

3) One year I had 40 AP Environmental Science students and the next year I had 50 Environmental Science students, what percentage did the population of APES students grow by?

4) Electricity costs 6 cents per kilowatt hour. In one month one home uses one megawatt hour of electricity. How much will the electric bill be? (be sure to look at the prefixes chart on the previous page for the conversion of kilo to mega)

5) Your car gets 15 miles to the gallon and your friend's car gets 25 miles to the gallon. You decide to go on a road trip to Virginia Tech, which is 300 miles away. If gas costs $4 per gallon and you decide to split the gas money, how much money will you save in gas by driving your friend's car?

6) Virginia Beach is 10 miles wide and 30 miles long. If one inch of rain falls on Virginia Beach, how many cubic feet of rain fell on Virginia Beach? (Hint: convert all units to feet first).

7) An MP3 takes up about 16 kilobytes of memory per second of music. If you owned a one terabyte hard drive and filled it with only mp3s, how many days worth of music would you have? (keep track of units: kilobytes to terabytes and seconds to days)