AP Environmental Science   Summer Assignment 2020
Dr. Solomon

AP Environmental Science designed to be a lab based course to examine ecological, biological, chemical, physical and environmental concepts and interactions. As a student of environmental science, you should be familiar with local, regional and global concerns within your own environment. The objective of this summer assignment is to get you thinking environmentally and to refresh some math skills. I hope that you have an enjoyable, exciting, and educational summer!

Integrity
By your enrolling in this course, you show that you are willing to challenge yourself. *This is a college-level course*. You are expected to complete your own work in your own words. **Plagiarism and cheating will not be tolerated.** Discipline will be followed according to the Student Handbook. **Simply because you worked with a partner does not mean you submit identical assignments.**

Virtual Learning
We are going to be using Canvas and the College Board AP Classroom for our virtual learning resources. At this time, the Canvas course is not yet set up. However, you should join our AP Classroom here (myap.collegeboard.org). Use your Round Lake user id to register for the AP Classroom. Our class's join code is DMN4J7.   Also, you will be using Gizmo simulations for some lab work. Join our Gizmo class by going to www.explorelearning.com and press 'Enroll in Class'. Our class code is VFNHTV.

I. Experience the Natural World*:* Visit at least ONE natural outdoor area, go for a walk, and make some observations. Please go beyond your backyard.
On your walk, please do the following:
1.   Record the time, date, location, approximate duration of your outing, and whether you went alone or with a friend(s).
2.   Record brief observations of the areas. Record the flora and fauna, the geology of the area, the type of path you are walking on (grass, sand, rock, etc). Specific details are not necessary (ex., "I saw two black turtles sunning themselves on a log…"). This should be at least a paragraph.
3.   Identify 8 interactions in nature that you spot this summer. Using a cell phone camera or your ipad, document these interactions in nature. Each picture should be labeled with the type of interaction observed, the organisms involved, where the incident occurred, and a brief description of the interaction.

4.   Respond to the following in a brief paragraph: Is this natural area really "natural"? Explain. How do you think it appeared 25 years ago, 2000 years ago, and 20,000 years ago?

Types of interactions:

·   **Competition**: A & B compete for resources.

o   Ex: Zebra mussels compete with native mussels in Lake Erie for phytoplankton

·   **Inhibition**: Actions of A inhibit B

o   Ex: A bacterial colony secretes chemicals to prevent others from growing too close to it, without injuring the other bacteria.

·   **Predation**: A feeds on B, with a direct negative effect on B

o   Ex: Deer eat host plants, lions hunt antelope

·   **Parasitism**: A feeds on B with an indirect negative effect

o   Ex: Sea lamprey attach to fish and suck their blood

·   **Mutualism/Symbiosis**: A & B require each other to survive or thrive. Symbiosis entails a direct connect between the two.

o   Ex: Plant roots provide energy and protection for fungi while the fungi help plants absorb nutrients

·   **Commensalism**: A requires B, but B is not effected.

o   Ex: Maple trees provide shade for moss to grow

II. Current Events in Environmental Science

Identify an environmentally themed article that interests you. You can use our school's resources here. (https://www.rlas-116.org/Page/8015) 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 compared to some other sources, such as 'clickbait' websites. Also magazines such as *Discover*, *National Geographic*, *Natural History*, *Science*, or *Nature* can provide excellent articles about current environmental issues.

1.   Summarize the article in a paragraph

2.   Write a response to the article:

a.   What is your opinion of the issue?

b.   How does the issue impact the future?

c.   How do you think the article relevant to an APES course? (IE: Why did you choose this article)

III. *Math skills:*

The APES Examination will require you to do mathematical calculations. This worksheet is designed help to prepare you for the type of calculations you may encounter on this year's APES exam. **Expect a math skills test in the first week of school.**
For each problem show every step of your work, and indicate the cancellation of all units…

Scientific Notation—All APES students should be able to work comfortably with numbers in scientific notation.
*Place the following numbers into scientific notation. **No Calculators!!***

1) one billion   4) twenty three thousand

2) 70 trillion   5) three hundred

3) 0.00025   6) 7,310,000

Metric Conversions—All APES students should be comfortable converting between common metric prefixes. Below are common prefixes, and the number of base units each represents. For example, 1 teraWatt = 10^9 Watts; 1 millimeter = 10^{-3} meters

n = nano = 10^{-9} u = micro = 10^{-6} m = milli = 10^{-3}
k = kilo = 10^3 M = mega= 10^6 T = Tera = 10^9 G = Giga = 10^{12}

7) 2.8 mm = _____ m

8) 1.3 nm = _____ m

9) 300 mg   = _____ g

10) 12 g   = _____ng

11) 250 mL   = _____ L

12) 400 GW = _____W

Unit conversions—All APES students should be able to convert from one system of units to another

Use the information below to complete the following. Show all of your work including the canceling of all units. **No Calculators!!**

1 mi^2 = 640 acres	1 acre = 0.405 hectares
1 barrel oil = 42 gallons	1 L = 0.264 gallons
1 kilowatt-hour = 3.4 x 10^4	BTU= 8.6 x 10^5 calories
1 metric ton = 1 x 10^3 kg	

13) A 100 square mile area of national forest is how many acres? how many hectares?

14) A city that uses ten billion BTUs of energy each month is using how many kilowatt-hours of energy?

15) Fifty eight thousand kilograms of solid waste is equivalent to how many metric tons?