AP Environmental Summer Assignment 2020 Northview High School

Welcome to APES! I am very happy that you have decided to take this course and embark on what I hope will be a beneficial and relevant educational journey. Your summer assignment is to perform several tasks to help you prepare for a successful year and to get you thinking about the environment and how humans affect it. Parts 1-4 of this assignment are mandatory, and for Part 5 you have a choice of 2 assignments. You are expected to enter the course with a good understanding of basic chemistry formulas, math concepts and geography so the goal of parts 2-4 of this assignment is to help you brush up on these, as we will be referencing these throughout the year.
For Part 5 of the summer work, you may choose between 2 different assignments. One is a current event assignment to increase your awareness about current environmental issues. The second choice is to visit a park or natural area at least 20 miles from Northview High School and write a paper about your experience.
If you have questions, please feel free to email me at rogersla@fultonschools.org. I will be checking my email (somewhat) regularly. Please don't leave this all until the few days before school begins - don't be the "pro" in procrastinator! I hope you have a fun summer and spend time in the great outdoors. I look forward to getting to know you and to an exciting year of APES!
Cheers! Mrs. Laurie Rogers

This summer assignment consists of the following parts which are presented on these 4 pages. Except for the email, ALL work is due the FIRST day of class. Be prepared for an assessment on parts 2, 3 and 4 on Wednesday (8/12/20) of the first week back.

1. **Introductory email**: Please email me by Wednesday 8/5/20
2. **Basic Chemistry Review:** Review some chemistry formulas that you will encounter in APES.
3. **Math Review Problems**: Sharpen up your math skills and complete the math questions. You must show all work.
4. **Geography Review**: The physical and political boundaries of our world are reviewed.
5. **Your Choice of 2 activities: a) Current Events Articles:** Refer to the instructions under Part 5.
   OR b) Get Outside your Self-ie park visit: Refer to the instructions under Part 5

Part 1: Introductory email: Please email me, Mrs. Laurie Rogers, at rogersla@fultonschools.org by Wednesday 8/5/20 and tell me your name, something you love about nature, why you are taking APES, and a specific goal you have for the class.

Part 2: Basic Chemistry review: Please write these out in list form or as flashcards. You need to know the names and formulas of the following chemical compounds & elements: CO_2, CO, $C_6H_{12}O_6$, CH_4, H_2, H_2O, N_2, NO_x, NH_3, NH_4^+, NO_3^-, O_2, O_3, P, PO_4^{3-}, S, SO_2, H_2SO_4, Cl, K, NaCl, Pb, Hg, Rn, U, CFC, $CaCO_3$, H_2CO_3

Part 3. Math Review:

This is the 2nd year that APES students will be able to use calculators so you will not need to worry about messing up long division. But you still need to brush up on some basic math skills that are required for APES. Work the following practice problems on a separate sheet, and remember to show all your work, including units. Topics: Percentages, metric conversions, Temperature conversions, scientific notation, Dimensional Analysis. Answers will be posted in class on Tuesday 8/11/20

a) Percentages

1. A farmer grows 156 acres of wheat. If 6 percent of the crop is lost to pests, how many acres of wheat will he yield?
2. If a country has a population of 66 million, and the total annual water use by this country is 3.77×10^{12} L what is the per capita daily water usage in liters? (per capita means per person)
3. The Greenland Ice Sheet contains 2,850,000 cubic kilometers of ice. It is melting at a rate of .008% per year. How many cubic kilometers are lost each year?
4. If 57.5 square miles, or 15%, of a forest is being logged, how large is the forest?
5. Calculate the percentage growth for a county with a population of 6 million in a year in which it had 100,000 births, 70,000 deaths, 30,000 immigrants and 40,000 emigrants.
6. A coal fired power plant is 35% efficient. If one ton of coal contains 20 million BTU of energy, then how many BTU of waste heat are produced per ton of coal?
7. If the concentration of iron in a water supply changes from 45ppm to 8 ppm in a ten-year period, what is the annual percent change of the iron concentration?
8. If 25% of a natural area is to be developed, leaving 750 acres untouched, how many acres are to be developed?

b) Metric Conversions

Common Metric prefixes:

μ (Micro) = 1/1,000,000 = 10^{-6} m (milli) = 1/1000 = 10^{-3} c (centi) = 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}

9. 1200 kilograms =? milligrams
10. 2.3 Gbyte =? Mbyte
11. 6544 liters =? milliliters
12. .78000 cm =? Km

c) Temperature Conversions: Formulas: °C = 5/9 (°F – 32) and °F = (°C x 9/5) + 32

13. a) 85°F = __ °C b) 15 °C =___ °F c) -35 °C = ___ °F

d) Scientific Notation

Write the following numbers in scientific notation:

14. 145,000,000,000
15. 135 trillion
16. 1 millionth

e) Dimensional Analysis (remember this??☺)

Handy Conversion factors:

1 square mile = 640 acres 1 hectare (Ha) = 2.47 acres 1 kW-hour = 3,413 BTUs
1 barrel of oil = 159 liters 1 metric ton = 1000 kg 1 inch = 2.54 cm 1 mile= 1.6 km or 5280 feet
1 pound = 16 ounces or 454 grams 1 ton = 2000 lbs. 1 liter = 1.057 quart 1 mL = 1 cm^3

17. 1.35 kilometers per second =? miles per hour
18. A 540 million square mile forest is how many hectares?
19. The total amount of freshwater on earth is estimated to be 3.7 x 10^8 km^3. What is the volume in L?
20. Your car gets 15 miles per gallon, and your friend's car gets 25 mpg. If you go on a 200-mile road trip in your friend's car, and gas costs $2.50 per gallon, how much gas money will you save by using your friend's car instead of your car?
21. If one barrel of crude oil provides six million BTUs of energy, how many kW-hr will one liter of crude oil provide?
22. Fifty-eight thousand kilograms of solid waste is equivalent to how many metric tons?
23. Sapelo Island, off the coast of Georgia, is 16500 acres in size. If one inch of rain falls on the island, how many cubic feet of rain fell on the island?
24. Your house is 1000.0 sq. ft., and you have a natural gas furnace. 60,000. BTUs of heat per square foot are required to heat your house for one winter season. A) How many BTUs of energy will be needed? B) If one cubic foot of natural gas supplies 1,000. BTUs of heat, how many cubic feet of natural gas will be needed for this one winter season?
25. Suppose my car gets 32 miles to the gallon of gas and I drive approximately 15,000 miles per year. How many gallons of gas do I use in a year? If one gallon of gasoline emits 20 pounds of CO_2, when burned in the internal combustion engine of my car, how much CO_2 does my car emit each year?

Part 4: World Geography Refresher:

Please print out 2 copies of the attached world map (or another world map of your choice) and label the following on the maps. Please print neatly & legibly; it is recommended that you label the maps with numbers and create a corresponding key.

1. World Political Map: Label the following:
   - all oceans
   - Equator, Topic of Cancer, Tropic of Capricorn, Arctic Circle, Antarctic Circle
   - Countries: China, Japan, Korea, India, Pakistan, Indonesia, Philippines, Brazil, Chile, Cuba, Mexico, Haiti, Dominican Republic, Hawaiian Islands, Galapagos Islands, Nigeria, South Africa, Burkina Faso, Saudi Arabia, Iran, Iceland, Sweden, Germany, Russia, Greenland
2. World Physical Map: Label the following:
   - Rivers: Amazon, Congo, Nile, Danube, Volga, Ganges, Yangtze, Mississippi
   - Lakes/Seas/ Regions: Great Lakes, Lake Chad, Lake Victoria, South China Sea, Gulf of Mexico, Red Sea, Aral Sea, Black Sea, Mediterranean Sea, Bering Sea, Hudson Bay, Chesapeake Bay
   - Mountain ranges: Andes, Alps, Himalayas, Rockies, Sierra Nevada region, Cascades, Appalachians
   - Other: San Andreas fault, Everglades, Grand Banks

Part 5: Do EITHER part A or Part B, your choice.

Part 5A: Current Events Articles

A goal of this course is to educate you about environmental issues that are important locally and globally and to get you thinking about the environment and how we affect it. For this assignment, find and read **two** current (from this summer: May, June, July or August) articles regarding some issue relating to the environment- these can be about climate change, pollution, agriculture, populations, mining, geology, water & land resources, energy, biodiversity, etc. Each article must pertain to a different topic! You will summarize and reflect about each article according to the requirements below.

For **EACH** of your **TWO** chosen articles you must TYPE a response in the following way:

a. ***A heading*** which includes the following:
   i. Title of the Article
   ii. Author(s) of the Article
   iii. Date of publishing
   iv. Source of Article: name of news source
   v. internet link to the article

b. ***A brief introduction:***
   i. What is the article's relevance to the environment? What topic does it cover?

c. ***A summary (10 sentences minimum):***
   i. In your own words, summarize the article's main points. Point out the major environmental themes discussed.

d. ***A reflection: personal reaction statement (8 sentences minimum):***
   i. You will address the following questions as part of a personal reaction to your article:
      - Why is the science research in this article important?
      - How will these findings affect us now and/or in the future?
      - What is your opinion on these scientific findings?
      - Do you feel that the information in this article is biased in some way? Defend your view.
      - Does this information support or refute other information you've heard or read? Explain.
      - What questions do you still have about this topic?

Part 5B. Get outside yourself-ie!

Get outside! We have been cooped up too long! Enjoy the glorious summer weather and explore our beautiful natural world! Please visit **at least one public park or natural area** (regional, state, or national) **that is at least 20 miles from Northview High**, take a picture of yourself (must include Mr. APES) at the park, and TYPE a paper reflecting on your visit, and describing and providing information about the park. Please include all the following:

- park name and location and weather conditions on the day of your visit
- the organization responsible for upkeep of this park
- history of the park
- why you chose this park and how you spent your time at the park
- plants & animals (describe & identify at least 8 species that you observed, give both common & scientific names, & identify habitat conditions needed by each of these species to thrive)
- visible signs of human impact in the park
- challenges faced by this park (usage, traffic, water use, topography, etc.)
- your overall impressions of the park and your visit
- Attach your photo to your paper (with Mr. APES, cut out the picture to the right and include in your photo)
- Include a list of references

Note: You will need to do some research. This is an AP course. Please do not bore us all with elementary quality work such as "I saw trees and birds". 😊

MR. APES!