

Lenape Valley Regional High School

AP Environmental Science 2019

Summer Assignment



June 6, 2019

Dear Scientists,

Welcome to AP Environmental Science (APES)! Students who enroll in APES should be ready and willing to devote sufficient ***time, focus, energy, and a positive attitude*** to the course! The course will include various types of assignments such as daily text readings, taking extensive notes in and outside of class, preparing for frequent quizzes, exams, participating in laboratory experiments, writing reports, giving oral presentations, and participating in class discussions. Students need to be willing to devote a significant amount of time and energy to this course.

In order to be successful in this course and on the AP Exam, work needs to be done over the summer. The purpose of this assignment is to encourage thinking about the environment and challenges that humanity faces to ensure a sustainable quality of life. These thought processes are necessary for success in AP Environmental Science. You should plan on immersing yourself in the subject of environmental science for the next *twelve months*. Please complete the following assignment this summer.

The summer assignment is a test grade for marking period 1, and will be due on the first full day of school.

The summer assignment consists of several parts. The first part of the assignment involves a math review. The following problems represent some of the basic math skills that are required to be successful in AP Environmental Science. ***No calculators*** are allowed to be used in class, on exams, or on the AP Exam. This part of the assignment can be completed through the use of various internet resources as a reference.

Allow yourself ample time to complete the summer assignment. This assignment was designed to take several weeks to complete, working a reasonable amount of time per day. ***Do not stress yourself by trying to cram this assignment in at the end of the summer.*** This assignment may seem like a lot of work but it is designed to give you a good foundation for which to approach the AP Environmental Science course.

If you have any issues on the assignment feel free to reach me at rstrodel@lvhs.org. Have a wonderful and relaxing summer! I can't wait to meet you in September!



Sincerely,

Mrs. Strodel

Teacher of Biological Science

Part 1: Math Review (30 points)

Please answer the questions below without the use of a calculator. You must show your work on scrap paper to get full credit. Below are some helpful tutorials to review your math skills. No calculators.

Scientific notation: <http://www.chem.tamu.edu/class/fyp/mathrev/mr-scnot.html>

Dimensional analysis: <http://www.chem.tamu.edu/class/fyp/mathrev/mr-da.html>

1. _____ What is ten million times three thousand?
2. _____ What is thirty-four million plus two hundred fifty-six thousand times four hundred?
3. _____ A population of deer had 200 individuals. If the population dropped 15% in one year, how many deer were lost? What is the total population of deer the next year?
4. _____ One year we had 120 APES students and the next year we had 150 APES students. What percentage did the population of APES students grow by?
5. _____ One year we had 2500 endangered sea turtles hatch. After one year there were only 1500. What percentage of turtles died?
6. _____ Electricity costs 6 cents per kilowatt hour. In one month one home uses one megawatt of electricity. How much will the electric bill be? (be sure to look at the conversion chart for the conversion factor from kilo to mega)
7. _____ Your car gets 12 miles to the gallon and your friend's car gets 20 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 by driving your friend's car?
8. _____ A turtle was crawling at the rate of 38 cm per minute. How many kilometers would the turtle crawl in 2 hours?
9. _____ A turtle was crawling at the rate of 43 cm per minute. How many kilometers would this turtle crawl in one day (24 hours) if it did not rest and continued to crawl at a continuous pace?
10. _____ There are 125 blades of grass in a square cm of lawn. Assuming the grass stand is even, how many blades of grass would be found in a lawn measuring 8 meters by 6 meters? Use scientific notation in your answer.
11. _____ You purchase a home that is 2500 square feet of living space. How many square meters of living space is this?
12. _____ If a calorie is equivalent to 4.184 joules, how many joules are contained in a 250 kilocalorie slice of pizza?
13. _____ A coal-fired electric power plant produces 12 million kilowatt-hours (kWh) of electricity each day. Assume that an input of 10,000 BTUs of heat is required to produce an output of one kilowatt-hour of electricity. Calculate the number of BTUs of heat needed to generate the electricity produced by the power plant each day.
14. _____ (Using the information in 13) Calculate the pounds of coal consumed by the power plant each day assuming that one pound of coal yields 5,000 BTUs of heat.
15. _____ If a city of 10,000 experiences 200 births, 60 deaths, 10 immigrants and 30 emigrants in the course of a year, what is its net annual percentage growth rate? (By what percentage did the population change?)

Part 2: Chemistry Review (25 points)

In order to be successful in APES you will need a basic understanding of chemistry. For each of the following, write out the chemical name that goes with the symbol.

1. CO₂ _____
2. CO _____
3. C₆H₁₂O₆ _____
4. CH₄ _____
5. H₂ _____
6. N₂ _____
7. NO₂ _____
8. NO₃ _____
9. NH₃ _____
10. NH₄ _____
11. O₂ _____
12. O₃ _____
13. P _____

14. PO₄³⁻ _____
15. S _____
16. SO₂ _____
17. SO₃ _____
18. H₂SO₄ _____
19. NaCl _____
20. Pb _____
21. U _____
22. Rn _____
23. Hg _____
24. Cl _____
25. H₂O _____

Part 3: Be Aware and Enjoy Nature (20 points)

Visit a natural area, go for a walk, sit in your backyard, go to a park or the beach or anywhere outside (get the point?) and make some observations!

- Record the date, time, duration, and location of your outing.

- Record observations on the following things:

- Flora (plants)
- Fauna (animals, fungi, etc.)
- Geology (rocks, soil, etc.)
- Weather (today)/Climate (throughout the seasons)
- You don't need to know specific species names for all of the plants and animals and types of rocks and soil that you see, but describe them. What color are they? How big are they? What are they doing? How are they interacting with each other, with other types of organisms?
- This part of the assignment can just be a running list of things you see, can use bullet points, and doesn't need to be in complete sentences.
- You can also include drawings or photographs of what you see.

Write a paragraph (complete sentences, etc.) reflecting on the following questions:

- ★ What did you encounter?
- ★ What questions did you wonder as you observed everything?
- ★ How much and what kinds of human impacts did you notice in that area?
- ★ How did you enjoy the activity?

Part 4: How much do you waste? (25 points)

Take a cardboard box, reusable shopping bag(s), or large plastic garbage bag, and collect all your personal (not your whole family's) solid waste for exactly one week. This should include paper (junk mail), cardboard, plastic - all shopping bags, cereal bags, bread bags, any plastic film from around paper towels, toilet paper, and napkins, glass, metal, rubber foam products, leather, etc, everything except gross food waste which you should throw away. Be sure to rinse all recyclables. (This why you can use a reusable bag; don't put anything wet in here). After the week, make an analysis of your bag of solid waste and answer the following:

1. How much did your bag weigh and what percent of your body weight did it represent?
2. Which category from above made up the largest percent of your waste?
3. Because we are not collecting food waste; approximate how much food waste you think you would have collected -- you can list the food items, or estimate how many lbs. you think you threw away.
4. Estimate what percent of your bag of waste is recyclable. SEPARATE everything that is recyclable: paper/cardboard; ALL types of plastic - bottles and shopping bags/plastic film; and recycle these materials in the proper locations. (take all plastic bags/plastic film to your grocery store; Kohl's or Target for collection)
5. Weigh the container again AFTER you recycled everything that could be recycled. How much does it weigh now? What is the difference in weight before and after recycling.
6. List all the categories of waste you collected. Pay careful attention to beverage containers, and all types of plastic bags/packaging/wrapping.
7. What was the most impressive thing that you learned through this process?
8. What were your impressions of solid municipal waste prior to this experience? How have your impressions about solid municipal waste changed/evolved as a result of this experience?
9. Be sure to include pictures of your waste bag! **YOU ARE NOT TO BRING IN YOUR WASTE BAG!**
PROPERLY DISPOSE OF AND RECYCLE ALL ITEMS AFTER YOUR WEEK OF COLLECTION.

Part 5: Getting to Know You (5 points)

- Join Google classroom for APES! The password is: u6h372w
- Once you have joined, please complete the form "Getting to Know You"
- We will use Google classroom for many things throughout the course. It is imperative that you join! 😊

Please gather Parts 1-4 of the assignment into a small binder or folder and have the assignment ready for submission on the first FULL day of school.

There is no extension for this assignment, as you have the entire summer to work on this. Remember the summer assignment will count as a test grade for marking period 1.

You may email me at rstrodel@lvhs.org if you run into any difficulties or have any questions.

Name: _____

Summer Assignment Grading Rubric

Part 1: Math Review _____ /30 pts

Part 2: Chemistry Review _____ /25 pts

Part 3: Be Aware and Enjoy Nature _____ /20 pts

Part 4: How Much Do You Waste? _____ /25 pts

Part 5: Getting to Know You _____ / 5 pts

Total Points _____ / 105 pts

Comments:

