Welcome to AP Environmental Science (APES)! This summer assignment will give you a brief overview of overarching topic of sustainability threaded through this course by looking at some of the associated readings, prerequisites and math calculations. It will also give an idea of the amount of work expected for this class and how you MUST budget and allocate time for this course as well as meeting the rest of your academic demands. Check off items as you complete them!

The major topics of the class are as follows:

Earth Systems – atmosphere, soil, groundwater, and geology

Energy Resources and Consumption – fossil fuels, nuclear energy, conservation and consumption

The Living World – ecosystems and cycles

Pollution – types of pollution and its impact, waste disposal

Populations – demographics, dynamics and growth

Global Change – ozone, global warming, loss of biodiversity

Land and Water Use – agriculture, forestry, mining, fishing and global economics

Over the course of the year we will learn more about the scientific, social and economic aspects of these topics. There are several parts to the summer assignment, all with different due dates, and one of which will be collected on the first day of class. If you have any questions about the assignment, feel free to email me at minnie.dwaram@henry.k12.ga.us. The summer assignment will count for a significant portion of your grade for the first grading period. All work turned in must be your own work. Please visit my website through Woodland High School’s Main Page for supporting links and materials to complete this assignment.

1. Email me by July 25th (10 points):
   - Last name, First name, APES 2019-20 in the subject line
   - Your full name at the beginning of the email
   - Your home address
   - Parent or Guardian Name #1/ Main Contact Phone
   - Parent or Guardian Name #2/ Main Contact Phone
   - Confirm that you AND a parent/guardian have registered for Remind Service using the information on the website
   - Briefly discuss how you will plan and schedule time for meeting the rigors of an AP (college level) course. (Discuss organization, planning, homework and study methods)
2. **Prerequisite Knowledge and Skills** — Quiz the first week of class on vocab and math skills

Prerequisite Knowledge and Skills: AP Environmental Science is a college level course that combines content area from earth science, biology, chemistry, physics, math, and social studies. You are expected to enter the course with a good understanding of basic scientific and mathematical concepts and skills, as well as strong reading, writing, and speaking abilities. Although we will continue to develop these skills throughout the school year, your success in the class is also dependent upon what you bring to it at the onset. One goal of this summer assignment is to help you brush up on these skills and concepts. Over the summer, **review the scientific vocabulary & concepts below** (either by making **online or actual flashcards**, **concept mapping**, **stories with terms** in them) as well as the **mathematical calculations on the next page** we will be building upon and referencing them throughout the school year. You should be prepared to take a quiz on these skills and concepts during the first week of school. If you do not receive at least an 85% on the quiz, you will need to stay after for tutoring until you are able to achieve an 85% on it.

**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**
- **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**
- **Natural Selection**
- **Biodiversity**
- **Extinction**
- **Plate Tectonics**
- **Weathering**
- **Climate Change**
- **Rocks vs. Minerals**
- **Climate vs. Weather**

*The full name of each of these chemical abbreviations:*

- CO₂, CO, C₆H₁₂O₆, CH₄, H₂,
- H₂O, N₂, NOₓ, NO₃⁻, NH₃, O₂,
- O₃, P, PO₄³⁻, S, SO₂, Cl, K,
- NaCl, Pb, Hg, Rn, U
3. **Math Problems (35 points)** – Due by Monday, July 25th
- Drop it off in the main office, email, scan or snail mail it to CSS; be sure that both your name and my name are visible (grading: 2 points for setting up the problem, 2 points for the answer, 2 points for neatness)

**Prerequisite Basic Mathematical Skills**

**Percentage**

Ex. 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

**Percent change**

Percent increase and percent decrease are measures of **percent change**, which is the extent to which something gains or loses value. Percent changes are useful to help people understand changes in a value over time.

\[
\text{Percent Change} = \frac{\text{New Value} - \text{Old Value}}{\text{Old Value}} \times 100
\]

**Scientific Notation**

Thousand = \(10^3 = 1,000\)
Million = \(10^6 = 1,000,000\) (people in the US)
Billion = \(10^9 = 1,000,000,000\) (people on Earth)
Trillion = \(10^{12} = 1,000,000,000,000\) (National debt)
- When using very large numbers, scientific method is often easiest to manipulate. For example, the US population is 300 million people or 300x10^6 or 3x10^8
- 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. \(9 \times 10^5 / 3 \times 10^2 = (9/3) \times 10^{5-2} = 3 \times 10^3\)

**Dimensional Analysis**

You should be able to convert any unit into any other unit accurately if given the conversion factor.
Online tutorials are available via my support web page.

**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 = \(10^9\)
Math Problems Answer the questions. Show all work (Use a separate sheet of paper if necessary.)

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 30 APES students and the next year I had 55 APES students, what is the percent increase in APES students?

4) The price of oil decreased from $54 per barrel to $50 per barrel. What is the percent decrease in oil prices?

5) 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)

6) Your car gets 20 miles to the gallon and your friend’s car gets 35 miles to the gallon. You decide to go on a road trip to SUNY-Oneonta, which is 165 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?
7) Manhattan is 2.3 miles wide and 13.4 miles long. If Manhattan receives two inches of rain, how many cubic feet of rain fell on Manhattan. (Hint: convert all units to feet first).

4. Current Event (20 points) – Due Thursday, August 1st, 2019 (That’s the first day of school) 😁 (see below instructions)
- Summary and response to an article dealing with APES topics, environmental issues

- In environmental science, it’s important to know about current issues in the news. One of our goals for this course is to educate you about environmental issues that are important to our community, our country, and our world. We will be reading and discussing a variety of current events throughout the school year as well. This is a great opportunity to start thinking about the environment and how it affects us.

Over the course of the summer, find an article that relates to environmental science. All articles should be current (from August 2018 on) and taken from a reliable source. The sources may be scientific publications, popular magazines, newspapers or the like. Try the NY Times (especially Tuesdays), Washington Post, National Geographic, Discover Magazine, Scientific American, Science, Nature, etc. The articles should be long enough for you to write a substantial summary and well-thought out response. All bibliographic information should be included with the summary. You must find a variety of articles either at the state, national, and global level, (i.e. Not all articles should be about New York City or the Hudson River) that address multiple environmental issues.

Topics include, but are not limited to: pollution, climate change, environmental legislation, alternative energy sources, fossil fuels, human population growth, renewable resources, recycling/waste management, air quality, water quality, conservation/wildlife, food production/food safety, deforestation, GMOs (genetically modified organisms), etc.

This portion of the summer assignment:
- **must be typed in 12 pt. Times New Roman or Arial Font. It must be double spaced.**

On the first day of class, you should submit for each article:
- Bibliography for article(s) (I do not want a copy of the actual article) (MLA or APA format) (2 pts)
- a summary of the article content (6 pts)
- a personal reaction (7 pts)

**Summary:**
Write a brief summary of the article(s) and point out the major environmental themes discussed. Your summary should be no less than 250 words.

**Personal Reaction:**
Your personal reaction should clearly state your opinions and/or reflection on the article. You can offer potential solutions, compare it to another environmental problem, ask questions about the article, or simply reflect on the article’s content. Do not simply write, “This article was very interesting/good.” It should be no less than 250 words. Some questions to drive your discussion:
- What are the key points made in the article?
- What are the points of view presented about this issue?
- Does the article teach you something new?
- Does it support or refute other information you’ve heard or read? How so/in what way?
5. Silent Spring Analysis (20 points) – Due Thursday, August 1st, 2019

Research as much information you can about the book “Silent Spring”. Use the support links under the Summer Assignment Page on my website, as well as any other sources you find.

→ You will write a minimum of 250 words answering the following Research Question: Has Rachel Carson’s book Silent Spring contributed to an increase or decrease in world Malaria cases?; why or why not?

→ Please cite all your sources.

6. Notebook Set-Up (15 points) – Due Friday, August 9th – This will be your first Notebook Check

Divide a binder (1½ Inch 3-Ring Recommended) into the following 5 sections in order:
- Bellwork – Must be dated
- Notes (this will include Handouts & Agendas)
- Current Events
- Quizzes Tests
- Labs

*****3 Composition Book (Separate from Notebook)

JUST A FEW SIDE NOTES:

✓ Please review my syllabus in detail.
✓ I post all assignments to my website as well as any other pertinent information.
✓ If you need help with anything or have any issues/concerns, please do not hesitate to contact me at minnie.dwaram@henry.k12.ga.us. It is best to contact me in advance and not wait until the last minute. Be more proactive and less reactive.
✓ Plagiarism is Not New & Is Not Okay

I am working to help build good habits that will benefit you in the long term. All work submitted in this class must be your own original work as stated in the class syllabus for APES. This includes summer work, essays, vocabulary, lab reports and any other work submitted for credit. If the words are not yours, neither is the credit! Aside from appropriately cited article, inclusion of work done by anyone other than yourself will receive a grade of “0” (zero). Repeated instances of plagiarism will result in a grade of Fail in AP Environmental Science.

SUMMER ASSIGNMENT CHECKLIST:

☐ EMAIL ME BY JULY 25th
☐ MATH PROBLEMS JULY 25th
☐ CURRENT EVENT AUGUST 1st

☐ SILENT SPRING ANALYSIS AUG. 1st
☐ STUDY PRE-REQUISITES FOR QUIZ
☐ NOTEBOOK SET-UP AUG. 9th