

***AP Environmental Science 2018-2019  
Summer Assignment***

Welcome to APES!

AP Environmental Science is a lab based course that is designed to examine ecological, biological, chemical, physical and environmental concepts and interactions. A student in this course should be familiar with local, regional and global concerns within their own environment. The objective of this summer assignment is to get you thinking environmentally and to refresh some math skills. Please note that this assignment will be collected for a grade at the end of the first week of school. Please assemble all materials in a binder with dividers. Materials should be typed, unless where otherwise noted. I hope that you have an enjoyable, exciting, and educational summer!! - Mrs. Carr

The major topics of the class are as follows:

**Energy Systems and Resources** – atmosphere, soil, groundwater, and geology

**The Living World** – ecosystems and cycles

**Populations** – demographics, dynamics and growth

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

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

**Pollution** – types of pollution and its impact, waste disposal

**Global Change** – ozone, global warming, loss of biodiversity

***Below are the tasks you should complete this summer. There are four parts. All final materials should be typed, and assembled in order in a binder with dividers to be handed in at the end of the first week of school.***

**1. E-mail Me- [jcarr@hopatcongschools.org](mailto:jcarr@hopatcongschools.org) with the following information by June 30<sup>th</sup>:**

- Brief introduction and why you are taking AP Environmental Science.
- Why you think you will be successful on the AP Exam. (10 points)

## 2. Environmental Documentary

Watch “Home”, by Yann Arthus-Bertrand on YouTube and answer the questions. These do NOT have to be typed. Include this in your binder.

1. What are the major global environmental issues?
2. Explain the role art plays (cinema, photography) and that of the media (journalism) towards global issues.
3. What is your impact and responsibility as a citizen of the world?
4. What are some solutions to save Earth from humans?

## 3. Tragedy of the Commons

Directions: Read the essay “Tragedy of the Commons” by Garrett Hardin. The essay can be found at this link:

[http://www.garretthardinsociety.org/articles/art\\_tragedy\\_of\\_the\\_commons.html](http://www.garretthardinsociety.org/articles/art_tragedy_of_the_commons.html).

After reading, answer the following questions.

1. What is Garrett Hardin’s central idea in this essay?
2. Do you personally agree with Hardin’s central idea?
3. Is the “Tragedy of the Commons” unavoidable?
4. Identify one “commons” in your own life.

## 4. Environmental Articles.

Find five articles that deal with environmental science issues (five different issues). Articles may come from the newspaper, magazines, journals or the internet; however, only two of your articles may be from the internet. Be sure to follow the format for your summaries.

### Format:

1. Title (underlined)
2. Author’s name
3. Source and date
4. Summary of the article
5. Concluding Paragraph – include any outcomes in the article and your opinion about the issue.

**\*Turn in the article or a copy of the article with each abstract. If necessary, mount or photocopy each article on a piece of computer paper.**

**\*All articles used must be current- within the past two years.**

## 5. Environmental Legislation chart.

Create a chart similar to the one below page and fill in the missing information pertaining to important legislation. **Make sure this is typed so that you can add as many details as needed!** You can change the formatting to fit your preferences (example – make it landscape if that’s easier for you). We will study MANY different environmental policies throughout the year. This is just to get you started.

Legislation Name	Is this a US or World Treaty, Law or Act?	Date Enacted (Year)	Description of the Legislation (Give the purpose, important founding organizations or people, any major points that you find)
Kyoto Protocol			
Montreal Protocol			
Agenda 21			
London Dumping Convention			
Helsinki Convention			
CITES			
SMRCA			
RCRA			
Lacey Act			
Clean Water Act			
Safe Drinking Water Act			
Clean Air Act			
Antiquities Act			
Endangered Species Act			
CERCLA			

## **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 concepts below 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.*

## **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

## **Prerequisite Basic Mathematical Skills**

### **Percentage**

$$17\% = 17/100 = 0.17$$

- 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?  $15 \text{ million} / 300 \text{ million} = 0.05 = 5\%$
- What is 20% of this \$15 bill so that I can give a good tip?  $\$15 \times \$0.20 = \$15 \times 20/100 = \$3$

### **Rates**

Rise  $Y_2 - Y_1$  slope change  $y = mx + b$   $dX$

Run  $X_2 - X_1$  time  $dt$

- 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 =  $10^6 = 1,000,000$  (x300 = people in the US)

Billion =  $10^9 = 1,000,000,000$  (x7 = people on Earth)

Trillion =  $10^{12} = 1,000,000,000,000$  (x15 = National debt)

- When using very large numbers, scientific method is often easiest to manipulate. For example, the US population is 300 million people or  $300 \times 10^6$  or  $3 \times 10^8$
  - 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.  $9 \times 10^6 / 3 \times 10^2 = (9/3) \times 10^{(6-2)} = 3 \times 10^4$

## 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.chemprofessor.com/dimension\\_text.htm](http://www.chemprofessor.com/dimension_text.htm)

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

## 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) =  $1,000,000,000,000 = 10^{12}$

**Additionally for this summer, here are some ways to “GO APES.” None are required; all are fun.**

Instead of driving, ride a bike or take a walk

Follow a stream to its headwaters

Speaking of water, where does yours come from?

Watch an ant colony

Go into the marsh and smell decomposition at work

Grow your favorite vegetable

Go fishing

Pretend that you have no electricity for an evening

Camp out, even if it's in your back yard

Go for a hike to someplace new. Sussex County is full of wonderful hiking trails!!

Pick berries

Use sunscreen regularly

Watch some birds or bats

Visit a farm, or at least the farmer's market

**Contact Info:** If you have any questions about the assignment or the course you may email me at [jcarr@hopatcongschools.org](mailto:jcarr@hopatcongschools.org)