Welcome to AP Environmental Science (APES)! Enjoy your Summer Assignment!

There is much more information on the AP test than we can possibly cover in class, so being prepared for the first units of study is vital. The Summer Assignment is designed to assist you in developing a stronger foundation, and to help connect you with course ideas and concepts. This assignment will be part of your 'Homework/Classwork' grade, which accounts for 20% of your overall term grade. It is your responsibility to complete all of the items, but only some of the items will actually be submitted. All of assignments need to be completed so that you are ready for APES.

Assignments that are not submitted by first Friday of school will not be accepted for students who were listed as pre-registered in June. All late adds will have 2 weeks to complete the Summer Assignment in August. You will submit your UN Background Questions to our Google Classroom Class Code **znredk**l. If you have any questions, email me any time at mjones@powayusd.com . I will check my email every week or two.

-Mrs. Megan Jones

- Section 1: Review & Sign the Syllabus (Google Doc)
- Section 2: Personal Information Sheet (Google Form)
- Section 3: AP Central' Website Tour exercise
- Section 4: Review Textbook Companion Website Ch 1-3 Outlines
- Section 5: Math (Google Form) & Chemistry Review
- Section 6: UN Country Selection (Google Doc) & UN Background Questions (Google Doc)*

Section 3: AP Central Website Tour exercise

A. Browse to: https://apcentral.collegeboard.org/courses/ap-environmental-science/exam
    a. Locate *AP Environmental Science Course and Exam Description*
    This document is long (244 pages) I want you to review
        i. Scientific Practices (20-22)
        ii. Course Content (24-30)
    b. Read the Exam Format
    c. Read Calculator Policies and Approved Calculators obtain an appropriate version to use in class and on the test
    d. Under Exam Questions and Scoring Information read the available Questions from 2019 & 2020
        i. Free-Response Questions (FRQ)
        ii. Scoring Guidelines
        iii. Samples and Commentary
            1. By reading all of these you get a good idea of just how and why you earn max points on your FRQs.

Section 4: Textbook Companion Website Tour exercise

A. You will be reviewing the Chapter Outlines for the first 3 chapters of the Textbook.
B. Browse to: https://www.cengage.com/cgi-wadsworth/course_products_wp.pl?fid=M20b&product_isbn_issn=0534997295&discipline_number=22
    a. If that link doesn't work for you, Google: "ISBN-13: 9780534997298" and select "Living in the Environment" Book Companion site from Cengage Learning.
C. This is a very helpful resource for pre-reading, reviewing, and practice problems. Notice there is a dropdown menu for the chapters in the upper left. Select Chapter 1.
D. You will need to download (right click and save as) the Chapter Outline to review the content for Chapters 1-3. You will be doing this for most chapters during the term.

Section 5: MATH Review & Chemistry Review exercises

The APES Exam will require you to do mathematical calculations, with a calculator. Occasionally these calculations may be somewhat esoteric, and you may find it possible to do them in your head; nonetheless, it is mandatory to show all work for all calculations on the free-response section of the APES exam. This worksheet is designed help to prepare you for the type of calculations you may encounter on this year's APES exam. For each

problem, show every step of your work, and indicate the cancellation of all units…remember…use dimensional analysis to cancel units!!

APES Chemistry Review

Basics

→ Neutrons, protons, and electrons are the components of atoms, which combine to form molecules.

→ The basic unit of all chemical compounds, whether natural or man-made, is the molecule.

Abbreviations

C ≡ carbon	S ≡ sulfur	U ≡ uranium	Cl_2 ≡ chlorine
O_2 ≡ oxygen	N_2 ≡ nitrogen	H_2 ≡ hydrogen	P ≡ phosphorus
NO_2^{-1} ≡ nitrite	NO_3^{-1} ≡ nitrate	SO_4^{-2} ≡ sulfate	NH_3 ≡ ammonia

NO_x ≡ oxides of nitrogen or nitrogen oxides (NO, NO_2)

SO_x ≡ oxides of sulfur or sulfur oxides (SO_2, SO_3)

VOC ≡ volatile organic compounds (compounds containing carbon which readily evaporate, ex. methane, benzene)

PAN ≡ peroxyacyl nitrates

pH

→ pH is the negative log of the hydrogen ion concentration (sometimes called the potential of hydrogen ion).

→ Mathematically it is represented by the equation: $pH = -\log[H^+]$ or $pH = -\log[H_3O^+]$

→ $[H^+]$ is the molarity (# of moles per liter) of H^+ ions

→ $[H^+]$ and $[H_3O^+]$ are essentially the same. H_3O^+ is called the hydronium ion, it results when H^+ are in water.

→ Low pH corresponds to being more acidic. High pH corresponds to being more basic.

→ The opposite of acidic is basic.

→ The range of pH is from 0 to 14.

pH=1 ∴ $[H^+]=1 \times 10^{-1}$ moles/liter (very acidic)	pH=4 ∴ $[H^+]=1 \times 10^{-4}$ moles/liter (acidic)
pH=6 ∴ $[H^+]=1 \times 10^{-6}$ moles/liter (slightly acidic)	pH=7 ∴ $[H^+]=1 \times 10^{-7}$ moles/liter (neutral)
pH=8 ∴ $[H^+]=1 \times 10^{-8}$ moles/liter (slightly basic)	pH = 13 ∴ $[H^+]=1 \times 10^{-13}$ moles/liter (very basic)

Nuclear Fission

→ Nuclear fission (splitting atoms) is the source of energy in today's nuclear power plants. The reactions used are chain reactions, in which one neutron initiates the reaction of millions of Uranium nuclei.

$1\ U\text{-}235 + 1\ n \rightarrow 1\ Kr\text{-}92 + 1\ Ba\text{-}141 + 3\ n + energy$ (the 3 neutrons (n) initiate further reactions)

$3\ U\text{-}235 + 3\ n \rightarrow 3\ Kr\text{-}92 + 3\ Ba\text{-}141 + 9\ n + energy$ (the 9 neutrons initiate further reactions)

$9\ U\text{-}235 + 9\ n \rightarrow 9\ Kr\text{-}92 + 9\ Ba\text{-}141 + 27\ n + energy$ (the 27 neutrons initiate further reactions)

This continues until there are millions of neutrons being produced and millions of times more energy, as well.

→ A moderator and control rods are used to absorb neutrons to prevent the chain reaction from getting out of control which would result in a meltdown.

Section 6: UN Country Selection & Background Questions

a. The United Nations is usually thought to be involved only in peacekeeping and humanitarian assistance. However, the UN works diligently to solve troubles that face the human race. There are over two dozen associated organizations, the UN system, that work to solve these problems. The United Nations and the UN system work on human rights, the AIDS epidemic, poverty, global climate change, racism, health, and more, see Sustainable Development Goals
Many environmental organizations, treaties, and conventions were initiated in the United Nations. The health of people worldwide is monitored by the WHO or World Health Organization. Environmental protection and socioeconomic development were addressed at the Earth Summit. The fight to protect the stratospheric ozone layer was the focus of the Montreal Protocol. The attempt to solidify the world against global climate change was initiated via the Kyoto Protocol. The Endangered Species Act (ESA) of the United States was established in 1973 as was the United Nation's version which is called Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).
    - Select nation for the year from the UN Country List **-Summer Assignment**
    - Complete UN Background research on the UN Country you selected **-Summer Assignment**