Welcome to AP Environmental Science!

The purpose of this summer assignment is to review skills that we will be using throughout the course and to preview content we will be learning this year. The assignment should be completed before the first day of the school year. There are four parts, I estimate it will take 2-3 hours to complete depending on the individual. There will be a quiz on the material the first day of class.

Please feel free to email me with any questions you may have, I will respond as soon as I can but please know that I am not checking my email every day.

Looking forward to class next year! - Mrs. Knoke
taylor.knoke@richlandone.org

Part 1: Experimental Design (10 pts)
Answer the following questions using the following statement, your knowledge of experimental design and the graph below. Need a refresh on experimental design? Watch this video or this one.

A clam farmer has been keeping records concerning the water temperature and the number of clams developing from fertilized eggs. The data is recorded below.

Water Temperature in ^{o}C	Number of developing clams
15	75
20	90
25	120
30	140
35	75
40	40
45	15
50	0

a.) What is the dependent variable?

b.) What is the independent variable?

c.) What is the optimum (best) temperature for clam development?

d.) What is the average temperature in this experiment?

e.) What are some constants the scientists should consider?

Part 2: Watch the Write Like A Scholar Series

An important part of AP Environmental Science is being able to communicate your understanding of the content through writing. The AP exam has three free-response questions (FRQs) that count for 40% of your overall score. The following videos provide an introduction to get you on the path to writing successful FRQs.

Video 1: Write Like A Scholar Series: Annotating AP Environmental Science FRQs

Video 2: Write Like A Scholar Series: Writing AP Environmental Science FRQs

Video 3: Write Like A Scholar Series: Scoring AP Environmental Science FRQs

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Part 3: Math Skills (what this is a science class, why so much math?) (30 pts)

There are seven Science Practices that we will incorporate throughout the year, these are skills and a way to apply your content knowledge. You can check them all out here.

Practice 6 is Mathematical Routines: Apply quantitative methods to address environmental concepts.

- 6.A Determine an approach or method aligned with the problem to be solved.
- 6.B Apply appropriate mathematical relationships to solve a problem, with work shown (e.g., dimensional analysis).
- 6.C Calculate an accurate numeric answer with appropriate units.

Reminders

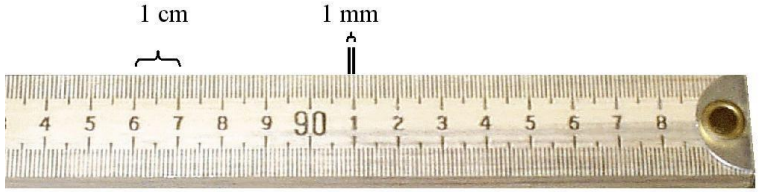
1. Write out all your work, even if it's something really simple. This is required on the AP ENVS exam so it will be required on all your assignments, labs, quizzes, and tests as well.
2. **Include units in each step.** Your answers always need units and it's easier to keep track of them if you write them in every step. No naked numbers!
3. Check your work. Go back through each step to make sure you didn't make any mistakes in your calculations. Also check to see if your answer makes sense. For example, a person probably will not eat 13 million pounds of meat in a year. If you get an answer that seems unlikely, it probably is. Go back and check your work.
4. You may use a calculator but will not be provided with a formula sheet.

Metric Units: YOU MUST MEMORIZE THE METRIC CONVERSION CHART

We usually see these units in class

Prefix	Symbol	Multiply Base Unit by	Example
tera	T	1,000,000,000,000	teragram = Tg = 10^{12} g
giga	G	1,000,000,000	gigaliter = GL = 10^{9} L
mega	M	1,000,000	megagram = Mg = 10^{6} g
kilo	k	1,000	kilogram = kg = 10^{3} g
hecto	h	100	hectogram = hm = 10^{2} m
deka	da	10	decagram = dag = 10 g
deci	d	1/10	deciliter = dL = 10^{-1} L
centi	c	1/100	centimeter = cm = 10^{-2} g
milli	m	1/1000	millimeter = mm = 10^{-3} m
micro	μ	1/1,000,000	microgram = μg = 10^{-6} g

Base Unit (g, m, W, L, etc.)



1. How many mm are in a centimeter?

2. How many centimeters are in a meter?
   (The prefix *centi-* means 100. How many cents (pennies) are in a dollar?) ___

3. The prefix milli- means a thousand. How many millimeters are in a meter?

Percent Change = $\frac{(\text{New} - \text{Original})}{\text{Original}} \times 100$

4. If you scored a 1090 on your first PSAT and 1210 on your second PSAT. What was your percent improvement?

5. If one termite can destroy 1.2mg of wood per day, how many kilograms of wood can 10 termites destroy in 1 week?

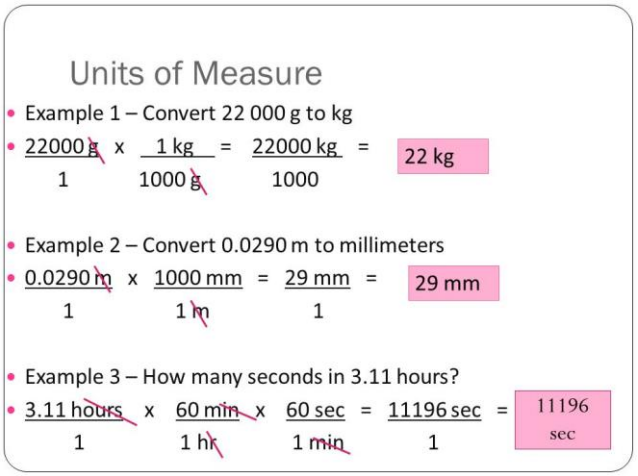
6. What is 70% of 640?

Must use dimensional analysis for conversions.

7. 400 kilograms = _____milligrams

8. 600 mm = _____ cm

9. 25 MW = _____ W



Write the following in scientific notation

10. 394 billion

11. 0.000070202

12. If I can run 6km in 24 minutes, how many cm can I run in 5 hours?

13. Fourteen percent of a 55,000 acre forest is destroyed by the invasive pine weevil. How many acres of the forest were not destroyed?

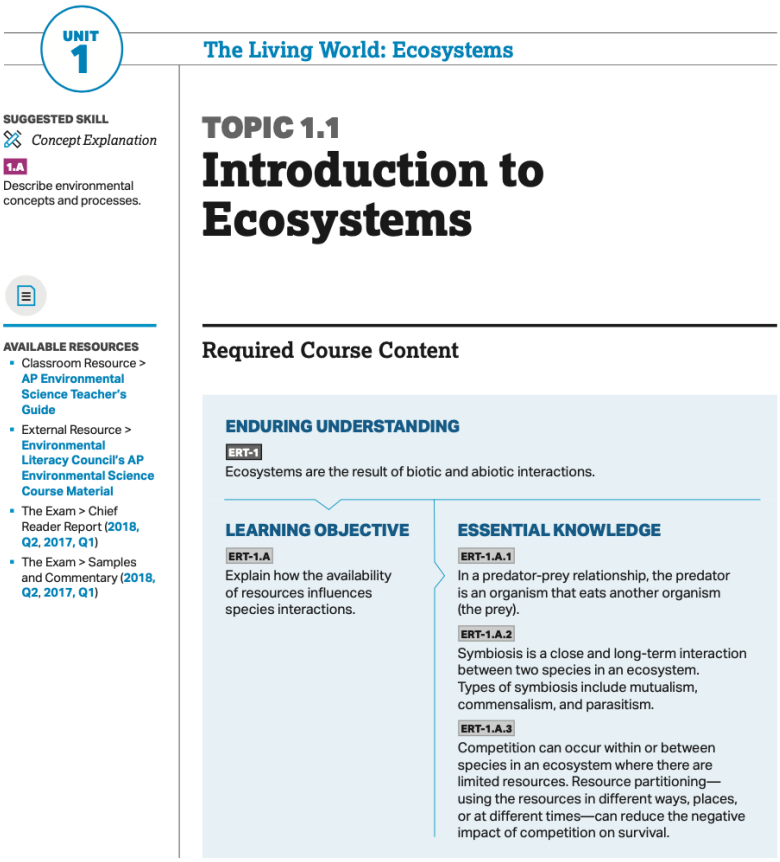
14. A pesticide was sprayed on a portion of a forest. The pesticide killed 25,000 termites. This is 71% of the local termite population. What is the total termite population?

Now that you've attempted all of these problems, review your answers here. (Try the problems before looking at the answers!!) You should be familiar with these math skills from previous math classes. If you struggled with the problems and are still confused after looking at the key that's okay! Everyone enters the course with different strengths and skill levels, if you're willing to put in the effort I am happy to work with you to help you succeed in the class.

Part 4: Are you ready to go APES? Photo Search Challenge (60 pts)

Part of the interesting thing about this course is seeing how it fits into our everyday lives. There are nine units we will cover throughout the year, each unit is broken down into *Topics*. Every topic has *Learning Objectives*, which are further detailed by the *Essential Knowledge.*

Here is an example for a topic from Unit 1:


UNIT 1

The Living World: Ecosystems

SUGGESTED SKILL

Concept Explanation

1.A

Describe environmental concepts and processes.

AVAILABLE RESOURCES

- Classroom Resource > AP Environmental Science Teacher's Guide
- External Resource > Environmental Literacy Council's AP Environmental Science Course Material
- The Exam > Chief Reader Report (2018, Q2, 2017, Q1)
- The Exam > Samples and Commentary (2018, Q2, 2017, Q1)

TOPIC 1.1

Introduction to Ecosystems

Required Course Content

ENDURING UNDERSTANDING

ERT-1

Ecosystems are the result of biotic and abiotic interactions.

LEARNING OBJECTIVE

ERT-1.A

Explain how the availability of resources influences species interactions.

ESSENTIAL KNOWLEDGE

ERT-1.A.1

In a predator-prey relationship, the predator is an organism that eats another organism (the prey).

ERT-1.A.2

Symbiosis is a close and long-term interaction between two species in an ecosystem. Types of symbiosis include mutualism, commensalism, and parasitism.

ERT-1.A.3

Competition can occur within or between species in an ecosystem where there are limited resources. Resource partitioning—using the resources in different ways, places, or at different times—can reduce the negative impact of competition on survival.

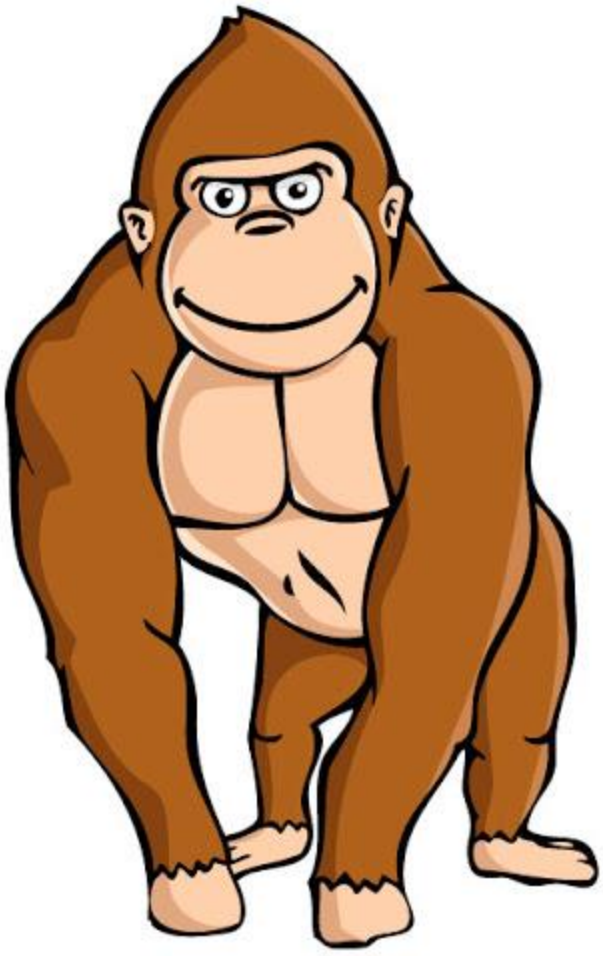
Your challenge is to take two pictures that represents each unit. For each picture you will need to:

1. **List the date the picture was taken and the location**
2. **Identify the topic it represents**
    a. (example: Topic 1.1, Introduction to Ecosystems)
3. **Identify the learning objective for the topic**
    a. (example: ERT-1.A – Explain how the availability of resources influences species interactions)
4. **Explain in detail how/why it represents that topic**

Your work should be compiled into a PowerPoint. The first slide (Title Slide) must include a title, your name, “AP Environmental Science”, and “Summer 2021”. Each slide after that should be specific to one picture. The entire presentation will be 19 slides long. See the last page for an example.

The pictures must be your own. You will need to show your face in the photo (selfie style or have someone take the picture) AND you must have a cut out of the cute little APE included in your picture (see next page).

All of the units, topics, and learning objectives can be found in the Course Exam Description (CED). Here is a copy of the CED in AP Central College Board. Here is a copy of the CED in google docs. Before you begin taking pictures, browse through the CED to see what type of content you should be looking for.



Example of a PowerPoint Slide:

Unit 8

June 14, 2021

Dreher High School, Media Center

Topic 8.10 – Waste Reduction Methods

STB-3.M – Describe changes to current practices that could reduce the amount of generated waste and their associated benefits and drawbacks.

The picture illustrates a recycling bin filled to the brim with paper and other waste materials. Recycling consist of the collection of waste material that can then undergo processing in order to be converted into products. This reduces the amount of waste material in landfills and helps to reduce the global demand on minerals.

Summer Assignment 2021 Rubric:

	Points Earned:	Points Possible:
Part 1: Experimental Design (10 pts)		
2 points for each correct answer		10
Part 2: Watch the Write Like a Scholar Series		
Part 3: Math Skills (30 pts)		
#1-3: 1 point for each correct answer		3
#4: 1 point for correct answer, 1 point for correct set up		2
#5: 1 point for correct answer, 1 point for correct set up, 1 point for units throughout		3
#6: 1 point for correct answer, 1 point for correct set up		2
#7: 1 point for correct answer, 1 point for correct set up (dimensional analysis), 1 point for units throughout		3
#8: 1 point for correct answer, 1 point for correct set up (dimensional analysis), 1 point for units throughout		3
#9: 1 point for correct answer, 1 point for correct set up (dimensional analysis), 1 point for units throughout		3
#10-11: 1 point for correct answer		2
#12: 1 point for correct answer, 1 point for correct set up (dimensional analysis), 1 point for units throughout		3
#13: 1 point for correct answer, 1 point for correct set up (dimensional analysis), 1 point for units throughout		3
#14: 1 point for correct answer, 1 point for correct set up (dimensional analysis), 1 point for units throughout		3
Part 4: Go APES (60 pts)		
1 point for each picture (must include you and the APE)		18
2 points for each picture/slide that includes all criteria		36
Title slide (all criteria present)		2
Effort and Creativity		4
Total:		100