

Advanced Placement Environmental Science 2017-2018

Mr. Muley

Email: smuley@pasco.k12.fl.us

Grades: My student

Summer Assignment:

1. Legislation Review
2. Summer Math Homework
3. Current Events

Course Description:

Advanced Placement (AP) Environmental Science is a course that is designed to be the equivalent of a first year, general science college course.

Since AP Environmental Science students at Wiregrass Ranch High School (WRHS) are enrolled in a college level class, they need to exhibit unusually high levels of commitment, motivation and academic maturity. To illustrate these points the College Board (CB) makes the following statement in the course description in relation to student commitment:

Students in an AP Environmental Science course should spend at least five hours a week in individual study outside the classroom.

The AP examinations are sponsored by the CB and administered and operated by the Educational Testing Service. The CB provides a topic outline for the subject, which is intended to be a guide to the level and breadth of the treatment expected, but not a specific syllabus. The specific syllabus and objectives for the AP course at WRHS have been determined based on past success. 2017 AP Environmental Science Exam administration results are released in July and above national average results are anticipated. This is due largely to an unwavering commitment of the students in a well-designed course.

Summer Break/Summer Assignment Info:

Students are expected to complete **ALL** components of the summer assignment below.

It is recommended that students follow the attached suggested timeline for the summer assignment (**especially on the construction and memorization of your flashcards!**). Students are encouraged to contact Mr. Muley through email over the summer if needed at smuley@pasco.k12.fl.us

Students will take an exam on the second day of school based on the summer assignment. Students who do not perform well on this exam are unlikely to be prepared to begin the course at a high level of performance and may struggle with the material going forward. A copy of last year's test will be provided below so students can "practice" and get a feel for the difficulty of the exam. Students should take the practice test seriously and grade it to determine if more review is needed. An answer key will also be provided for the practice test on the first day of school.

Required/Suggested Materials:

- 3 ring binder (1 ½ inch minimum)
- Page dividers
- A Review book (do not buy any because I will be deciding between the Princeton and "5 Steps to a 5" for the 2017-2018 school year)
- Graph paper

Late Work

As this is an Advanced Placement class, late work is not an option. Due dates are not flexible and it is not my responsibility or problem if you fail to plan or attempt to plan at the last minute. If for some reason you honestly feel you have extenuating circumstances that justify a deviation from the late work policy you must see me **beforehand**. Talking to me about it when it is already due is totally unacceptable.

Make-Up Work

If an absence is excused you may turn in a make-up assignment. You have one day per day absent to make up any homework, class work or tests. It is totally up to you to approach me to find out what make-up work you have. Make-up tests will be at my discretion. If you know ahead of time that you will be out please see me and I can give you work before you are absent.

Grading Scale

Your grade will be determined by a combination of factors, including homework assignments, tests and quizzes, and labs. The breakdown is as follows:

Course Work	Percentage of Final Grade
Tests and Quizzes	75%
Labs/Homework	25%

**AP ENVIRONMENTAL SCIENCE SUGGESTED TIMELINE FOR SUMMER ASSIGNMENT
2017-2018**

Date(s)	SUGGESTED WORK	Assignments Due
June 8 th to August 1 st	Complete Notecards (assignment #1) of the summer assignment and begin to study them. Complete Current Events (assignment #3) of the summer assignment Go to the beach and relax with friends/family. – Take a break from school!	
August 1 st – 10 th	Complete Summer Math Review (assignment #2) of the summer assignment	
August 11 th	Complete last years “ 2015-2016 practice test”.	
August 13 th -14 th	Study for the summer assignment test. Monday August 14 th is the first day of school. Grade last years “practice test” and determine what grade you would have earned. There is very little partial credit awarded for incorrect answers. Be honest with yourself!!! If you have done poorly on the practice test expecting a different outcome on the real test is not reasonable.	The summer assignment is due on the 1st day of school August 14th
August 15 th	Summer assignment test in class.	
August 16 th	Pass back summer assignment test	

There will be some students who will procrastinate and try to do **ALL** of this summer work and studying just before (like the night before) the start of school. Those students may even cram well enough to do well on the initial test. However, they will quickly forget the how to do the math, and struggle every time that these concepts are used in lecture, homework, quizzes, tests and labs.

All research on human memory shows us that frequent, short periods of study, spread over long periods of time will produce much greater retention than long periods of study of a short period of time. I could wait and throw these at you on the first day of school, but I don’t think that would be fair to you.

Legislation Review

Directions: Find the following for each of the laws and/or treaties listed below and put on an index card. Feel free to hand write or type. You will use these laws throughout the school year, so coming into the course with these already done will be VERY helpful.

Include this information for each item:

Side one = title of legislation

Side two =

1. Year it was drafted and what type of legislation - International or National
2. Description of Function; Environmental Issues Affected
3. Agency/Group Responsible for Regulation and Enforcement (i.e. United Nations, Department of Interior, EPA, etc.)

Clean Air Act	Food, Drug, and Cosmetics Acts	Occupational Safety and Health Act
Clean Water Acts	Mining and Reclamation Act	Ocean Dumping Ban Act
Comprehensive Environmental Response, Compensation Liability Act	Kyoto Protocol	Oil Pollution Act
Consumer Product Safety Act	Law of the Sea Convention	Oil Spill Prevention and Liability Act
Convention on International Trade in Endangered Species	Marine Mammal Protection Act	Pollution Prevention Act
Emergency Planning & Community Right-To-Know Act	Marine Plastic Pollution Research and Control Act	Resource Conservation and Recovery Act
Endangered Species Act	Migratory Bird Hunting Stamp Act	Safe Drinking Water Act
Energy Policy Act	Montreal Protocol	Soil and Water Conservation Act
Federal Food, Drug, and Cosmetic Act	National Energy Act	Solid Waste Disposal Act
Federal Insecticide, Fungicide and Rodenticide Act	National Environmental Policy Act	Surface Mining Control and Reclamation Act
Federal Water Pollution Control Act	National Park Act	Toxic Substances Control Act
Fish and Wildlife Conservation Act	National Wildlife Refuge System Act	Wild and Scenic Rivers Act
Food Quality Protection Act	Nuclear Waste Policy Act	Wilderness Act

Summer Math Homework

Reminders

1. Write out all your work, even if it's something really simple. This is required on the APES 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.
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.

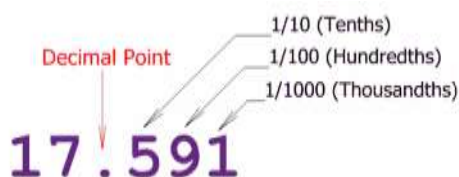
Directions

Read each section below for review. Look over the examples and use them for help on the practice problems. When you get to the practice problems, write out all your work and be sure to include units on each step. Check your work.

Decimals

Part I: The basics

Decimals are used to show fractional numbers. The first number behind the decimal is the tenths place, the next is the hundredths place, the next is the thousandths place. Anything beyond that should be changed into scientific notation (which is addressed in another section.)



Part II: Adding or Subtracting Decimals

To add or subtract decimals, make sure you line up the decimals and then fill in any extra spots with zeros. Add or subtract just like usual. Be sure to put a decimal in the answer that is lined up with the ones in the problem.

$$\begin{array}{r} 123.0000 \\ 0.0079 \\ +43.5000 \\ \hline 166.5079 \end{array} \qquad \begin{array}{r} 27.583 \\ - 0.200 \\ \hline 27.383 \end{array}$$

Part III: Multiplying Decimals

Line up the numbers just as you would if there were no decimals. DO NOT line up the decimals. Write the decimals in the numbers but then ignore them while you are solving the multiplication problem just as you would if there were no decimals at all. After you have your answer, count up all the numbers behind the decimal point(s). Count the same number of places over in your answer and write in the decimal.

$$3.77 \times 2.8 = ?$$
$$\begin{array}{r} 3.77 \text{ (2 decimal places)} \\ \times 2.8 \text{ (1 decimal place)} \\ \hline 3016 \\ +754 \\ \hline 10.556 \text{ (3 decimal places)} \end{array}$$

Part IV: Dividing Decimals

Scenario One: If the divisor (the number after the / or before the $\overline{)$) not have a decimal, set up the problems just like a regular division problem. Solve the problem just like a regular division problem. When you have your answer, put a decimal in the same place as the decimal in the dividend (the number before the / or under the $\overline{)$).

$$\begin{array}{r} 424.9 \\ 38 \overline{) 16146.2} \\ \underline{152} \\ 94 \\ \underline{76} \\ 186 \\ \underline{152} \\ 342 \\ \underline{342} \\ 0 \end{array}$$

Scenario Two: If the divisor does have a decimal, make it a whole number before you start. Move the decimal to the end of the number, then move the decimal in the dividend the same number of places.

$$\begin{array}{r} 3.8 \overline{) 1614.62} \end{array}$$

Then solve the problem just like a regular division problem. Put the decimal above the decimal in the dividend. (See Scenario One problem).

Practice: Remember to show all your work, include units if given, and NO CALCULATORS! All work and answers go on your answer sheet.

1. $1.678 + 2.456 =$
2. $199.007 - 124.553 =$
3. $90.3 - 32.679 =$
4. $28.4 \times 9.78 =$
5. $64.5 / 5 =$

Averages

To find an average, add all the quantities given and divide the total by the number of quantities.

Example: Find the average of 10, 20, 35, 45, and 105.

Step 1: Add all the quantities. $10 + 20 + 35 + 45 + 105 = 215$

Step 2: Divide the total by the number of given quantities. $215 / 5 = 43$

Practice: Remember to show all your work, include units if given, and NO CALCULATORS! All work and answers go on your answer sheet.

6. Find the average of the following numbers: 124, 456, 788, and 343
7. Find the average of the following numbers: 4.56, .0078, 23.45, and .9872

Percentages

Introduction:

Percents show fractions or decimals with a denominator of 100. Always move the decimal TWO places to the right to go from a decimal to a percentage or TWO places to the left to go from a percent to a decimal.

Examples: $.85 = 85\%$. $.008 = .8\%$

Part I: Finding the Percent of a Given Number

To find the percent of a given number, change the percent to a decimal and MULTIPLY.

Example: 30% of 400

Step 1: $30\% = .30$

Step 2: 400

$$\begin{array}{r} 400 \\ \times .30 \\ \hline 12000 \end{array}$$

Step 3: Count the digits behind the decimal in the problem and add decimal to the answer.

$$12000 \rightarrow 120.00 \rightarrow 120$$

Part II: Finding the Percentage of a Number

To find what percentage one number is of another, divide the first number by the second, then convert the decimal answer to a percentage.

Example: What percentage is 12 of 25?

Step 1: $12/25 = .48$

Step 2: $.48 = 48\%$ (12 is 48% of 25)

Part III: Finding Percentage Increase or Decrease

To find a percentage increase or decrease, first find the percent change, then add or subtract the change to the original number.

Example: Kindles have dropped in price 18% from \$139. What is the new price of a Kindle?

Step 1: $\$139 \times .18 = \25

Step 2: $\$139 - \$25 = \$114$

Part IV: Finding a Total Value

To find a total value, given a percentage of the value, DIVIDE the given number by the given percentage.

Example: If taxes on a new car are 8% and the taxes add up to \$1600, how much is the new car?

Step 1: $8\% = .08$

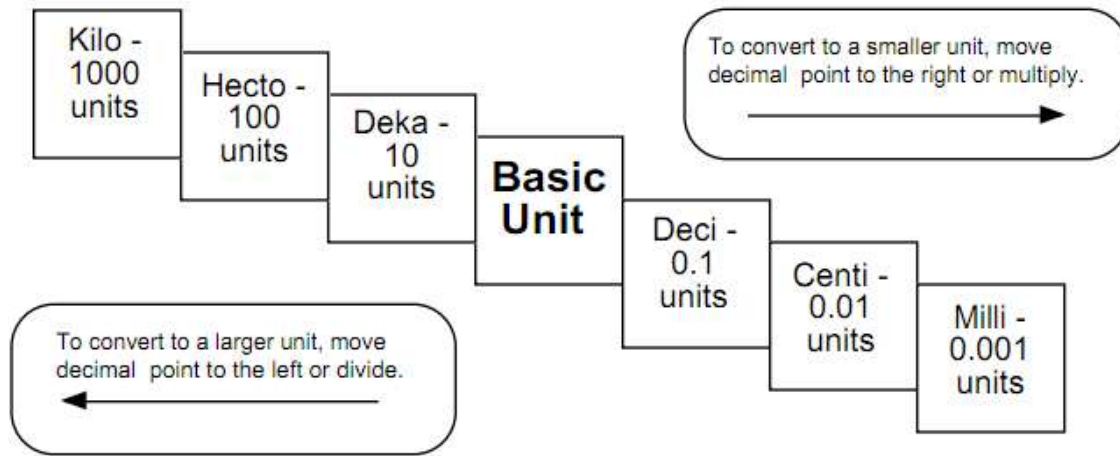
Step 2: $\$1600 / .08 = \$160,000 / 8 = \$20,000$ (Remember when the divisor has a decimal, move it to the end to make it a whole number and move the decimal in the dividend the same number of places. .08 becomes 8, 1600 becomes 160000.)

Practice: Remember to show all your work, include units if given, and NO CALCULATORS! All work and answers go on your answer sheet.

8. Thirteen percent of a 12,000 acre forest is being logged. How many acres will be logged?
9. A water heater tank holds 280 gallons. Two percent of the water is lost as steam. How many gallons remain to be used?
10. What percentage is 25 of 162.5?

Metric Units

Kilo-, centi-, and milli- are the most frequently used prefixes of the metric system. You need to be able to go from one to another without a calculator. You can remember the order of the prefixes by using the following sentence: *King Henry Died By Drinking Chocolate Milk*. Since the multiples and divisions of the base units are all factors of ten, you just need to move the decimal to convert from one to another.



Example: 55 centimeters = ? kilometers

Step 1: Figure out how many places to move the decimal. King Henry Died By Drinking... – that's six places. (Count the one you are going to, but not the one you are on.)

Step 2: Move the decimal five places to the left since you are going from smaller to larger.

$$55 \text{ centimeters} = .00055 \text{ kilometers}$$

Example: 19.5 kilograms = ? milligrams

Step 1: Figure out how many places to move the decimal. ... Henry Died By Drinking Chocolate Milk – that's six places. (Remember to count the one you are going to, but not the one you are on.)

Step 2: Move the decimal six places to the right since you are going from larger to smaller. In this case you need to add zeros.

$$19.5 \text{ kilograms} = 19,500,000 \text{ milligrams}$$

Practice: Remember to show all your work, include units if given, and **NO CALCULATORS!** All work and answers go on your answer sheet.

11. 14000 millimeters = ? meters
12. 670 hectometers = ? centimeters
13. 6544 liters = ? milliliters

Scientific Notation

Introduction:

Scientific notation is a shorthand way to express large or tiny numbers. Since you will need to do calculations throughout the year **WITHOUT A CALCULATOR**, we will consider anything over 1000 to be a large number. Writing these numbers in scientific notation will help you do your calculations much quicker and easier and will help prevent mistakes in conversions from one unit to another. Like the metric system, scientific notation is based on factors of 10. A large number written in scientific notation looks like this:

$$1.23 \times 10^{11}$$

The number before the x (1.23) is called the coefficient. The coefficient must be greater than 1 and less than 10. The number after the x is the base number and is always 10. The number in superscript (11) is the exponent.

Part I: Writing Numbers in Scientific Notation

To write a large number in scientific notation, put a decimal after the first digit. Count the number of digits after the decimal you just wrote in. This will be the exponent. Drop any zeros so that the coefficient contains as few digits as possible.

Example: 123,000,000,000

Step 1: Place a decimal after the first digit. 1.23000000000

Step 2: Count the digits after the decimal...there are 11.

Step 3: Drop the zeros and write in the exponent. 1.23×10^{11}

Writing tiny numbers in scientific notation is similar. The only difference is the decimal is moved to the left and the exponent is a negative. A tiny number written in scientific notation looks like this:

$$4.26 \times 10^{-8}$$

To write a tiny number in scientific notation, move the decimal after the first digit that is not a zero. Count the number of digits before the decimal you just wrote in. This will be the exponent as a negative. Drop any zeros before or after the decimal.

Example: .0000000426

Step 1: 00000004.26

Step 2: Count the digits before the decimal...there are 8.

Step 3: Drop the zeros and write in the exponent as a negative. 4.26×10^{-8}

Part II: Adding and Subtracting Numbers in Scientific Notation

To add or subtract two numbers with exponents, the exponents must be the same. You can do this by moving the decimal one way or another to get the exponents the same. Once the exponents are the same, add (if it's an addition problem) or subtract (if it's a subtraction problem) the coefficients just as you would any regular addition problem (review the previous section about decimals if you need to). The exponent will stay the same. Make sure your answer has only one digit before the decimal – you may need to change the exponent of the answer.

Example: $1.35 \times 10^6 + 3.72 \times 10^5 = ?$

Step 1: Make sure both exponents are the same. It's usually easier to go with the larger exponent so you don't have to change the exponent in your answer, so let's make both exponents 6 for this problem.

$$3.72 \times 10^5 \rightarrow .372 \times 10^6$$

Step 2: Add the coefficients just as you would regular decimals. Remember to line up the decimals.

$$\begin{array}{r} 1.35 \\ + .372 \\ \hline 1.722 \end{array}$$

Step 3: Write your answer including the exponent, which is the same as what you started with.

$$1.722 \times 10^6$$

Part III: Multiplying and Dividing Numbers in Scientific Notation

To multiply exponents, multiply the coefficients just as you would regular decimals. Then add the exponents to each other. The exponents DO NOT have to be the same.

Example: $1.35 \times 10^6 \times 3.72 \times 10^5 = ?$

Step 1: Multiply the coefficients.

$$\begin{array}{r} 1.35 \\ \times 3.72 \\ \hline 270 \\ 9450 \\ \hline 40500 \\ 50220 \rightarrow 5.022 \end{array}$$

Step 2: Add the exponents.

$$5 + 6 = 11$$

Step 3: Write your final answer.

$$5.022 \times 10^{11}$$

To divide exponents, divide the coefficients just as you would regular decimals, then subtract the exponents. In some cases, you may end up with a negative exponent.

Example: $5.635 \times 10^3 / 2.45 \times 10^6 = ?$

Step 1: Divide the coefficients.

$$5.635 / 2.45 = 2.3$$

Step 2: Subtract the exponents.

$$3 - 6 = -3$$

Step 3: Write your final answer.

$$2.3 \times 10^{-3}$$

Practice: Remember to show all your work, include units if given, and NO CALCULATORS! All work and answers go on your answer sheet.

Write the following numbers in scientific notation:

14. 13 million
15. 435 billion

Complete the following calculations:

16. $3 \times 10^3 + 4 \times 10^3$
17. $2.9 \times 10^{11} - 3.7 \times 10^{13}$
18. $3.78 \times 10^3 \times 2.9 \times 10^2$
19. three million times eighteen thousand
20. one thousandth of seven thousand

Dimensional Analysis

Introduction

Dimensional analysis is a way to convert a quantity given in one unit to an equal quantity of another unit by lining up all the known values and multiplying. It is sometimes called factor-labeling. The best way to start a factor-labeling problem is by using what you already know. In some cases you may use more steps than a classmate to find the same answer, but it doesn't matter. Use what you know, even if the problem goes all the way across the page!

In a dimensional analysis problem, start with your given value and unit and then work toward your desired unit by writing equal values side by side. Remember you want to cancel each of the intermediate units. To cancel a unit on the top part of the problem, you have to get the unit on the bottom. Likewise, to cancel a unit that appears on the bottom part of the problem, you have to write it in on the top.

Once you have the problem written out, multiply across the top and bottom and then divide the top by the bottom.

Example: 3 years = ? seconds

Step 1: Start with the value and unit you are given. There may or may not be a number on the bottom.

$$\left[\frac{3 \text{ years}}{1} \right]$$

Step 2: Start writing in all the values you know, making sure you can cancel top and bottom. Since you have years on top right now, you need to put years on the bottom in the next segment. Keep going, canceling units as you go, until you end up with the unit you want (in this case seconds) on the top.

$$\left[\frac{3 \text{ years}}{1} \right] \left[\frac{365 \text{ days}}{1 \text{ year}} \right] \left[\frac{24 \text{ hours}}{1 \text{ day}} \right] \left[\frac{60 \text{ minutes}}{1 \text{ hour}} \right] \left[\frac{60 \text{ seconds}}{1 \text{ minute}} \right]$$

Step 3: Multiply all the values across the top. Write in scientific notation if it's a large number. Write units on your answer.

$$3 \times 365 \times 24 \times 60 \times 60 = 9.46 \times 10^7 \text{ seconds}$$

Step 4: Multiply all the values across the bottom. Write in scientific notation if it's a large number. Write units on your answer if there are any. In this case everything was cancelled so there are no units.

$$1 \times 1 \times 1 \times 1 = 1$$

Step 5: Divide the top number by the bottom number. Remember to include units.

$$9.46 \times 10^7 \text{ seconds} / 1 = 9.46 \times 10^7 \text{ seconds}$$

Step 6: Review your answer to see if it makes sense. 9.46×10^7 is a really big number. Does it make sense for there to be a lot of seconds in three years? YES! If you had gotten a tiny number, then you would need to go back and check for mistakes.

In lots of APES problems, you will need to convert both the top and bottom unit. Don't panic! Just convert the top one first and then the bottom.

Example: 50 miles per hour = ? feet per second

Step 1: Start with the value and units you are given. In this case there is a unit on top and on bottom.

$$\left[\frac{50 \text{ miles}}{1 \text{ hour}} \right]$$

Step 2: Convert miles to feet first.

$$\left[\frac{50 \cancel{\text{ miles}}}{1 \text{ hour}} \right] \quad \left[\frac{5280 \text{ feet}}{1 \cancel{\text{ mile}}} \right]$$

Step 3: Continue the problem by converting hours to seconds.

$$\left[\frac{50 \cancel{\text{ miles}}}{1 \cancel{\text{ hour}}} \right] \quad \left[\frac{5280 \text{ feet}}{1 \cancel{\text{ mile}}} \right] \quad \left[\frac{1 \cancel{\text{ hour}}}{60 \cancel{\text{ minutes}}} \right] \quad \left[\frac{1 \cancel{\text{ minute}}}{60 \text{ seconds}} \right]$$

Step 4: Multiply across the top and bottom. Divide the top by the bottom. Be sure to include units on each step. Use scientific notation for large numbers.

$$\begin{aligned} 50 \times 5280 \text{ feet} \times 1 \times 1 &= 264000 \text{ feet} \\ 1 \times 1 \times 60 \times 60 \text{ seconds} &= 3600 \text{ seconds} \\ 264000 \text{ feet} / 3600 \text{ seconds} &= 73.33 \text{ feet/second} \end{aligned}$$

Practice: Remember to show all your work, include units if given, and NO CALCULATORS! All work and answers go on your answer sheet. Use scientific notation when appropriate.

Conversions:

- 1 square mile = 640 acres
- 1 hectare (Ha) = 2.47 acres
- 1 kw-hr = 3,413 BTUs
- 1 barrel of oil = 159 liters
- 1 metric ton = 1000 kg

21. 121 miles = ? inches
22. 8.9×10^4 tons = ? ounces
23. A 325 million square mile forest is how many hectares?
24. If one barrel of crude oil provides seven million BTUs of energy, how many BTUs of energy will one liter of crude oil provide?
25. Sixty eight thousand kilograms of solid waste is equivalent to how many metric tons?

Current Events

In environmental science, it is important to know about current issues in the new. One of my goals is to familiarize you with environmental issues that are important to our community, country and world. We will be reading and discussing a variety of current events throughout the school year as well. Over the course of the summer, **find 3 recent articles related to environmental science.**

All articles should be current (during the past 2 years) and taken from a reliable source. The sources may be scientific publications, popular magazines, newspapers etc. Try the NY times (especially Tuesday), Washington Post, National Geographic, Discover Magazine, Natural History Magazine, Treehugger.com, etc. I do not care if you use a paper or online copy of your article as long as it is properly cited.

Each article should relate to a different topic chosen from the following list. As the year progresses you will be able to cover all of the topics!

Environmental Law	Ecosystems	Climate	Evolution	Preserving our biodiversity
Water pollution	Population growth	Cities and waste	Geology	Renewable Energy
Nonrenewable energy	Food/agriculture	Air pollution	Human Health	Forest or Rangeland

Article Analysis Directions:

Include all of the following components and clearly identify each component with headings. Each analysis should be either typed or very neatly written in blue or black ink. Each article should be on its own paper.

- Title of the Article
- Summary: **brief** summary that tells me what the article is about.
- Analysis:
 - a. Points of view – does the article have more than one side/POV? If so what are they?
 - b. Bias – Is this article biased in any way? In your opinion, does the author give a positive, negative, or neutral view of the environmental science topic?
 - c. Controversy: Is there any controversy surrounding this article? If so briefly explain it.
 - d. Your perspective: State your perspective on this news article based on your personal knowledge of the topic and your reading of the article.
 - e. Effect on you: How does this topic relate to you or affect you?

Attach the article – either a physical copy of the article or a working web address must be included.

APES Summer Homework Test 2016 - 2017

a.	Establishes the basic structure for regulating discharges of pollutants into waters of the United States	j.	Requires EPA to regulate air emissions of pollutants from stationary and mobile sources
b.	Authorizes financial and technical assistance for the development, revision and implementation of conservation plans and programs for nongame fish and wildlife	k.	Prohibits the "take" of marine mammals in United States waters or by United States in high seas
c.	Provides a federal "superfund" to clean up uncontrolled or abandoned hazardous waste	l.	Addresses energy production in the United States
d.	Authorizes EPA to establish minimum standards to protect tap water and requires all owners or operators of public water systems to comply with these primary (health-related) standards	m.	Assures that all branches of the government give proper consideration to the environment prior to undertaking any major federal actions
e.	Created soil and water conservation program within the department of natural resources to promote soil and water conservation by preventing erosion	n.	Requires waterfowl hunters of 16 years and older to possess a valid federal hunting stamp
f.	Applies to ship-generated garbage and it aims to reduce the amount of garbage - both plastics and other persistent wastes - that ships dump into the oceans	o.	Defines the rights and responsibilities of nations with respect to their use of world's oceans
g.	Authorizes the EPA to control hazardous waste from the "cradle-to-grave"	p.	Established the National Park Service
h.	Ensures that employers provide employees with an environment free from recognized hazards, such as exposure to toxic chemicals, excessive noise levels, and unsanitary conditions	q.	It is hereby declared to be the policy of the United States that certain selected rivers, with their immediate environments, possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values, shall be preserved in free-flowing condition
i.	Authorizes Department of the Interior to regulate active coal mines and reclaim abandoned mine lands	r.	Created the National Wilderness Preservation System and defined the characteristics of wilderness lands

- ___ 1. Clean Air Act
- ___ 2. National Environmental Policy Act
- ___ 3. Marine Mammal Protection Act
- ___ 4. Soil and Water Conservation Act
- ___ 5. Energy Policy Act
- ___ 6. Safe Drinking Water Act
- ___ 7. Fish and Wildlife Conservation Act
- ___ 8. Clean Water Act
- ___ 9. Comprehensive Environmental Response, Compensation and Liability Act
- ___ 10. Law of the Sea Convention
- ___ 11. Marine Plastic Pollution Control Act
- ___ 12. Occupational Safety and Health Act (OSHA)
- ___ 13. National Park Service Act
- ___ 14. Migratory Bird Hunting Stamp Act
- ___ 15. Mining and Reclamation Act (SMCRA)
- ___ 16. Resource Conservation and Recovery Act
- ___ 17. Wild and Scenic Rivers Act
- ___ 18. Wilderness Act

Short Answer

- 19. The Convention of International Trade in Endangered Species is a monumental agreement that paved the way for many conservation programs. (Problem is worth 6 points)
- 20. Explain how CITES lead to the signing and creation of the Endangered Species Act
- 21. Briefly describe the purpose of the Endangered Species Act.
- 22. What agencies were given conservation responsibilities as a result of the Endangered Species Act and then explain their responsibilities.

Problem

23. Thorpeville is a rural community with a population of 8,000 homes. It gets its electricity from a small, municipal coal-burning power plant just outside of town. The power plant's capacity is rated at 20 megawatts with the average home consuming 10,000 kilowatts hours (kWh) of electricity per year. Residents of Thorpeville pay the utility \$0.12 per kWh. A group of entrepreneurs is suggesting that the residents support a measure to install 10 wind turbines on existing farmland. Each wind turbine is capable of producing 1.5 MW of electricity. The cost per wind turbine is \$2.5 million dollars to purchase and operate for 20 years. (1 Megawatt is equal to 1000 kilowatt) (This question is worth 6 points)

24. The existing power plant runs 8,000 hours per year. **How many kWh of electricity is the current plant capable of producing?**
25. **How many kWh of electricity do the residents of Thorpeville consume in one year?**
26. Assuming that the population of Thorpeville remains the same for the next 20 years, and that electricity consumption remains stable per household, **what would be the cost (expressed in \$ per kWh) of electricity to the residents over the next 20 years if they decided to go with wind turbines?**

Extra credit: Identify which energy source and how much more (expressed as a percentage) it will cost more over 20 years? (Students must get both parts correct in order to get extra credit)