

May 28, 2019

2019-20 AP Environmental Science Summer Assignment

Dear parents and students,

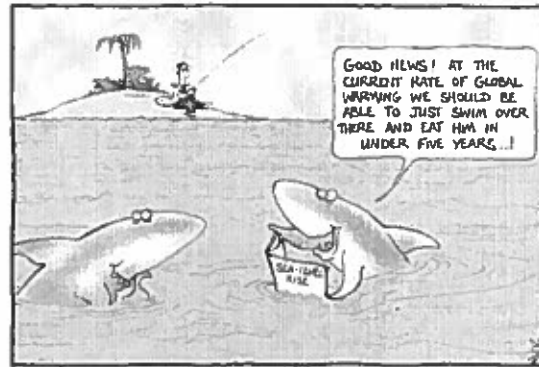
Welcome to AP Environmental Science. I'm looking forward to working with you next year but in order to cover all material before the AP Exam next May you will need to complete work this summer. This letter along with the included assignments will explain the requirements for completion prior to beginning school in the fall.

The summer assignment consists of 3 parts:

Part 1: Prerequisite Knowledge

Part 2: Math Review

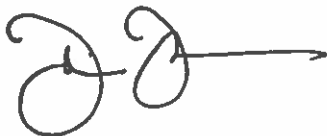
Part 3: Environmental Problems Research



All assignments have due dates for completion, **NO** assignments will be accepted late. All assignments are to be submitted on school.irsd.net. Any issues or questions should be directed to me at: john.jaskewich@irsd.k12.de.us. It is very important to make sure you are able to login **BEFORE** you leave for the summer. Once logged in there will be a folder entitled "Summer Work 2019-20," within that folder you will have instructions for submitting assignments with due dates. In addition you may email me with any questions you may have during completion of the assignments. Keep in mind I do not check my email every day and will get back to you as soon as possible.

This is the 8th year IRHS has offered APES and we will be working together to ensure you're prepared for the AP Exam on **Monday May 11th**. All students are expected to take the APES exam in the spring. Please make sure you set aside adequate time this summer to complete your assignment, beginning an AP course behind is never a good way to start the year. Hope you have an enjoyable summer break and I look forward to seeing you in the fall.

Sincerely,



Mr. John Jaskewich

APES Instructor

Science Department Instructional Co-Chairperson

May 28, 2019

Part I Prerequisite Knowledge

Due Date: June 21, 2019

AP Environmental Science is a college level course that combines content from earth science, biology, chemistry, physics, math, social and political sciences. 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 public speaking abilities. A goal of the summer assignment is to get reacquainted with these skills and concepts. Over the summer review the scientific concepts below using the textbook and any other science resources you have available. We will be building on and referencing these concepts throughout the year.

The assignment is as follows:

1. Read chapters 1-2
2. Complete multiple choice questions on basic science concepts (schoolology).
3. Research the following chemical compounds and submit your work (schoolology).

Research the following chemical compounds. Include the full name, a detailed description and a diagram of its molecular structure.

CO₂, CO, C₆H₁₂O₆, C₃H₈NO₅P CH₄, H₂,

H₂O, N₂, NO_x, NO₃⁻, NH₃, O₂,

O₃, P, PO₄³⁻, S, SO₂, Cl, K,

NaCl, Pb, Hg, Rn, U, U₂₃₅

Part II: Math Review

Due Date: July 26, 2019

The APES Examination will require you to do mathematical calculations. Occasionally 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 all of the following problems: show every step of your work, and cancelation of all units. No Calculators!! When finished take a picture of your completed work with your phone and submit it to schoolology

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Part III Environmental Problems Research

Due Date: August 16, 2019

For this assignment you will be given an introduction to three real environmental problems. Detailed instructions for each environmental problem are on schoology. Follow instructions and submit your work on schoology for the topics below:

1. **Shark Finning**
2. **Oceanic Pollution**
3. **Glyphosate and Cancer**

Here is what your summer work should look like to you on schoology:

SummerIRHS: AP Environmental Science 2019 (Jaskewich)

Indian River School District

Notifications

Add Materials Options

- Summer Work 2019-20
 - Part I Prerequisite Knowledge
 - Part I Prerequisite Knowledge Chemical Compounds Submission
 - Basic Science Concepts Multiple Choice
 - Part II Math Review
 - Part II Math Review
 - APES MATH REVIEW RESOURCES
 - Part III Environmental Problems Research
 - Shark Finning
 - Oceanic Pollution
 - Glyphosate and Cancer

All Materials

Upcoming

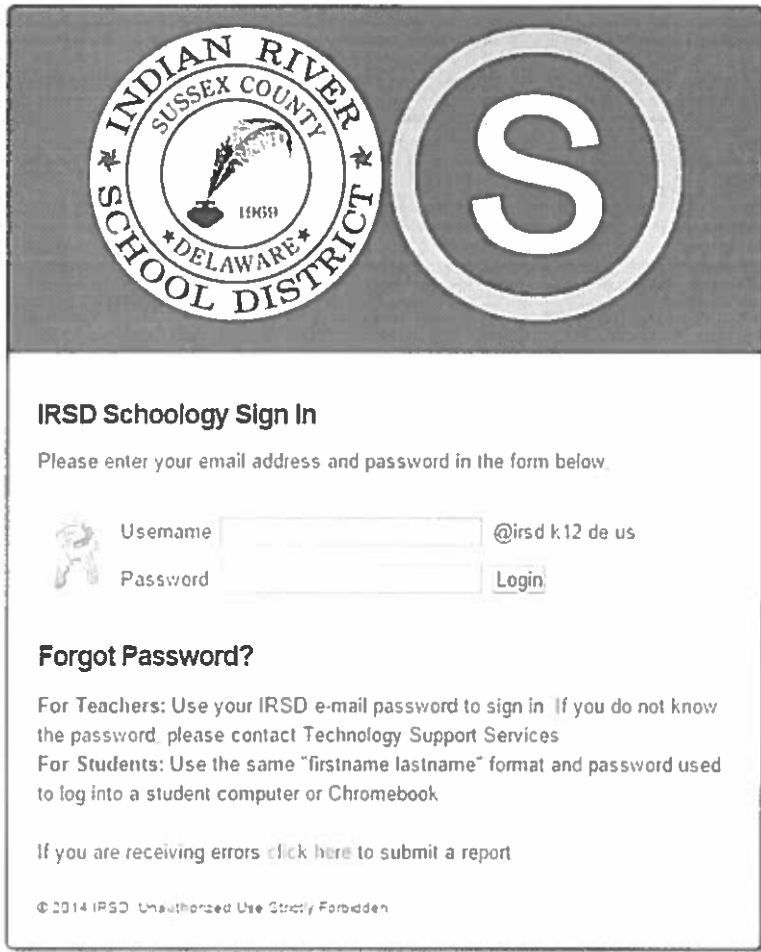
Add Events

- Friday, June 27, 2019
 - Part I Prerequisite Knowledge Chemical Compounds Submission
 - Basic Science Concepts Multiple Choice
- Friday, July 26, 2019
 - Part II Math Review
- Friday, August 16, 2019
 - Shark Finning
 - Oceanic Pollution
 - Glyphosate and Cancer

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Refer to the below pictures below on how to login to schoology, there is also an app for your convenience. Once the app is downloaded schoology can be accessed from any mobile device at any time.

To login to schoology go to: schoology.irsd.net. Below is how the page should look, it has instructions on how to login at the bottom.



IRSD Schoology Sign In

Please enter your email address and password in the form below.

Username @irsd k12 de us

Password

Forgot Password?

For Teachers: Use your IRSD e-mail password to sign in. If you do not know the password, please contact Technology Support Services.

For Students: Use the same "firstname lastname" format and password used to log into a student computer or Chromebook.

If you are receiving errors [click here](#) to submit a report.

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Schoology

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View in iTunes

Description

Get the award-winning app that extends Schoology's powerful learning management solution to your iOS device. Manage your classroom, create and submit assignments, participate in interactive discussions, perform assessments, collaborate with your peers, and much more!

With Schoology's iOS mobile app, you can have rich and engaging academic experiences anytime, anywhere. Start by registering for a free Schoology account today.

*A Schoology account is required to use this app. You can register for your free account at <http://www.schoology.com/register>

[Schoology, Inc. Web Site](#) > [Schoology Support](#) >

APES: Basic Math Concepts

Directions: Please complete the following to the best of your ability. No calculators allowed! Please round to the nearest 10^{th} as appropriate.

1. Convert the following numbers into scientific notation.

16,502 = _____

0.0067 = _____

0.015 = _____

600 = _____

3950 = _____

0.222 = _____

2. Convert from scientific notation to regular notation.

$6.96 \times 10^3 =$ _____

$3.46 \times 10^5 =$ _____

$2.54 \times 10^4 =$ _____

$9.1 \times 10^{-2} =$ _____

$5.0 \times 10^{-3} =$ _____

$9.444 \times 10^2 =$ _____

3. Complete the following mathematical functions. You must show all work!

$$45 \times 61 =$$

$$350 \times 1.5 =$$

$$550 \div 2 =$$

$$426 \div 4 =$$

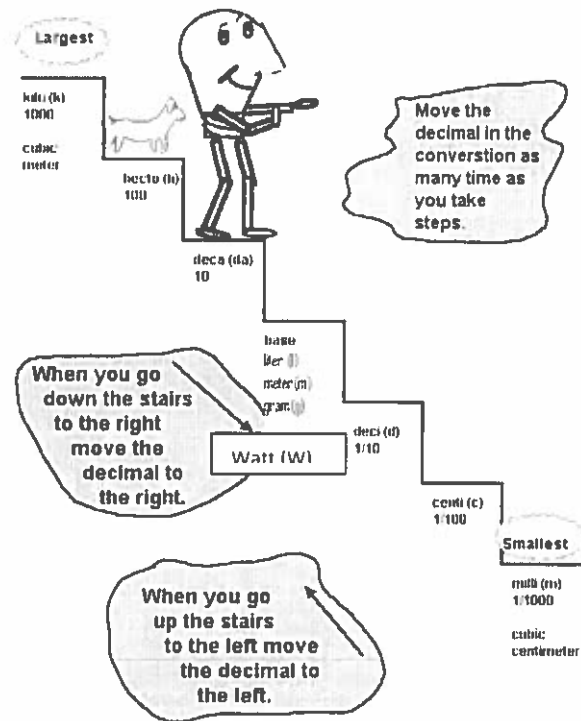
$$3465 \div 2.2 =$$

Use scientific notation (and only scientific notation) to solve the following problems:

$$3.0 \times 10^5 \times 3.3 \times 10^4 =$$

$$9.0 \times 10^8 \div 4.5 \times 10^3 =$$

4. Metric Conversion: convert the following numbers as indicated.



$$25\text{cm} = \underline{\hspace{2cm}} \text{ km}$$

$$0.01\text{km} = \underline{\hspace{2cm}} \text{ mm}$$

$$123\text{m} = \underline{\hspace{2cm}} \text{ dam}$$

$$578\text{mm} = \underline{\hspace{2cm}} \text{ dm}$$

$$35\text{kW} = \underline{\hspace{2cm}} \text{ W}$$

Percent Change: Use the following equation to assist in solving the next two problems.

$$\text{Percent change} = \frac{|\text{past-present}|}{\text{past}} \times 100$$

5. Calculate the percent increase in world grain production per person between 1950 and 2000 using the following data.

Year	Per capita world grain production (kg)
1950	200
1970	223
1990	240
2000	250

6. The total fertility rate (TFR) of a country is the average number of births per women in that country. In Madagascar the TFR went from 6.0 in 1995 down to 5.0 in 2005. What is the percent change in the TFR in Madagascar from 1995 to 2005?

Dimensional Analysis:

Dimensional analysis (also called the factor-label method) is a mathematical system using conversion factors to move from one unit of measurement to a different unit of measurement. For example, you can use dimensional analysis to calculate how many seconds are in a day.

(<http://www2.franciscan.edu/academic/mathsci/mathscienceintegration/MathScienceIntegation-617.htm>)

A good video to go over dimensional analysis can be found here:

<http://www.youtube.com/watch?v=fEUaQdaOBKo>

The key with dimensional analysis is that each of the conversion factors is equal to one. Using these factors will allow you to move from one unit of measurement to another.

Remember that:

$$\frac{2}{2} = 1 \qquad \frac{520}{520} = 1 \qquad \frac{x}{x} = 1 \qquad \frac{cm}{cm} = 1$$

Examples of conversion factors:

$$\frac{60 \text{ sec}}{1 \text{ min}} = 1 = \frac{1 \text{ min}}{60 \text{ sec}} \qquad \frac{1 \text{ inch}}{2.54 \text{ cm}} = 1 = \frac{2.54 \text{ cm}}{1 \text{ cm}}$$

Note in these last two examples that the conversion factor can be used in either form and both are equal to 1. Determining which form should be used depends on the units you start with and the units requested for your answer.

If you want to determine how many seconds are in one day, you would set up your dimensional analysis problem as shown below. Note the importance of UNITS! When solving these problems in APES, units are vital! The units help you determine which way to use the conversion factors. Also, if you do not show the units in your set-up *and* answer you do not get credit for your work.

$$\frac{1 \text{ day}}{1} \times \frac{24 \text{ hours}}{1 \text{ day}} \times \frac{60 \text{ minutes}}{1 \text{ hour}} \times \frac{60 \text{ seconds}}{1 \text{ minute}} = 86,400 \text{ seconds}$$

In this example, I can cross out "day" in both the numerator denominator because $\frac{\text{day}}{\text{day}} = 1$. This is true

for hours and minutes as well and leaves us with the answer we are looking for which is in seconds.

Notice in the example above that day is put over 1. Often a problem starts with the given value over 1.

In the example that follows, start with $\frac{8 \text{ inches}}{1}$.

Solve the following problems using dimensional analysis.

How many millimeters are in 8 inches? Please round your answer to the nearest 10th. 1 inch = 2.54 cm. Please show the set up and work for the problem. Units must be shown throughout the problem!

Use the following conversion factors to answer the questions below.

The biomass of the forest increases at an annual rate of 2.7×10^5 kg/ha
The forest biomass is 50 percent carbon by mass.
Each year the district uses 3.0×10^5 gallons of fuel oil for heating and hot water.
10 kg of CO ₂ is produced when 1 gallon of fuel oil is burned.
1.0 kg of CO ₂ contains 0.27 kg of carbon.
The cost of putting 1 ha of the forest in conservancy is \$12,000.

- ✓ Calculate the mass of carbon, in kg, that is accumulated and stored in 1.0 ha of forest in one year.

- ✓ Calculate the mass of carbon, in kg, that is emitted by the school as a result of its fuel-oil consumption in one year.

- ✓ Calculate the number of hectares (ha) of forest the school district needs to conserve in order to offset the carbon released in one year by the school burning its fuel oil.

- ✓ Calculate the amount of money the school district must raise for the conservation project.

Use the assumptions in the table below to perform the calculations that follow.

Assume that the total global area of corals growing in reefs is $2.5 \times 10^{11} \text{ m}^2$.
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Assume that corals only grow vertically and that the average vertical growth rate of corals is 3 mm/year.

Assume that the average density of CaCO_3 in corals is $2.0 \times 10^3 \text{ kg/m}^3$.
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- ✓ Calculate the current annual global increase in volume, in m^3 , of CaCO_3 in coral reefs. Show all steps in your calculation.

- ✓ Calculate the current annual global increase in mass, in kg, of CaCO_3 in coral reefs. Show all steps in your calculation.

- ✓ Because of ocean acidification, it is expected that in 2050 the mass of CaCO_3 deposited annually in coral reefs will be 20 percent less than is deposited currently. Calculate how much less CaCO_3 , in kg, is expected to be deposited in 2050 than would be deposited if ocean water pH were to remain at its current value.