AP environmental science: Mrs. Bradley

Your first assignment is to email me at: ckbradley@gaston.k12.nc.us

with your answers to the following questions:

1.What other science classes have you taken?

2. What other AP classes are you taking next year?

3. How do you plan to balance your workload knowing that AP classes with require a lot of out of class work?

Required Summer reading

You'll need to read this one over the summer.
You will complete a reading guide/ summary that you will be able to access on my google site by July 1st.
www.tinyurl.com/bradleybiology look under the materials section for the hand out- it will be titled *AP Environmental science summer reading guide*.

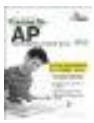
you will be tested on this book the first week of class.

Raising Elijah: Protecting Our Children in an Age of Environmental Crisis

Raising Elijah: Protecting Our Children in an…(Paperback)
by Sandra Steingraber

(21)
16.57

You'll need this one to help you review throughout the semester



Cracking the AP Environmental Science Exam, 2... (Kindle Edition)
by Princeton Review

 (6)

In addition to the summer reading you will have to complete the attached assignments and watch the documentary HOME. You will need to answer the questions that go along with the documentary. You will probably have to pause it quite a bit to get your answers.
Follow this link to the documentary: HOME
http://www.youtube.com/watch?v=jqxENMKaeCU&wide=1&safe=active

Worksheet for *HOME* : ***YOU can skip up to 15 without penalty! Some sections go by really quickly so it may be hard to catch every single answer.***

1. What does the term *homo sapiens* mean?
2. When did life originate on Earth?
3. When did homo sapiens originate?
4. What was our planet like originally?
5. Why was a cloud of a good knitted dust particles similar to so many similar clusters in the universe?
6. What was our Earth like at its birth?
7. Why was it important for the Earth to be at the right distance from the sun-not too far, not too near?
8. How is the water cycle described?
9. How did the ocean get salty?
10. What is shared by every life-form on our planet?
11. What originated as stardust?
12. What provides the Earth's red, black, blue, and yellow?
13. Where did life first spark into being?
14. What fed off the Earth's heat?
15. What organism were the first to capture the Sun's energy?
16. How did these organisms change the destiny of our planet?
17. What happened to the carbon that poisoned the atmosphere?
18. How much time can be read in the walls of Colorado's Grand Canyon?
19. How did the organisms grow their shells?
20. What happened to the shells of the microorganisms that died?
21. What did plant life finally do?
22. What is the Earth's water cycle?
23. Why is water called one of the most unstable of all molecules?
24. What happens when water freezes?
25. What is the engine of life?
26. Why are water and air inseparable?
27. What are the green organisms that supply _____% of the oxygen?

28. Coral is the mutualistic relationship between what two organisms?
29. Where is and how big is the Great Barrier Reef?
30. The Great Barrier Reef has_____ species of fish,_____species of mollusks and _____species of coral.
31. It took more than _____ years for it to make trees.
32. In a chain of species, why are trees a pinnacle species?
33. Trees have inherited from _____ the power to capture light's energy.
34. Why are trees so important for the formation of soils?
35. Soils are the factory of _____.
36. How is soil a world of incessant activity?
37. Why is it said that the Earth is a miracle?
38. What is meant by the phrase that "Every species has a role to play"?
39. Humans settled down after _____ nomadic years.
40. The _____ was, an invention that opened up new horizons and turned humans into navigators.
41. The majority of mankind lives _____.
42. The first _____ grew up less than 6000 years ago.
43. One in _____ people still use only the strength of their bodies.
44. _____ billion human beings is more than the combined population of all the wealthy nations.
45. _____ are a family's only asset, as long as every extra pair of hands is a necessary contribution to its subsistence.
46. _____ feeds people, clothes them and provides for their daily needs. Everything comes from the Earth.
47. How did towns change humanity's nature as well as its destiny?
48. The physical energy and strength with which nature had not endowed them was found in
49. _____ was humans' first great revolution that was developed barely _____ years ago.
50. The uncertainty of _____ resulted in the first surpluses and gave birth to cities and civilizations.
51. Humans harnessed the energy of animal species and plant life, from which they at last extracted the _____.
52. _____ are the yeast of life.
53. The principal daily concern of all humans is to _____.
54. _____ of humankind tills the soil over _____ of them by hand.
55. What is the pure energy-the energy of the sun-captured over millions of years by millions of plants more than a hundred million years ago.
56. In the last _____ years, the Earth's population has almost _____, and over _____ people have moved to the cities.
57. Today, over _____ of the world's _____ inhabitants live in cities.
58. _____ resulted in the invention of _____ which in turn permitted the invention of skyscrapers.
59. A _____ of oil generates as much energy as _____ in 24 hours, but worldwide only percent of farmers have use of a tractor.

60. In the United States, only _____ farmers are left. (Equal to number of people in jails and prison in US)
61. They produce enough grain to feed _____ people. But most of that grain is used to feed or _____.
62. Agriculture accounts for _____% of humanity's water consumption.
63. _____, another gift of the petrochemical revolution, exterminated _____.
64. Toxic pesticides seeped into the _____.
65. _____ of the varieties developed by farmers over _____ of years have been wiped out.
66. How can a growing worldwide demand for meat be satisfied without recourse to farms?
67. The result is that it takes _____ of water to produce one kilogram of potatoes, _____ for one kilo or rice and _____ for one kilo of beef.
68. We know that the end is imminent, but we refuse to believe it.
69. The automobile shapes _____ where every _____ , a safe distance from the asphyxiated _____ , and where neat rows of houses huddle round _____ .
70. If LA's model were followed by all, the planet wouldn't have _____ vehicles, as it does today, but _____ .
71. Everywhere, machines dig, bore and rip from the Earth the pieces of stars buried in its depths since its creation:_____.
72. As a privilege of power, _____ % of this mineral wealth is consumed by _____ % of the world's population.
73. Before the end of this century excessive _____ will have exhausted nearly all the planet's .
74. Since _____ , the volume of international trade has increased _____ times over.
75. _____ percent of trade goes by sea. _____ million containers are transported every year headed for the world's major hubs of consumption.
76. _____ is one of the biggest construction sites in the world, a country where the impossible becomes possible.
77. The ocean covers _____ of the planet.
78. The_____remain a secret. They contain_____of species whose existence remains a mystery to us.
79. Since_____ , fishing catches have increased_____, from _____to million metric tons a year.
80. _____of fishing grounds are exhausted, depleted or in danger of being so. Most large fish have been fished out of existence since they have no time to _____. Fish is the staple diet of one in five humans.
81. _____ humans live in the world's desert lands, more than the combined population of .
82. What is fossil water?
83. Across the planet, one major river in _____ no longer flows into the sea for several months of the year.
84. Lake Powell took _____ to reach high-peak mark. Its level is now _____ of that.
85. Water shortages could affect nearly _____ people before _____ .

86. These wetlands are crucial to all life on Earth. They represent _____ percent of the planet. What are wetlands?_____
87. Trees provide a habitat for _____ of the planet's biodiversity-that is to say, of all life on Earth. Every year, Why is this biodiversity important?_____
88. What are mangrove forests and why are they important?
89. Every year, _____ hectares of tropical forests disappear in smoke and as lumber.
90. What happens when the rain forest burn?
91. How long did it take Borneo's vast primary forest to totally disappear?_____
92. Over _____ people-almost a _____ of the world's population-still depend on charcoal for cooking and heating.
93. On the hills of Haiti, only _____ percent of the forests are left.
94. What is the story of the Rapa Nui, the inhabitants of the Easter Island?
95. In _____ years, the gap between rich and poor has grown wider than ever. Today, of the world's wealth is in the hands of the richest _____ percent of the population.
96. One human being in _____ now lives in a precarious, unhealthy, overpopulated environment, without access to daily necessities, such as water, sanitation or electricity. Hunger is spreading once more. It affects nearly _____ people.
97. It's all about carbon. Under the effect of global warming, the ice cap has lost _____ % of its thickness in _____ years. Its surface area in the summer shrinks year by year. It could disappear before _____.
98. By _____ , a _____ of the Earth's species could be threatened with extinction.
99. Around the North Pole, the ice cap has lost _____ % of its surface area in _____ years.
100. Greenland's ice contains _____ % of the freshwater of the whole planet. When it melts, sea levels will rise by nearly _____ meters.
101. Sea levels are rising. Water expanding as it gets warmer caused, in the 20th century alone, a rise of _____ centimeters.
102. Coral reefs, for example, are extremely sensitive to the slightest change in water temperature. _____ percent have disappeared.
103. _____ of the _____ biggest cities stand on a coastline or river estuary. As the seas rise, salt will invade the water table, depriving inhabitants of drinking water.
104. What will happen when the glaciers in the Himalayas recede?_____
105. Droughts are occurring all over the planet. In Australia, _____ of farmland is already affected.
106. The permafrost is the ground that is constantly frozen. What will happen when it melts?
107. The world spends _____ times more on military expenditures than on aid to developing countries.
108. _____ people a day die because of dirty drinking water
109. _____ people have no access to safe drinking water
110. Nearly _____ people are going hungry
111. Over _____ % of grain traded around the world is used for animal feed or bio fuels
112. _____ % of arable land has suffered long-term damage
113. Every year, _____ hectares of forest disappear
114. One mammal in _____ , one bird in _____ , one amphibian in _____ are threatened

with extinction

115. Species are dying out at a rhythm _____ times faster than the natural rate
116. _____ of fishing grounds are exhausted, depleted or in dangerous decline
117. The average temperature of the last _____ years have been the highest ever recorded
118. The ice cap is _____ % thinner than _____ years ago
119. There may be at least _____ climate refugees by 2050
120. In Bangladesh, a man thought the unthinkable and founded a bank that lends only to the poor. In barely _____ years, it has changed the lives of _____ people around the world.
121. Gabon is one of the world's leading producers of wood. What is selective logging?_____
122. I have seen houses producing their own energy. _____ people live in the world's first ever eco-friendly district in _____.
123. _____ % of the energy we consume comes from fossil energy sources. Every week, new coal-fired generating plants are built in _____ alone.
124. _____ , _____ , _____ and _____ are the biggest investors in renewable energy. They have already created over _____ jobs.
125. In _____ hour, the sun gives the Earth the same amount of energy as that consumed by all humanity in _____ year. As long as the Earth exists, the sun's energy will be inexhaustible.

Law Review Summer Assignment

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

a) Draft Year, International or National
b) Description of Function; Environmental Issues Affected
c) Agency/Group Responsible for Regulation and Enforcement (i.e. United Nations, Department of Interior, EPA, etc.)

Clean Air Act	Food, Drug, and Cosmetics Acts * REPEAT	Occupational Safety and Health Act
Clean Water Acts	Hardrock Mining and Reclamation	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

- This can be hand written or typed. Please leave room at the end as we may be adding more as the year progresses.

- **You will have your first quiz on these laws the 2nd week of school.**

Prerequisite knowledge and skills:

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 year, your success in the class is also dependent upon what you bring to it at the onset. Over the summer, review the scientific concepts and mathematical calculations below. We will be building upon and referencing them throughout the 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

The full name of each of these chemical abbreviations: CO_2, CO, $C_6H_{12}O_6$, CH_4, H_2, H_2O, N_2, NO_X, NO^{3-}, NH_3, 0_2, 0_3, P, $P0_4^{3-}$, S, $S0_2$, Cl, K, NaCl, Pb, Hg, Rn, U

Prerequisite Basic Mathematical Skills

Percentage

17% = 17/100 = .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 million / 300 million = .05 = 5%
- What is 20% of this $15 bill so that I can give a good tip? $15 x .20 = $15 x 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 (people in the US)

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

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

- When using very large numbers, scientific method is often easiest to manipulate. For example, the US

population is 300 million people or 300xl0^{6}or 3xl0^8
- 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. 9xl0^6/ 3xl0^2 = (9/3) x $10^{(6-2)}$ = 3 x 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.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}

Sample Math Problems

Be sure you are able to complete the following types of problems.

1) What is one million times one thousand? Show your work in scientific notation. Give the answer in scientific notation and in words.

2) A population of deer had 200 individuals. If the population grows by 15% in one year, how many deer will there be the next year?

3) One year I had 40 AP Environmental Science students and the next year I had 50 Environmental Science students, what percentage did the population of APES students grow by?

4) Electricity costs 6 cents per kilowatt hour. In one month one home uses one megawatt hour of electricity. How much will the electric bill be? (be sure to look at the prefixes chart on the previous page for the conversion of kilo to mega)

5) Your car gets 15 miles to the gallon and your friend's car gets 25 miles to the gallon. You decide to go on a road trip to Virginia Tech, which is 300 miles away. If gas costs $4 per gallon and you decide to split the gas money, how much money will you save in gas by driving your friend's car?

6) Virginia Beach is 10 miles wide and 30 miles long. If one inch of rain falls on Virginia Beach, how many cubic feet of rain fell on Virginia Beach. (Hint: convert all units to feet first).

7) An MP3 takes up about 16 kilobytes of memory per second of music. If you owned a one terabyte hard drive and filled it with only mp3s, how many days worth of music would you have? (keep track of units: kilobytes to terabytes and seconds to days)