Honors Biology Summer 2010 Assignment
Lenape Valley Regional High School

Dear Incoming Students and Parents or Guardians,

Welcome to Honors Biology! In an effort to prepare you for the upcoming school year the following summer assignment will need to be completed.

This summer assignment is a collection of questions and writing prompts to encourage you to think scientifically during the summer. We hope that you will find the activities both enjoyable and insightful. Many of the questions require outside resources such as the Internet.

The Honors Biology summer assignment will be due the first day of class for all students, if not handed in the grade will be a zero. The summer assignment will count for both an assignment grade and a lab grade.

We look forward to seeing you next school year!

Mrs. Motyka and Mrs. Strodel

Honors Biology Summer Assignment 2010 Instructions

- Answers should be composed on separate paper.
- Answers must be numbered and labeled as given in the writing prompts.
- Keep your answers organized!
- Answer all questions with complete thoughts and complete sentences.

Part I: Careers in Biology

*GO TO: http://www.aibs.org/careers
Answer the following questions/fill in the following blanks:

A. Studying biology teaches us to ask _____, make _____, evaluate _____, and solve _____. Biologists learn how living things work, how they _____ with one another, and how they evolve. They may study cells under a microscope, insects in a rainforest, viruses that affect human beings, plants in a greenhouse, or lions in the African grasslands. Their work increases our _____about the natural world in which we live and helps us address issues of personal well being and worldwide concern, such as _____ depletion, threats to human _____, and maintaining viable and abundant _____ supplies.

B. What do biologists do? There are several career paths that a biologist can pursue: List and describe three of these paths and explain which one would interest you most.

C. List and describe 8 new directions in biological careers. Which one interests you most and why?

D. If you are planning a career in Biology, what should you do in high school?

1. _____
2. _____
3. _____
4. _____

E. What should you do in college?

1. _____
2. _____
3. _____
4. _____

F. What is the job outlook for the future?

Part II: Analyzing a Scientific Journal Article

In class we will discuss how organisms interact with each other and their environment. This scientific journal article discusses an example of these interactions. Read the article from the link below in its entirety. Then return to this handout and answer the following questions:
Go to:
http://afrsweb.usda.gov/SP2UserFiles/Place/64022000/Publications/Boyette/Boyette%20et%20al%2002%20BST%2012.pdf

1. Using a chart, list the 4 main parts of this scientific journal article and then describe what type of information is put into each section. (The first part of the article in italics is the "Abstract")

2. In the introduction, what is the information that is in parenthesis? For example: "In the early 1900s, kudzu was promoted as inexpensive forage in over-grazed pastures and for erosion control in the South (Piper, 1920)."

3. What broad types of background information did the writer provide in the introduction? List at least 3-5 examples.

4. What is the objective of this study?

5. What is the hypothesis being tested in this study?

6. In what tense is the materials and methods section written? (past, present or future)

7. What is a control in an experiment? List at least 2 from the experimental setup.

8. What is a variable in an experiment? Identify one variable in this experiment.

9. Besides paragraphs stating the results, what else is found in the results section?

10. How is the labeling of the graphs different from the labeling of the table? Identify WHERE the label is.

11. In the discussion, what is the overall conclusion of the study?

12. Is there any experimental error mentioned in the discussion section? If so, explain.

13. How many references are listed on the citation page (Literature cited)?

14. Was the hypothesis correct? Explain.

15. Why is the article important to you or anyone?

16. What are two new, interesting pieces of information you learned from this article?

17. Write down two unfamiliar words and find their definitions.

Part III. Calculate Your Carbon Footprint

Figure out your **carbon footprint** or how much carbon dioxide you add to the atmosphere. This worksheet must be done as soon as possible because some of these steps will take several weeks to get the information back to you. You may also need your parents to help you with some of these steps!

TRASH

Hint: A typical kitchen size trash can is 13 gallons or a typical trash can contains 32 gallons.

1. How many gallons of trash does your family go through each week? _____
2. Once you have the gallons of trash, multiply that number by 101.92 as this is the pounds of CO_2 per gallon of trash
3. _____ (# of gallons) X 101.92 = _____ lbs CO_2

ELECTRIC & GAS

Call your electric and gas companies and ask them for a 1 - 2 year history of your usage. You should get it in a few days. Or use the last few statements to get an annual estimate or go to your account online.

1. Electric: What is your average Household **kWh** usage per year? _____
2. _____ (kWh per year) X 1.4 lbs CO_2 per kWh = _____ lbs CO_2

Your account will information will either be in Therms or CCF. If your gas is measured in a CCF (cubic foot), then look on your bill and find the BTU factor. The CCF X the BTU factor = Therms.

CCF _____ X _____ BTU = _____ Therms.

3. What is your average Therms of Natural **Gas** used per year _____

4. _____ (Therms / year) X 11.7 lbs CO_2 per Therm of NG = _____ lbs CO_2

CARS

Estimate your weekly/annual mileage and fuel efficiency for each of your cars. Ask your parents or guardian what is the average number of miles they drive per week.

1. Car #1: Average number of miles per week: _____ X 52 = _____ miles/year

2. Car #1: Average number of miles per week: _____ X 52 = _____ miles/year

Next you will need to find the average gas mileage for your cars. Go to the following website and follow the steps below to help determine it. http://www.fueleconomy.gov/

a. Click on **YOUR MPG (Miles per Gallon)** on the bottom left hand side of the page.
b. Select the Car Make
c. Select the Car Model
d. Find the Correct YEAR your car was made.
e. Write down the first number in RED, which is the average gas mileage of the car.
f. REPEAT this process for the second car.

3. Average MPG for Car # 1: _____

4. Average MPG for Car # 2: _____

Car #1:

5. _____ (avg. miles driven / year) ÷_____ (average MPG) = _____

Take the total from above and multiply it by 19 because there is 19 lbs CO_2 used per gal of gas

6. Car # 1 uses _____ lbs CO_2 per gal of gas

Car #2:

7. _____ (avg. miles driven / year) ÷_____ (average MPG) = _____

Take the total from above and multiply it by 19 because there is 19 lbs CO_2 used per gal of gas

8. Car # 1 uses _____ lbs CO_2 per gal of gas

AIRPLANES:

You will need to figure out approximately how many airplane miles you and **your family** traveled in the past year. If you need help go to http://www.webflyer.com/travel/milemarker/ Simply type in your city of origin and then your destination. DON'T FORGET you want the round trip distance.

1. I traveled _____ TOTAL air miles this past year.

2. The rest of my family traveled _____ TOTAL air miles this past year.

3. _____ (total miles for everyone) **X** 1 lb CO_2 per air mile = _____ lb CO_2

FINALLY:

Go to the following website and enter ALL of the above information, following the directions, in order to get your **CARBON FOOTPRINT!**

http://www.empowermentinstitute.net/lcd/lcd_files/LCDcalcNet.html

** Make sure you keep the ZERO's in the boxes for those things that you did not have to figure out. For example you did not have to find gallons of propane or gallons of fuel, so leave the zeros in the box.

1. I use a total of _____ lbs. of CO_2 per year. (or Total Emissions)
2. Based on my current lifestyle practices I am at level _____ out of 10.
3. My goal is to reduce my annual CO_2 emissions by _____pounds.

HOW MANY PLANETS DO YOU NEED?

Go to the following website and take the quiz to find out how many earth's you need to support your current lifestyle.

http://www.myfootprint.org/en/about_the_quiz/what_it_measures/

How many planets would it take to support you?

_____

Part IV: Your Own Biology Questions

As you are enjoying your summer, think about the world around you scientifically. The last part of your summer assignment is to write down 5 questions you would like to have answered in Biology class next year. These should be thoughtful questions that ask "how" or "why." Don't force these! The questions should come naturally based on something you are curious about. For example, "Why do antibiotics not work for Swine flu?"