IB Environmental Systems & Societies (IBESS) Summer Assignment

You MUST have a firm understanding of scientific practices, evolution, photosynthesis, & cellular respiration in order to be successful in this course. **It is your responsibility to review these concepts *before* class begins in August.**

PART 1 - Scientific Practices:

You will be designing LOTS of experiments; this means that you need to understand the Scientific Method. You need to complete the attached practice handouts in this order:

1. Experimental Design Outline
2. Data Table Design and Practice
3. Rules For Graphing

PART 2 - Evolution:

1. Visit following website to get the information: bit.ly/Evol101
2. Take notes to ensure you must understand all the concepts and terms on this website. Make sure you go through all the sections (#1→ #7)
3. Answer the following **evolution questions** on a separate sheet of paper:
    1. Define evolution.
    2. Explain phylogenies and how to read them.
    3. Explain two misconceptions about humans.
    4. What are homologous characteristics?
    5. What are analogous characteristics?
    6. What are three methods and evidence that scientists use to put dates on evolutionary events?
    7. Explain the following important mechanisms of evolution:
        a. Descent and the genetic differences that are heritable and passed on to the next generation;
        b. Mutation, migration (gene flow), genetic drift, and natural selection as mechanisms of change;
        c. The importance of genetic variation;
            i. How do mutations occur?
        d. The random nature of genetic drift and the effects of a reduction in genetic variation;
        e. How variation, differential reproduction, and heredity result in evolution by natural selection; and
            i. Explain the concept of "fitness."
            ii. Explain the misconceptions about natural selection.
        f. How different species can affect each other's evolution through coevolution.
    8. Explain microevolution.
    9. Can an individual evolve?
    10. How can we detect microevolution?
    11. Define speciation.
    12. Explain the three causes of speciation.
    13. Explain macroevolution and write the "equation" to explain macroevolution.
    14. Define adaptive radiation. When does it occur?
    15. When were the last four mass extinctions and what (generally) caused them?

PART 3 - Photosynthesis and Cellular Respirations topics:

1. Visit following website and take notes on all of the information:
    a. bit.ly/PSN_Khan
    b. bit.ly/Auto_Hetero
    c. bit.ly/CellularResp
2. Create a 1-page (front and back) study guide. Include equations, inputs and outputs, and diagrams differentiated between both processes.

This work will be due the first day of school. There will be an exam of this material on the first day of school.