**AICE Biology Guided Reading: Gene Technology and Biotechnology   
(J&F Ch 19 and 23: Old book)**

This guided reading is due this Friday, April 17th.  This assignment is worth 42 points and will count as a quiz/assessment grade.

\*\*\*5 extra credit points if you type your answers!!!

**Gene Technology:**

1. Overall, what is gene technology and genetic modification? (2 pts)
2. Do your best to outline the process by which a genetically modified bacteria is created.  Include steps explaining how the plasmid is formed, how a target gene is inserted into a reproducing bacteria, and what term we use for successfully modified bacteria. (3 pts)
3. What is a promoter and what role does it serve? (2 pts)
4. Outline the process of polymerase chain reaction (PCR) (4 pts)
5. What is an electrophoresis technique and why is it significant for genetic studies? (2 pts)
6. What research has been done in terms of gene therapy to potentially cure Cystic Fibrosis?   
   (2 pts)
7. How does genetic counseling work and why is it important ethically? (2 pts)
8. Describe the process of genetic screening.  Include specifics regarding the test and how fetal genes are sampled. (2 pts)
9. Differentiate between somatic and germ cell gene therapy.  Which do we use in research now? (2 pts)

**Biotechnology:**

1. What is biotechnology and how prevalent is it in today’s society? (2 pts)
2. How might microorganisms be used to collect minerals from the lithosphere?  What are the advantages and disadvantages of this process? (3 pts)
3. How is penicillin manufactured on a massive scale?  Include the organism that produces penicillin in your response. (2 pts)
4. Outline the process by which enzymes are manufactured using microorganisms. (2 pts)
5. What is Mycoprotein and how is it manufactured? (2 pts)
6. Compare and contrast the advantages and disadvantages of batch and continuous cultures. (4 pts)
7. Biologically and biochemically, how does penicillin work? What aspect of this function makes it an important antibiotic? (3 pts)
8. Describe the laboratory technique by which enzymes are immobilized and explain the use for these immobilized enzymes. (3 pts)