Complete the following questions for homework. You can complete them in your notebook or type them and put them in your binder. We will go over the answers in a student-led discussion.

**Questions:**

1. Describe the hierarchy of life starting from the atom level and ending at the ecosystem level.

2. What is the purpose of a control group in an experiment? Give an example

3. What is Descent with Modification? How does it relate to gene frequencies?

4. What is meant when someone says that an object has “energy”? What can it do if it has energy?

5. Explain how it is that all organic molecules contain energy. Where do you find that energy?

6. What is meant when I say that humans have a more recent ancestor with frogs than with oak trees? Draw a phylogenetic tree that depicts this.

7. Compare and contrast prokaryotes and eukaryotes.

8. Compare negative to positive feedback and give biological examples of each.

9. Explain the analogy “DNA is a book”.

10. What is meant by differential gene expression?

11. Why is differential gene expression important in terms of differentiation of stem cells into adult cells?

12. What does ATP stand for and what does it fuel?

13. What are the four major elements of life?

14. What are trace elements? Give an example that demonstrates the importance of these elements even though we only need them in small amounts.

15. If I had a mole of pencils, how many pencils would I have?

16. Explain how you can use radioactive carbon (C-14) to determine the fate of CO2 after entering the leaf of a plant.

- Watch video from Bozeman Biology on ["Essential Characteristics of Life"](http://www.youtube.com/watch?v=bILvTe2_FEE&feature=plcp) and take notes in your notebook.