

Week 2 Assignments  
Environmental Science

Read the chapter “Matter, Energy, and Life.

Answer the following questions:

1. Your body contains vast numbers of carbon atoms. How is it possible that some of these carbon atoms may have been part of the body of a prehistoric creature?
2. What are the six characteristics of water that makes it so valuable for living organisms and their environment?
3. In the biosphere, matter follows a circular pathway while energy follows a linear pathway. Explain.
4. Explain the difference between high-quality and low-quality energy.
5. Ecosystems require energy to function. Where does this energy come from? Where does it go? How does the flow of energy conform to the laws of thermodynamics?
6. Heat is released during metabolism. How is this heat useful to a cell and to a multicellular organism? How might it be detrimental, especially in a large, complex organism?
7. Photosynthesis and cellular respiration are complementary processes. Explain how they exemplify the laws of conservation of matter and thermodynamics.
8. What do we mean by carbon-fixation of nitrogen-fixation? Why is it important to humans that carbon and nitrogen be “fixed”?
9. The population density of large carnivores is always very small compared to the population density of herbivores occupying the same ecosystem. Explain this in relation to the concept of an ecological pyramid.
10. Complete the 10% Rule Activity.
11. Draw the sulfur, nitrogen, phosphate, carbon, and water cycles in your note book.
12. Describe how layers of energy-rich organic material have been gradually turned into great coal beds and oil pools by the pressure of the overlying earth. What happens when we burn fossil fuels?
13. Explain how the chemical elements that make up the molecules of living things pass through food webs and are combined and recombined in different ways.