APES Ch. 2 Review Questions Section I

1. Describe what happened to the people on Easter Island and how it may relate to the current situation on the earth.

2. Distinguish among *scientific hypothesis, scientific theory*, and *scientific law*.

3. What is a *controlled experiment*? What is *multivariable analysis*?

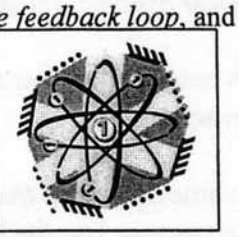
4. Distinguish between *inductive reasoning* and *deductive reasoning*, and give an example of each.

5. What are the major distinctions between *frontier science* and *sound science*.

6. What is *junk science*? List two characteristics of junk science.

7. Distinguish among the *inputs, flows* or *throughputs*, and *outputs* of a system.

8. What is a *feedback loop*? Distinguish between a *positive feedback loop* and a *negative feedback loop*, and give an example of each.



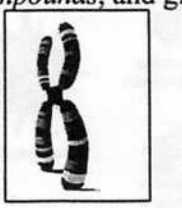
9. Define *synergy*, and give an example of how it can change a system.

10. Distinguish among *atoms, ions*, and *molecules*, and give an example of each.

11. What three major types of subatomic particles are found in atoms? How do their charges and masses compare?

12. What is an *isotope* of an atom?

13. What is a *chemical formula*? Distinguish between *ionic compounds* and *covalent compounds*, and give the names chemical formulas for an example of each of these types of compounds.



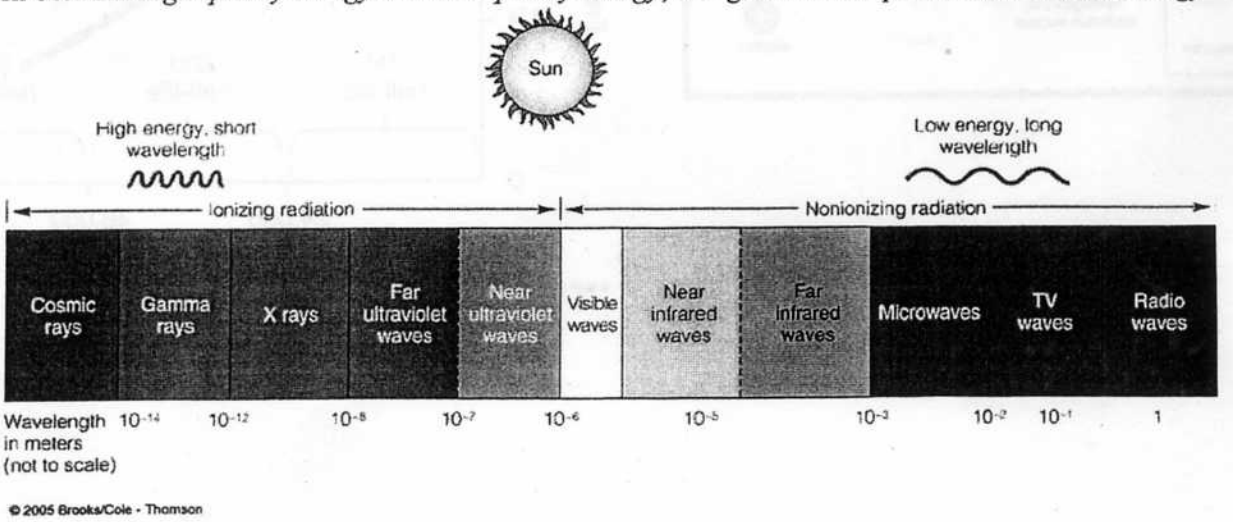
14. What is the relationship between a gene and a chromosome?

15. Describe an example where *potential energy is converted to kinetic energy*.

16. What is *electromagnetic radiation*? List three types of electromagnetic radiation. List an example of *ionizing radiation* and *nonionizing radiation*.

17. Distinguish between *heat* and *temperature*. Explain how *convection, conduction*, and *radiation* can transmit heat.

18. Distinguish between *high-quality energy* and *low- quality energy*, and give an example of each. What is *energy efficiency*?



APES Review Questions Section II Ch. 2

1. What is the *law of conservation of matter*? Explain why there is no "away" as a repository for pollution. What is a *balanced chemical equation*, and how is it related to the law of conservation of matter?

2. What three factors determine the harm that a pollutant causes? Distinguish among concentrations of *parts per million, parts per billion*, and *parts per trillion*. What is the persistence of a pollutant? Distinguish between *degradable (nonpersistent), biodegradable, slowly degradable (persistent)*, and *nondegradable pollutants*, and give an example of each type.

3. What is *radioactive decay?* For how many half-lives should radioactive material be stored safely before it decays to an acceptable level of radioactivity?

4. how is *nuclear fission* different from *nuclear fusion*.

5. Distinguish between the *first law of thermodynamics* and the *second law of thermodynamics*, and give an example of each law in action.

6. Distinguish among a *high-throughput (high-waste) economy*, a *matter-recycling society*, and a *low-throughput (low-waste) economy*. Use the law of conservation of matter and the first and second laws of thermodynamics to explain the need to shift from a high-throughput economy to a matter-recycling economy and eventually to a low-throughput economy.