Chapter 2 Environmental Systems

Reading Guide

Vocabulary

Learn the definition of each term. The **bold** words require you to know more than just the definition.

Isotopes	Chemical Energy	System Analysis
Radioactive Decay	**1st Law of thermodynamics**	Steady State
Half-Life	**2nd Law of thermodynamics**	**Negative Feedback Loops**
pH	**Energy Efficiency**	**Positive Feedback Loops**
Law of Conservation of Matter	Energy Quality	**Adaptive Management Plan**
Potential Energy	Open System	
Kinetic Energy	Closed System	

A Lake of Salt Water, Dust Storms, and Endangered Species

1. **In class activity.**

2.1 Earth is a single interconnected system

2. **Using the fisheries of the North Atlantic as an example, come up with a list of ten systems within the larger system that is Westridge. Five should be whole school systems and five should be smaller systems.**

3. **Make a list of 5 environmental systems.**

2.2 All environmental systems consist of matter

4. **What is radioactive decay and why would we study it in environmental science? (see if you can come up with more than one reason)**

5. **What is a half life and why would we study it in environmental science?**

6. **How does carbon dating work?**

7. **Water has four important properties that help it support life on earth. List the four properties and define any that you are not familiar with.**

8. **The pH scale is logarithmic. How much more basic is something with a pH of 10 than something with a pH of 7?**

2.3 Energy is a fundamental component of environmental systems

9. **What is energy? Name three types of energy.**

10. **For each situation below, state whether the 1st or 2nd law of thermodynamics applies**
    a. **In a car, only some of the energy from the gasoline is used to propel the car. The rest is lost as heat.**
    b. **Nothing can ever be 100% efficient in terms of converting energy to work.**
    c. **When you walk up a hill you gain the same amount of energy you will lose as you walk down.**

d. **Your computer, TV, and refrigerator all need a fan to keep from overheating.**
e. **There is no such thing as perpetual motion.**

11. What is the difference between energy efficiency and energy quality?

2.4 Energy conversions underlie all ecological processes

12. Why are there very few plants near the poles? On the bottom of the ocean?

2.5 Systems analysis shows how matter and energy flow in the environment

13. What is the difference between an open and a closed system? Give an example of each.

14. Feedback loops (VERY IMPORTANT). Label the following as a positive or negative feedback loop:

a. **The baby boom resulted in lots of children which meant the US population grew. Those children grew up and had more babies making the population continue to grow -**
b. **Cole takes a nap and gets a sticker when he gets up (yay stickers!) so the next day he takes a nap so that he will get another sticker -**
c. **Cole does not take a nap and has to go to bed 1 hour earlier meaning he misses out on taking a walk, so the next day he takes a nap so he can stay up for the walk –**
d. **Cole throws a temper tantrum, which means that Mommy stops doing whatever she is doing and he gets to sit in Mommy's lap and "talk" about what he did wrong and then Daddy "talks" to him about it later that night, so he keeps throwing temper tantrums so he can have Mommy and Daddy's undivided attention -**
e. **Air conditioner and thermostat –**
f. **Compounding interest –**

15. Positive and negative just indicate the direction of change (positive = keeps going in the same direction, negative = a change in direction). We use the words constructive and destructive to indicate whether or not the feedback loop is good (constructive) or bad (destructive). Give an example of a constructive negative feedback loop and a destructive positive feedback loop (you can make it up or use one of the above)

Additional Work:

Answer all the MC questions and FRQ #1 at the end of Ch 2.