Section 2.2
Nutrient Cycles in Ecosystems
Study Notes

By the end of section 2.2 you should be able to understand the following:

- ❒ Earth's biosphere is like a sealed terrarium, where all nutrients and wastes are constantly recycled.
- ❒ The carbon cycle, nitrogen cycle and phosphorous cycle move nutrients in and out of ecosystems.
- ❒ Human activities such as land clearing, agriculture, industry an motorized transportation can affect nutrient cycles.

NOTES

What was the Biosphere 2? What was Biosphere 2 symbolizing?	1. 2.
What are nutrients? What is the name for areas that nutrients accumulate? What is a nutrient cycle? Why are these nutrient stores usually described as being "in balance"?	1. 2. 3. 4.
What affects can human activities have on nutrient cycles?	1.

Do the Reading Check on page 71

NOTES

What are the five chemical elements that are essential for life? Put a star (*) beside the four that are cycled between living things and the atmosphere.	1.	2.
	3.	4.
	5.	
Where is carbon stored in the carbon cycle? List the stores from largest to smallest in approximate number of gigatonnes.	1.	2.
	3.	4.
	5.	6.
	7.	
What is sedimentation?	1.	
Where is the largest store(s) of carbon on Earth?	1.	
What processes help to cycle carbon through ecosystems?	1.	2.
	3.	4.
	5.	

NOTES

How does photosynthesis cycle carbon through ecosystems? Write the chemical equation for photosynthesis.	1. 2.
What organisms undergo photosynthesis? Why is photosynthesis so important for consumers?	1. 2. 3.
How does cellular respiration cycle carbon through ecosystems? Write the chemical equation for cellular respiration.	1. 2.
How is decomposition a part of the carbon cycle?	1.

Do the Reading Check on page 75

NOTES

Describe how ocean mixing, volcanic eruptions, decomposing trees and forest fires also are a part of the carbon cycle.	1. 2. 3. 4.
What human activities have changed the natural carbon cycle? Briefly explain each.	1. 2. 3. 4.
	Do the Reading Check on page 78
How is nitrogen important for life?	1. 2. 3. 4.

NOTES

How is nitrogen stored?	1. 2. 3. 4.
How is nitrogen cycled through ecosystems?	1. 2. 3.
Describe the three methods of nitrogen fixation.	1. 2. 3.
Where does nitrification take place?	1. 2.

Do the Reading Check on page 80

NOTES

What is nitrogen uptake? Why is this process important?	1. 2.
How is nitrogen removed from ecosystems?	1. 2. 3.
How have human activities increased the amount of nitrogen in the biosphere in the past 50 years?	1. 2. 3. 4. 5. 6.
What is eutrophication, and what role does nitrogen play in this process?	1. 2.

Do the Reading Check on page 83

NOTES

How is phosphorous important for life?	1.	2.
	3.	4.
How is phosphorous stored naturally?	1.	
How is phosphorous cycled through ecosystems?	1.	
	2.	
	3.	
	4.	
What are the human impacts on the phosphorous cycle?	1.	
	2.	

Do the Reading Check on page 86

NOTES

How do changes in the nutrient cycles affect biodiversity?	1. 2. 3. 4.