

Lesson 8.5

Cycling of Water, Carbon, and Nitrogen

Name

Date

Period



Engage

The Florida Everglades

This subtropical region receives between 100 and 165 cm (40 – 65 in) of rain each year, but only during the rainy season, which lasts from May to October. The heavy rainfall causes shallow Lake Okeechobee to overflow. A wide thin sheet of water spreads out from the lake, creating an extensive marshy area. Early in the twentieth century, the slow-moving river that flows out of Lake Okeechobee was 80 km (50 miles) wide in some places and only 15 -90 cm (0.5 to 3 feet) deep. This wetland teamed with fishes, amphibians, and other animals that fed millions of wading birds. Healthy populations of crocodiles, alligators, and other large animals also lived here. During the dry season, from December to April, water levels dropped. Fishes and other water dwellers moved into the deeper pools that held water all year long.

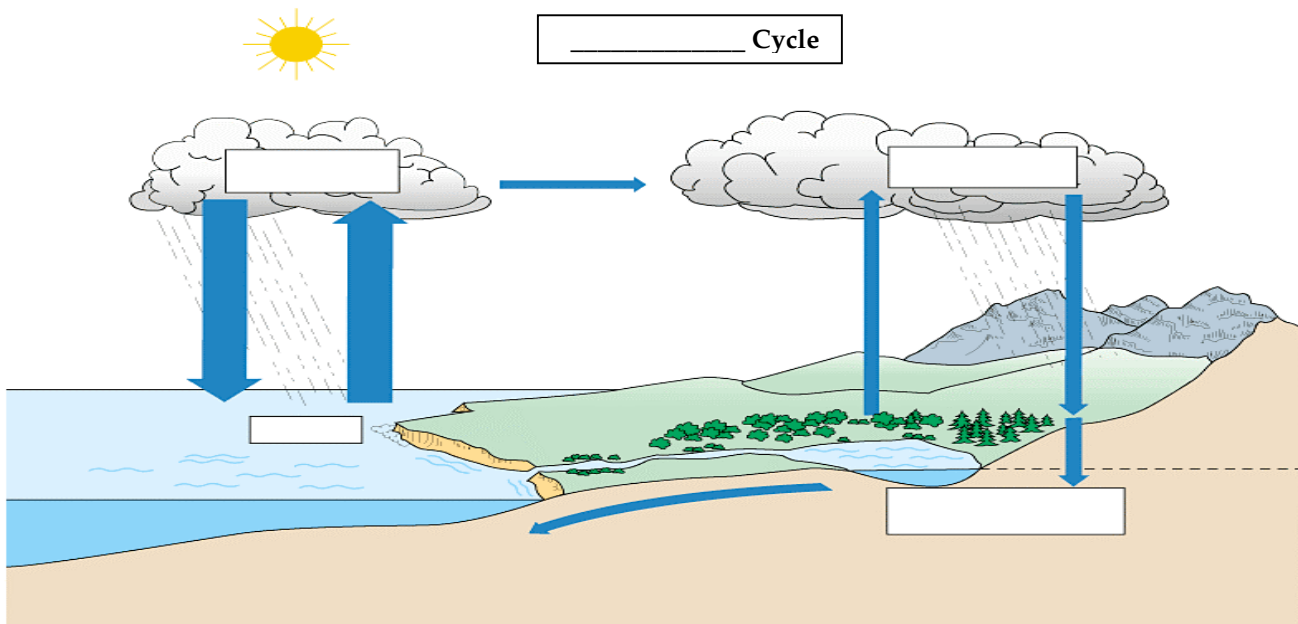
Water from Lake Okeechobee is no longer allowed to flood the countryside. Instead, it is diverted into channels in order to create dry land for agriculture and homes, and stored behind levees to supply water for cities. As a result, half of the area of the original everglades has been drained. Many of the species originally found in the area are gone or are present only in greatly reduced numbers.

1. Where does the water come from that causes Lake Okeechobee to overflow?
2. What organisms depended on Lake Okeechobee being allowed to overflow?
3. Humans have changed the way water levels cycle throughout the year in Lake Okeechobee. What affect has this had on the organisms that live there?

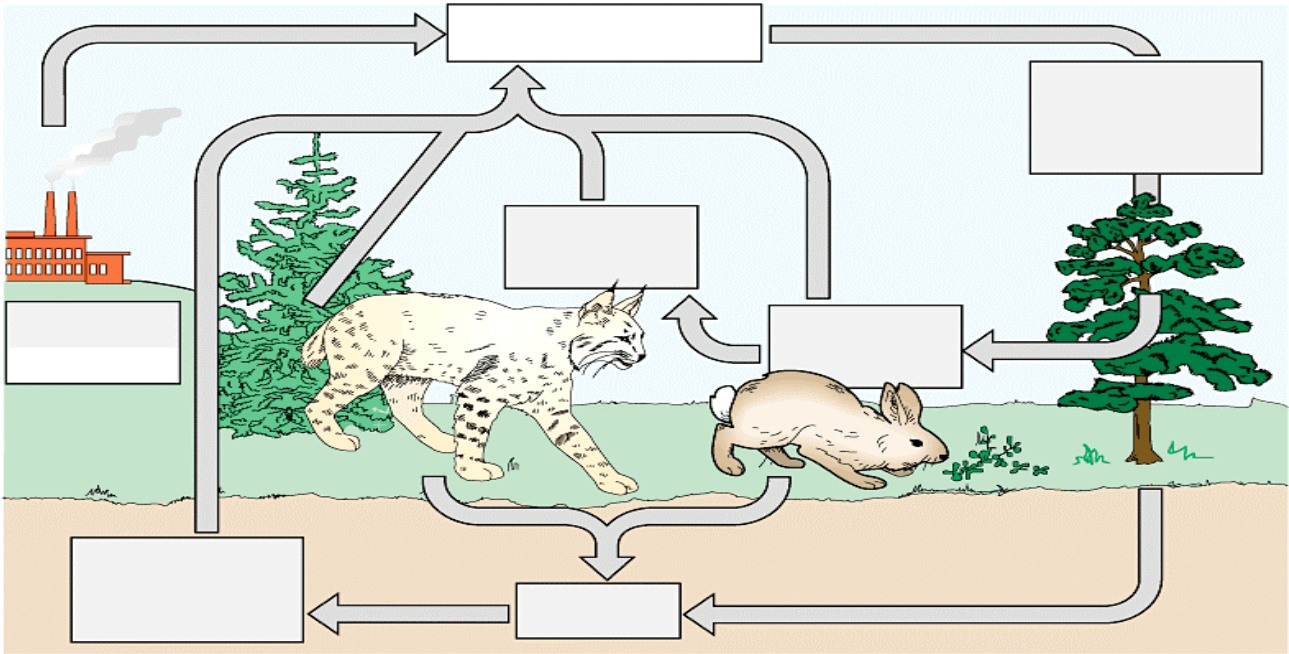


Explore

Listen to your teacher's lecture as you take notes and fill out the diagrams on the water cycle, carbon cycle, and nitrogen cycle on the pages that follow.

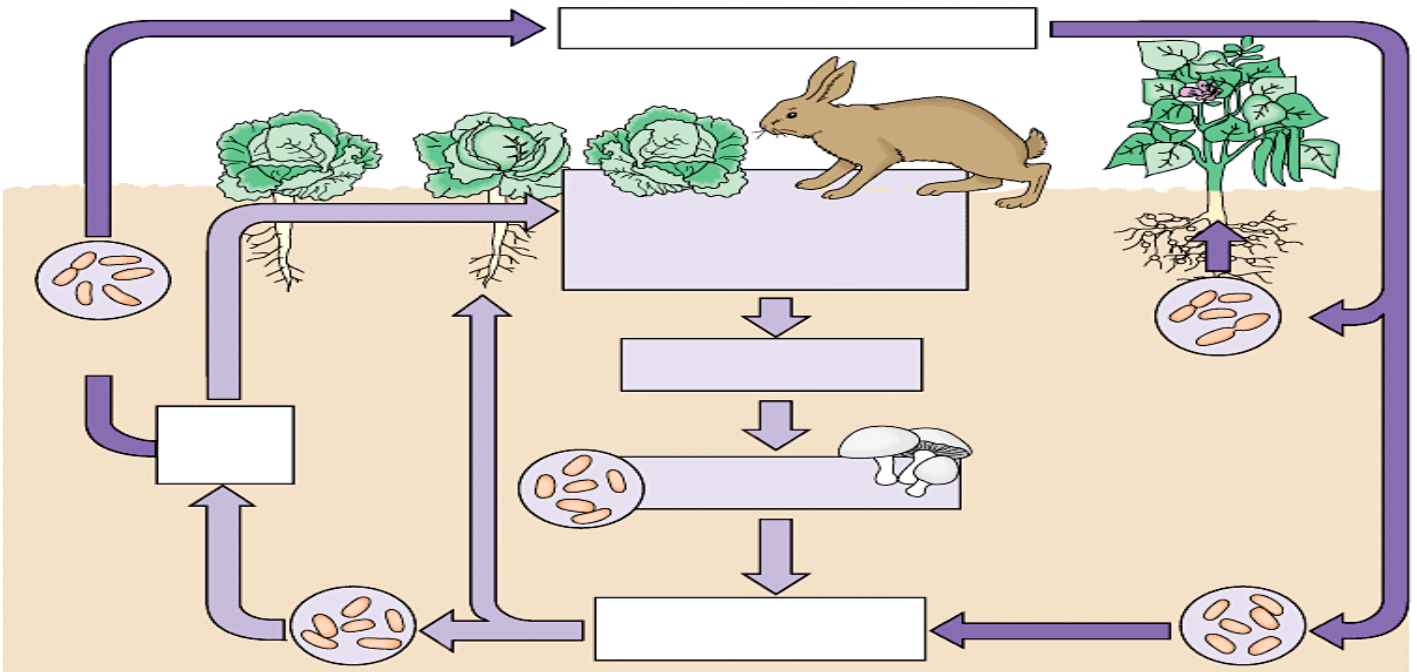


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Matter in Nature is Going Around in Cycles ... What Next?

1. What is matter that is not living?
2. What is matter that is living?
3. What would happen to the ecosystem if an excess number of beavers were able to survive for several seasons?
4. What happens to the remains of dead and decaying remains of beavers in the described ecosystem?
5. Describe the short process of the water cycle.
6. List four paths that water could take to leave the ground and get into a cloud.
7. What impact would a significant increase in the water in the community have on the members of the described ecosystem?
8. What impact would a significant decrease in the water in the community have on the members of the described ecosystem?
9. What happens to the total number of carbon atoms in a stable ecosystem?
10. List 2 ways that carbon dioxide can be returned from the atmosphere into living organisms or water.
11. List 4 ways that carbon dioxide can be introduced into the atmosphere.
12. If humans introduce non-native species into an environment, what can happen?

13. Which process represents evaporation?
 a) A b) B c) C d) D
14. Which process represents transpiration?
 a) A b) B c) C d) D
15. Which of the following processes also releases water into the atmosphere?
 a. respiration
 b. perspiration
 c. transpiration
 d. all of the above
16. Which process represents photosynthesis?
 a) A b) B c) C d) D
17. Which process represents respiration?
 a) A b) B c) C d) D
18. The total carbon within the described ecosystem
 a. increases over time
 b. decreases over time
 c. remains relatively constant
 d. is always zero
19. Nitrogen could not be obtained by plants and animals without
 a. autotrophs
 b. fossil fuels
 c. bacteria
 d. hydrochloric acid
20. The reason soybeans have a mutualistic relationship with bacteria is related to
 a. obtaining oxygen from the soil
 b. obtaining water from the soil
 c. obtaining nitrogen from the soil
 d. obtaining carbon dioxide from the soil

