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| **iLearn BI 101** | **Nutrient Cycles Assessment:**  **Nutrient Cycling Diagrams** |

Now is your opportunity to demonstrate what you have learned about nutrient cycling. After completing this activity and question set you will be submitting a report for grading through the course website. Upon completion of this assignment with the minimum required score, you will have completed the Nutrient Cycles module. The details on the grading and submission process can be found on the course website.

Be sure to answer the questions in this report in your own words, using appropriate vocabulary and terminology learned in the lecture, lab, and reading materials. You may have to do some independent research to answer some of the questions completely and thoughtfully.

**Introduction:**

The lessons and activities in this module included 4 important nutrient cycles: carbon, nitrogen, phosphorus, and water. Your task in this assignment is to create your own diagram of each cycle that clearly demonstrates the detail of each cycle. You will not be graded on artistic ability or creativity; however you are encouraged to be as creative and artistic as you can. The more thought and effort you put into each diagram, the deeper your understanding of the components of each cycle. Your diagrams must include all of the following elements:

* A clear representation of both the inorganic and food web portions of the cycle, with the main reservoir indicated in some way, as well as
* Clear labels of each of the processes that are involved in moving the nutrient throughout an ecosystem. Every single arrow must be labeled!
* At each part of the cycle (all reservoirs and the time spent in a food web) indicate the form that the molecule occurs in. In other words, how is it used in the body of an organism? When is it in its gaseous form? What form it must be in to enter and exit the food web?
* Any organisms that the cycle relies upon to continue, and their appropriate placement and role clearly demonstrated.

The formatting of this document requires your diagrams to be saved as a picture file in order to upload into this document. There are a variety of ways you can accomplish this. For instance, if you have a smart phone or digital camera, you could draw out each nutrient cycle by hand and take a picture of it to upload onto your computer. Or you could use a drawing program to create it on the computer, and save it as a picture file (.jpg) to upload into the report.

Regardless of how you accomplish this, all 4 nutrient cycles must be included in your report. Contact your instructor if you need assistance on this step.

In addition to your diagrams, you will answer the questions below that are specific to each cycle. When completed, submit this document through the submission page on the course website.

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**Carbon Cycle**

1. Insert a picture of your carbon cycle by clicking on the image icon below:



1. Name 3 non-living places where the element carbon can be found?
2. Carbon is moved from the atmosphere to plants in the form of what gas?
3. By what process are plants able to use carbon in the atmosphere?
4. How does carbon get into the ground?
5. What does carbon become after millions of years?
6. By what process do plants & animals release gas to the atmosphere?
7. How does carbon return to the atmosphere in industry?
8. According to your textbook, historical carbon levels in the atmosphere have fluctuated between 180 ppm and 300 ppm. How do we know this, i.e. what types of data can be collected to give us data on ancient global conditions?
9. .What are some of the potential impacts of an increasing amount of greenhouse gases in the atmosphere?

**Nitrogen Cycle**

1. Insert a picture of your nitrogen cycle by clicking on the image icon below:



1. Where is most of the nitrogen on Earth? Approximately how much nitrogen is found in this reservoir, relative to other molecules (i.e. percentage)?
2. What do plants & animals use nitrogen to make?
3. How is nitrogen converted to a form that plants & animals can use?

1. How do plants take in nitrogen?
2. How do animals take in nitrogen?
3. Name 2 human actions have caused changes to the nitrogen cycle.

1. What is the impact onto plants & animals when nitrate levels increase?

**Phosphorus Cycle**

1. Insert a picture of your phosphorus cycle by clicking on the image icon below:



1. Where is most phosphorus found?

1. How do living organisms use phosphorus?

1. What aspect of the phosphorus cycle sets it apart from the others?

1. What types of organisms are essential to this nutrient cycle?

1. As you learned in the lab activities, phosphorus is most often the first limited nutrient that organism’s compete for. How does the speed of processes involved in this cycle contribute to this fact?

**Water Cycle**

1. Insert a picture of your water cycle by clicking on the image icon below:



1. Name the 4 locations on Earth where water can be found.
2. What is the process of evaporation?
3. What is the process of sublimation?
4. What is the process of transpiration?
5. What is the process of condensation?
6. How do clouds become precipitation?
7. What does precipitation become a part of after it falls?
8. In what form might water remain on the Earth’s surface?

1. Explain the role of aquifers in the water cycle. Discuss what is meant by overdrafting and some of the environmental consequences of this process.