Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_

**Pre-AP Biology Biogeochemical Cycling WebQuest**

Directions: Visit the following websites and answer the related questions. Your goal is to gain a

better understanding of the carbon and nitrogen cycles.

Background: In biogeochemical cycles (including carbon, water and nitrogen cycles), elements are

transported between the atmosphere, biosphere (living things), hydrosphere (water), and geosphere

(rocks, minerals, and soils). These cycles help us remember that Earth is a complex system.

**Carbon Cycle:**

Go to [http://www.windows.ucar.edu/tour/link=/earth/Water/co2\_cycle.html](http://www.windows.ucar.edu/tour/link%3D/earth/Water/co2_cycle.html) and answer these

questions:

1. Draw the carbon cycle.
2. How does carbon exist in the atmosphere?

1. How are fossil fuels created? Explain.
2. Describe two ways that carbon enters the atmosphere.
3. How are the oceans involved in the carbon cycle?
4. How is the temperature of the Earth partly controlled by carbon?
5. What role do rocks have within the carbon cycle?

**Go to** [**http://www.windows.ucar.edu/earth/climate/carbon\_cycle.html**](http://www.windows.ucar.edu/earth/climate/carbon_cycle.html) **to play the carbon cycle**

**game. You are a carbon atom!**

1. Where are you starting within the carbon cycle?
2. “Click to begin your journey”
3. How much of the atmosphere is made of carbon dioxide (CO2)?
4. By how much has CO2 increased in the atmosphere during the past 150 years?

As you work through this game, take some notes about where you go as a carbon atom. Make sure

you visit all reservoirs!

1. Next stop = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ What did you learn?

 13. Next stop = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_What did you learn?

**Nitrogen Cycle:**

Go to: <http://users.rcn.com/jkimball.ma.ultranet/BiologyPages/N/NitrogenCycle.html> and answer these questions.

1. Draw the nitrogen cycle.

 2. What percentage of the air we breathe is nitrogen?

 3. Even though considerable nitrogen is available in the air, most plants do not use the nitrogen

 (N2) found in the air. Why not?

 4. In what compounds can plants use nitrogen?

 5. How do animals get the nitrogen they need?

 6. Why is nitrogen needed by plants and animals?

**Water Cycle:**

Go to <http://www.mbgnet.net/fresh/cycle/index.htm>. Answer the following questions.

1. Define "water cycle".
2. Draw the water cycle.
3. What fraction of the Earth’s surface is covered in water?
4. What percentage of all the Earth’s water is in a form that is useable to humans and land

 animals?

Click on <http://www.mbgnet.net/fresh/cycle/concepts.htm>. Answer the following questions.

1. Define evaporation.
2. Why is evaporated water so clean?
3. Define condensation.
4. When the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are right, the small droplets of water in clouds form larger droplets and precipitation occurs.
5. Define transpiration.
6. Define percolation.

Go to <http://www.mbgnet.net/fresh/cycle/cycle.htm>. Answer the following questions.

1. Using the terms "evaporation", "condensation", and "precipitation", explain the water cycle in your own words.
2. What factor is most important in determining whether water is a solid, liquid, or gas?
3. Is the amount of water on Earth always changing or is it a constant amount?