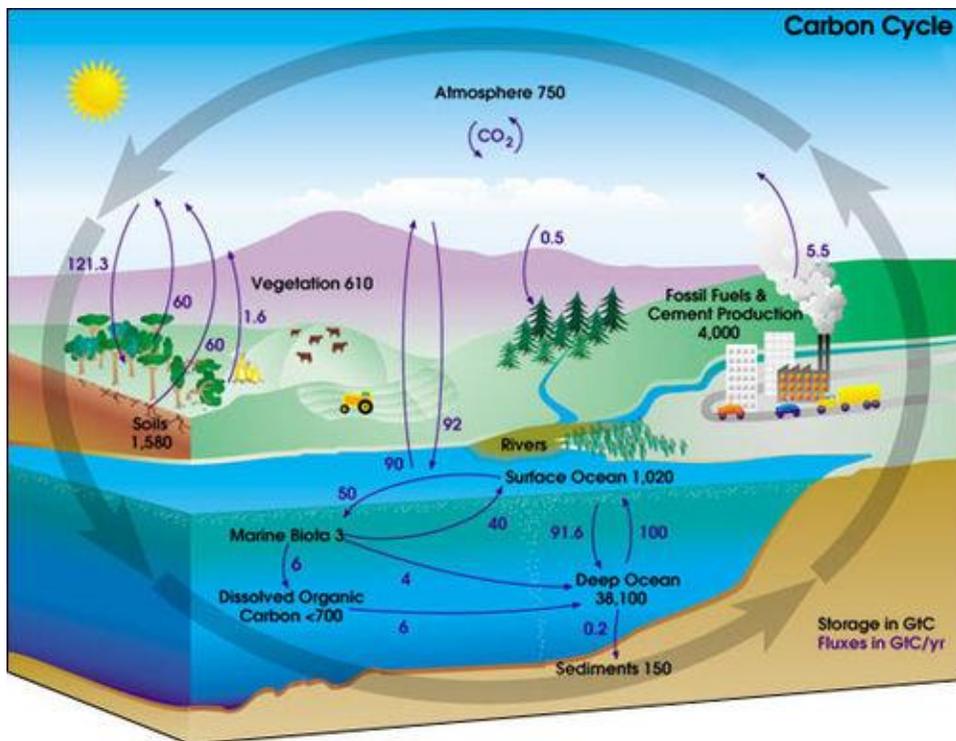


Lab: Carbon Cycle MAKEUP ASSIGNMENT

Remember: As per GHHS Policy, you have two days for each day absent to makeup assignments.

(modified from Holt Environmental Science)



Background: Carbon, a chemical element, is a component of nearly all biological molecules. Carbon is found in all organisms, where it is one of the main components of cells. Organisms get energy from carbon compounds. Organisms obtain carbon from their environment. Plants get carbon through photosynthesis, while animals get carbon by eating plants or by eating organisms that ate plants.

So what do organisms do with carbon compounds? Through a process called cellular respiration, the cells of most organisms use oxygen to release the energy that

is stored in food molecules. Fungi use a different process called fermentation that does not use oxygen to release energy. During both cellular respiration and fermentation, energy is released when the chemical bonds that hold the food molecules together are broken. All organisms then use elements, such as carbon, to build their own biological molecules. The molecules left after these processes are waste products.

One of the waste products of respiration and fermentation is carbon dioxide. Photosynthetic organisms, like plants, absorb this carbon dioxide and use it in photosynthesis. The carbon gets incorporated into parts of the plant and may end up being consumed by an animal. The constant cycling of carbon through organisms to the atmosphere and back again is called the carbon cycle.

Prelab Questions:

1. Why do organisms need carbon?
2. How do plants and animals and fungi obtain carbon? (What are the three processes?)

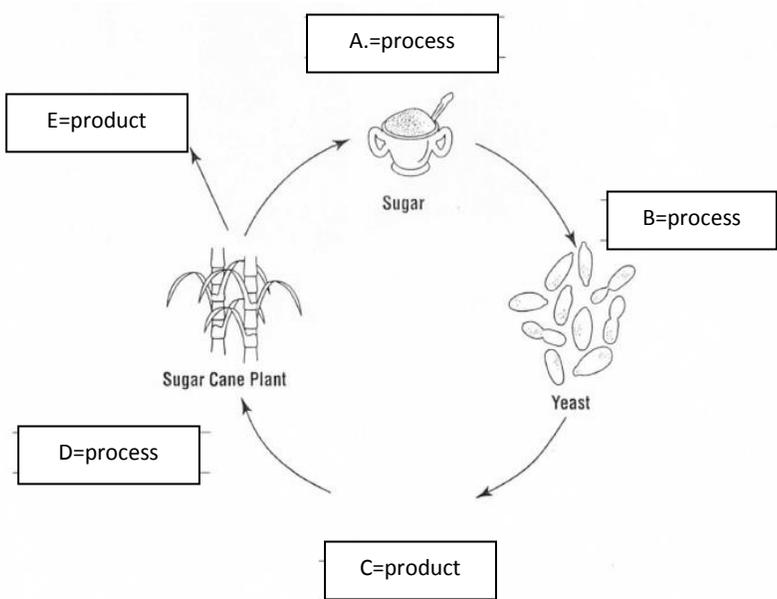
What We Did in Class:

Students demonstrated the carbon cycle by observing the reaction of yeast to sugar and salt. While salt (NaCl_2) was not found to be a food for yeast, sugar ($\text{C}_{12}\text{H}_{22}\text{O}_{11}$) was. The resulting process is called fermentation, in which the yeast took in sugar and oxygen to yield carbon dioxide and alcohol.

Analysis:

3. In the experiment described above, what was the source of carbon dioxide being released by yeast?

4. In the diagram below, fill in the blanks to describe what is during each step.



A - _____

B - _____

C - _____

D - _____

E - _____

5. How would humans fit into the cycle above?

6. How is burning gas in a car similar to digestion in living organisms?

7. Sugar is a fuel for living organisms. Gasoline, which comes from the remains of dead organisms, provides fuel for cars. Why is there so much stored energy in these fuels?

Watch the video <http://www.bozemanscience.com/ap-es-011-biogeochemical-cycles> and answer the following

8. What does CHNOPS stand for?

9. Which biogeochemical cycle elements are limiting nutrients?

10. What animal is used in the video to demonstrate a role in biogeochemical cycles?

11. What organisms on land photosynthesize? What organisms in the ocean photosynthesize?

12. What role does combustion have in the carbon cycle? Relate photosynthesis, combustion and respiration.

13. Bacteria plays the biggest role in which biogeochemical cycle?

14. Which biogeochemical cycle plays the largest role in acid precipitation?

15. What have you learned from this makeup lab?