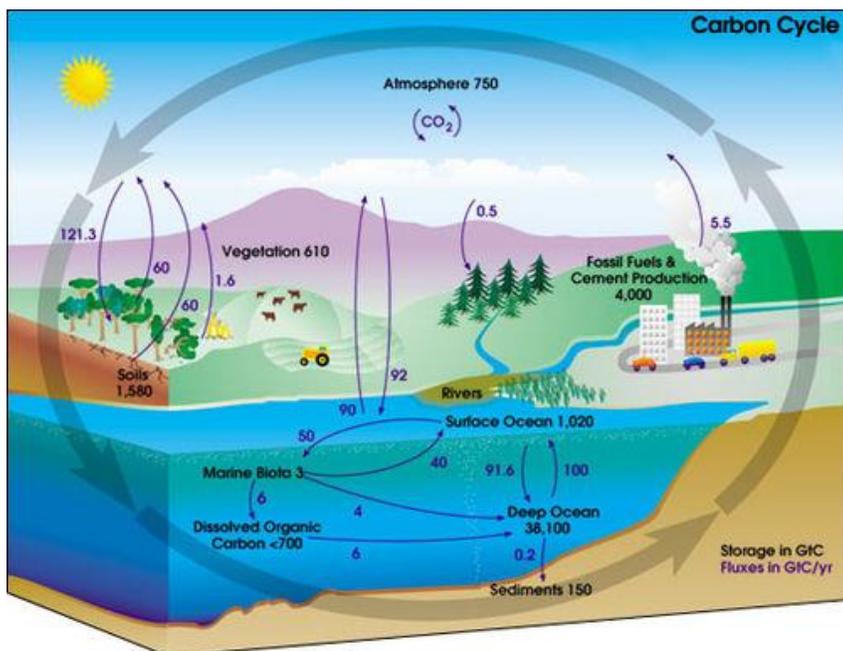


Lab: Carbon Cycle

(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?)

Procedure:

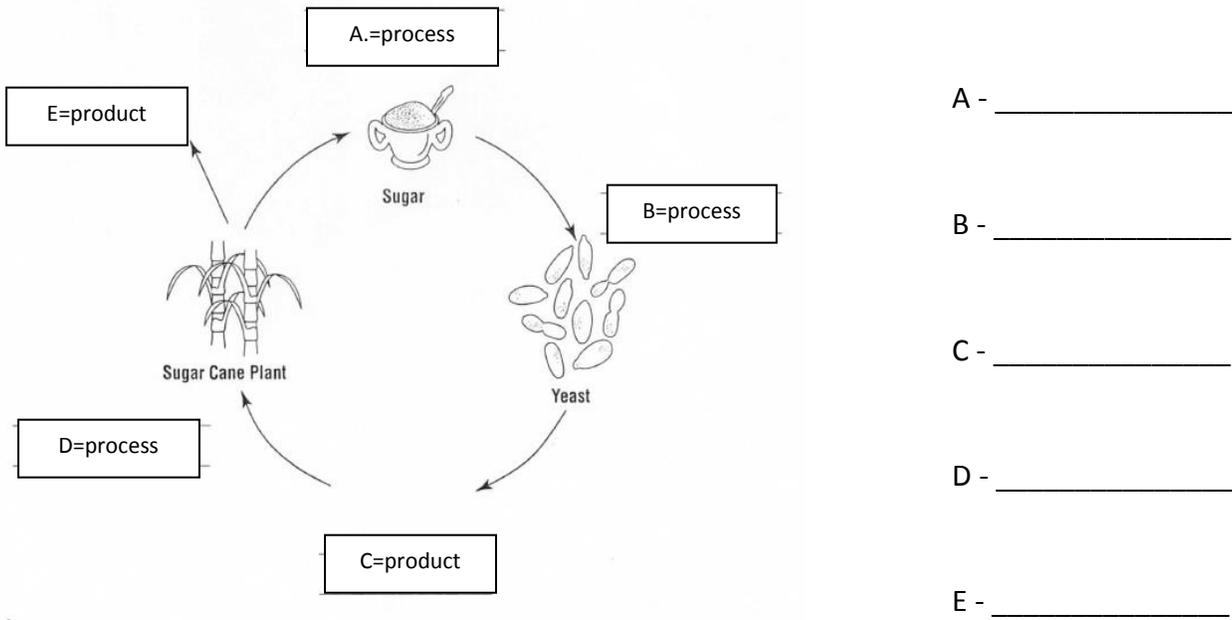
In this experiment you will be working with yeast, a single-celled organism that is a fungus. Yeast obtains energy from food through the process of fermentation. By providing yeast with different sources of food, we will determine what yeast uses as a source of energy.

- a. Label three beakers 1, 2 and 3 and place 1 gram of yeast into each.
- b. Add 1 gram of sugar to beaker 2 and Add 1 gram of salt to beaker 3.
- d. Add 100 mL of warm water to each beaker and stir gently.
- e. Observe what happens in each beaker over the next 10-15 minutes and record your observations in the table below. Look for bubbles rising to form a foamy layer. This is evidence of carbon dioxide production.

Reaction of Yeast to Different Food Sources	
Beaker	Observations
1 (yeast only = control)	
2 (yeast & sugar)	
3 (yeast & salt)	

Analysis:

- In which of the beakers did you notice bubbling? What does this mean?
- Did you notice particular smells from any of the beakers? What could be the source(s)?
- Why didn't fermentation happen in all of the beakers?
- In the experiment described above, what was the source of carbon dioxide being released by yeast?
- In the diagram below, fill in the blanks to describe what is during each step.



- How would humans fit into the cycle above?
- How is burning gas in a car similar to digestion in living organisms?
- 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?