

## BUOI I: Biogeochemical Cycles Unpacked

On a scale of 1-5 rate your level of understanding for each statement.

The water or hydrologic cycle is the process by which water circulates between the Earth's oceans, atmosphere, and land, involving precipitation (as rain, snow, sleet, and hail), drainage in streams and rivers, and return to the atmosphere by evaporation and transpiration.

The Laws of Conservation of Mass and Energy state that matter and energy are conserved—that is matter and energy are not created nor destroyed.



### WATER AND CARBON CYCLE SUMMATIVE ASSESSMENT



The student will respond to the following writing prompt:

Lessened amounts of precipitation over an area for an extended period of time has many effect on farmland and crops. Drought conditions result from a lack of precipitation and this has many effects on the surrounding land and weather conditions. Drought conditions can worsen after prolonged periods of no rainfall, especially in areas where the water supply is short. Discuss two possible impacts a drought can have on the carbon cycle, and therefore, the overall impact it can have on the environment. Your answer should be at least 2 paragraphs and make reference of data and discussions that you have used over the last 2 days.

Matter and energy are moved through biogeochemical cycles, including the water cycle and carbon cycle.

The carbon cycle is the combined processes, including photosynthesis, decomposition, and cellular respiration, by which carbon as a component of various compounds, cycles between its major reservoirs—the atmosphere, oceans, and living organisms.

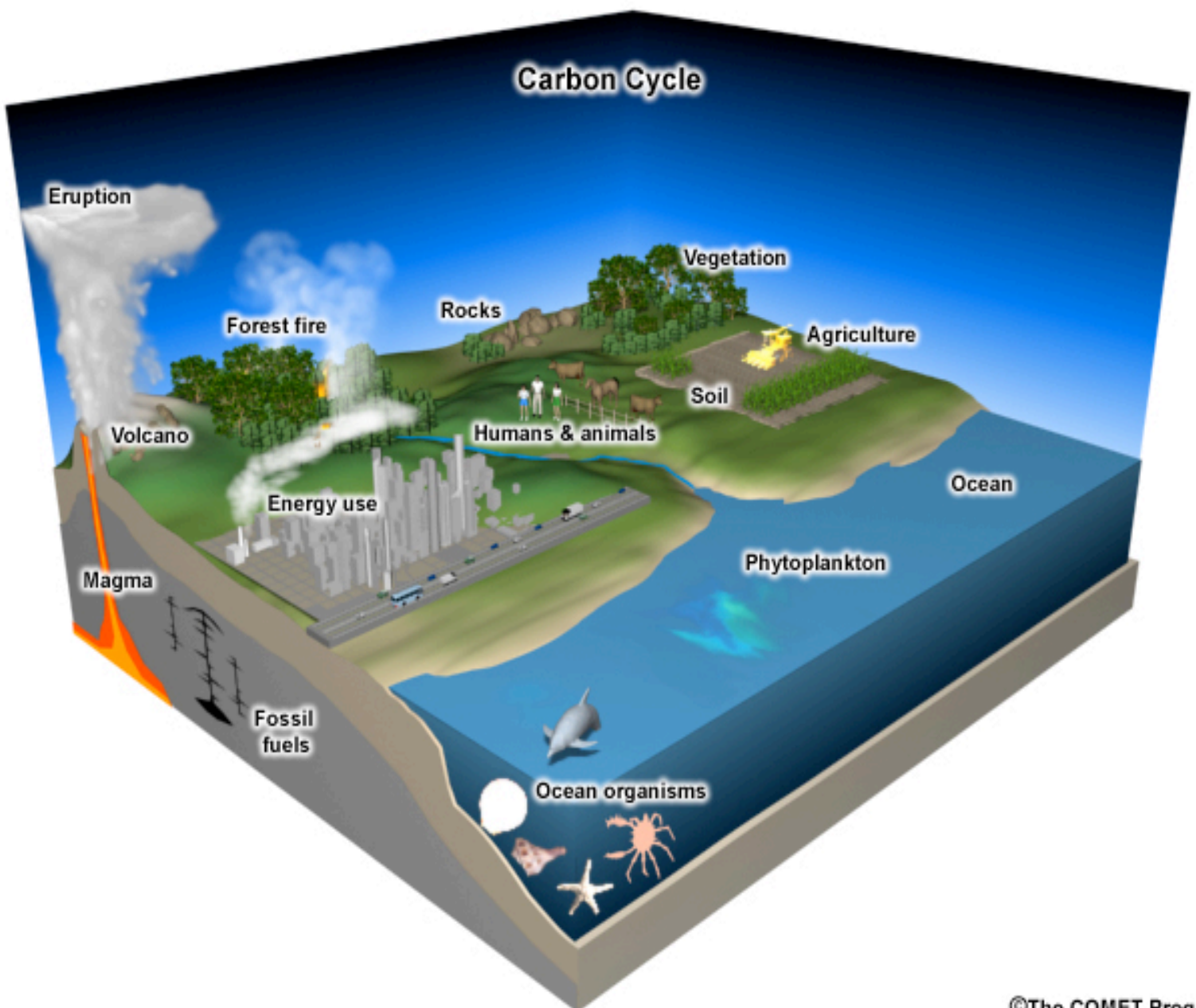






## Cycle Story

Earth's natural systems are very good at conserving energy and matter. The conservation of energy and matter is done through different natural cycles. Some scientists describe the movement of matter through cycles as a giant recycling station, where the "trash" products from one system are the "treasure" for another.



## Cycle Story

1. In the above diagram use arrows to represent the movement of both water and carbon through an ecosystem.
  - Use thick black arrows to represent the movement of carbon.
  - Use thin red arrows to represent the movement of water.
  - Label your arrows with the process that is occurring (eg evaporation, photosynthesis, condensation, etc).
  - Use your data from your data charts to help get started. Meet with at least 2 other classmates to ensure you have drawn all of the possible pathways that water and carbon can flow in this ecosystem.
2. Write a brief explanation of what is meant by the phrase, “In the carbon cycle, the waste products of one system are the stuff of life for another.”
  - Your example should describe at least one of the following natural processes: decomposition, forest fires, photosynthesis, respiration, or weathering
3. Explain what is happening to the concentration of carbon dioxide in the atmosphere over time, and what you believe is causing this change. Include an explanation of where this “extra” carbon dioxide was before it was emitted into the atmosphere.

---

---

---

---

---

---

---

---

---

---

Name: \_\_\_\_\_

**Instructions:** Complete the following task in the chart below.

Carbon flow is the movement of carbon in gaseous, dissolved, or solid form from one carbon reservoir to another. As you play the **Carbon Flow Game**, describe the processes at work in each scenario and record how you believe carbon flows from reservoir to reservoir in the global carbon cycle.

Carbon Flow Observation Log		
Carbon Flow Card	Reservoir: Carbon Started Here	Reservoir: Carbon Moved Here
Feel the Burn		
Seeing the Forest Through the Trees		
Our Changing Landscape		
Fossil Fuels "Old-Growth" Carbon		

Name: \_\_\_\_\_

<b>Carbon Flow Observation Log</b>		
<b>Carbon Flow Card</b>	<b>Reservoir: Carbon Started Here</b>	<b>Reservoir: Carbon Moved Here</b>
Pumping Carbon		
How Permanent Is Permafrost?		
A Wetland "Wasteland?"		
Cement, Our Modern Building Block		
Made of Wood Is Good		



- List the four main carbon reservoirs, from greatest to smallest according to how much carbon each currently holds. (1 point each)

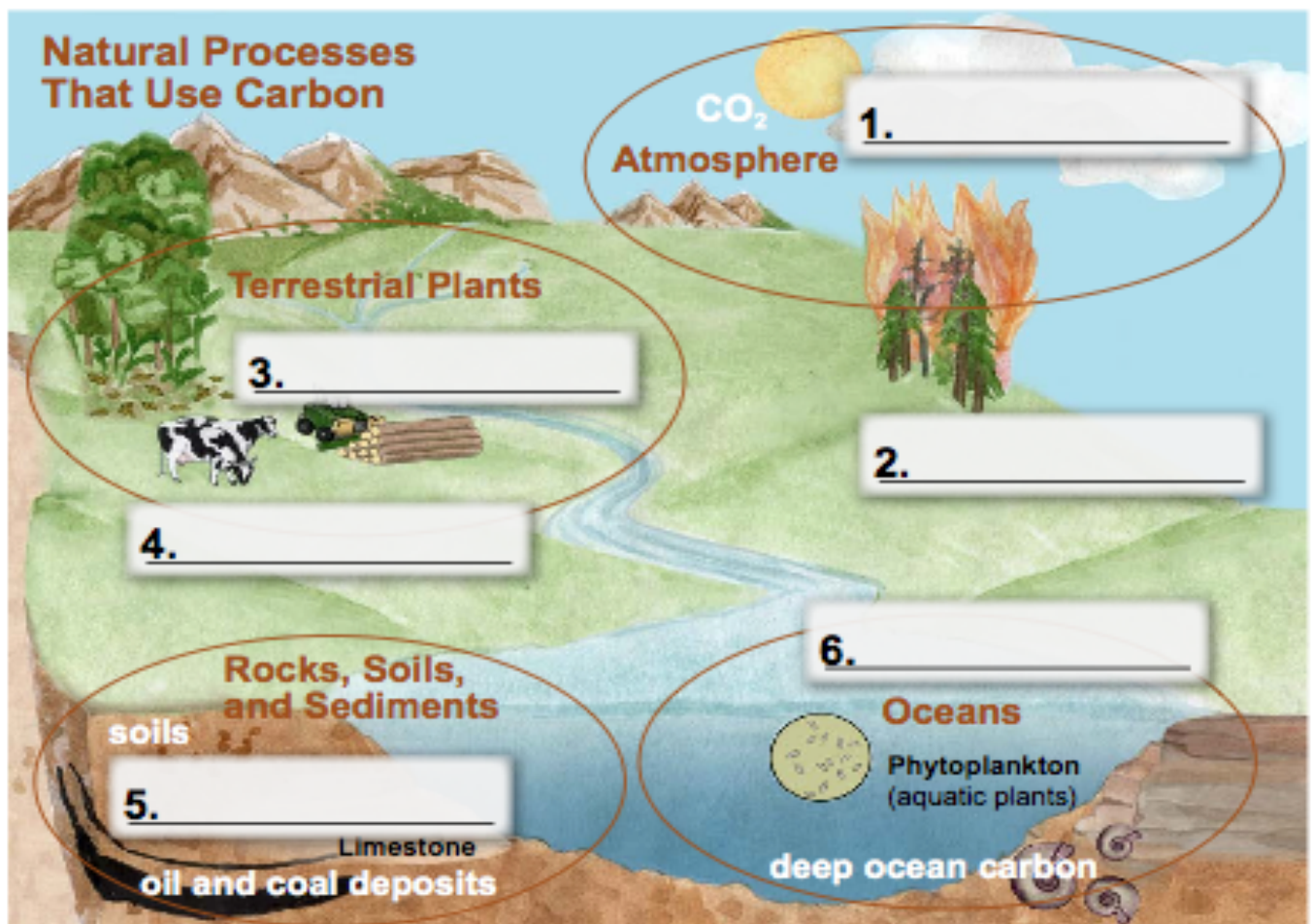
---



---

- As a group, brainstorm how carbon moves from one reservoir to another. Use the following questions to guide your discussion:
  - What function does carbon serve in each reservoir?
  - What are the different natural processes involved in carbon movement?
  - How do people or natural systems benefit from these functions?

On each of the lines in the illustration identify a natural process that moves carbon to or from the reservoir. (1 point each)



- On the drawing shown add arrows between the processes and reservoirs to show the movement of carbon and carbon energy from one reservoir to another. (4 points)



