The Nutrient Cycles

The Water Cycle

1. Water cycles between the oceans, atmosphere and land. All living organisms require water.
	1. Water enters the atmosphere as **\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_**, a gas, when water evaporates from the ocean or other bodies of water.
		1. \_\_\_\_\_\_\_\_\_\_\_\_—the process by which water changes from a **\_\_\_\_\_\_\_\_** to a **\_\_\_\_\_\_\_\_\_\_.**
	2. Water can also enter the atmosphere by evaporating from the leaves of plants\_\_**\_\_\_\_\_\_\_\_\_\_\_\_\_**.
	3. Precipitation-**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
		1. The sun heats the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**.
		2. Warm, moist air rises and cools.
		3. Eventually, the water vapor condenses into tiny droplets that form **\_\_\_\_\_\_\_\_\_\_\_\_**.
		4. When the droplets become large enough, the water return to Earth’s surface.
	4. **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_—**Precipitation runs along the surface of the ground until it enters a river or a stream that carries the run-off back to an **\_\_\_\_\_\_\_\_\_\_** or lake.
	5. \_\_\_\_\_\_\_\_\_\_\_\_\_\_—Rain also seeps into the soil, some of it deeply enough to become \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Water in the soil enters plants through the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_**, and the water cycle begins anew.



The Carbon Cycle

1. Every **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** molecule contains the element **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**.
	1. Carbon and oxygen form **\_\_\_\_\_\_\_\_\_\_\_\_\_\_** gas (CO2), an important component of the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**.
	2. Carbon dioxide is taken in by plants during **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** and is given off by plants and animals during **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**.
2. Four main types of processes move carbon through its cycle:
	1. Biological processes, such as **\_\_\_\_\_\_\_\_\_\_\_\_\_**, **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**, and **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**, take up and release carbon and oxygen.
	2. Geochemical processes, such as **\_\_\_\_\_\_\_\_\_\_\_\_\_** and volcanic activity, release carbon dioxide into the atmosphere and oceans.
	3. Mixed biogeochemical processes, such as the burial and decomposition of **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** and their conversion under pressure into **\_\_\_\_\_\_\_\_\_\_\_** and **\_\_\_\_\_\_\_\_\_\_\_\_**(fossil fuels), store carbon underground.
	4. Human activities, such as **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**, cutting and **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** forests, and burning **\_\_\_\_\_\_\_\_\_\_\_\_**, release carbon dioxide into the atmosphere.



The Nitrogen Cycle

1. All organisms require nitrogen to make **amino** **acids**, which in turn are used to build **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**.
	1. Nitrogen gas makes up 78% of Earth’s **atmosphere**.
	2. Nitrogen containing substances such as **ammonia** (NH3), **nitrites** (NO2-), and **nitrates** (NO3-) are found in the wastes produced by many organisms and in dead and **decaying** organic matter.
	3. Nitrate is major component of plant **\_\_\_\_\_\_\_\_\_\_\_\_\_\_**.
2. Nitrogen gas is the most abundant form but only certain **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** can use this form.
	1. Such bacteria live in the \_\_\_\_\_\_\_\_\_ and on the **\_\_\_\_\_\_\_\_\_\_\_\_** of plants.
	2. These bacteria convert nitrogen gas into ammonium--**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**.
	3. Other bacteria in the soil convert ammonia into **nitrites** and **nitrates**.
3. Once the nitrites and nitrates are available, **\_\_\_\_\_\_\_\_\_\_\_** (plants) can use them to make **\_\_\_\_\_\_\_\_**.  **\_\_\_\_\_\_\_\_\_\_\_\_\_\_** then eat the producers and reuse the nitrogen to make their own proteins.
4. When organisms die, **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** return nitrogen to the soil as ammonia.
5. Other soil bacteria convert nitrates into nitrogen gas--**denitrification**. This process releases nitrogen into the atmosphere once again.

