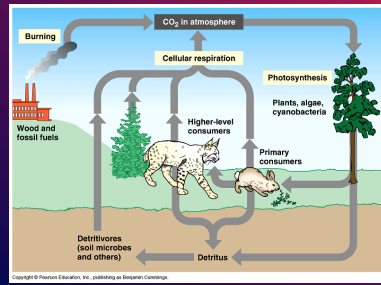


## Chapter 13 Principles of Ecology

### 13.5 Cycling of Matter

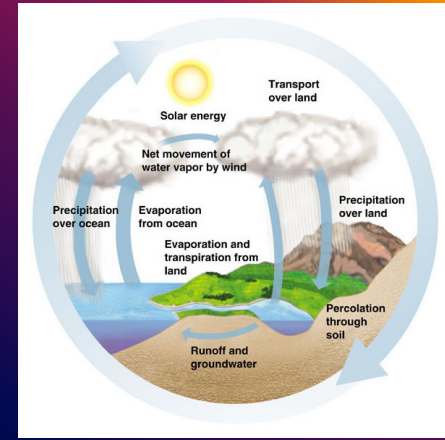
#### I. Water, minerals and compounds cycle between the biosphere, ecosystems, and organisms.

How is this different from how energy flows in an ecosystem?



#### II. Water cycles through the environment-

##### A. Water moves between land, bodies of water, living organisms, and the atmosphere.



##### B. Steps of the water cycle:

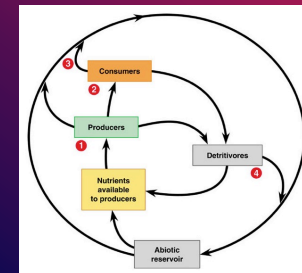
1. evaporation – loss of water from land or bodies of water
2. transpiration – loss of water from organisms
3. condensation – formation of clouds from water vapor
4. precipitation – when water returns back to the surface of Earth

#### III. Elements essential for life also cycle through ecosystems-

##### A. Biogeochemical cycles connects biological, geological, and chemical aspects of the biosphere.

##### B. There are three nutrient cycles:

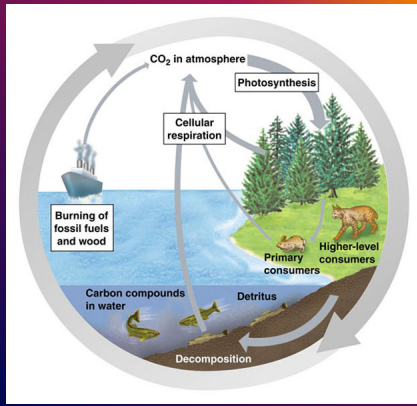
1. Carbon
2. Nitrogen
3. Phosphorus



### C. The Carbon Cycle

1. Carbon is a key ingredient in living tissue and is stored in the atmosphere, water, fossil fuels, rocks, ice and in the soil.

Where are the abiotic reservoirs?



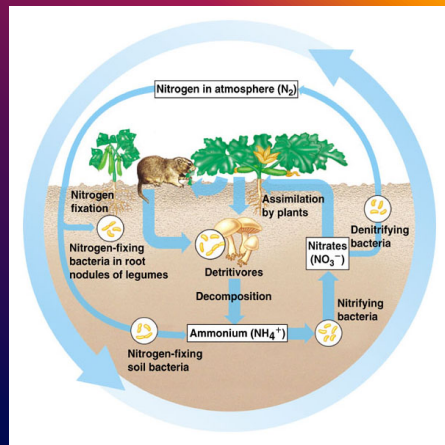
### 2. Steps of the carbon cycle:

- a. photosynthesis – takes carbon from the atmosphere and stores it in organisms as sugar
- b. respiration – released the stored carbon in sugar as CO<sub>2</sub> and energy
- c. decomposition – releases CO<sub>2</sub> from organisms as they decompose
- d. burning of fossil fuels - releases CO<sub>2</sub> from organisms as humans burn them for energy

### D. The Nitrogen Cycle

1. Nitrogen is needed to make amino acids and proteins in living organisms.

Where is the biotic reservoir?



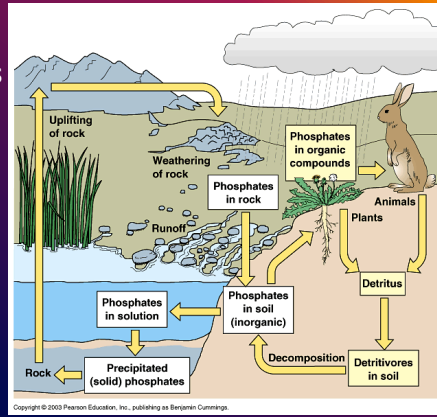
### 2. Steps of the nitrogen cycle

- a. nitrogen fixation - bacteria convert the nitrogen in the air into nitrogen that can be used by producers.
- b. consumption - organisms eat producers or other consumers that have obtained proteins.
- c. denitrification - bacteria convert nitrogen from decaying matter into nitrogen gas.

## E. The Phosphorus Cycle

1. Phosphorus is needed to make DNA, amino acids and proteins in living organisms.

Where are the abiotic reservoirs?



## Think – Pair - Share

- 1) What are the main processes of the water cycle?
- 2) Identify the process that moves carbon from the atmosphere into producers.
- 3) How do animals obtain the carbon they need if they are unable to do photosynthesis?
- 4) What are the two main processes in the nitrogen cycle.
- 5) What kinds of organisms are responsible for driving this process?
- 6) Identify the abiotic reservoirs for nitrogen.
- 7) Why do living organisms need phosphorus?