2.5  
The Carbon Cycle  
Game with interactive movement through the carbon cycle:  
<http://www.windows.ucar.edu/earth/climate/carbon_cycle.html>  
Excellent explanation and activity for the carbon cycle:   
1. <http://www.enviroliteracy.org/article.php/478.html>   
Carbon Cycle is the key element for living things.  
Each year about 50 – 70 billion tones of carbon from inorganic carbon dioxide are recycled through the process of PHOTOSYNTHESIS  
Reactant Producers  
6CO2 + 6H2O + Sun Light ◊ C6H12O6 + 6O2  
Carbon Dioxide + water + Light Energy◊ Sugar (glucose) + oxygen  
Some of the organic carbon that is created is released back into the environment through the process of RESPIRATION  
Reactant Producer  
C6H12O6 + 6O2 ◊ 6CO2 + 6H2O  
Sugar (glucose) + oxygen ◊ Carbon Dioxide + water  
Reservoirs for inorganic Carbon time in years stored  
1. Atmosphere 3  
2. Soil 25-30  
3. Oceans 1500  
Reservoirs for Organic Carbon - Stored in the bodies of all living things  
Human are changing the Carbon Cycle by   
1. Releasing organic reservoirs faster than would normally occur in nature by:  
a. burning forests  
b. mining  
c. burning fossil fuels  
2. Increasing the amount of carbon dioxide in the inorganic reservoir by:  
a. Clearing vegetation, for farm land, urban sprawl, development, wood supply…

2.6   
The Nitrogen Cycle  
View the animated cycle in action:  
<http://www.mhhe.com/biosci/genbio/tlw3/eBridge/Chp29/animations/ch29/1_nitrogen_cycle.swf>   
An excellent explanation of the cycle:  
<http://www.enviroliteracy.org/article.php/479.html>   
Nitrogen is required for:  
1. cells to make proteins  
2. The synthesis of DNA  
Nitrogen makes up nearly 79% of the earths atmosphere  
Nitrogen gas is very stable and reacts only under limited conditions. A complicated process called nitrogen fixation which creates a useable form called nitrate NO3-.  
Nitrogen fixation occurs by:  
1. Lightning causes nitrogen to react with oxygen and form nitrate which dissolves in rain and snow and falls to the ground.  
2. Bacteria in the soil – Nitrogen fixing bacteria found in the soil and on the roots of clover, soybeans and other plants ensure an ample supply of nitrate for the producer level of the food chain and trophic level.  
Nitrogen and decomposers   
All organisms die ◊ decomposers break the organic matter into ammonia NH3 ◊ other bacteria convert NH3 into nitrites ◊ other bacteria convert nitrites into nitrates ◊ and the cycle continues as producers absorb the nitrates through their roots.  
Denitrification   
Completes the cycle and maintains the balance between soil and atmospheric nitrogen. Some Bacteria who do not need oxygen break Nitrate down into Nitrite AND THEN NITRITE INTO Nitrogen gas which is released into the atmosphere. This step keeps levels balanced.  
  
The Phosphorous Cycle  
Animation  
[http://highered.mcgraw-hill.com/sites/0072879351/student\_view0/chapter10/animations.html#](http://highered.mcgraw-hill.com/sites/0072879351/student_view0/chapter10/animations.html)   
Explanation and details:  
<http://www.enviroliteracy.org/article.php/480.html>   
Phosphorous is a key element in:  
1. Cell membranes  
2. Molecules that help release energy  
3. Making long molecules of DNA  
4. Calcium phosphate in bones  
Phosphorous is found in bed rock in the form of Phosphate ions.  
Phosphates are soluble in water.  
When dissolved they can be absorbed by photosynthetic organisms (producers)  
Phosphates are used to make bones and shells   
The decaying shells in the ocean fall to the ocean floor and become sediment which eventually turns to rock and continues the Phosphorous cycle. It can take millions of years.