

<b>CHAPTER 2</b>	<b>Hydrologic and Biogeochemical Cycles Review Question and Answer Exercise Answer Key</b>	<b>BLM 2.2.15A</b>
<b>ANSWER KEY</b>		

1. a) Energy moves in a linear pattern from one trophic level to the next until it leaves the ecosystem. Matter is continuously cycled through the ecosystem.  
  
b) Earth is often referred to as a closed system with regards to matter because no new matter, other than occasional meteors or space debris, is added to the Earth as a system. Instead the planet recycles the material it has. Conversely, Earth is often referred to as an open system with regards to energy because the planet is constantly receiving energy from the Sun and radiating it into space as heat.
2. a) transpiration; evaporation; energy, radiant energy, or radiation  
b) nutrient reservoirs; rapid cycling  
c) sulfate ( $\text{SO}_4^{2-}$ ); atmosphere or air; acid deposition  
d) nitrogen fixation; denitrification  
e) atmosphere; aquatic; algal bloom
3. Oxygen is an end product of photosynthesis and a reactant in cellular respiration. Carbon dioxide is an end product in cellular respiration and a reactant in photosynthesis. Thus the carbon and oxygen cycles are linked.
4. Nitrogen fixation involves atmospheric nitrogen, while ammonification involves nitrogen released from decomposition of organic matter. The processes are similar as they both involve bacteria.
5. Excess dissolved phosphorus in a lake could result in an algal bloom. Resulting algal overgrowth can block sunlight so that plants below the surface of the lake can no longer photosynthesize. When these plants die, the decomposer population grows quickly, depleting oxygen levels in the water.