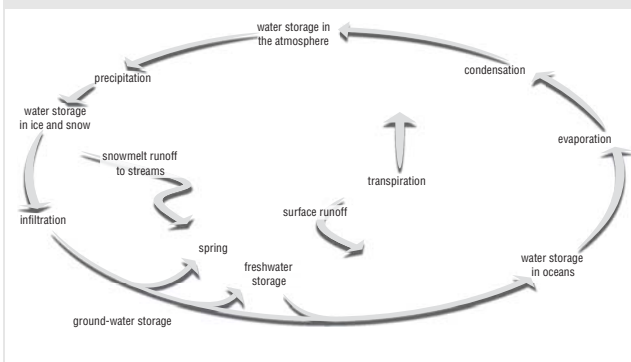


Section 2.1 Review Answers

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1. (a)

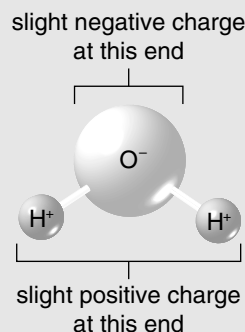


(b) The hydrologic cycle shows the pathway that water takes through the biosphere in clouds, precipitation, ice caps, rivers and streams, and lakes and oceans. It also indicates that water percolates through the ground in ground water and enters the atmosphere again via transpiration. Based on the hydrologic cycle, a biogeochemical cycle can be defined as the path a nutrient takes as it cycles through the biosphere, in different phases, through living, as well as non-living parts of the environment.

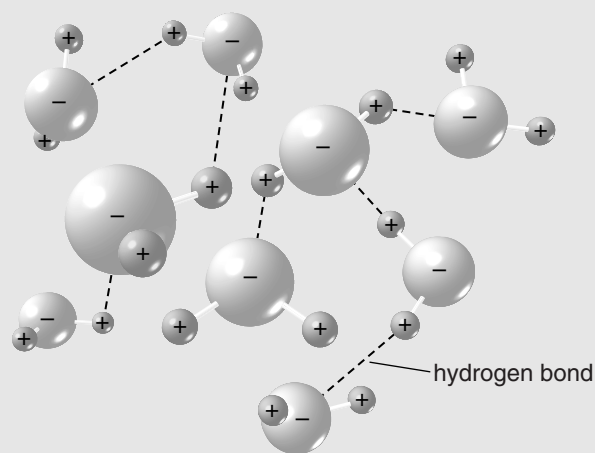
2. Water is a greenhouse gas and therefore traps heat in Earth's atmosphere, helping to maintain global temperatures within a certain range. Water also transfers heat. Water vapour distributes heat away from the equator. Ocean currents transfer warm water from hotter to cooler regions and vice versa. The ocean also moderates the temperature over nearby land. Further, photosynthesis will decrease if insufficient water is available to photosynthetic organisms. Such a reduction will decrease the amount of carbon dioxide such organisms take up, thus increasing carbon dioxide levels in the atmosphere.

Because carbon dioxide is an important greenhouse gas, global temperatures may increase as a result.

3. (a)



(b)



4. Water is polar, having partial positive charges and a partial negative charge at either end, enabling the molecules to form hydrogen bonds. The charged portions of a water molecule attract oppositely charged ions and other polar molecules, enabling water to dissolve a wide variety of molecular and ionic compounds.
5. Cohesion, the attraction of water molecules to each other due to hydrogen bonding, creates surface tension. Surface tension prevents the water strider's legs from penetrating the water.
6. Water is important to life because:
 - It is a reactant in photosynthesis and product of cellular respiration
 - It moderates environmental temperature and body temperature
 - It is a major transport material
7. Animals may obtain more water (from cellular respiration or by drinking, eating, or absorbing water through the skin). Some animals live in or near water, while others, like Ord's kangaroo rat, are physiologically and behaviourally adapted to retain water. Such organisms excrete very little water and are often nocturnal.

- 8.** In Alberta, water is used mainly for irrigation, commercial/industrial uses, agriculture, municipal uses (drinking, washing, cooking), recreation, wildlife and fish management, habitat enhancement, and water management (lake levels).
- 9.** Water quality is an indicator of purity (lack of pollutants).
 - (a)** Maintaining water quality is important to society because we use clean water for drinking, cooking, washing, irrigating food crops, and for recreation.
 - (b)** Healthy water quality is important for ecosystems because pollutants can harm organisms throughout the food chain.