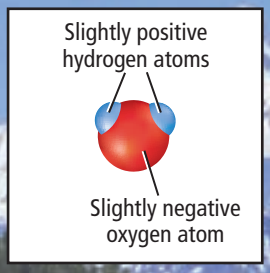
Visualizing Properties of Water

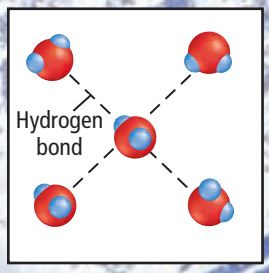
Figure 6.20
Water is vital to life on Earth. Its properties allow it to provide environments suitable for life and to help organisms maintain homeostasis. Humans can survive many days without food, but can survive only a few days without water.

Water Molecule

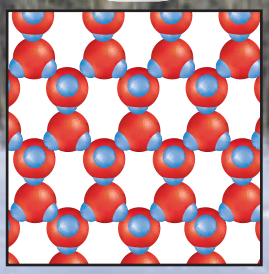


- Water is made up of one oxygen atom and two hydrogen atoms.
- Water is polar. Its bent shape results in a slightly positive charge on the hydrogen atoms and a slightly negative charge on the oxygen. As a result, it forms hydrogen bonds.
- Water is called the universal solvent because many substances dissolve in it.

Hydrogen Bonding

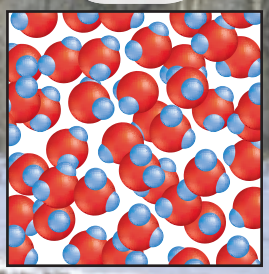


Solid



Liquid water becomes more dense as it cools to 4°C. Yet ice is less dense than liquid water. As a result, nutrients in bodies of water mix due to changes in water density during spring and fall. Also, fish can survive winter because ice floats—they continue to live and function in the water beneath the ice.

Liquid



Water is adhesive—it forms hydrogen bonds with molecules on other surfaces. Capillary action is the result of adhesion. Water travels up the stem of a plant, and seeds swell and germinate by capillary action.

Water is cohesive—the molecules are attracted to each other due to hydrogen bonds. This attraction creates surface tension, which causes water to form droplets and allows insects and leaves to rest on the surface of a body of water.

Interactive Figure To see an animation of water, visit biologygmh.com.

David Whitten/index Stock Imagery

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