iv. Chemical compounds contain atoms from at least two different elements all salts are compounds but a molecule is a compound only if it contains atoms from at least two different elements

c. 2.3 the special properties of water
   i. Hydrogen bonds are weak associations between two molecules such that a partially positive hydrogen atom within one molecule is attracted to a partially negative region of the other molecule partial electrical charges result from the unequal sharing or electrons between atoms giving rise to polar molecules
   ii. Water is a polar molecule hydrogen bonding between water molecules accounts for the special properties of water including its high heat capacity and high heat vaporization properties that enable water to moderate temperature swings.
   iii. Water has the highest surface tension of any liquid except mercury surface tension is a force that tends to minimize the surface are of water at an air water boundary and it influences many biological phenomena

d. 2.4 chemical reactions
   i. In chemical reactions bond between atoms are formed or broken although the participants in a chemical reaction are modified to give rise to ions or molecules atoms are neither created nor destroyed in the process
   ii. Some chemical reactions release energy others cannot proceed without an input of energy

e. 2.5 the PH scale
   i. The life supporting chemical reactions of a cell are conducted in a watery medium acids donate hydrogen ions in a solution bases accept hydrogen ions
   ii. The concentrations of free hydrogen ions in water is expressed by the PH scale
   iii. Buffers help maintain a constant PH in an aqueous solution

f. 2.6 the chemical building blocks of life
   i. Carbon atoms can link with each other and with other atoms to generate a great diversity of compounds
   ii. The four main biomolecules are carbohydrates proteins lipids and nucleic acids

g. 2.7 carbohydrates
   i. Carbohydrates include simple sugars monosaccharides as well as disaccharides and more complex polymers (polysaccharides)
   ii. Carbohydrates provide energy and physical support for living organisms

h. 2.8 portions
   i. Amino acids are the building blocks of proteins a chain of amino acids linked together makes a polypeptide which constitutes the primary structure of a protein
   ii. The three-dimensional shape of a protein is critical for its biological function

i. 2.9 lipids
   i. Lipids are hydrophobic substances containing one or more rings or chains of hydrocarbons fatty acids the building blocks of most lipids are saturated or unsaturated depending on the absence or presence respectively of double covalent bonds in their hydrocarbon chains
   ii. Triglycerides are important for energy storage