

Unit 6: The Chemistry of Life

review of basic chemistry

atom: the basic unit of matter, smallest unit of an element that shows properties of element, can't be broken down smaller & still be element
ex. H, O, C

subatomic particles:

proton, neutron, electron

proton: + charge, found in nucleus of atom

neutron: no charge, found in nucleus of atom

electron: - charge, found in electron cloud, orbitals, shells, E levels

isotope: atoms of an element where there are different #s of neutrons, naturally occurring forms of an element
this makes them heavier

radioisotopes are unstable, nuclei break down at constant rate over time

mixture: 2 or more elements physically mixed together

what is a nonchemical example of a mixture?

what is a **solution**? **solute**? **solvent**?

compound: 2 or more elements chemically combined

example?

molecule: smallest unit of a compound

bonding

why do atoms interact?

what types of atoms do not interact?

how active an element is depends on # of electrons and

how many are needed to fill outermost E level

ion: a charged atom, charged b/c it has given up or gained an electron

ex: H^+ , Na^+ , Cl^-

ionic bond: when one element gives up one or more e^- , one element takes one or more e^-

this creates 2 ions of opposite charges, attraction of charges holds elements together

covalent bond: when e^- are shared btw atoms

the e^- circle around nuclei of both atoms holding them together

covalent bonds are very strong, can be hard to break them

sometimes e^- are not shared equally in a covalent bond and

b/c of the rapid movement of e^- , both of these result in parts of the molecule having a slight charge, which means it is polar

if there is a charge, they can attract other molecules to them

water is a polar molecule

oxygen, being bigger has a stronger pull on the H e^- and

they are more likely to be found circling around the O

b/c H_2O is polar, it attracts other H_2O molecules

H tends to be $+$ and is attracted to other $-$ parts of molecule

this is called **H bonding**

pH refers to how acidic or basic (alkaline) a substance is
this relates to concentration of H^+ and OH^- in a solution
if there is a greater conc of H^+ : acidic
if there is a greater conc of OH^- : basic

pH scale: 0-14 7=neutral, equal conc of H^+ & OH^-
0-6: acidic 8-14: basic

living organisms function best in near neutral pH
acids can burn, alkalis can burn

organic compounds: have C, H, O as base
make up living organisms, made by living organisms
97% of compounds making up living organisms are
composed of 6 elements: SPONCH

biochemistry: study of organic compounds, study of
chemistry of living organisms

why is C the basic molecule?

C tends to form covalent bonds, creates strong
molecules

C also tends to form 4 bonds with other atoms or it can
form double & triple bonds

molecular formula: tells # of atoms of each element
does not tell how atoms are arranged
 H_2O , CO_2 , $NaCl$

structural formula: shows how atoms are arranged, shows
where bonds are formed

there are **4 main classes of organic compounds:**
carbohydrates, lipids, proteins, nucleic acids

