

- a. Have unstable nuclei that change or decay into simpler forms releasing high-energy radiation in the process
- b. 2.2 the bonds that link atoms
 - i. Intro
 - 1. Chemically inert atoms tend not to interact with other atoms by losing gaining or sharing electrons
 - 2. Most atoms are far more social by sharing, giving up and taking electrons
 - 3. The interaction that causes two atoms to associate with each other is known as a chemical bond
 - a. Covalent bonds
 - i. In which atoms share electrons from molecules
 - b. Ionic bonds
 - i. In which atoms with opposite electrical charge are held together by their mutual attraction atoms held together by ionic bonds are salts
 - 4. A chemical formula represents the atomic composition of molecules and salts.
 - 5. Ions have one negatively charged atom and one positively charged atom
 - 6. Chemical compounds are a substance in which atoms from two or more different elements are bonded together
 - ii. Covalent bonds from by electron sharing between atoms
 - 1. a molecule contains at least two atoms held together by covalent bonds.
 - 2. When an element has all its electron shells fully stocked then it is stable
 - 3. Atoms that have unfilled outer shells can achieve a more stable state by interacting in ways that will achieve maximum occupancy of the outer most shell (the valence shell)
 - 4. Atoms can be in a double bond is where 2 electrons are shared between two atoms as in O_2 or oxygen gas
 - 5. There can be multiple bonds between atoms
 - 6. There are several different types of models such as the ball and stick model. A space filling model
 - iii. Ionic bonds from between atoms of opposite charge
- c. 2.3 The special properties of water
 - i. Intro
 - 1. Life started in the oceans about 3.5 billion years ago
 - 2. The average cell is about 70% water
 - 3. Nearly every chemical process associated with life occurs in water
 - ii. Water is a polar molecule
 - 1. Electrons in covalent bonds do not always shared equally, for instance in water the oxygen atom is in possession of the electron more than the hydrogen proton. so, in this case the hydrogen becomes partially positively charged and the oxygen becomes partially negatively charged.

i. Intro

1. Sugars are an important source of energy for nearly all organism
2. The name carbohydrates come from the atoms that are in carbs. And those atoms are carbon, hydrogen oxygen, for every carbon atom there is one oxygen and two hydrogens.
3. Monosaccharides are the simplest sugars, often called by the amount of carbons they have
4. The most monosaccharide is glucose found in almost all living things
5. Two monosaccharides joined covalently make a disaccharide
6. Dehydration is the process of removing a water molecule as a covalent bond is formed.
7. A hydrolytic reaction is where water is added to break a substance.
8. Polysaccharides are large polymers built by linking many monosaccharides
9. Cellulose is a polysaccharide that is bundled into strong parallel fibers. Fibers that help support the plant cell body
10. Starch is abundant in mashed potatoes. It's a polysaccharide that serves as an energy storage molecule inside plant cells.
11. Glycogen is the main storage polysaccharide in animal cells most it is in the liver and skeletal muscle cells.

h. 2.8 Proteins

i. Intro

1. Proteins are composed of amino acid monomers are among the most famous biomolecules
2. Proteins functions are
 - a. Storage
 - i. Bird eggs and plant seeds contain storage proteins whose function is to supply the building blocks that offspring need for growth
 - b. Structure
 - i. Our own bodies contain thousands of different types of proteins some of these form anatomical structures and are classified as structural proteins such as those found in bones cartilage hair and nails
 - c. Transport
 - i. Some proteins ferry nutrients and other materials within the body the proteins hemoglobin abundant in our red blood cells binds oxygen and helps move it through the body
 - d. Catalysis
 - i. Substances that speed up chemical reactions are called catalysts almost all chemical reactions in living organisms are catalyzed by proteins as enzymes.

ii. Proteins are built from amino acids

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