

**Note-taking
Worksheet****Organic Compounds****Section 1 Simple Organic Compounds**

A. Organic compounds—compounds mostly found in living things and containing the element _____

B. Carbon can form many _____ because:

1. It has _____ electrons in its outer energy level, so it can form _____ covalent bonds with atoms of carbon or other elements.
2. It can link together with other _____ atoms in many different arrangements, like chains, branched chains, or rings.
3. It can form single, double, or triple _____.
4. It can bond with atoms of other _____, such as hydrogen and oxygen.

C. Hydrocarbon—a compound made up of only _____ and _____ atoms

1. Many, many different compounds
2. Hydrocarbons produce more than 90 percent of the _____ humans use.
3. Examples:
 - a. _____, CH_4 , which is the chemical name for natural gas
 - b. _____, C_3H_8 , which is used in outdoor grills and heaters in hot air balloons

D. Single bonds

1. **Saturated hydrocarbons**—hydrocarbons that contain only _____ carbon atoms
 - a. Holds as many _____ atoms as possible
 - b. Examples: methane, ethane, propane, butane
 - c. Boiling point _____ with addition of carbon atoms
2. **Structural isomers**—compounds that have _____ chemical formulas but _____ molecular structures and shapes
 - a. The _____ of isomers can vary a lot.
 - b. Generally, melting points and boiling points _____ with more branching in the isomer.

E. Multiple bonds

1. **Unsaturated hydrocarbons**—hydrocarbons that contain at least one _____ or _____ bond

Note-taking Worksheet (continued)

2. Example of double bond
 - a. _____, C_2H_4 ; also called _____
 - b. Two carbon atoms share _____ electrons
 - c. Aids in ripening of peaches
3. Example of triple bond
 - a. _____
 - b. Two carbon atoms share _____ electrons
4. Polyunsaturated hydrocarbons have _____ double or triple bond.

Section 2 Other Organic Compounds

- A. Aromatic compound**—a compound that contains a _____ structure, which is a ring with six carbon atoms
1. The _____ are shared by all six carbon atoms in the ring.
 2. Equal sharing of _____
 - a. Shown as alternating _____ and _____ bonds
 - b. Causes the benzene molecule to be very _____
- B. Substituted hydrocarbons**—compounds that have one or more of their _____ atoms replaced by atoms or groups of other elements
1. **Alcohols**—hydrocarbons in which _____ groups replace one or more hydrogen atoms in a hydrocarbon
 - a. Example: _____, or grain alcohol, C_2H_5OH
 - b. Uses: solvents, disinfectants, pieces to make larger molecules
 2. Organic acids
 - a. Hydrocarbons in which _____ groups replace one or more hydrogen atoms in a hydrocarbon
 - b. Examples: _____ acid in citrus fruits, _____ acid in sour milk, _____ acid in vinegar
 3. Other _____ can be added to hydrocarbons as well.
 - a. Example: foul-smelling _____ result when sulfur replaces oxygen in the $-OH$ group of an alcohol
 - b. use of mercaptans: add to _____ so leaks can be detected

Note-taking Worksheet (continued)**Section 3 Petroleum—A Source of Carbon Compounds**

- A. Petroleum is a mixture of thousands of _____ compounds.
1. Fractional distillation—process that uses the different _____ of compounds to separate the individual carbon compounds in petroleum
 2. Some uses of petroleum compounds: fuels, solvents, asphalt, and _____
- B. **Polymers**—extremely large, _____-like molecules
1. _____—small molecules that form links in the polymer chain
 2. Polymers can be made to have many different _____, from light and flexible to strong and rigid. These properties depend on:
 - a. Which _____ are used to make the polymer
 - b. The amount of _____ in the polymer molecule
 - c. How the polymer is _____
 3. Example: _____
 - a. Made when ethylene combines with _____ repeatedly
 - b. Uses: shopping bags, _____

Section 4 Biological Compounds

- A. Biological polymers—huge, chain-like molecules that are found in _____
- B. **Proteins**—large organic polymers formed from organic monomers called _____
1. _____ amino acids arranged in different ways make millions of different proteins.
 2. Proteins make up your muscles, tendons, hair, and _____.
 3. Your body breaks down the proteins into their amino acid monomers. Your body then uses these amino acid monomers to make new _____ for muscles, blood and other body tissues.
- C. **Nucleic acids**—organic polymers formed from monomers called _____.
1. Nucleic acids control the activities and reproduction of _____.
 2. **Deoxyribonucleic acid**, or _____—the nucleic acid, found in the nuclei of cells, that stores the genetic code
 3. In human DNA, four nucleotides form two chains that twist together to form a _____.
 4. Use: DNA fingerprinting

Note-taking Worksheet (continued)

D. Carbohydrates—compounds that contain carbon, hydrogen, and oxygen and that have twice as many _____ atoms as oxygen atoms

1. _____ provide quick energy soon after eating.
2. _____ are polymers made of monomers of the sugar glucose.
3. Every amino acid contains an _____ group, $-\text{NH}_2$, and a _____ group, $-\text{COOH}$.
4. _____ bonds form between the amine group of one amino acid and the carboxyl group of another amino acid.
5. Proteins are polymers of about 100 or more _____ linked by _____.

E. _____ contain the same elements as carbohydrates, but in different proportions.

1. Includes fats, oils, and _____
2. Saturated fats contain only _____ between carbon atoms.
3. Unsaturated fats contain at least one _____.