**Carbon Compounds Guided Notes**

1. All living things are made up of chemical \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. The smallest unit of all things is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Atoms are composed of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ found in the nucleus, and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ found in energy levels around the nucleus.

2. Electrons in the last, or outermost energy level, are important for forming \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ between other atoms. A substance consisting of only one type of atom is an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Lots of bonds between different types of atoms are called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are pure substances that are made of the same type of atom. EX: Carbon (C), Hydrogen (H), Oxygen (O), Nitrogen (N), Phosphorus (P).

One of the most important elements to living things is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

4. Carbon is unique. It can:

 (1) Form 4 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ with many different elements

 (2) Can bond to other carbon atoms, giving it the ability to form \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ almost unlimited in length

 (3) Can form bonds of different \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (single, double, triple bonds)

 (4) Is extremely \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (can form millions of different large and complex structures)

 (5) is abundant – there’s lots of it!

5. Carbon can bond with up to four other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Carbon has 4 (outermost) electrons that can be shared with other elements. This allows it to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ with 4 other atoms.

6. Carbon \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ readily with itself. This allows carbon to be the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of large and complex molecules. Carbon bonds readily with other elements - in living things: Sulfur, Phosphorus, Oxygen, Nitrogen, & Hydrogen (\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_)

7. Carbon bonds to build a variety of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ including straight chains, branched chains and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

8. Carbon forms bonds of different \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ including single, double and triple \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

9. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are substances made up of different elements EX: Water (H2O), Glucose (C6H12O6), Carbon Dioxide (CO2). Molecules are examples of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, single building blocks that are joined together to make polymers.

10. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are macromolecules. Macromolecules – “giant molecules” made from thousands or hundreds of thousands of smaller molecules. Formed through a process called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Smaller units (\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_) join together to make larger, longer units (\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_).

11. Polymerization is similar to stringing beads on a necklace. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are represented by beads and the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is represented by the necklace. Monomers can be the same, or different.

12. —Four types of biomolecules:

(1) Carbohydrates – sugars and starches

(2) Lipids – fats and oils

(3) Proteins – enzymes

(4) Nucleic Acids – DNA, RNA, ATP, ADP

13. Each type of biomolecule has its own monomer unit

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| **Biomolecule (polymer)** | **Monomer** |
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**Polymer**