Name / Date / Period

Source: _____, Section: _____, pg. _____

Objectives:

1. Define elements and compounds
2. Explain why carbon is essential to life on Earth
3. Describe the structure and function of the four major types of organic compounds

Matter and Organic Compounds	
Chemical Sub-	A **chemical substance** is matter that has a definite composition. It also has
stances	the same composition throughout. A chemical substances may be either
	an element or a compound.
Elements	An element is a pure substance. It cannot be broken down into other types
	of substances. An **atom** is the smallest particle of an element.
Compounds	A **compound** is a substance that consists of two or more elements that is
	always the same. The smallest particle of a compound is called a molecule.
	Molecules have **chemical bonds**, a force that holds them together. This is
	much like a drop of water. A **chemical reaction** is the process that changes
	some chemical substances into another and is needed to form a
	compound or to separate the substances in a compound.
The Significance	An **organic compound** is mainly found in living things. They make up cells
of Carbon	and other structures of necessary to carry out the function of life. **Carbon**
	is the main element in organic compounds, so it is very necessary to life on
	Earth.
	Carbon is responsible for making stable bonds with many elements. This
	allows carbon to form a big variety of complex molecules. This character-
	istic is what makes carbon such an important element. Also, carbon makes
	up millions of organic compounds that can be grouped into just four types:
	carbohydrates, lipids, proteins, and nucleic acids. *Complete the table*

Table 1.1

Compound Type	Example	Elements	Functions	Monomer
Carbohydrates				
	fats, oils			
			Helps cell keep shape, makes up muscles, speeds up chemical reactions, carries messages	
Nucleic acids				

Carbohydrates, proteins, and nucleic acids are large molecules (macromolecules) built from smaller molecules (monomers) through dehydration reactions, where water is removed as two monomers are joined together.

Carbohydrates are the most common type of organic compounds. A **Carbohydrate** is an organic compound such as sugar or starch, and is used to store energy.

A **monosaccharide** is the simple sugar such as fructose or glucose. Fructose is in fruits and glucose is a result of digestion or other carbohydrates. It is used for energy by the cells of most living things.

A **polysaccharides** is a complex carbohydrate that forms when a simple sugar bind (joins) together in a chain. These carbs have two main functions: storing energy and forming structures of living things. ***Complete the table***

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Table 1.2

Name	Function	Example
Starch		
Glycogen		
Cellulose		
Chitin		

Lipids	A **Lipid** is an organic compound such as fat or oil. Living things (organisms)
	use lipids to store energy and are repeating units called fatty acids that
	include saturated fatty acids and unsaturated fatty acids.
	Saturated fatty acids are where carbon atoms are bonded to as many
	hydrogen atoms as possible. this caused the molecule to form straight
	chains that can be packed together tightly.
	Unsaturated fatty acids are where carbon atoms are not bonded (joined)
	to as many hydrogen atoms as possible. They bond to other groups of
	atoms. These acids form bent chains that cannot be paced together as
	tightly
	Types of lipids can include just fatty acids, or other molecules as well: tri-
	glycerides, phospholipids, and steroids.

Complete this table to show the major functions of the different types of lipids.

Lipid Types:	**Major Function:**
Triglycerides	
Phospholipids	
Steroids	

Proteins	A **protein** is an organic compound made up of small molecules called
	amino acids.
Protein	**Polypeptides** are amino acids that are bound together in a long chain. All
Structure	proteins have one or more polypeptide chain(s).
	A protein may have up to four levels of structure that include: Primary
	protein structure, secondary protein structure, tertiary protein structure,
	and quaternary protein structure.
Functions of	Proteins help cells keep their shape, and some make up muscle tissue.
Proteins	Many proteins speed up chemical reactions, while some form antibodies
	to get rid of foreign substances, like harmful bacteria. Other proteins
	carry messages or materials (like oxygen to other parts of the body).
Nucleic Acids	**Nucleic acids** are organic compounds, like RNA and DNA, that are built of
	small units called **nucleotides.** Many nucleotides bind together to form
	a chain called polynucleotides.
	Deoxyribonucleic acid, or **DNA**, is made up of two polynucleotide chains,
	where ribonucleic acid, or **RNA**, is made up of just one polynucleotide
	chain.
Structure of	**Nucleotides** have three smaller molecules: **Sugar, phosphate group,** and
Nucleic Acids	**nitrogen base**. The sugar of one nucleotide binds to the phosphate group
	of the next nucleotide to form the backbone of the nucleotide chain.
	The nitrogen base in a nucleic acid stick out from the backbone.
	There are four different types of bases: Cytosine, adenine, guanine, and
	either thymine (in DNA) or uracil (in RNA).
Role of Nucleic	DNA is found in genes and have information that tells cells when to grow
Acids	and stop growing by telling amino acids in a protein the correct order. RNA
	uses the information from DNA to assemble the correct amino acids in the
	correct sequence to make the proteins needed for the task.

SUMMARY: On a **separate piece of paper**, write a paragraph summary of the notes. Be sure to incorporate as many of the lesson objectives as possible. Lastly**, attach the summary to these notes.**