Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period: \_\_\_\_\_\_\_\_

**The Chemistry of Life**

**Four things all organisms need:**

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ needed for chemical reactions

2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_ needed to get energy from food

3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_ needed for energy/ATP (small energy packet)

4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ needed for resources (food, water, etc.)

**Why do we have to learn chemistry in life science???**

Chemistry is a HUGE part of life science because every living thing is made up of matter which is made up of elements….which are made of atoms…. Getting the picture here??

Air…Water….Food

**Some Definitions you gotta know!**

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_—anything that has \_\_\_\_\_\_\_\_\_\_\_\_ and takes up \_\_\_\_\_\_\_\_\_\_\_\_!
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_—a substance that is made of only\_\_\_\_\_\_\_ kind of \_\_\_\_\_\_\_\_\_\_\_. An element cannot be broken downinto simpler substances

**Elements**

* **\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**that make up everything
* Names of elements are abbreviated using \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* The most common elements in living things are:
	+ **Carbon (C)**
	+ Oxygen (O)
	+ Hydrogen (H)
	+ Nitrogen (N)
	+ Sulfur (S)
	+ Phosphorus (P)

**Even more definitions…**

* \_\_\_\_\_\_\_\_\_\_\_\_—the smallest \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_of an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that still

has the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_or properties of that element

* Basic building blocks of all matter

 For ex. Iron atoms act like iron, gold atoms act like gold, etc.



In the center, there are

* **\_\_\_\_\_\_\_\_\_\_\_\_\_** (positive charge)
* **\_\_\_\_\_\_\_\_\_\_\_\_\_** (neutral charge)
* Outside of the nucleus are **\_\_\_\_\_\_\_\_\_\_\_\_** (

**As a review…**

What two particles are found in the center of the atom? What are their charges?

What particles are floating around the nucleus in energy levels? What are their charges?

NOTE: Atoms of different elements have different \_\_\_\_\_\_\_\_\_\_\_\_\_of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_!

**Here’s a question for you……**

How do the electrons not fly away? Hint: Think about the charges!

**So what else do we need to know?**

Review: Where are atoms found in living things?

Atoms bond together to form \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_in living things.

 Example: Table salt is made of sodium atoms bonded to chlorine atoms:

 Table salt: \_\_\_\_\_\_\_\_\_\_\_\_

**Chemical Reactions**

Chemical reactions occur when \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ between atoms, changing one substance into another



**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: all the chemical reactions that occur in an organism**

* Just know that a compound is made up of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_and that they exist in living things!
* Can you name any compounds yourself?

**Symbols and Formulas**

* The chemical formula for the compound water is \_\_\_\_\_\_\_\_\_\_\_
* The “2” is written in subscript—this tells us \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_atoms of each element are

in a compound. So for water…

 There are \_\_\_\_\_\_\_\_\_ atoms of \_\_\_\_\_\_\_\_\_\_\_\_\_\_ (H) and \_\_\_\_\_\_ atom of \_\_\_\_\_\_\_\_\_\_\_\_(O).

**Try to decode these formulas:**

* Tell me how many and what types of atoms are in the following compounds:
1. CH4
2. CO2
3. C6H12O6
4. NH4

**One more thing on formulas**

* If you see a big number out in front of a formula, this tells you how many molecules you have. For example,

 6 H20 means that you have\_\_\_\_\_\_\_\_\_\_ molecules of water! How many atoms are in 6 H2O?

**Anything else I need to know?**

Yes—there are \_\_\_\_\_\_\_\_\_\_ kinds of compounds:

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_compounds contain \_\_\_\_\_\_\_\_\_\_\_\_and \_\_\_\_\_\_\_\_\_\_\_\_ and are usually quite \_\_\_\_\_\_\_\_\_\_\_\_(many atoms)
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_compounds usually do not contain carbon and are\_\_\_\_\_\_\_\_\_\_\_(few atoms

**Building blocks of life**

There are four kinds of organic compounds:

**Carbohydrates:**

 **Function:**

 **Examples:**

**Lipids:**

 **Function:**

 **Examples:**

**Proteins:**

 **Function:**

 **Examples:**

**Nucleic Acids:**

 **Function:**

 **Examples:**

**So what do I need to know?**

**Learn these definitions. You must have a basic understanding of these words in order to understand how they relate to life science. How’s that for your first chemistry lesson??**