Name:

**Similarities and Difference Among Living Things and Chemistry Study Guide**

1. What are the four main characteristics of life?
	1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. All living things are separated into general categories called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
3. Nonliving things do not have function cells, maintain \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, have no metabolic activity and are not able to reproduce.
4. Define Metabolism:
5. What are the kingdoms that all living things are categorized into?
6. There are 8 life processes that living things carry out to survive. Name all 8 life processes:
	1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	5. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	6. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	7. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	8. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
7. Define Diffusion:
8. Why is diffusion important?
9. All things, both living and nonliving are made of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
10. Complete the chart:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Mass | Charge | Location | Symbol |
| Protons |  |  |  |  |
| Neutrons |  |  |  |  |
| Electrons |  |  |  |  |

1. Define atom:
2. Atomic number is the same as the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. All atoms want a full \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. To achieve this all atoms want to have \_\_\_\_\_\_ electrons in their outer orbital.
4. Atomic mass = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_+\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. Define ion:
6. An isotope has the same number of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ but a different number of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
7. Define Radioisotope:
8. All living things have a high percentage of which 4 elements?
	1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
9. All bonds have to do with the interaction of electrons between atoms. An ionic bond\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ electrons from one atom to another. Covalent bond \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_electrons between two atoms. Metallic bonds have the ability for electrons to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ between atoms of the same metal.
10. If an atom loses electrons it becomes more (POSITIVE or NEGATIVE) in charge. If an atom gains electrons it becomes more (POSITIVE or NEGATIVE) in charge. (CIRCLE ONE)
11. Metallic bonds have electrons that move freely. This allows for elements like copper to have good electrical \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
12. What is the difference between inorganic molecules and organic molecules?
	1. Write the chemical formula of at least 3 inorganic molecules:
13. What are the four main organic macromolecules?
	1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
14. Complete the chart:

|  |  |  |  |
| --- | --- | --- | --- |
|  | Building Blocks | Use | Enzyme that can break them down |
| Proteins |  |  |  |
| Carbohydrates |  |  |  |
| Nucleic Acids |  |  |  |
| Lipids |  |  |  |

1. Why are some lipids liquids at room and some are solids at room temperatures?
2. What are the four purposes of proteins:
	1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Enzymes are proteins that act as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. A catalyst is a substance that can speed up a reaction. Enzymes act on \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and are shape-specific to that substrate. The substrate and the enzyme connect at the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and form the enzyme-substrate complex. Changes in the environment can change the shape of the enzyme which is known as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. If you \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_the temperature the enzyme may never function again. However, if the temperature is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the enzyme simply works slower but still should be able to function if temperature is returned to normal.
4. DNA stands for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. RNA stands for\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
	1. What is the difference between DNA and RNA?
5. Define dehydration synthesis:
6. Define hydrolysis:
7. The pH scale compares how acidic or basic substances are. They do this by comparing the amount of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ions and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ions in solution. If you have a lot of hydrogen ions in your solution then you will have a low number of pH. If you have a high number as your pH then you would not be considered acidic but \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. A pH of 7 is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, a compound that has a pH of 7 is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
8. Water has a chemical formula of \_\_\_\_\_\_\_\_\_\_\_. When drawn it looks like:

Water has the ability to “stick” to other molecules which is known as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. It also can stick to itself which is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

1. Store energy is known as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Energy of motion is known as\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
2. If I start with water (H2O) and it is changed to hydrogen peroxide (H2O2) this would be an example of a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_change. If I start with ice and allow it to melt this would be an example of a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ change.
3. A reaction that releases heat is known as an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ reaction. A reaction that absorbs heat is known as an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ reaction. A reaction in which something is broken down is known as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_reaction. A reaction where molecules are put together, this is known as a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_reaction. Two compounds that have components that switch places is known as a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_reaction.
4. In salt water, what is the Solute, Solvent, and Solution?
	1. Solute\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	2. Solvent\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	3. Solution\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. What do the following prefixes mean? A. Mono\_\_\_\_\_\_\_\_\_\_ B. Poly\_\_\_\_\_\_\_\_\_ C. Marco\_\_\_\_\_\_\_\_\_\_\_ D.Di\_\_\_\_\_\_\_\_\_\_
6. What does the suffix saccharide mean?
7. The suffix –ose is used for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
8. Starch is made of many \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_molecules.