Elements & Compounds

All living organisms are composed of cells, from just one to many trillions.

Is life a form of chemistry?

From nonliving to living
As you know, all living things are made of ____________, and a cell is the basic unit of _____________. But where did the first cells come from? And, how did things go from nonliving to living? Well, in the 1950s, American scientist Stanley _____________ tried to find take ____________________ ingredients and make _____________. Miller put the chemicals found in Earth’s early ________________ in a closed container and sent an electric charge through that mixture to simulate lightning going through the atmosphere. Perhaps, Miller suggested, this was how ______________ compounds were made on the ancient Earth before life existed. While Miller did not find a recipe for making life, he DID make some ____________________. Amino acids are the building blocks of _____________—one of the compounds that make up all living things.

Chemistry
Miller, like other scientists, knew that life is a form of _________________. So, for us, that means in order to understand ________________, we need to learn some chemistry.

Atoms and Elements
A single ________________ is the smallest particle of an element that keeps the chemical ________________ of the element. Each element has a ________________ type of atom. All atoms of a given element are ________________ to each other. If you examined a million atoms of carbon you would find them all to be ________________.

Compounds
Sometimes elements are found in their pure form, but more often they are combined with other _________________. Most substances contain several elements ________________ together. A compound is a substance that contains ________________ or more different elements that are ________________ joined. Water, for example, is a compound that is made from the elements ________________ and ________________. Compounds contain more than one type of atom joined together. Note: All compounds are ________________ but not all molecules are compounds. Example: Oxygen (O2) is a molecule, but not a compound because it is composed of a single _________________.

Molecules
If you could magnify a sample of pure water so you could see its atoms, you would notice that the hydrogen and oxygen atoms are joined together in groups of two hydrogen atoms to one oxygen atom. These groups are called _________________. A molecule is a group of two or more atoms joined together _________________.

Mixtures
Many substances you encounter are a ________________ of different elements and compounds. ________________ is an example of a mixture that contains nitrogen, oxygen, water vapor, carbon dioxide, argon, and other gases. The elements and compounds in a mixture are ________________ ________________ joined together.