Elements, Compounds, Mixtures

Learning Objectives:

* Distinguish and describe the three types of matter: elements, compounds, mixtures
* Define pure and impure materials
* Give examples of elements, compounds, and mixtures

Introduction:

Everybody is completely surrounded by matter. To better understand this matter – hot it affects you, how you affect his and how it can be manipulated for the benefit of the society, it is important to build a basic understanding of the types and properties of matter. The diversity of the matter in the world and in the universe is astounding. If we are to understand this diversity, we must start with a way of organizing and describing matter.

All matter is made up of elements which are fundamental substances that cannot be broken down by chemical means. Element is a substance that cannot be further reduced as a simpler substance by ordinary processes.

A compound is a pure substance composed of two or more different atoms chemically bonded to one another. That means that it cannot be separated into its constituents by mechanical or physical means and only can be destroyed by chemical means.

A mixture is a material containing two or more elements or compounds that are in close contact and are mixed in any proportion. For example, air, seawater, crude oil, etc. The constituents of a mixture can be separated by physical means like filtration, evaporation, sublimation, and magnetic separation. The constituents of a mixture retain their original set of properties. The mixtures can be classified to homogeneous and heterogeneous mixtures. A homogeneous mixture has the same uniform appearance and composition throughout its mass. For example, sugar or salt dissolved in water, alcohol in water, etc. A heterogeneous mixture does not have a uniform composition throughout its mass.

Vocabulary/Definitions:

**Elements** – A substance consisting of one type of atom

**Mixture** – A substance consisting of mixing two or more compounds or elements

**Compound** – A substance consisting of two or more elements chemically combined so that their properties are different than that of the elements that it consists of\

**Homogeneous Mixture** – A mixture that has the same uniform appearance and composition throughout its mass

**Heterogeneous Mixture** – A mixture that consists of visibly different substances

Set-Up

* Dish 1: 4 washers
* Dish 2: 4 bolts
* Dish 3: 4 nuts
* Dish 4: combine 1 nut with 1 bolt (4 sets)
* Dish 5: combine 2 nuts with 1 bolt (4 sets)
* Dish 6: combine 1 nut and 1 washer with 1 bot (4 sets)
* Dish 7: 1 washer, 1 nut, 1 compound as in dish 5, and 1 compound as in dish 6
* Dish 8: 2 washers, 1 nut, and 2 bolts
* Dish 9: 1 compound as in dish 4 and 2 compounds as in dish 5