

Unit 1 Learning Outcomes

Chem 1010

1A: What is chemistry?

You should be able to:

- give a definition of chemistry

1B: The World is made of Legos

You should be able to:

- explain how atoms, elements, compounds, and chemical reactions relate to each other
- give the names of the people who first coined the word “atom” and published the first modern atomic theory
- give the number of known elements, naturally occurring elements, and artificial elements
- give one example of how small atoms are, including enough detail to make the point
- explain what it means to have a mole of something
- give the three elementary particles with their symbols, charges, masses, and location in the atom
- give the atomic number, atomic mass, and charge of an atom if given the number of each elementary particle it has
- recognize what will happen if you add or subtract an elementary particle from an atom

1C: Meet the Elements

You should be able to:

- explain why some elements are familiar, and others are not
- explain why some elements don't occur naturally, and which ones these are
- match groups of elements with how they were discovered
- give examples of how elements were named
- using the Periodic Table, give names and symbols of the elements
- give the elements which are most common in the universe, the earth, and our bodies
- give characteristics of metals elements, nonmetal elements, metalloid elements, and elements of unknown characteristics, and know how many of each there are
- explain what allotropes are and recognize examples of them
- explain what native elements are, and know which elements are found this way

1D: The Periodic Table

You should be able to:

- give the atomic name, symbol, and atomic mass for any element using the Periodic Table
- explain why atomic numbers on the Periodic Table are not usually whole numbers, and why some are; use the atomic mass to predict the most common isotope of an element
- give the name of the person who first organized the Periodic Table
- explain how the Periodic Table is organized (what happens in the rows and columns)
- explain what is happening with the two rows below the main part of the Periodic Table
- correctly label periods of the Periodic Table
- correctly label families on the Periodic Table
- recognize properties of alkali metals, alkaline earth metals, halogens, and noble gases (as a set)
- locate metals, nonmetals, and metalloids on the Periodic Table
- locate transition metals and inner transition metals on the Periodic Table

1E: Classifying Substances

You should be able to:

- explain the differences between pure elements, compounds, and mixtures, and how to recognize examples of each
- determine whether a formula is an ionic or covalent compound
- use the Periodic Table to determine what elements are made of individual atoms, diatomic molecules, and complex molecules
- explain which compounds are made of molecules, and which are made of ions
- draw a picture to represent the atoms of a pure element with individual atoms or diatomic molecules, a covalent or ionic compound, or an alloy