Chemistry, Level 1

5 credits - Level: I (This course fulfills the chemistry requirement for graduation.)
Grades: 10 -12
Prerequisite: Minimum grade of 70 in both Algebra I Level I and the last Level I science course taken, (or a minimum grade of 90 in the level II course of any of the two courses listed).

This is a laboratory course, which requires students to use their problem-solving skills to discover and investigate the main principles of inorganic and organic chemistry. Topics discussed during this semester include basic atomic theory, the formation of chemical bonds, chemical and physical changes, periodic relationships, mixtures and solutions, acids and bases, and chemical thermodynamics. Each topic examined is accompanied by laboratory work intended to illustrate basic concepts and introduce students to the proper use of chemical tools, equipment observation, and reporting.

Proficiencies

INTRODUCTION TO CHEMISTRY AND MATTER

- Define chemistry and describe the interdisciplinary relationship with other branches of science as well as its role in science and technology.
- Safely and correctly use the tools of the chemist to determine the physical and chemical properties of matter.
- Define the states of matter and describe matter using qualitative, quantitative, physical and chemical properties.
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THE ATOMIC MODEL

- Discuss the historical development of Atomic Theory from the Early Greeks to current Quantum Theory.
- Discuss the development of the various Atomic Models from Plum Pudding to the Quantum Mechanical Model.
- Detail the mass, charge, location and behavior of subatomic particles.

ELEMENTS AND PERIODICITY

- Identify an element based on its atomic number, name, symbol, mass or location on the periodic table.
- Identify the contributions of various scientists as to the development of the periodic table
- Detail the mass, charge, location and behavior of subatomic particles.
- Define and account for the trends in atomic radii, ionization energy and electronegativity.

BONDING

- Predict the type of bond formed between two atoms and the polarity of various molecules.
- Discuss the properties and formation of monatomic, binary and polyatomic ions and the formation of ionic bonds.
- Discuss the properties and formation of single, double, and triple covalent bonds.
- Use proper nomenclature when naming compounds.

REACTIONS

- Describe the 4 basic chemical reactions (synthesis, decomposition, single, and double replacement) and use them to predict the products formed when given the reactants.
- Apply the mathematics of chemical reactions utilizing mass-mass relationships, percent composition and percent error.
- Discuss the factors that affect chemical reactions.

- Discuss the involvement of energy in chemical reactions. (Exo and Endothermic)