

Chemistry Honors

5 credits - Level: Honors (This course fulfills the chemistry requirement for graduation.)

Grades: 10 -12

Prerequisite: Minimum grade of 80 in both Algebra I Honors and the last honors science course taken (or a minimum grade of 90 in the Level I course of the two courses listed)

This course uses a laboratory approach, which places its major emphasis on the main principles of inorganic, and organic chemistry. Topics included are theories of the atom, the chemical bond, chemical thermodynamics, reaction kinetics, the states of matter, and periodic relationships. Extensive laboratory work accompanies each unit of study. The lab work is intended to develop the proper use of chemical tools and equipment, scientific laws, and methods of reporting results. Advanced skills in mathematics are developed when needed and combined with appropriate technology and problem solving skills used to explore concepts in detail.

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 utilizing scientific notation and significant digits.
- ☒ Define the states of matter and describe matter using qualitative, quantitative, physical and chemical properties.
- ☒ Differentiate (classify) types of matter based on physical and chemical properties.

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, electronegativity, and electron affinity.

BONDING

- ☒ Predict the type of bond formed between two atoms and the polarity and geometry 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, triple and hybrid covalent bonds.
- ☒ Use proper nomenclature when naming compounds.

REACTIONS

- ⌘ Describe the 5 basic chemical reactions (synthesis, decomposition, single, and double replacement, and combustion) and use them to predict the products formed when given the reactants.
- ⌘ Apply the mathematics of chemical reactions utilizing mass-mass relationships, percent composition, percent error, and limiting and excess reactants.
- ⌘ Discuss the factors that affect chemical reactions.
- ⌘ Discuss the involvement of energy in chemical reactions.