



Reavis High School

Chemistry Curriculum Snapshot



Unit 1: Matter: Properties and Changes

15
Days

Fundamentally, chemistry is the study of matter and how matter changes. In order to study matter, students will need to be safe in a lab; therefore, students will be able to demonstrate proper lab safety and lab equipment usage throughout the school year. While in the class, students will use the scientific method to conduct research and design experiments. Students will gain skills in analyzing and manipulating qualitative and quantitative data and expressing results in a proper scientific manner. Experiments and research in this unit will have students classifying matter (substance vs. mixture) and discriminating between the states of matter as well as distinguishing among structures and behaviors of matter.



Unit 2: Atomic Structure and Periodic Table

20
Days

From the study of matter comes knowledge of the smallest form of matter, the atom. Students will be able to describe modern atomic theory and how scientists experiment and collaborate to develop scientific theory. They will be able to compare and contrast atomic structures based on properties while describing the origins and types of nuclear radiation associated with different atomic structures. Additionally, students will be able to generate and solve radioactive decay math sentences for those atomic structures. Using periodic table trends, electron configuration, and the Bohr Model, students will be able to predict how elements form compounds.



Unit 3: Chemical Bonding

20
days

Atoms combine to form compounds and the combination--the chemical bond that occurs between atoms or compounds--depends upon the the characteristics of each atom or compound. Students will be able to differentiate between ionic and covalent bonding which are two common types of bonds that occur in nature. In order to predict how atoms and compounds bond, students will learn how to create Lewis Structures of molecules and then analyze and predict the geometry of that molecule while being able to describe its subsequent properties based on those geometries.



Unit 4: Chemical Formulas and Reactions

20
Days

Once compounds are formed, they often interact with other compounds which causes a reaction. Chemists assign variables and symbols to compounds and reactions so they can study them efficiently. Students will be able to describe how scientists use symbols to represent chemical interactions between matter and use this symbology to differentiate amongst the different types of chemical reactions. Since most reactions consume or give off energy, students will be able to identify what role energy played in those chemical reactions using a technique called calorimetry which determines the energy of reaction (heat of reaction).



Unit 5: Measurement and Problem Solving

25
Days

When chemists study reactions, they must measure accurately and precisely. Often, chemists use a unit called a mole to measure the amount of a compound. Given that each mole of compound may have different amounts of elements in it, students will be able to calculate the percent composition of a compound. Students will also be able to apply dimensional analysis, a mathematical strategy, to solve problems regarding the quantities in chemical reactions often dealing with moles. This process is called stoichiometry.



Unit 6: Gases and Gas Laws

25
Days

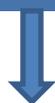
Knowing the number of moles in a reaction is very important when trying to understand the nature of that reaction. This is especially true when studying gases because they behave very differently under different conditions. Students will be able to apply the Kinetic Molecular Theory when describing the properties of gases while differentiating between gases and the other states of matter. Understanding the gas laws help students predict the behavior of gases. A useful tool for predicting the behavior of gases is the triple point graph which students will use to analyze and interpret how temperature and pressure affect a substance's state of matter.



Unit 7: Water and Solutions

25
Days

Water is essential for life and understanding how it behaves not just as a gas, but as a solid and liquid enables students to apply chemistry to a critical everyday substance. Students will be able to describe how the polarity and bonding of the water molecule give it its high surface tension and low vapor pressure. These properties can change depending on the pH of a solution, the state of water, and vary with temperature and pressure. Students will be able to describe and draw a molecular model of water in the solid state, differentiate among solvents, solutes, electrolytes, and nonelectrolytes; identify different types of heterogeneous solutions, and identify factors that affect solubility, including temperature, pressure, concentration, and pH.



Unit 8: Energy

20
Days

Energy, like water, is something everyone needs. The study of energy in chemistry is called thermochemistry and involves how energy moves in a given system. Students will be able to differentiate between exothermic and endothermic processes and be able to describe chemical processes in terms of energy. Students will also measure and express changes in energy of a system while being able to describe how free energy affects chemical systems and processes in terms of enthalpy and entropy.