Mesquite ISD Curriculum Sequence Second Semester
Integrated Physics and Chemistry

4th Six Weeks

Students will investigate the following:

Properties of Matter
- Students will examine differences in physical properties of solids, liquids, and gases as explained by the arrangement and motion of atoms, ions, or molecules of the substances and the strength of the forces of attraction between those particles.
- Students will relate chemical properties of substances to the arrangement of their atoms or molecules.
- Students will analyze physical and chemical properties of elements and compounds such as color, density, viscosity, buoyancy, boiling point, freezing point, conductivity, and reactivity.

Classifying Matter
- Students will practice classifying substances as an element, a compound, or a mixture, through active participation in hands-on, minds-on investigations.

Density
- Students will analyze the physical property of density.
- Students will work extensively with the concept by measuring the mass and volume of various materials and computing the value through the equation: Density = Mass/Volume. Students will also analyze relative density by making density columns.

Viscosity
- Students will analyze physical properties of elements such as viscosity, which is defined as a material's resistance to flow.

Buoyancy
- Students will understand that water provides an upward force on any submerged object, and if the object has a lower density than water, then it will float.

Phase Changes
- Students will examine differences in physical properties of solids, liquids and gases as explained by the arrangement and motion of atoms, ions, or molecules of the substances and the strength of the forces of attraction between those particles.

5th Six Weeks

Students will investigate the following

Atomic Structure/Atomic Models
- Students will relate chemical properties of substances to the arrangement of their atoms or molecules.
- Students will understand that relationships exist between the structure and properties of matter.
- Students will relate the physical and chemical behavior of an element, including bonding and classification, to its placement on the Periodic Table.

Periodic Table and History
- Students will use the Periodic Table to determine the reactivity of any element. Students will use the Periodic Table to find other elements that have similar physical and/or chemical properties of another element.

Chemical Bonding
- Students will analyze how atoms of elements combine chemically to form new substances, through a process known as bonding.
- Students will relate the physical and chemical behavior of an element, including bonding and classification, to its placement on the Periodic Table.
- Students will relate the structure of water to its function as a solvent and investigate the properties of solutions and factors affecting gas and solid solubility, including the nature of the solute, temperature, pressure, pH, and concentration.

Classifying Reactions
- Students will investigate changes of state as it relates to the arrangement of particles of matter and energy transfer.
- Students will recognize that chemical changes can occur when substances react to form different substances and that these interactions are largely determined by the valence electrons.
- Students will demonstrate that mass is conserved when substances undergo chemical change and that the number and kind of atoms are the same in the reactants and products.

6th Six Weeks

Students will investigate the following:

Endothermic and Exothermic Reactions
- Students will analyze energy changes that accompany chemical reactions such as those occurring in heat packs, cold packs, and glow sticks and classify them as exothermic or endothermic reactions.

Conservation of Mass
- Students will demonstrate that mass is conserved when substances undergo chemical change and that the number and kind of atoms are the same in the reactants and products.

Balancing Equations
- Students will understand that during any kind of chemical reaction, there is no gain or loss of mass.
- Students will recognize and write chemical formulas and equations.
- Students will practice counting the atoms going in and coming out of a chemical reaction.
- Students will balance equations by adding coefficients.

Nuclear Reactions
- Students will describe types of nuclear reactions such as fission and fusion and their roles in applications such as medicine and energy production.
- Students will research and describe the environmental and economic impact of the end-products of chemical reactions such as those that may result in acid rain, degradation of water and air quality, and ozone depletion.