**2023-2024 CHEMISTRY SCOPE AND SEQUENCE**

|  |  |  |
| --- | --- | --- |
| **QUARTER 1** | | |
| CHEMISTRY – P1: All matter in the Universe is made of very small particles.  Structure and Properties of Matter | | |
| **STANDARDS** | **TOPICS** | **# of Weeks** |
| **Essential HS.P1U1.1**  Develop and use models to explain the relationship of the structure of atoms to patterns and properties observed within the Periodic Table and describe how these models are revised with new evidence  **Plus HS+C.P1U1.1**  Develop and use models to demonstrate how changes in the number of subatomic particles  ( protons, neutrons, electrons ) affect the identity, stability and properties of the element.  **Essential HS.E1U1.12**  Develop and use models of the Earth that explains the role of energy and matter in Earth’s constantly changing internal and external systems  ( geosphere, hydrosphere, atmosphere, biosphere)  **Essential HS.E1U1.13**  Evaluate explanations and theories about the role of energy and matter in geologic changes over time | * Physical and Chemical Properties * Physical and Chemical Changes * Earth’s Four Major Spheres * Earth’s Internal Structure * Rock Cycle * Types of Rocks   B.   * Types of Matter * States of Matter   C.   * Atomic Structure ( number of subatomic particles, electron configuration, Bohr’s Diagram) * Organization of the Periodic Table * Trends of the Periodic Table | 3 wks  1 wk  5 wks |
| **Crosscutting Concepts** | **Science and Engineering Practices** | |
| Patterns  Cause and Effect  Scale, Proportion and Quantity  Systems and System Models  Energy and Matter  Structure and Function  Stability and Change | Ask questions and define problems  Develop and use models  Plan and carry out investigations  Analyze and interpret data  Use mathematical and computational thinking  Engage in argument from evidence  Obtain, evaluate and communicate information | |

|  |  |  |
| --- | --- | --- |
| **QUARTER 2** | | |
| CHEMISTRY – P1 : All matter in the Universe is made of very small particles.  Structure and Properties of Matter | | |
| **STANDARDS** | **TOPICS** | **# of Weeks** |
| **Essential HS.P1U1.2**  Develop and use models for the transfer or sharing of electrons, to predict the formation of ions, molecules, and compounds in both natural and synthetic processes. | * Ionic and Metallic Bonding   B.   * Covalent Bonding * VSEPR Theory and Molecular Geometry   C.   * Hydrogen Bonding * Polar and Nonpolar Molecules   D.   * Chemical Formula Writing: Ionic Compounds * Chemical Formula Writing: Covalent Compounds * Naming Ionic Compounds * Naming Covalent Compounds and Acids | 2 wks  3 wks  2 wks  2 wks |
| **Crosscutting Concepts** | **Science and Engineering Practices** | |
| Patterns  Cause and Effect  Scale, Proportion and Quantity  Systems and System Models  Energy and Matter  Structure and Function  Stability and Change | Ask questions and define problems  Develop and use models  Plan and carry out investigations  Analyze and interpret data  Engage in argument from evidence  Obtain, evaluate and communicate information | |

|  |  |  |
| --- | --- | --- |
| **QUARTER 3** | | |
| CHEMISTRY – P1 : All matter in the Universe is made of very small particles.  Chemical Reactions | | |
| **STANDARDS** | **TOPICS** | **# of Weeks** |
| **Essential HS.P1U1.3**  Ask questions, plan, and carry out investigations to explore the cause and effect relationship between reaction rate factors.  **Plus HS+C.P1U1.7**  Use mathematics and computational thinking to determine stoichiometric relationships between reactants and products in chemical reactions. | 1. **Chemical Quantities**  * The Mole: Measurement of Matter * Mole-Mass and Mole-Volume Relationships  1. **Chemical Reactions**  * Describing and Balancing Chemical Reactions * Types of Chemical Reactions * Predicting Products of Chemical Reactions  1. **Stoichiometry**  * Arithmetic of Equations * Chemical Calculations  1. **Reaction Rates and Chemical Equilibrium**  * Factors Affecting Rate of Reaction * Le Chatelier’s Principle: Factors Affecting Equilibrium | 2 wks  2 wks  2 wks  3 wks |
| **Crosscutting Concepts** | **Science and Engineering Practices** | |
| Patterns  Cause and Effect  Scale, Proportion and Quantity  Energy and Matter  Stability and Change | Ask questions and define problems  Plan and carry out investigations  Analyze and interpret data  Use mathematical and computational thinking  Engage in argument from evidence  Obtain, evaluate and communicate information | |

|  |  |  |
| --- | --- | --- |
| **QUARTER 4** | | |
| CHEMISTRY – P1 : All matter in the Universe is made of very small particles.  Nuclear processes and Application of Chemistry | | |
| **STANDARDS** | **TOPICS** | **# of Weeks** |
| **Plus HS+C.P1U1.3**  Analyze and interpret data to develop and support an explanation for the relationships between kinetic molecular theory and gas laws.  **Essential HS.P1U1.4**  Obtain, evaluate, and communicate information about how the use of chemistry related technologies have had positive and negative ethical, social, economic, and/or political implications.  **Plus HS+C.P1U3.8**  Engage in argument from evidence regarding the ethical, social, economic , and/or political benefits and liabilities of fission, fusion , and radioactive decay.  **Essential HS.E2U1.15**  Construct an explanation based on evidence to illustrate the role of nuclear fusion in the life cycle of a star. | 1. The Behavior of Gases  * Properties of Gases * The Gas laws  1. Nuclear Chemistry  * Nuclear Radiation * Nuclear Transformations * Fission and Fusion * Radiation in Your Life  1. Beyond Our Solar System  * Interstellar Matter * Classifying Stars * Star Evolution  1. Chemical Technologies – Their Ethical, Socio-Economic and Political Implications | 2 wks  3 wks  4 wks |
| **Crosscutting Concepts** | **Science and Engineering Practices** | |
| Patterns  Cause and Effect  Scale, Proportion and Quantity  Systems and System Models  Energy and Matter  Structure and Function  Stability and Change | Ask questions and define problems  Develop and use models  Plan and carry out investigations  Analyze and interpret data  Use mathematical and computational thinking  Engage in argument from evidence  Obtain, evaluate and communicate information | |