

Ganado Unified School District (CHEMISTRY/Grade 11th and 12th)

PACING Guide SY 2021 - 2022

Timeline	AZ Science Standards	Crosscutting Concepts and Background Information	Learning Goals and Topics
<p>Quarter 1</p>	<p>P1: All matter in the Universe is made of very small particles.</p> <p>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</p>	<p>Crosscutting Concepts: Patterns; Cause and Effect; Scale, Proportion and Quantity; System and System Models; Energy and Matter; Structure and Function; Stability and Change</p> <p>Background Information: Each atom has a charged substructure consisting of a nucleus, which is made of protons and neutrons, surrounded by electrons. The periodic table orders elements horizontally by the number of protons in the atom's nucleus and places those similar chemical properties in columns. The repeating patterns of this table reflect patterns of outer electron states. The structure and</p>	<p>Structures and Properties of Matter</p> <ul style="list-style-type: none"> - Matter and Change - Atomic Structure - Electrons in Atoms - The Periodic Table

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		<p>interactions of matter at the bulk scale are determined by electrical forces within and between atoms. Stable forms of matter are those in which the electric and magnetic field energy is minimized. Atoms of each element emit and absorb characteristic frequencies of light, and nuclear transitions have distinctive gamma ray wavelength. These characteristics allow identification of the presence of an element, even in microscopic quantities.</p>	
<p>Quarter 2</p>	<p>P1: All matter in the Universe is made of very small particles.</p> <p>Essential HS. P1U1.2 Develop and use models for the transfer of sharing of electrons to predict the formation of ions, molecules and compounds in both</p>	<p>Crosscutting Concepts: Patterns; Cause and Effect; Scale, Proportion and Quantity; System and System Models; Energy and Matter; Structure and Function; Stability and Change</p> <p>Background Information: Chemical processes, their rates, and whether or not energy is stored or released can be understood in terms of the collisions of molecules</p>	<p>Chemical Reactions</p> <ul style="list-style-type: none"> - Ionic and Metallic Bonding - Covalent Bonding - Chemical Names and Formulas - Chemical Reactions

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	natural and synthetic processes	and the rearrangements of atoms into new molecules, that are matched by changes in kinetic energy . In many situations, a dynamic and condition-dependent balance between a reaction and the reverse reaction determines the numbers of all types of molecules present. The fact that atoms are conserved , together with knowledge of the chemical properties of the elements involved, can be used to describe and predict chemical reactions.	
Quarter 3	<p>P1: All matter in the Universe is made of very small particles.</p> <p>Essential HS. P1U1.3</p> <p>Ask questions, plan and carry out investigations to explore the cause and effect relationship between reaction rate factors</p>	<p>Crosscutting Concepts:</p> <p>Patterns; Cause and Effect; Scale, Proportion and Quantity; System and System Models; Energy and Matter; Structure and Function; Stability and Change</p> <p>Background Information:</p> <p>Chemical processes, their rates, and whether or not energy is stored or released can be understood in terms of the collisions of</p>	<p>Chemical Reactions</p> <ul style="list-style-type: none"> - Solutions - Thermochemistry - Reaction Rates and Equilibrium - Acids, Bases and Salts - Oxidation – Reduction Reactions

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		<p>molecules and the rearrangements of atoms into new molecules, that are matched by changes in kinetic energy. In many situations, a dynamic and condition-dependent balance between a reaction and the reverse reaction determines the numbers of all types of molecules present. The fact that atoms are conserved, together with knowledge of the chemical properties of the elements involved, can be used to describe and predict chemical reactions.</p>	
<p>Quarter 4</p>	<p>P1: All matter in the Universe is made of very small particles.</p> <p>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.</p>	<p>Crosscutting Concepts: Patterns; Cause and Effect; Scale, Proportion and Quantity; System and System Models; Energy and Matter; Structure and Function; Stability and Change</p> <p>Background Information: Scientific understanding can help to identify implications of certain applications but decisions about whether certain actions should be taken will</p>	<p>Nuclear Processes and Applications of Chemistry</p> <ul style="list-style-type: none"> - Nuclear Radiation - Nuclear Transformations - Fission and Fusion - Radiation in Your Life

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		<p>require ethical and moral judgements which are not provided by knowledge of science. There is an important difference between the understanding that science provides about, for example, the need to preserve biodiversity, the factors leading to climate change and the adverse effects of harmful substances and lifestyles, and the actions that may or may not be taken in relation to these issues. Opinions may vary about what action to take but arguments based on scientific evidence should not be a matter of opinion. The total number of neutrons plus protons does not change in any nuclear process. Strong and weak nuclear interactions determine nuclear stability and processes. Spontaneous radioactive decays follow a characteristic exponential decay law. Nuclear lifetimes allow radiometric dating to be used to determine the ages of rocks and other materials from the isotope ratios present.</p>	