Ganado Unified School District #20
(Science/ 8th Grade)

PACING Guide SY 2022-2023

Time Line & Resources (Identify textbook, page number or website link & etc.)	**AZ College and Career Readiness Standard**	**Essential Question (HESS Matrix)**	**Learning Goal**	**Vocabulary (Content/Academic)**
First Quarter				
Week One FOSS (Full Option Science System) Textbooks Table Top Investigation Kits PowerPoint Presentations Google Classroom	(8.W.2.a) Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content. a. Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information into broader categories; include formatting (e.g., headings), graphics (e.g., charts, tables), and multimedia when useful to aiding comprehension. (8.U.1) Scientists explain phenomena using evidence obtained from observations and/or scientific investigations. Evidence may lead to developing models and/or theories to	What is "science?" What are some of the explanations to our reality? What are particles as opposed to atoms? What is a pattern? What is the purpose of function? What is important about structure? How are all the numbers within the periodic table used to explain each element?	Convey to students to use the skills of reading, writing, listening, and speaking as a whole to record or take notes on informational text specifically in the Science context. Students will define the ideas and concepts of cause/effect/stability/change/ energy/matter.	Introductory information and material for eighth grade science. Cross Cutting Concepts "Cause and Effect" Sii'hasin Nahat'a Nitsahakees Iina Universe Big Bang Theory Origin Stories Value Morality Scientific Inquiry Hypothesis Analysis Testing Observation(s)

	make sense of phenomena. As new evidence is discovered, models and theories can be revised.			Experiment Experience
Week Two	(8.U.1) Scientists explain phenomena using evidence obtained from observations and/or scientific investigations. Evidence may lead to developing models and/or theories to make sense of phenomena. As new evidence is discovered, models and theories can be revised.		Students will define the ideas and cross-cutting concepts of patterns, structure and function, systems and models, proportions, quantity, and scale.	
Week Three	(6.P1U1.3) Develop and use models to represent that matter is made up of smaller particles called atoms. (8.P1U1.1) Develop and use a model to demonstrate that atoms and molecules can be combined or rearranged in chemical reactions to form new compounds with the total number of each type of atom being conserved.		Students identify basic molecular structures and models of compounds. Students practice orally naming the name of elements and the number of atoms as guided by the instructor.	
Week Four	(6.P1U1.3) Develop and use models to represent that matter is made up of smaller particles called atoms. (8.P1U1.1) Develop and use a model to demonstrate that atoms and molecules can be combined or rearranged in chemical reactions to form new compounds with the total		Students identify basic molecular structures and models of compounds. Students practice orally naming the name of elements and the number of atoms as guided by the instructor.	

	number of each type of atom being conserved.			
Week Five	(8.PU1.1) Develop and use a model to demonstrate that atoms and molecules can be combined or rearranged in chemical reactions to form new compounds with the total number of each type of atom conserved.		Students will observe the patterns seen in so many items like the solar system, the cell, and the structure of atoms.	
Week Six	(8.PU1.1) Develop and use a model to demonstrate that atoms and molecules can be combined or rearranged in chemical reactions to form new compounds with the total number of each type of atom conserved.		Students will observe the patterns seen in so many items like the solar system, the cell, and the structure of atoms.	
Week Seven	(8.P1U1.1) Develop and use a model to demonstrate that atoms and molecules can be combined or rearranged in chemical reactions to form new compounds with the total number of each type of atom conserved. (8.P4U1.3) Construct an explanation on how energy can be transferred from one energy store to another.		Students practice balancing simple chemical equations to understand Law of Conserving Matter. Students observe and identify information gained from visual models on matter by recognizing chemical formulas, element symbols, and counting atoms in a given formula	

Week Eight Week Nine Week Ten	(6.P1U1.1) Analyze and interpret data to show that changes in states of matter are caused by different rates of movement of atoms in solids, liquids, and gases (Kinetic Theory). (6.P1U1.3) Develop and use models to represent that matter is made up of smaller particles called atoms. (7.P2U1.1) Collect and analyze data demonstrating how electromagnetic forces can be attractive or repulsive and can vary in strength. (6.P1U1.1) Analyze and interpret data to show that changes in states of matter are caused by different rates of movement of atoms in solids, liquids, and gases (Kinetic Theory). (6.P1U1.3) Develop and use models to represent that matter is made up of smaller particles called atoms. (7.P2U1.1) Collect and analyze data demonstrating how electromagnetic forces can be attractive or repulsive and can vary in strength.		Students observe data and scientific tools and models for identifying facts on interactions. Students evaluating data like the periodic chart to formulate the concepts of the atomic structure. Having students navigate the essential information of element cards from the modern day periodic table and also exploring the features of the periodic table such as the groups, numbering, and layout of the chart.	
Second Quarter				

Week One Week Two/Three/ Four/Five FOSS (Full Option Science System) Textbooks Table Top Investigation Kits Triple Beam Balances Periodic Tables Rulers and Meter Sticks	(8.P1U1.2) Obtain and evaluate information regarding how scientists identify substances based on unique physical and chemical properties. (8.P4U1.3) Construct an explanation on how energy can be transferred from one energy store to another. (8.P1U1.1) Develop and use a model to demonstrate that atoms and molecules can be combined or rearranged in chemical reactions to form new compounds with the total number of each type of atom conserved.	How are chemical changes different from physical changes? (irreversible) What does reactivity mean? What are the processes known as between each change in the states of matter like freezing (change from a liquid to a solid)? What are physical properties of matter?	Students use a hands on exploration for measuring water in its three phases of matter, solid-liquid-gas. Students observe structures in engineering to conceptualize how "space" or vacuum creates an invisible barrier against the transfer of heat energy. Students test the temperature changes in solid water and liquid water at different ratios and collect data then make inferences. Students investigate how energy is measured in calories even in changes of states in matter. Students observe and record the physical and/or chemical changes through a demonstration by writing descriptive portions.	Elements Matter Particles Atoms Protons Neutrons Electrons Families Groups Mendeleyev Theories Models Lab Safety Directions/Processes Density Physical Property Chemical Property Boiling Point Melting Point Freezing Point Solvent Solution Phase of Matter pH Scale Observations Conclusions Concentration Diffusion Neutrality Precipitation Reaction Endothermic Exothermic Explosive Energy

Week Six/Seven Week Eight CBAS Testing All Week Week Nine	(8.P1U1.1) Develop and use a model to demonstrate that atoms and molecules can be combined or rearranged in chemical reactions to form new compounds with the total number of each type of atom conserved.		Students will be able to illustrate the number of atoms as chemical formulas show a change in products. Students solve chemical formula equations to connect with the idea that nothing new is really created, just something different.	

Third Quarter				
Week One Week Two-Three-Four Week Five-Six	(8. E1U1.6) Analyze and interpret data about the Earth's geological column to communicate relative ages of rock layers and fossils. (8.L4U1.11) Develop and use a model to explain how natural selection may lead to increases and decreases of specific traits in populations over time. (8.L3U1.9) Construct an explanation of how genetic variations occur in offspring through the inheritance of traits or through mutations.	What is the difference between genotype and phenotype? How do structural adaptations affect natural selection and survival? What is the purpose of DNA? What types of dysfunctions and abnormalities comes from genetic disorders?	Students will be able to correlate different Origin accounts and compare and contrast the "evidences" about explaining the past. Students will identify and name examples given in demonstrations how conclusions about the "evolutionary" past is explored. Students will identify the critical language and vocabulary associated with the early foundations of genetic information. Identifying the partnership between Genotype and	Alleles Trait(s) Recessive Dominant Phenotype Genotype Heterozygous Homozygous Mitosis Meiosis Reproduction Asexual Gametes Zygotes IPMAT(Phases) Cytokinesis Survival Homeostasis Pollination

			Phenotype through the study created by Gregor Mendel in the middle 1800's.	Mimicry Adaptations Natural Selection Charles Darwin Evolution
Week Seven	(7.L1U1.8) Obtain, evaluate, and communicate information to provide evidence that all living things are made of cells, cells come from existing cells, and cells are the basic structural and functional unit of all living things. (8.L3U3.10) Communicate how advancements in technology have furthered the field of genetic research and use evidence to support an argument about the positive and negative effects of genetic research on human lives. Develop an understanding of the recent discoveries made in the science of Genetics particularly the processes carried out by DNA and RNA molecules.		Students will dissect the vocabulary words and use the metaphorical perspective of processes to match the definitions. Students will explore the descriptions of a selected group of genetic disorders and their symptom information.	
Week Eight	(8. L3U3.10) Communicate how advancements in technology have furthered the field of genetic research and use evidence to support an argument about the positive and negative effects of genetic research on human lives.		Students will dissect the vocabulary words and use the metaphorical perspective of processes to match the definitions. Students will explore the descriptions of a selected group of genetic disorders and their symptom information.	

Week Nine	(8.L4U1.12) Gather and communicate evidence on how the process of natural selection provides an explanation of how new species can evolve.		Students re-narrate the origins of the Darwin theory of evolution. Students identify vocabulary within the theory of evolution.	
Week Ten	(8.L3U3.10) Communicate how advancements in technology have furthered the field of genetic research and use evidence to support an argument about the positive and negative effects of genetic research on human lives.		Identify the structures and functions of viruses and how it replicates into new variant forms. Identify the causes and geographic connections to outbreaks of major viruses.	
FOSS (Full Option Science System) Textbooks Table Top Investigation Kits Video Lessons PowerPoint Presentations Google classroom				
Fourth Quarter				

Week One-Six FOSS Textbook FOSS Lab Activities Videos	(8.P4U1.4) Develop and use mathematical models to explain wave characteristics and interactions.	What kinds of known energies exist in our universe? What are the detriments and benefits of each? How many ways and methods can we safely explore some of the properties and behaviors of waves?	Students will be able to identify and define wavelength, frequency, crest, trough, and node(s) or resting line. Student will be able to clearly and confidently read passages of science text with emphasis to fluency and pronunciations of vocabulary terms. Students will be able to define measurements using a protractor for angles in reflections. Students explore the property of light behavior and visually observe reflection, refraction, and absorption through opaque objects and recording their angle measurements. Involve students in "hands on" learning and working with others with some limited tools on how light behaves when seen through specialized lens for seeing the separation of colors(ROYGBIV). Students will read textual information and draw	Waves of all types… Seismic Radio Microwave Infrared ROYGBIV/Spectrum Ultraviolet X-Ray Gamma Wavelength Crest Node Frequency Trough LASER Optical Fiber Satellite Binary Numbers Greenhouse Effect

Week Seven-Eight	(8.EU1.6) Obtain, evaluate, and communicate information about data and historical patterns to predict natural hazards and other geological events.	What are some causes of severe weather? What are parts of our atmosphere? What are the foundations of seasons on our planet? What are some measures used in meteorology? How do we study concepts such as "density"?	conclusions and connections for comprehension on severe weather and its patterns. Students will read text and summarize information into a poster size concept map.	Overpopulation Pollution(s) Biodiversity Fossil Fuels Global Warming Emissions Research Hypothesis Experimental