

Ganado Unified School District #20

(Science/Grade 8/Mr. G. Tracey)

PACING Guide SY 2020-2021

Resources	AZ College and Career Readiness Standard	Essential Question (HESS Matrix)	Learning Goal	Vocabulary (Content/Academic)
First Quarter				
<p>FOSS (Full Option Science System) Textbooks and Table Top Investigation Kits</p>	<p>G8.1S.C2.PO5 (I can keep a record of observations, notes, sketches, questions, and ideas using <u>written</u> or computer logs)</p>	<p>Where does science all start?</p>	<p>Students will acknowledge the safety and policy expectations of the school and classroom environment</p>	<p>Universe Big Bang Theory Origin Stories Value Morality Scientific Inquiry</p>
<p>Triple Beam Balances</p>	<p>(New AZ Standards) 8. E2. U3 “The earth and our solar system are a very small part of one of many galaxies within the universe...therefore...applications of science often have both positive and negative ethical, social, economic, and/or political implications.”</p>	<p>How is all matter related to one another?</p>	<p>Students will construct academic models of collected information on the stories of the origins of the universe and to utilize large numbers of information to identify the immensity of the universal size surrounding we humans.</p>	<p>Hypothesis Analysis Testing Observation(s) Experiment Experience Elements Matter Particles Atoms</p>
	<p>(New AZ Standards) 8. P1. U1 “All matter in the universe is made of small particles...therefore...scientists explain phenomena using evidence obtained from observations and/or scientific investigations. Evidence</p>	<p>Which element from the periodic table is the most abundant in the universe?</p>	<p>Students will construct a series of pie graphs based on the textbook reading. Student will compose a one-page writing synopsis of the theories and readings as an</p>	<p>Protons Neutrons Electrons Families Groups Mendeleev Theories</p>

may lead to developing models and/or theories to make sense of phenomena. As new evidence is discovered, models and theories can be tested.”

(New AZ Standards) 8. P1. U1 “All matter in the universe is made of small particles... therefore... 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 tested.”

G8.5S.C2.PO6: I can explain how the periodic table is organized,
G8.RST.04: I can discover the meanings of symbols. Key terms, and other technical context

How can I compare data in narrative form and convert to another model like a Venn Diagram?

What are some basic symbols used in practicing the identification of elements and compounds?

informal measure of their writing abilities.

Students will construct and adapt narrative information to a Venn diagram with three concentric circles rather than the traditional two circles

Students will observe and identify eight different white substances by studying their unique physical and chemical properties.

Models
Lab Safety
Directions/Processes

G8.5S.C1.PO1: I can identify different kinds of matter,
G8.5S.C1.PO4: I can classify matter in terms of elements, compounds, and mixtures

Why is it critical to follow every detail of an investigation?

Students compare and critique their observations and findings in a lab setting by helping each other in groups so that all students are interactive.

G8.5S.C1.PO1: I can identify different kinds of matter,
G8.5S.C1.PO4: I can classify matter in terms of elements, compounds, and mixtures.

What are particles as opposed to atoms?

Students analyze gases with very little available tools but also explore the relationships between particles (unseen by the human eyes except with microscopic tools or testing).

GAP.HS.5S.C1.PO8: I can explain the details of atomic structure (e.g., electron configuration, energy levels, and isotopes), G85S.C1.PO6: I can explain how the periodic table is organized

What are the models of the atomic theory?

Students will organize abstract information through Harvard Outlining

ongoing HS.5S.C1.PO8 (Explain the details of atomic structure, e.g., electron configuration, energy levels, isotopes)
ongoing G8.5S.C1.PO6 (Explain how the periodic table of elements is organized)

How are all the numbers within the periodic table used to explain each element?

The student will be able to identify and explain the periodic table energy levels and group numbers with corresponding arrangements of electrons in an atomic structure of any element

HS.5S.C1.PO8 (Explain the details of atomic structure i.e., electron configuration, energy levels, and isotopes) G8.5S.C1.PO6 (Explain the systematic organization of the periodic table)

How are ions identified and used in the chemical symbols?

Students can explain, identify, and comprehend chemical symbols, vocabulary, and concepts on the periodic table and the structure of the atom.

Second Quarter

**FOSS (Full Option Science System)
Textbooks and Table Top Investigation Kits**

Triple Beam Balances

Periodic Tables

Rulers and Meter Sticks

G8.5S.C1.PO1 (Identify different kinds of matter based on the following physical properties: States-density-boiling point-melting point-solubility)

What are physical properties of matter?

The student will be able to calculate density of certain materials such as wood and metals. The student will be able to observe and conceptualize the atomic matter of solids, liquids, and gases. The student will identify the formula $d=m/v$

**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**

G8.5S.C1.PO1 (Identify different kinds of matter based on the following physical properties: States-density-boiling point-melting point-freezing point-solubility)

What is a phase change and how is it caused?

Students explain and recognize the specific time and temperature that cause matter to change between solids, liquids, and gases.

G8.5S.C1.PO1 (Identify different kinds of matter based on the following physical properties: States-density-boiling point-melting point-freezing point-solubility)

What are the processes known as between each change in the states of matter like freezing (change from a liquid to a solid)?

Students explain and recognize the specific time and temperature that cause matter to change between solids, liquids, and gases.

G8.5S.C1.PO1 (Identify different kinds of matter based on the following physical properties: States-density-boiling point-melting point-freezing point-solubility)

What is absolute zero?

Students identify and explain how obvious physical changes in the states of matter are mathematically measured with the use of formulas and equations.

G8.5S.C1.PO1 (Identify different kinds of matter based on the following physical properties: States-density-boiling point-melting point-freezing point-solubility)

How many calories are we measuring?

Students identify and explain how obvious physical changes in the states of matter are mathematically measured with the use of formulas and equations.

G8.3S.C2.PO3: Design and construct a solution to an identified need or problem using simple classroom materials

How can a doghouse be made using just cardboard material?

Students will propose and design a doghouse using recycled cardboard materials with just glue as fastener

G8.5S.C1.PO2: I can identify characteristics of matter based on their chemical properties; reactivity, pH, and oxidation

Why are there lots of materials all around us?

Allow students to manipulate the testing of safe substances and identifying what changes

G8.5S.C1.PO7: Investigate how the transfer of energy can affect the physical and chemical properties of matter, GAP.HS.5S.C3.PO7: Explain how molecular motion is related to temperature and phase changes

What happens as two different substances are mixed and then allowed to evaporate over time?

are evident and why they happen.

Students analyze and test simple solutions for understanding molecular interactions

G8.5S.C1.PO2 (Identify different kinds of matter based on the following chemical properties:

Reactivity – pH – Oxidation)

G8.5S.C1.PO3 (Identify the following types of evidence that a chemical reaction has occurred:

Formation of a precipitate –
Generation of gas – Color change –
Absorption of heat)

How are chemical changes different from physical changes? (irreversible)

What does reactivity mean?

Have students experience a thorough reading and producing feedback in writing through textual information and demonstrations that are aligned with the assigned text.

G8.5S.C1.PO2: (Identify different kinds of matter based on the following chemical properties; reactivity, pH, and oxidation),
G8.RST.03:(I can precisely follow a multistep procedure when carrying out experiments; taking

What is acidic? What is basic? What is pH?

Have students learn the very basic aspects of the pH concept and reinforce with hands on understanding by using tools and practice specifically designed for testing pH through different methods of using indicators and staining techniques.

measurements, or performing technical tasks)

Third Quarter

**FOSS (Full Option Science System)
Textbooks and Table Top Investigation Kits**

Video Presentations

G8.3S.C2.PO1: Analyze the risk factors associated with natural, human induced, and/or biological hazards, including wastes, disposal of industrial chemicals, and greenhouse gases.

G8.5S.C2.PO2: Identify the conditions under which an object will continue in its state of motion (Newton's First Law).

What is scientific inquiry?



What did Isaac Newton observe to create the first Law of Motion?

Begin the scientific inquiry process in practice for Science Fair Project ideas and also PowerPoint Presentation as the other option for addressing our human involvement with altering the natural order of things on earth.

Have students demonstrate and experience real live activities on measuring the concepts of speed and acceleration.

**Isaac Newton
Inertia
Force
Motion
Potential Energy
Kinetic Energy
Conservation of Energy
Unbalanced Forces
Constant Velocity
Acceleration
Mass
Net Force
Rate of Change
Time
Distance
Gravity
Weight**

G8.5S.C2.PO2: Identify the conditions under which an object will continue in its state of motion (Newton's 1st Law). G8.5S.C2.PO3: Describe how acceleration of a body is dependent on its' mass and the net applied force/ $F=ma$ (Newton's 2nd Law)

How can we measure and test as a class the speeds and distances being investigated?

Have students demonstrate and experience real live activities on measuring the concepts of speed and acceleration.

Bodies
Data Tables
Speed and Distance
Graphs
Time and Position
Graphs
Light Speed

G8.5S.C2.PO3: Describe how acceleration of a body is dependent on its' mass and the net applied force.

How can the Laws of Motion be demonstrated by a person without any tools? (Demo)

Students explore through lecture, reading, and hands on applications the four-hundred-year old contribution by Isaac Newton and his theories of force and motion and the advanced technology by these simple understandings of forces.

G8.1S.C3.PO2: Form a logical argument about a correlation between variables or sequence of events (e.g., construct a cause and effect chain that explains a sequence of events, G8.3S.C2.PO2: I can compare numerous solutions

What issue am I going to share with my peers in science?

Students organizing and construct a work of writing in clarity and summarized fashion.

to fill a need or solve a problem.

G8.5S.C2.PO3: Describe how the acceleration of a body is dependent on its' mass and the net applied force, G8.5S.C2.PO4: Describe forces as interactions between bodies

How are the phases of motion all displayed in a Marble rolling down a ramp?

Students solving where each phase of motion and its' specific vocabulary is taking place such as acceleration or where the kinetic energy is being displayed

G8.5S.C2.PO3: Describe how the acceleration of a body is dependent on its' mass and the net applied force, G8.5S.C2.PO4: Describe forces as interactions between bodies

What analysis was made from observing marbles coming off a ramp and colliding with other objects?

Students solving where each phase of motion and its' specific vocabulary is taking place such as acceleration or where the kinetic energy is being displayed

G8.5S.C2.PO3: Describe how the acceleration of a body is dependent on its' mass and the net applied force, G8.5S.C2.PO4: Describe forces as interactions between bodies, G8.5S.C2.PO2: Identify the conditions under which an object will continue in its state of motion

What summaries can be made of Newton's Three Laws of Motion?

Students will relate and recall events that display the laws of motion in action

G8.1S.C2.PO2: Design a controlled investigation to support or reject a hypothesis, G8.3S.C2.PO3: Design and construct a solution to an identified need or problem using simple classroom materials

How can I design a simple model for a “Bean Brain” drop?

Students engage with the construction and design of their own model for testing the theories behind collision safety

8.RST.04: Determine the meaning of symbols, key terms, and other domain specific words and phrases as they are used in specific scientific or technical context relevant to grade 8 text and topics

What have I learned up to this point with all of the units and concepts?

Students test their accumulation of knowledge for major topics covered up to this point

Fourth Quarter

FOSS (Full Option Science System) Textbooks and Table Top Investigation Kits

G8.4S.C2.PO3: I can use the Punnett Square to represent dominant and recessive alleles in organisms

What is the difference between genotype and phenotype?

Students will distinguish between the nature of traits in humans

**Alleles
Trait(s)
Recessive
Dominant
Phenotype
Genotype
Heterozygous
Homozygous
Mitosis
Meiosis
Reproduction
Asexual**

Video Lessons

G8.4S.C2.PO1: I can explain the purpose of cell division for growth and tissue repair and reproduction

What are the steps of the cell cycle?

Students will recognize the order and stages of mitosis and meiosis

PowerPoint Presentations through google classroom

G8.4S.C3.PO6: I can describe each of the following factors that allow

What is natural selection?

Students will identify and explain how structural

for survival of living organisms:
protective coloration-beak design-
seed dispersal-pollination
G8.1S.C3.PO4: I can formulate a
future investigation based on
existing data

G8.1S.C4.PO4: Present analysis and
conclusions in clear and concise
formats
G8.3S.C2.PO2: I can compare
numerous solutions to fill a need or
solve a problem
G8.3S.C1.PO1: Analyze the risks
factors associated with natural,
human induced, and/or biological
hazards including waste, disposal of
industrial chemicals, and greenhouse
gases
G8.3S.C2.PO1: Propose viable
methods of responding to an
identified need or problem
G8.2S.C1.PO3: Evaluate the impact
of a major scientific development
occurring within the past decade
G8.RST.09: I can compare and
contrast information from various
sources to that of a written text
G8.RST.07: I can visually represent
quantitative or technical information
from written text
G8.3S.C2.PO4: I can compare the
risks and benefits of technological
advances

How do structural
adaptations affect
natural selection and
survival?

How many issues and
concerns are there
throughout our delicate
earth of today?

How can I present and
offer possible solutions
or interventions to global
catastrophes?

adaptations are used and the
environments and in which
environment it takes place

Students will interact through
the means of visual media and
peer presentations to
culminate the purpose of
science in general for today's
'worldwide concerns

Gametes
Zygotes
IPMAT(Phases)
Cytokinesis
Survival
Homeostasis
Pollination
Mimicry
Adaptations
Natural Selection
Charles Darwin
Evolution
Greenhouse Effect
Overpopulation
Pollution(s)
Biodiversity
Fossil Fuels
Global Warming
Emissions
Research
Hypothesis
Experimental

