Ganado Unified School District #20
(Science/ 4th Grade)

PACING Guide SY 2018-2019

Resources	AZ College and Career Readiness Standard	Essential Question (HESS Matrix)	Learning Goal	Vocabulary (Content/Academic)
First Quarter August 2018 – October 2018 Life Science Unit A: Living Things Chapter 1, 2, and 4 in the Textbook				
Science A Closer Look Teacher's Edition **Reading and Writing workbook** **Visual Literacy workbook** **Activity Lab book** **Assessment Workbook** **Activity Flipchart** **School to Home Activities workbook** **Key Concept Cards**	**Strand 4: Life Science Concept 1: Characteristics of Organisms** P.O. 1 Compare structures in plants (e.g., roots, stems, leaves, flowers) and animals (e.g., muscles, bones, nerves) that serve different functions in growth and survival. P.O. 2 Classify animals by identifiable group characteristics: • Vertebrates – mammals, birds, fish, reptiles, amphibians • Invertebrates – insects, arachnids. **Concept 3: Organisms and Environments** PO 1. Describe ways various resources (e.g., air, water, plants, animals, soil) are utilized to meet the needs of a population. PO 2. Differentiate renewable resources from nonrenewable resources.	Chapter 1: Kingdoms of life Big Idea: What are living things and how are they classified? Lesson 1: Essential Question: How are living things grouped? Lesson 2 Essential Question How are living things grouped? Lesson 3 Essential Question	Lesson 1 KFO: • I can summarize five functions of living things. • I can compare plant and animal cells. Lesson 2 KFO: • I can define and compare the kingdoms of living things. • I can describe different types of microorganisms. Lesson 3 KFO: • I can describe the functions of roots, stem, and leaves. • I can explain the processes of	▪ Cell ▪ Oxygen ▪ Organism ▪ Tissue ▪ Organ ▪ Organ system ▪ Trait ▪ Kingdom ▪ Life Function ▪ Off spring ▪ Root ▪ Root hair ▪ Stem ▪ Photosynthesis ▪ Stomata ▪ Transpiration

Online tools at: https://connected.mcgraw-hill.com	PO 3. Analyze the effect that limited resources (e.g., natural gas, minerals) may have on an environment. PO 4. Describe ways in which resources can be conserved (e.g., by reducing, reusing, recycling, finding substitute. **Concept 4: Diversity, Adaptation, Behavior** PO 1. Recognize that successful characteristics of populations are inherited traits that are favorable in a particular environment. PO 2. Give examples of adaptations that allow plants and animals to survive. • Camouflage – horned lizards, coyotes. • Mimicry – Monarch and Viceroy butterflies • Physical – cactus spines • Mutualism – species of acacia that harbor ants, which repel other harmful insects. **Strand 1: Inquiry Process** **Concept 1: Inquiry Process** PO 1. Differentiate inferences from observation. **Concept 2: Scientific Testing (Investigating and Modeling)** PO 4. Measure using appropriate tools (e.g., related to erosion, plant life cycles, weather, magnetism) in life, physical, and Earth and space sciences. PO 5. Record data in an organized and appropriate (e.g., t-chart, table, list, written log). **Concept 3: Analyze and Conclusions** PO 1. Analyze data obtained in a scientific investigation to identify.	What are plants? Lesson 4 Essential Question: How do seed plants grow and reproduce? Chapter 2: Big Idea: How are animals different from one another? Lesson 1 Essential Question: How do animals compare? Lesson 2 Essential Question: Which animals have backbones?	photosynthesis and respiration. Lesson 4: • I can describe pollination in flowering plants. • I can explain the life cycle of a flowering plant. Chapter 2 KFO: Lesson 1 KFO: • I can define and list the basic needs and characteristics of animals. • I can summarize the characteristics of groups of invertebrates. Lesson 2 KFO: • I can define vertebrates and describe their characteristics. • I can describe the seven groups of vertebrates. • I can infer using information I read. Lesson 3: KFO:	▪ Respiration ▪ Spore ▪ Parts of a Cell ▪ Seed ▪ Reproduction ▪ Ovary ▪ Pollination ▪ Fertilization ▪ Germination ▪ Life cycle ▪ Invertebrate ▪ Sponge ▪ Cnidarian ▪ Mollusk ▪ Echinoderm ▪ Endoskeleton ▪ Arthropod ▪ Exoskeleton ▪ Vertebrate ▪ Warm-blooded ▪ Cold-blooded ▪ Amphibian ▪ Reptile ▪ Bird ▪ Mammal ▪ Skeletal system ▪ Muscular system

Concept 4: Communication **PO 3.** Communicate with other groups or individuals to compare the results of a common investigation.	Lesson 3 Essential Question: How do systems help animals survive?	• I can identify seven organ systems of animals. • I can summarize the structures and functions of the seven organ systems.	▪ Nervous system ▪ Respiratory system ▪ Circulatory system ▪ Excretory system ▪ Digestive system
	Lesson 4 Essential Question: How do animals grow and reproduce? Chapter 4 KFOs: Big Idea: Why do plants and animals live in different places and what happens when those places change?	Lesson 4 KFO: • I can compare incomplete metamorphosis to complete metamorphosis. • I can summarize how traits are passed from parent to offspring. • I can explain how trees reproduce without wind.	▪ Life cycle ▪ Life span ▪ Metamorphosis ▪ Clone ▪ Heredity ▪ Inherited behavior ▪ Instinct ▪ Learned behavior
	Lesson 1 Essential Question: How do animals survive in their environments?	Lesson 1 KFO: • I can define adaptation and give examples of how adaptations help animals to survive in their habitats. • I can define and describe the types of symbiotic relationships.	▪ Adaptation ▪ Hibernate ▪ Camouflage ▪ Mimicry
	Lesson 2 Essential Question	Lesson 2 KFO:	▪ Stimulus ▪ Tropism

		How do plants survive their environments? Lesson 3 Essential Question How can changes in an environment affect the organisms that live there?	• I can describe ways in which plants respond to their environments. • I can describe plant adaptations. Lesson 3 KFO: • I can describe how living and nonliving things cause ecosystems to change. • I can understand that changes to ecosystems affect living organisms.	▪ Accommodation ▪ Endangered ▪ extinct
Second Quarter October 2018 to December 2019 Chapter 5, 6 & 7				
Science A Closer Look Teacher's Edition Reading and Writing workbook Visual Literacy workbook Activity Lab book Assessment Workbook	**Strand 6: Earth and Space Science Concept 2: Earth's Processes and Systems** PO 1. Identify the Earth processes that cause erosion. PO 2. Describe how the currents and wind cause erosion and land changes. PO 3. Describe the role that water plays in the following processes that alter the Earth's surface features: • Erosion • Deposition • Weathering	Chapter 5 Big Idea: What causes Earth's surface to change? Lesson 1 Essential Question: What are Earth's features above the ground and below the ground? Lesson 2 Essential Question	Chapter 5 KFO: • I can what lichen is and how it grows on rocks. Lesson 1 KFO: • I can identify Earth's landforms and the features of the ocean floor. • I can describe the layers of Earth. Lesson 2 KFO:	▪ Crust ▪ Mantle ▪ Outer core ▪ Inner core ▪ Lava ▪ Magma ▪ Fault ▪ Landforms ▪ Plateau ▪ Fold ▪ Mountain ▪ Earthquake

Activity Flipchart **School to Home Activities workbook** **Key Concept Cards** **Vocabulary Cards English Language Learner Teacher's Guide**	PO 4. Compare rapid and slow processes that change the Earth's surface, including: • Rapid – earthquakes, volcanoes, floods. • Slow – wind, weathering PO 5. Identify the Earth events that cause changes in atmospheric conditions (e.g., volcanic eruptions, forest fires). PO 6. Analyze evidence that indicates life and environmental conditions have changed (e.g., tree rings, fish fossils in desert regions, ice cores). **Strand 1: Inquiry Process** **Concept 1: Observations, Questions, and Hypotheses** PO 2. Formulate a relevant question through observations that can be tested by an investigation. **Concept 2: Scientific Testing (Investigating and Modeling)** PO 2. Plan a simple investigation that identifies the variables to be controlled. PO 4. Measure using appropriate tools (e.g., related to erosion, plant life cycles, weather, and magnetism) in life, physical and Earth and space sciences.	How can Earth's crust change? Lesson 3 Essential Question What forces shape and change Earth's landforms? Lesson 4 Essential Question How does weather shape and change the land? Chapter 6 Big Idea: What are Earth's resources and how can we conserve them? Lesson 1 Essential Question: Why are there so many different kinds of rock?	• I can describe how the movement of plates builds mountains and causes earthquakes and volcanoes. • I can explain how scientist use seismic waves to study earthquakes. • I can explain the cause & effect of volcanic Eruptions. Lesson 3 KFO: • I can define and give examples of physical and chemical weathering. • I can explain what processes erode land and deposit land. • I can explain how erosion helps to break down and build up Earth's land. • I can explain how the size of pore spaces affect the permeability of soil. Lesson 4 KFO: • I can describe the effects of floods, fires,	▪ Seismic wave ▪ Seismograph ▪ Volcano ▪ plates ▪ Weathering ▪ Erosion ▪ Deposition ▪ Terminus ▪ Moraine ▪ Flood ▪ Tornado ▪ Hurricane ▪ Landslide ▪ Avalanche ▪ Mass Wasting ▪ Mineral ▪ Igneous rock ▪ Sedimentary rock ▪ Relative age ▪ Metamorphic rock ▪ Rock cycle ▪ Resource ▪ Humus ▪ Horizon ▪ Soil profile ▪ Top soil

PO 5. Record data in an organized and appropriate format (e.g., t-chart, table, list, written log). **Concept 3: Analysis and Conclusion** PO 1. Analyze data obtained in a scientific investigation to identify trends. **Concept 4. Communication** PO 3. Communicate with other groups or individuals to compare the results of a common investigation.	Lesson 2 Essential Question: How does soil differ from place to place? Lesson 3 Essential Question: What are fossils and fossil fuels? Lesson 4 Essential Question: How do people obtain and use water?	tornadoes, and hurricanes. • I can explain causes and effects of landslides and avalanches. Lesson 1 KFO: • I can describe the properties used to identify and classify minerals. • I can compare the three types of rocks. • I can explain how dinosaurs and mammals once lived together. • I can compare and contrast renewable and nonrenewable resources. Lesson 2 KFO: • I can describe the different layers of soil and how they form. • I can explain what happens to run off water.	▪ Subsoil ▪ Pore spaces ▪ Porous ▪ Permeability ▪ adaption ▪ Fossil ▪ Amber ▪ Mold ▪ Cast ▪ Imprint ▪ Fossil fuel ▪ Nonrenewable resource ▪ Renewable resource ▪ petrified ▪ alternative energy ▪ Soil water ▪ Groundwater ▪ Watershed ▪ Reservoir ▪ Well ▪ Runoff ▪ Irrigation ▪ evaporation ▪ Environment ▪ Pollution ▪ Acid rain

	Lesson 5 Essential Question: How can people reduce pollution and conserve resources? Chapter 7 KFO: Big Idea: What are weather and climate?	• I can define the texture, porosity, and permeability of soil.	▪ Conservation ▪ Compost ▪ Reduce ▪ Reuse ▪ Recycle
	Lesson 1 Essential Question: How can you tell that air is around you?	Lesson 3 KFO: • I can describe the different kinds of fossils, the ways they form, and how they provide evidence of Earth's past. • I can explain why fossil fuels are a valuable and nonrenewable resource. • I can explain how troposphere and the atmosphere are related. • I can describe the properties of weather.	▪ Atmosphere ▪ Temperature ▪ Humidity ▪ Air pressure ▪ Thermometer ▪ Wind vane ▪ Barometer ▪ Rain gauge ▪ wind current ▪ oxygen ▪ nitrogen
	Lesson 2 Essential Question: How is water recycled?	• I can describe the steps in evaporation and condensation. Lesson 4 KFO: • I can explain how the water cycle renews Earth's freshwater. • I can describe ways people use and obtain freshwater.	▪ Evaporation ▪ Water vapor ▪ Condensation ▪ Cloud ▪ Freeze ▪ Precipitation ▪ Water cycle ▪ Melt
	Lesson 3 Essential Question:		▪ Air mass ▪ Front ▪ Warm front ▪ Cold front

	How do fronts and air masses change the weather?	Lesson 5 KFO: • I can identify the effects of pollution to land, water, and air. • I can describe ways to reduce pollution and conserve resources.	▪ Stationary front ▪ Forecast
	Lesson 4 Essential Question: Why do weather patterns change?	Lesson 1 KFO: • I can define the atmosphere as a mixture of different gases. • I can describe four properties of weather that can be measured and the tools used to measure them. Lesson 2 KFO: • I can sequence the steps of the water cycle • I can identify and describe types of clouds and precipitation? Lesson 3 KFO: • I can explain how air masses form and identify the types of weather they cause.	▪ Climate ▪ current ▪ pressure ▪ Weather condition ▪ biomes ▪

			• I can forecast the weather by interpreting data on a weather map. Lesson 4 KFO: • I can define and give examples of climate. • I can explain the main factors that determine climate.	
Third Quarter January 2019 to March 2019 Chapter 11 & 12				
A Closer Look Teacher's Edition **Reading and Writing workbook** **Visual Literacy workbook** **Activity Lab book** **Assessment Workbook** **Activity Flipchart** **School to Home Activities workbook**	**Stand 5: Physical Science Concept 3: Energy and Magnetism** PO 1. Demonstrate that electricity flowing in circuits can produce light, heat, sound, and magnetic effects. PO 2. Construct series and parallel electric circuits. PO 3. Explain the purpose of conductors and insulators in various practical applications. PO 4. Investigate the characteristics of magnets (e.g., opposite poles attract, like poles repel, the force between two magnets poles depends on the distance between them).	Chapter 11 Big Idea: Why do things move? Lesson 1 Essential Question: How do objects move?	Chapter 11 Literature KFO: (Magnetic Migration) • I can explain that during migration some birds navigate using a magnetic mineral in their bodies. Lesson 1 KFO: • I can explain how motion, speed, velocity, and acceleration are related. • I can summarize the forces that act on a moving object, including friction and gravity.	▪ Speed ▪ Velocity ▪ Force ▪ Acceleration ▪ Inertia ▪ Friction ▪ Gravity ▪ Balanced forces ▪ Unbalanced forces ▪ Newton ▪ Work ▪ Energy ▪ Potential energy

Key Concept Cards **Vocabulary Cards English Language Learner Teacher's Guide** **Online tools at: https://connected.mcgraw-hill.com**	PO 5. State cause and effect relationships between magnets and circuitry. **Strand 1: Inquiry Process** **Concept 1: Observations, Questions, and Hypotheses** PO 1. Differentiate inferences from observations. PO 2. Formulate a relevant question through observations that can be tested by an investigation. PO 3. Formulate a predictions in the realm of science based on observed cause and effect relationships. **Concept 2: Scientific Testing (Investigating and Modeling)** PO 5. Record data in an organized and appropriate format (e.g., t-chart, table, list, written log). **Concept 3: Analysis and Conclusions** PO 1. Analyze data obtained in a scientific investigation to identify trends. **Concept 4: Communication** PO 3. Communicate with other groups or individuals to compare the results of a common investigation.	Lesson 2 Essential Question: How can pushes and pulls affect the way objects move? Lesson 3 Essential Question How are energy and work related? Lesson 4 Essential Question: How do simple machines make work easier? Chapter 12 Big Idea How do we use energy? Lesson 4 Essential Question:	Lesson 2 KFO: • I can demonstrate a basic understanding of how forces affect motion. • I can explain how friction affects motion. Lesson 3 KFO: • I can define work and energy. • I can compare and contrast potential and kinetic energy • I can explain the different energies and give an example of each. • I can explain alternative energy and suggest which energy is friendly to the Earth. Lesson 4 KFO: • I can identify the different kinds of simple machines. • I can explain how simple machines work	▪ Kinetic energy ▪ Simple machine ▪ Lever ▪ Load ▪ Effort force ▪ Inclined plane ▪ Compound machine ▪ wheel and axles ▪ pulley ▪ efficiency ▪ Static electricity ▪ Discharge ▪ Circuit ▪ Current electricity ▪ Series circuit ▪ Parallel circuit ▪ Attract ▪ Repel ▪ Pole ▪ Magnetic field ▪ Electromagnet ▪ Motor

How does electricity affect your bill?

together to make compound machine.

- I can compare and contrast a compound machine and a simple machine.

- generator

Lesson 5
Essential Question:
How are electricity and magnetism related?

Lesson 4 KFO:

- I can describe the characteristics of electrically charged objects.
- I can explain the difference between static and current electricity.

Lesson 5 KFO:

- I can describe a magnetic field and the effect of distance on magnetic force.
- I can understand how an electromagnet, an electric motor, and a generator work.

Fourth Quarter March 2019 to May 2019 Project Lead the Way Lessons				
A Closer Look Teacher's Edition **Reading and Writing workbook** **Visual Literacy workbook** **Activity Lab book** **Assessment Workbook** **Activity Flipchart** **School to Home Activities workbook** **Key Concept Cards** **Vocabulary Cards English Language Learner Teacher's Guide Online tools at: https://connected.mcgraw-hill.com** **Project lead the way Teacher resource book.**	Strand 5: Physical Science Concept 2: Motion and Forces PO 1. Describe the following forces: • Gravity • Friction PO 2. Describe the various effects forces can have on an object (e.g., cause motion, halt motion, change direction of motion, cause deformation) PO 3. Examine forces and motion through investigations using simple machines (e.g., wedge, plane, wheel and axle, pulley, lever). PO 4. Demonstrate effects of variables on an objects motion (e.g., incline angle, friction, applied forces).	Part 1: Energy 120 minutes How are potential and kinetic energy related? What happens to energy during a collision? Part 2: Energy Conversion in Action 120 minutes How are energy conversion and transfer related? How can humans use energy conversion and transfer to meet needs and wants? How is usable energy converted from resources in your area? What are some energy conversions that take place to create usable energy in a community?	• I can state question that engineers may ask gathering information about a situation people want to change. • I can list ways in which energy can be transferred. • I can build a vehicle that with restraints. • I can describe six main forms of energy, including light, thermal, electrical, mechanical, chemical, and nuclear. • I can list ways in which energy may be converted from one form to another. • I can knowledge or skill share findings and conclusions with an audience. • I can differentiate between potential and kinetic energy.	• module • collision • constraint • criteria • design process • elastic collision • energy • engineer • engineering • force • inclined plane • inelastic collisions • kinetic energy • lever • potential energy • prototype • pulley • simple machine • speed • work

- I can explain how energy can be converted to meet a human need or want.