High Priority Standards (CCSS, State, National, TILS, CREDE, etc.)

NGSS

CCC Patterns. Observed patterns of forms and events guide organization and classification, and they prompt questions about relationships and the factors that influence them.

Learning Goal	Proficiency Scale
Students will understand how patterns of forms and events guide organization and classification.	4: Student demonstrates an in-depth inference, advanced application or innovates with the learning goal. 3: Student demonstrates mastery with the learning goal as evidenced by: • using patterns of time, rates of change and cycles to form opinions or ideas about the natural or designed world. • classifying information based on observed patterns. • organizing data to reveal patterns and uncovers a solution to a natural or designed problem. • using patterns to identify cause and effect relationships. 2: Student demonstrates he/she is nearing proficiency by: • recognizing and recalling specific vocabulary, such as: evidence, qualitative, quantitative, bias, cause and effect. • performing processes such as: o identifying patterns related to time, including simple rates of change and cycles. o developing graphic representations to communicate patterns. 1: Student demonstrates limited understanding or skill with the learning goal.

Learning Targets - Rock Cycle

- identifying relevant and meaningful data to influence a conclusion.?
- identifying bias in interpretations of data.?

Learning Targets - History of the Earth

- MS-ESS2-3. Identifying patterns in data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions.
- Students will be able to use/know and understand/recognize and recall domain specific vocabulary such as: rock strata, relative, geologic, time scale, fossils, evolution, extinction, volcano, internal, external, sedimentary, igneous, weathering, erosion, volcano, earthquake, fault, expansion, contraction, decomposition, flood, mudslide, plate, tectonics.

Learning Targets - Matter and Energy in Organisms and Ecosystems

- MS-LS2-1. Analyzing and interpreting data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.
- Students will be able to use/know and understand/recognize and recall domain specific vocabulary such as: photosynthesis, reactants, products, chemical reaction, chloroplast, chlorophyll, molecule, respiration, ecosystem, resource, population, influence, physical, biological, food web, law of conservation of matter, producer, consumer, decomposer, ecosystem, predator, prey, scavenger, recycle, food chain.

Learning Targets - Natural Selection and Adaptation

- MS-LS4-1. Identifying patterns in the fossil record that document the existence, diversity, extinction, and change of life forms throughout the history of life on Earth under the assumption that natural laws operate today as in the past.
- MS-LS4-2. Identifying patterns found in anatomical similarities and differences among modern organisms and between modern and fossil organisms to infer evolutionary relationships.
- MS-LS4-3. Identifying patterns found in similarities in the embryological development across multiple species to identify relationships not evident in the fully formed anatomy.
- Students will be able to use/know and understand/recognize and recall domain specific vocabulary such as: fossil, diversity, extinction, anatomy, chronological, layer, era, fossil data, natural selection, adaptation, genetic, trait, survival, reproduction, chromosome, DNA, probability, sexual, asexual, proportional reasoning.

High Priority Standards (CCSS, State, National, TILS, CREDE, etc.)

NGSS

CCC Cause and effect: Mechanism and explanation. Events have causes, sometimes simple, sometimes multifaceted. A major activity of science is investigating and explaining causal relationships and the mechanisms by which they are mediated. Such mechanisms can then be tested across given contexts and used to predict and explain events in new contexts.

Learning Goal	Proficiency Scale
Students will be able to investigate and explain causal relationships.	4: Student demonstrates an in-depth inference, advanced application or innovates with the learning goal. 3: Student demonstrates mastery with the learning goal as evidenced by: • demonstrating that events that occur together with regularity might or might not signify a cause and effect relationship. • designing mechanisms in order to test the outcomes. • explaining effects that are seen as a result of causes that are unseen. • proving how effects, resulting from factors, are beneficial or detrimental to a system or organism. 2: Student demonstrates he/she is nearing proficiency by: • recognizing and recalling specific vocabulary, such as: factor, organism, outcome. • performing processes such as: o identifying and testing causal relationships. o using relationships to explain change. 1: Student demonstrates limited understanding or skill with the learning goal.

Learning Targets - Earth's Resources

- MS-ESS3-1. Determining how past and current geoscience processes (cause) have influenced the uneven distributions of

Earth's mineral, energy, and groundwater resources (effect).

Learning Targets - Engineering Design

- MS-ETS1-1. Defining the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
- Students will be able to use/know and understand/recognize and recall domain specific vocabulary such as: deforestation, overpopulation, water and air pollution, global warming, restoration of natural environments, river bank/coastal stabilization, recycling, channelization, reintroduction of species, depletion of resources, technology, mitigate, catastrophic, solution, monitoring, design, impact, aquifer, levee, development, wetland, pollution, population, per capita, consumption, resources, society

Learning Targets - Growth, Development, and Reproduction of Organisms

- MS-LS1-4. Identifying patterns in animal behaviors and specialized plant structures that affect the probability of successful reproduction of animals and plants respectively.
- Students will be able to use/know and understand/recognize and recall domain specific vocabulary such as: characteristics, behaviors, asexual, sexual, hereditary, Punnett square, genetic modification, chromosome, gene, gene therapy, predators, prey, trait, genetic modification, chromosome, gene, gene therapy, trait, sexual, asexual, agar, code, biotic, abiotic, composition, organism, competition, genotype, phenotype

Learning Targets - Human Impact

- MS-ESS3-4. Determining how increases in human population and per-capita consumption of natural resources impact Earth's systems.
- Students will be able to use/know and understand/recognize and recall domain specific vocabulary such as: volcano, earthquake, interior, exterior, mass wasting, tsunami, hurricane, typhoon, tornado, flood, magnitude, hazard, technology, mitigate, catastrophic, solution, monitoring, design, impact, aquifer, levee, development, wetland, pollution, population, per capita, consumption, resources, society, deforestation, overpopulation, water and air pollution, global warming, restoration of natural environments, river bank/coastal stabilization, recycling, channelization, reintroduction of species, depletion of resources, technology, mitigate, catastrophic, solution, monitoring, design, impact, aquifer, levee, development, wetland, pollution, population, per capita, consumption, resources, society

Learning Targets - Interdependent Relationships in Ecosystems

- MS-LS2-2. Using patterns to predict interactions among organisms across multiple ecosystems.
- Students will be able to use/know and understand/recognize and recall domain specific vocabulary such as: ecosystem, biotic, abiotic, producer, consumer, decomposer, community, population, species, niche, habitat, photosynthesis, organism, competitive, predator, prey, symbiotic, mutually beneficial, purification, recycling, nutrient, erosion, deforestation, overpopulation, pollution, global warming, climate change, channelization, depletion, endangered, invasive species, habitat, biodiversity.

Learning Targets - Matter and Energy in Organisms and Ecosystems

- MS-LS2-1. Providing evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.
- Students will be able to use/know and understand/recognize and recall domain specific vocabulary such as: photosynthesis, reactants, products, chemical reaction, chloroplast, chlorophyll, molecule, respiration, ecosystem, resource, population, influence, physical, biological, food web, law of conservation of matter, producer, consumer, decomposer, ecosystem, predator, prey, scavenger, recycle, food chain.

Learning Targets - Natural Selection and Adaptation

- MS-LS4-4. Describing how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment.
- MS-LS4-6. Explaining how natural selection may lead to increases and decreases of specific traits in populations over time.
- Students will be able to use/know and understand/recognize and recall domain specific vocabulary such as: fossil, diversity, extinction, anatomy, chronological, layer, era, fossil data, natural selection, adaptation, genetic, trait, survival, reproduction, chromosome, DNA, probability, sexual, asexual, proportional reasoning.

Learning Targets - Earth's Systems

- MS-ESS3-1. Determining how past and current geoscience processes (cause) have influenced the uneven distributions of Earth's mineral, energy, and groundwater resources (effect).
- Students will be able to use/know and understand/recognize and recall domain specific vocabulary such as: melting, crystallization, weathering, deformation, sedimentation, minerals, metamorphic, igneous, hydrosphere, geosphere, atmosphere, evaporation, condensation, precipitation, surface run-off, groundwater flow, convection, conduction, radiation, water cycle, rock cycle, gravity, renewable, nonrenewable, geothermal, hydroelectric, fossil fuel, petroleum, sediment, ore, subduction zone, hydrothermal, resources.

High Priority Standards (CCSS, State, National, TILS, CREDE, etc.)

NGSS

CCC Scale, proportion, and quantity. In considering phenomena, it is critical to recognize what is relevant at different measures of size, time, and energy and to recognize how changes in scale, proportion, or quantity affect a system's structure or performance.

Learning Goal	Proficiency Scale	
Students will understand how changes in scale, proportion, or quantity affect a system's structure and/or performance	4: Student demonstrates an in-depth inference, advanced application or innovates with the learning goal. 3: Student demonstrates mastery with the learning goal as evidenced by: • recognizing what is relevant to a phenomena at different measures of size, time, and energy • understanding the scale of systems too large or too small to be seen. • comparing models to a natural or designed system in terms of scale, proportion, or quantity. • creating a visual representation of data to communicate scale, proportion and/or quantity. 2: Student demonstrates he/she is nearing proficiency by: • recognizing and recalling specific vocabulary, such as: proportion. • performing processes such as: o recognizing natural objects and observable phenomena exist from the very small to the immensely large. o using standard units to measure and describe physical quantities such as, but not limited to, weight, time, temperature, and volume. o creating a visual representation of data to communicate scale, proportion and/or quantity. o recognizing numerical values of powers of 10. 1: Student demonstrates limited understanding or skill with the learning goal.	

Learning Targets - History of the Earth

- MS-ESS1-4. Explain, using evidence from rock strata, how the geologic time scale is used to organize Earth's 4.6-billion-year-old history.
- MS-ESS2-2. Describing how geoscience processes have changed Earth's surface at varying time and spatial scales.
- Students will be able to use/know and understand/recognize and recall domain specific vocabulary such as: rock strata, relative, geologic, time scale, fossils, evolution, extinction, volcano, internal, external, sedimentary, igneous, weathering, erosion, volcano, earthquake, fault, expansion, contraction, decomposition, flood, mudslide, plate, tectonics

High Priority Standards (CCSS, State, National, TILS, CREDE, etc.)

NGSS

CCC Systems and system models. Defining the system under study—specifying its boundaries and making explicit a model of that system—provides tools for understanding and testing ideas that are applicable throughout science and engineering.

Learning Goal	Proficiency Scale

Students will be able to define systems they are studying.	4: Student demonstrates an in-depth inference, advanced application or innovates with the learning goal.
	
	3: Student demonstrates mastery with the learning goal as evidenced by:
	• proving a system's boundaries, conditions, inputs and outputs.
	• identifying patterns of the inputs and outputs of a system.
	• using models to simulate systems.
	• evaluating the strengths and weaknesses of the models.
	
	2: Student demonstrates he/she is nearing proficiency by:
	• recognizing and recalling specific vocabulary, such as: boundaries, conditions, model.
	• performing processes such as:
	  ○ identifying the various functions the parts do within the whole.
	  ○ categorizing parts of a system and how they relate to the whole.
	
	1: Student demonstrates limited understanding or skill with the learning goal.

Learning Targets - Matter and Energy in Organisms and Ecosystems

- MS-LS1-7. Developing a model to describe how food is rearranged through chemical reactions forming new molecules that support growth and/or release energy as this matter moves through an organism.
- MS-LS2-3. Developing a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.
- Students will be able to use/know and understand/recognize and recall domain specific vocabulary such as: photosynthesis, reactants, products, chemical reaction, chloroplast, chlorophyll, molecule, respiration, ecosystem, resource, population, influence, physical, biological, food web, law of conservation of matter, producer, consumer, decomposer, ecosystem, predator, prey, scavenger, recycle, food chain.

Learning Targets - Earth's Systems

- MS-ESS2-1. Developing a model to describe the cycling of Earth's materials and the flow of energy that drives this process.
- MS-ESS2-4. Developing a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.
- Students will be able to use/know and understand/recognize and recall domain specific vocabulary such as: melting, crystallization, weathering, deformation, sedimentation, minerals, metamorphic, igneous, hydrosphere, geosphere, atmosphere, evaporation, condensation, precipitation, surface run-off, groundwater flow, convection, conduction, radiation, water cycle, rock cycle, gravity, renewable, nonrenewable, geothermal, hydroelectric, fossil fuel, petroleum, sediment, ore, subduction zone, hydrothermal, resources.

High Priority Standards (CCSS, State, National, TILS, CREDE, etc.)

NGSS

CCC *Energy and matter: Flows, cycles, and conservation.* Tracking fluxes of energy and matter into, out of, and within systems helps one understand the systems' possibilities and limitations.

Learning Goal	Proficiency Scale
Students will understand how changes in energy and matter help them define a system's limitations and possibilities.	4: Student demonstrates an in-depth inference, advanced application or innovates with the learning goal. 3: Student demonstrates mastery with the learning goal as evidenced by: • applying the law of conservation of matter as it is displayed in a natural or designed system. • illustrating the transfer and cycling of matter and energy in a system. 2: Student demonstrates he/she is nearing proficiency by: • recognizing and recalling specific vocabulary, such as: illustrate. • performing processes such as: o recognizing energy can be transferred in various ways and between objects. o observing and illustrating energy and matter flows and cycles in systems. 1: Student demonstrates limited understanding or skill with the learning goal.

Learning Targets - Matter and Energy in Organisms and Ecosystems

- MS-LS1-6. Interpreting the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms.
- MS-LS1-7. Showing how food is rearranged through chemical reactions forming new molecules that support growth and/or release energy as this matter moves through an organism.
- MS-LS2-3. Describing the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.
- Students will be able to use/know and understand/recognize and recall domain specific vocabulary such as: photosynthesis, reactants, products, chemical reaction, chloroplast, chlorophyll, molecule, respiration, ecosystem, resource, population, influence, physical, biological, food web, law of conservation of matter, producer, consumer, decomposer, ecosystem, predator, prey, scavenger, recycle, food chain

Learning Targets - Earth's Systems

- MS-ESS2-1. Describing the cycling of Earth's materials and the flow of energy that drives this process.
- MS-ESS2-4. Describing the cycling of water through Earth's systems highlighting the energy from the sun and the force of gravity.
- Students will be able to use/know and understand/recognize and recall domain specific vocabulary such as: melting, crystallization, weathering, deformation, sedimentation, minerals, metamorphic, igneous, hydrosphere, geosphere, atmosphere, evaporation, condensation, precipitation, surface run-off, groundwater flow, convection, conduction, radiation, water cycle, rock cycle, gravity, renewable, nonrenewable, geothermal, hydroelectric, fossil fuel, petroleum, sediment, ore, subduction zone, hydrothermal, resources.

High Priority Standards (CCSS, State, National, TILS, CREDE, etc.)
NGSS CCC *Stability and change*. For natural and built systems alike, conditions of stability and determinants of rates of change or evolution of a system are critical elements of study.

Learning Goal	Proficiency Scale
Students will understand conditions of stability and rates of change.	4: Student demonstrates an in-depth inference, advanced application or innovates with the learning goal. 3: Student demonstrates mastery with the learning goal as evidenced by: • understanding factors that influence stability and rates of change in a larger system. • identifying examples of systems in dynamic equilibrium. • measuring change (in systems, objects or organisms) in terms of differences over time. • identifying examples of systems that appear stable, but over long periods of time they will eventually, or already have, changed. 2: Student demonstrates he/she is nearing proficiency by: • recognizing and recalling specific vocabulary, such as: rate, system, equilibrium, dynamic equilibrium. • performing processes such as: o recognizing that change happens over time. o identifying rates of change. o identifying examples of stability and change within a system. 1: Student demonstrates limited understanding or skill with the learning goal.

Learning Targets - Interdependent Relationships in Ecosystems

- MS-LS2-5. Evaluating ways of maintaining biodiversity and ecosystem services.
- Students will be able to use/know and understand/recognize and recall domain specific vocabulary such as: ecosystem, biotic, abiotic, producer, consumer, decomposer, community, population, species, niche, habitat, photosynthesis, organism, competitive, predator, prey, symbiotic, mutually beneficial, purification, recycling, nutrient, erosion, deforestation, overpopulation, pollution, global warming, climate change, channelization, depletion, endangered, invasive species, habitat, biodiversity.

Learning Targets - Matter and Energy in Organisms and Ecosystems

- MS-LS2-4. Predict how changes to physical or biological components of an ecosystem affect populations.
- Students will be able to use/know and understand/recognize and recall domain specific vocabulary such as: photosynthesis, reactants, products, chemical reaction, chloroplast, chlorophyll, molecule, respiration, ecosystem, resource, population, influence, physical, biological, food web, law of conservation of matter, producer, consumer, decomposer, ecosystem, predator, prey, scavenger, recycle, food chain.