



2023 Science (Emended Feb. 2025)

Wyoming Content & Performance Standards (WYCPS)

Effective – July 17, 2024

To be Fully Implemented in Districts by the Beginning of School Year 2025-26

Rationale:

Today, quality science education enables students to learn science by being actively involved with scientific and engineering practices as they progress from kindergarten through 12th grade. They are encouraged to be inquisitive, to actively explore their environment, and to become productive, scientifically literate citizens. The standards we present here provide the necessary foundation for local school district decisions about curriculum, assessments, and instruction. Implementation of the standards will better prepare Wyoming high school graduates for the rigors of college and/or careers. In turn, Wyoming employers will be able to hire workers with a strong science and engineering base — both in specific content areas and in critical thinking and inquiry-based problem solving.

These standards were informed by *A Framework for K-12 Science Education* (National Research Council, 2012), the *Next Generation Science Standards* (National Academies Press, 2013), and the unique needs of Wyoming. They are distinct from prior science standards in that they integrate three dimensions of learning within each standard and have intentional connections across standards, grade bands, and subjects. The three dimensions are crosscutting concepts, disciplinary core ideas, and science and engineering practices.

Organization of the Standards:

Standard Code = Grade-Science Discipline & Domain-Standard #

Key: K-PS3-2 = Grade K - Physical Science (PS) Domain 3 - Standard 2 (or Performance Expectation 2)

Domains:

The core concepts to be studied in science. The Science Standards consist of four domains across the K-12 standards. 1) Physical Science; 2) Life Science; 3) Earth and Space Science; and 4) Engineering, Technology, and Applications of Science.

Three Dimensions of Science:

Dimension 1: Crosscutting Concepts (CCC)

The seven Crosscutting Concepts, listed below, have application across all domains of science. As such, they provide one way of linking across the domains of the Disciplinary Core Ideas.

1. Patterns.
2. Cause and effect.
3. Scale, proportion, and quantity.
4. Systems and system models.
5. Energy and matter.
6. Structure and function.
7. Stability and change.

Dimension 2: Disciplinary Core Ideas (DCI)

The continuing expansion of scientific knowledge makes it impossible to teach all of the ideas related to a given discipline in exhaustive detail during the K-12 years. But given the cornucopia of information available today, virtually at a touch, an important role of science education is not to teach “all the facts” but rather to prepare students in the four domains of science with sufficient core knowledge so that they can later acquire additional information on their own. The four domains referenced are: 1) physical science, 2) life science, 3) Earth and space science, and 4) engineering, technology and applications of science.

Dimension 3: Science and Engineering Practices (SEP)

The eight Science and Engineering Practices (SEPs), listed below, describe both (a) the major practices that scientists employ as they investigate and build models and theories about the world and (b) a key set of engineering practices that engineers use as they design and build systems. We use the term “practices” instead of skills to emphasize that engaging in a scientific investigation requires not only skill but also knowledge that is specific to each practice.

1. Asking questions (for science) and defining problems (for engineering).
2. Developing and using models.
3. Planning and carrying out investigations.
4. Analyzing and interpreting data.
5. Using mathematics and computational thinking.
6. Constructing explanations (for science) and designing solutions (for engineering).
7. Engaging in argument from evidence.
8. Obtaining, evaluating, and communicating information.

Kindergarten Science Content Standards

Physical Science

PS2 Motion and Stability: Forces and Interactions

- K-PS2-1** Plan and conduct an investigation to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object.

PS3 Energy

- K-PS3-2** Use tools and materials to design and build a structure that will reduce the warming effect of sunlight on an area.

Life Science

No standards exist for this domain for Kindergarten.

Earth and Space Science

ESS3 Earth and Human Activity

- K-ESS3-1** Use a model to represent the relationship between the needs of different plants and animals (including humans) and the places they live.

Engineering and Design

ETS1 Engineering, Technology, & Applications of Science

- K-2-ETS1-2** Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.

Grade 1 Science Content Standards

Physical Science

PS4 Waves and Their Applications in Technologies for Information Transfer

- 1-PS4-4 Use tools and materials to design and build a device that uses light or sound to solve the problem of communicating over a distance.

Life Science

LS1 From Molecules to Organisms: Structure and Processes

- 1-LS1-1 Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.

Earth and Space Science

ESS1 Earth's Place in the Universe

- 1-ESS1-1 Use observations of the sun, moon, and stars to describe patterns that can be predicted.

Engineering and Design

ETS1 Engineering, Technology, & Applications of Science

- K-2-ETS1-1 Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.

Grade 2 Science Content Standards

Physical Science

PS1 Matter and Its Interactions

- 2-PS1-2 Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.

Life Science

LS2 Ecosystems: Interactions, Energy, and Dynamics

- 2-LS2-2 Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.

LS4 Biological Evolution: Unity and Diversity

- 2-LS4-1 Make observations of plants and animals to compare the diversity of life in different habitats.

Earth and Space Science

ESS2 Earth's Systems

- 2-ESS2-1 Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land.

Engineering and Design

ETS1 Engineering, Technology, & Applications of Science

- K-2-ETS1-3 Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.

Grade 3 Science Content & Performance Standards

Physical Science

PS2 Motion and Stability: Forces and Interactions

3-PS2-3 Ask questions to determine cause and effect relationships of electric or magnetic interactions between two objects not in contact with each other.

- The Proficient student is able to ask questions to determine cause and effect relationships of electric or magnetic interactions between two objects not in contact with each other.

Life Science

LS3 Heredity: Inheritance and Variation of Traits

3-LS3-1 Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms.

- The Proficient student is able to analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms.

LS4 Biological Evolution: Unity and Diversity

3-LS4-4 Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.

- The Proficient student is able to make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.

Earth and Space Science

ESS3 Earth and Human Activity

3-ESS3-1 Make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard.

- The Proficient student is able to make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard.

Engineering and Design

ETS1 Engineering, Technology, & Applications of Science

3-5-ETS1-1 Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.

- The Proficient student is able to define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.

Grade 4 Science Content & Performance Standards

Physical Science

PS3 Energy

4-PS3-4 Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.

- The Proficient student is able to apply scientific ideas to design, test, and refine a device that converts energy from one form to another.

PS4 Waves and Their Applications in Technologies for Information Transfer

4-PS4-1 Develop a model of waves to describe patterns in terms of amplitude and wavelength and that waves can cause objects to move.

- The Proficient student is able to develop a model of waves to describe patterns in terms of amplitude and wavelength and that waves can cause objects to move.

4-PS4-3 Generate and compare multiple solutions that use patterns to transfer information.

- The Proficient student is able to generate and compare multiple solutions that use patterns to transfer information.

Life Science

LS1 From Molecules to Organisms: Structure and Processes

4-LS1-1 Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

- The Proficient student is able to construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

Earth and Space Science

ESS1 Earth's Place in the Universe

4-ESS1-1 Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time.

- The Proficient student is able to identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time.

Engineering and Design

ETS1 Engineering, Technology, & Applications of Science

3-5-ETS1-2 Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

- The Proficient student is able to generate and compare possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

Grade 5 Science Content & Performance Standards

Physical Science

PS1 Matter and Its Interactions

5-PS1-4 Conduct an investigation to determine whether the mixing of two or more substances results in new substances.

- The Proficient student is able to conduct an investigation to determine whether the mixing of two or more substances results in new substances.

PS3 Energy

5-PS3-1 Use models to describe that energy in animals' food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun.

- The Proficient student is able to use models to describe that energy in animals' food (used for body repair, growth, motion, and to maintain warmth) was once energy from the sun.

Life Science

LS2 Ecosystems: Interactions, Energy, and Dynamics

5-LS2-1 Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.

- The Proficient student is able to develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.

Earth and Space Science

ESS1 Earth's Place in the Universe

5-ESS1-2 Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky.

- The Proficient student is able to represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky.

ESS3 Earth and Human Activity

5-ESS3-1 Obtain and combine information about ways individual communities use science ideas to conserve Earth's resources and environment.

- The Proficient student is able to obtain and combine information about ways individual communities use science ideas to conserve Earth's resources and environment.

Engineering and Design

ETS1 Engineering, Technology, & Applications of Science

3-5-ETS1-3 Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

- The Proficient student is able to plan and carry out fair tests of a variety of solutions in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

Middle School Science Content & Performance Standards

Physical Science

PS1 Matter and Its Interactions

- MS-PS1-1** Develop models to describe the atomic composition of simple molecules and extended structures.
- The Proficient student is able to develop models to describe the atomic composition of simple molecules and extended structures.
- MS-PS1-4** Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.
- The Proficient student is able to develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.
- MS-PS1-5** Develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved.
- The Proficient student is able to develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved.

PS2 Motion and Stability: Forces and Interactions

- MS-PS2-1** Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects.
- The Proficient student is able to apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects.
- MS-PS2-2** Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.
- The Proficient student is able to plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.

PS3 Energy

- MS-PS3-2** Develop a model to describe that when the arrangement of objects interacting at a distance changes, different amounts of potential energy are stored in the system.
- The Proficient student is able to develop a model to describe that when the arrangement of objects interacting at a distance changes, different amounts of potential energy are stored in the system.
- MS-PS3-4** Plan an investigation to determine the relationships among the energy transferred, the type of matter, the mass, and the change in the average kinetic energy of the particles as measured by the temperature of the sample.
- The Proficient student is able to plan an investigation to determine the relationships among the energy transferred, the type of matter, the mass, and the change in the average kinetic energy of the particles as measured by the temperature of the sample.

PS4 Waves and Their Applications in Technologies for Information Transfer

- MS-PS4-1** Use mathematical representations to describe a simple model for waves, which includes how the amplitude of a wave is related to the energy in a wave.
- The Proficient student is able to use mathematical representations to describe a simple model for waves, which includes how the amplitude of a wave is related to the energy in a wave.
- MS-PS4-2** Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.
- The Proficient student is able to develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.

Life Science

LS1 From Molecules to Organisms: Structure and Processes

- MS-LS1-2** Develop and use models to describe the parts, functions, and basic processes of cells.
- The Proficient student is able to develop and use models to describe the parts, functions, and basic processes of cells.
- MS-LS1-3** Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.
- The Proficient student is able to use arguments supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.
- MS-LS1-6** Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms.
- The Proficient student is able to construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms.

LS2 Ecosystems: Interactions, Energy, and Dynamics

- MS-LS2-3** Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.
- The Proficient student is able to develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.
- MS-LS2-5** Evaluate competing design solutions for maintaining biodiversity and ecosystem services.
- The Proficient student is able to evaluate competing design solutions for maintaining biodiversity and ecosystem services.

LS3 Heredity: Inheritance and Variation of Traits

- MS-LS3-1** Develop and use a model to describe why structural changes to genes (mutations) located on chromosomes may affect proteins and may result in harmful, beneficial, or neutral effects to the structure and function of the organism.
- The Proficient student is able to develop and use a model to describe why structural changes to genes (mutations) located on chromosomes may affect proteins and may result in harmful, beneficial, or neutral effects to the structure and function of the organism.

MS-LS3-2 Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation.

- The Proficient student is able to develop and use a model to describe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation.

LS4 Biological Evolution: Unity and Diversity

MS-LS4-1 Analyze and interpret data for 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.

- The Proficient student is able to analyze and interpret data for 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-LS4-5 Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms.

- The Proficient student is able to gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms.

MS-LS4-6 Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time.

- The Proficient student is able to use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time.

Earth and Space Science

ESS1 Earth's Place in the Universe

MS-ESS1-1 Develop and use a model of the Earth-sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons.

- The Proficient student is able to develop and use a model of the Earth-sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons.

MS-ESS1-2 Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system.

- The Proficient student is able to develop and use a model to describe the role of gravity in the motions within galaxies and the solar system.

ESS2 Earth's Systems

MS-ESS2-1 Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process.

- The Proficient student is able to develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process.

MS-ESS2-3 Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions.

- The Proficient student is able to analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions.

MS-ESS2-4 Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.

- The Proficient student is able to develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.

MS-ESS2-6 Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates.

- The Proficient student is able to develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates.

ESS3 Earth and Human Activity

MS-ESS3-3 Apply scientific principles to design a method for monitoring, evaluating, and managing a human impact on the environment.

- The Proficient student is able to apply scientific principles to design a method for monitoring, evaluating, and managing a human impact on the environment.

Engineering and Design

ETS1 Engineering, Technology, & Applications of Science

MS-ETS1-1 Define 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.

- The Proficient student is able to define the criteria and constraints of a design problem, with precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and/or the natural environment that may limit possible solutions.

ETS2 Engineering, Technology, Science, and Society

MS-ETS2-2 Develop a model defining and prioritizing the impacts of human activity on a particular aspect of the environment, identifying positive and negative consequences of the activity, both short and long-term, and investigate and explain how the ethics and integrity of scientists and engineers and respect for individual property rights might constrain future development.

- The Proficient student is able to develop a model defining and prioritizing the impacts of human activity on a particular aspect of the environment, identifying positive and negative consequences of the activity, both short and long-term, and investigate and explain how the ethics and integrity of scientists and engineers and respect for individual property rights might constrain future development.

High School Science Content & Performance Standards

Physical Science

PS1 Matter and Its Interactions

- HS-PS1-1** Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms.
- The Proficient student is able to use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms.
- HS-PS1-2** Construct an explanation for the outcome of a simple chemical reaction based on the outermost electron states of atoms, trends in the periodic table, and knowledge of the patterns of chemical properties, and revise, as needed.
- The Proficient student is able to construct an explanation for the outcome of a simple chemical reaction based on the outermost electron states of atoms and knowledge of the patterns of chemical properties.
- HS-PS1-6** Evaluate the design of a chemical system by changing conditions to produce increased amounts of products at equilibrium, and refine the design, as needed.
- The Proficient student is able to evaluate the design of a chemical system by changing conditions to produce increased amounts of products at equilibrium.
- HS-PS1-7** Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction.
- The Proficient student is able to use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction.
- HS-PS1-8** Develop models to illustrate the changes in the composition of the nucleus of the atom and the energy released during the processes of fission, fusion, and radioactive decay.
- The Proficient student is able to develop models to illustrate the changes in the composition of the nucleus of the atom and the energy released during the processes of fission, fusion, and radioactive decay.

PS2 Motion and Stability: Forces and Interactions

- HS-PS2-3** Apply scientific and engineering ideas to design, evaluate, and refine a device that minimizes the force on a macroscopic object during a collision.
- The Proficient student is able to apply scientific and engineering ideas to design, evaluate, and refine a device that minimizes the force on a macroscopic object during a collision.
- HS-PS2-5** Plan and conduct an investigation to provide evidence that an electric current can produce a magnetic field and that a changing magnetic field can produce an electric current.
- The Proficient student is able to plan and conduct an investigation to provide evidence that an electric current can produce a magnetic field and that a changing magnetic field can produce an electric current.
- HS-PS2-6** Communicate scientific and technical information about why the molecular-level structure is important in the functioning of materials.
- The Proficient student is able to communicate scientific and technical information about why the molecular-level structure is important in the functioning of materials.

PS3 Energy

- HS-PS3-3** Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.

- The Proficient student is able to design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.

PS4 Waves and Their Applications in Technologies for Information Transfer

HS-PS4-1 Use mathematical representations to support a claim regarding relationships among the frequency, wavelength, and speed of waves traveling in various media.

- The Proficient student is able to use mathematical representations to support a claim regarding relationships among the frequency, wavelength, and speed of waves traveling in various media.

HS-PS4-5 Communicate technical information about how some technological devices use the principles of wave behavior and wave interactions with matter to transmit and capture information and energy.

- The Proficient student is able to communicate technical information about how some technological devices use the principles of wave behavior and wave interactions with matter to transmit and capture information and energy.

Life Science

LS1 From Molecules to Organisms: Structure and Processes

HS-LS1-1 Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.

- The Proficient student is able to construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.

HS-LS1-6 Construct explanations and revise, as needed, based on evidence for: 1) how carbon, hydrogen, and oxygen may combine with other elements to form amino acids and/or other large carbon-based molecules, and 2) how other hydrocarbons may also combine to form large carbon-based molecules.

- The Proficient student is able to construct explanations and revise, as needed, based on evidence for: 1) how carbon, hydrogen, and oxygen may combine with other elements to form amino acids and/or other large carbon-based molecules, and 2) how other hydrocarbons may also combine to form large carbon-based molecules.

LS2 Ecosystems: Interactions, Energy, and Dynamics

HS-LS2-5 Develop a model to illustrate the role of photosynthesis and cellular respiration in the cycling of carbon among the biosphere, atmosphere, hydrosphere, and geosphere.

- The Proficient student is able to develop a model to illustrate the role of photosynthesis and cellular respiration in the cycling of carbon among the biosphere, atmosphere, hydrosphere, and geosphere.

HS-LS2-6 Evaluate the claims, evidence, and reasoning that the complex biotic and abiotic interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a modified ecosystem.

- The Proficient student is able to evaluate the claims, evidence, and reasoning that the complex biotic and abiotic interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a modified ecosystem.

HS-LS2-7 Evaluate and assess impacts on the environment and biodiversity in order to refine or design a solution for detrimental impacts or enhancement for positive impacts.

- The Proficient student is able to evaluate and assess impacts on the environment and biodiversity in order to refine or design a solution for detrimental impacts or enhancement for positive impacts.

LS3 Heredity: Inheritance and Variation of Traits

HS-LS3-2 Make and defend a claim based on evidence that inheritable genetic variations may result from: (1) new genetic combinations through meiosis, (2) viable errors occurring during replication, and/or (3) mutations caused by environmental factors.

- The Proficient student is able to make and defend a claim based on evidence that inheritable genetic variations may result from: (1) new genetic combinations through meiosis, (2) viable errors occurring during replication, and/or (3) mutations caused by environmental factors.

LS4 Biological Evolution: Unity and Diversity

HS-LS4-2 Construct an explanation based on evidence that the process of evolution primarily results from four factors: (1) the potential for a species to increase in number, (2) the heritable genetic variation of individuals in a species due to mutation and sexual reproduction, (3) competition for limited resources, and (4) the proliferation of those organisms that are better able to survive and reproduce in the environment.

- The Proficient student is able to construct an explanation based on evidence that the process of evolution primarily results from four factors: (1) the potential for a species to increase in number, (2) the heritable genetic variation of individuals in a species due to mutation and sexual reproduction, (3) competition for limited resources, and (4) the proliferation of those organisms that are better able to survive and reproduce in the environment.

HS-LS4-5 Evaluate the evidence supporting claims that changes in environmental conditions may result in: (1) increases in the number of individuals of some species, (2) the emergence of new species over time, and (3) the extinction of other species.

- The Proficient student is able to evaluate the evidence supporting claims that changes in environmental conditions may result in: (1) increases in the number of individuals of some species, (2) the emergence of new species over time, and (3) the extinction of other species.

HS-LS4-6 Create and/or use a simulation to evaluate the impacts of human activity on biodiversity.

- The Proficient student is able to use a simulation to evaluate the impacts of human activity on biodiversity.

Earth and Space Science

ESS1 Earth's Place in the Universe

HS-ESS1-2 Construct an explanation of the Big Bang theory based on astronomical evidence of light spectra, motion of distant galaxies, and composition of matter in the universe.

- The Proficient student is able to construct an explanation of the Big Bang theory based on astronomical evidence of light spectra, motion of distant galaxies, and composition of matter in the universe.

HS-ESS1-5 Evaluate evidence of the past and current movements of continental and oceanic crust and the theory of plate tectonics to explain the ages of crustal rocks.

- The Proficient student is able to evaluate evidence of the past and current movements of continental and oceanic crust and the theory of plate tectonics to explain the ages of crustal rocks.

ESS2 Earth's Systems

HS-ESS2-2 Analyze geoscience data to make the claim that one change to Earth's surface can create feedbacks that cause changes to other Earth systems.

- The Proficient student is able to analyze geoscience data to make the claim that one change to Earth's surface can create feedbacks that cause changes to other Earth systems.

HS-ESS2-4 Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate.

- The Proficient student is able to use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate.

ESS3 Earth and Human Activity

HS-ESS3-2 Evaluate competing design solutions for developing, managing, and using energy and mineral resources based on cost-benefit ratios.

- The Proficient student is able to evaluate competing design solutions for developing, managing, and using energy and mineral resources based on cost-benefit ratios.

HS-ESS3-3 Use computational tools to illustrate the relationships among management of natural resources, the sustainability of human populations, and biodiversity.

- The Proficient student is able to use computational tools to illustrate the relationships among management of natural resources, the sustainability of human populations, and biodiversity.

HS-ESS3-5 Analyze data and the results from global climate models to make an evidence-based forecast of the current rate of global or regional climate change and associated future impacts to Earth systems.

- The Proficient student is able to analyze data and the results from global climate models to make an evidence-based forecast of the current rate of global or regional climate change and associated future impacts to Earth systems.

Engineering and Design

ETS1 Engineering, Technology, & Applications of Science

HS-ETS1-3 Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts.

- The Proficient student is able to evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts.

HS-ETS1-5 Evaluate the validity and reliability of claims in a variety of materials.

- The Proficient student is able to evaluate the validity and reliability of multiple claims that appear in scientific and technical texts or media reports.