

Archdiocese of Washington Comprehensive Science Standards

Suggested Learning Objectives

Scaled Score values 2150 or smaller

Life Science	Earth Science	Physical Science
<ul style="list-style-type: none"> The learner will explain that animals have internal and external structures that function to support survival, growth, behavior, and reproduction. (*) 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none">

Scaled Score values from 2151 - 2250

Life Science	Earth Science	Physical Science
<ul style="list-style-type: none"> The learner will understand that animals have traits that can be influenced by the environment. (*) The learner will understand that reproduction is required for the continued existence of every type of organism. (*) 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> The learner will explain that energy can be transferred by sound. (3.SC.3.PS.5)

Scaled Score values from 2251 - 2350

Life Science	Earth Science	Physical Science
<ul style="list-style-type: none"> The learner will recognize that animal groups vary in size and function. (*) The learner will explain that some animals form groups that help members survive. (3.SC.3.LS.2) The learner will recognize that organisms have unique and diverse life cycles. (2.SC.2.LS.3) The learner will use evidence to explain that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all. (*) The learner will understand that all organisms have in common birth, growth, reproduction, and death. (2.SC.2.LS.3) 	<ul style="list-style-type: none"> The learner will evaluate design solution that reduces the impacts of a weather-related hazard (barriers to prevent flooding, wind resistant roofs, lightning rods). (3.SC.3.ESS.3) 	<ul style="list-style-type: none"> The learner will use evidence to explain the relationship between the speed of an object and the energy of that object. (4.SC.4.PS.1) The learner will understand that a force has strength and a direction. (*) The learner will use observations as evidence to explain that energy can be transferred by sound. (3.SC.3.PS.5)

Scaled Score values from 2351 - 2450

Life Science	Earth Science	Physical Science
<ul style="list-style-type: none"> The learner will understand the relationship of predatory interactions among organisms and abiotic components of ecosystems, and that predatory interactions may reduce the number of organisms or eliminate whole populations. (*) The learner will explain that genetic factors influence the growth of organisms. (*) The learner will understand that anatomical similarities and differences between modern organisms and organisms in the fossil record infer evolutionary relationships. (6-8.SC.6-8.LS.2-4) The learner will understand that comparison of embryological development of different species can show similarities not found in fully formed anatomy. (*) The learner will define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost in a grade 3 standard. (Life Science) (3-5.SC.3-5.E.1) The learner will understand that plants have traits that can be influenced by the environment. (*) The learner will understand that when the environment changes some organisms survive and reproduce, some move to new areas, some die. (*) The learner will explain that environmental factors influence the growth of organisms. (*) The learner will explain that characteristic animal behaviors affect the probability of successful reproduction of animals. (*) The learner will describe how healthy ecosystems support the needs of different types of species in a relatively stable web of life. (*) 	<ul style="list-style-type: none"> The learner will use data in tables or graphs to describe typical weather conditions expected during a particular season (average temperature, precipitation, wind direction). (3.SC.3.ESS.1) The learner will use a model to describe/explain the influence of the ocean on climate. (*) The learner will define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost in a grade 3 standard. (Earth Science) (3-5.SC.3-5.E.1) The learner will understand the atmosphere consists of air. (*) 	<ul style="list-style-type: none"> The learner will ask questions about the changes in energy, due to change in speed, when objects collide. (4.SC.4.PS.2) The learner will make observations on an object's motion to predict future motion. (*) The learner will understand the effects of balanced forces on the motion of an object. (3.SC.3.PS.1) The learner will describe the atomic composition of an extended structure such as sodium chloride. (*) The learner will use mathematical representations to describe a simple model for waves. (*) The learner will 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 in a grade 3 standard. (Physical Science) (3-5.SC.3-5.E.2) The learner will understand that a pure substance has characteristic chemical and physical properties that can be used to identify it. (6-8.SC.6-8.PS.1-1) The learner will qualitatively describe that waves are reflected. (6-8.SC.6-8.PS.3-2) The learner will explain that energy can be transferred by heat. (*) The learner will ask questions to determine cause and effect relationships of electric interactions between two objects not in contact with each other. (3.SC.3.PS.2)

Life Science	Earth Science	Physical Science
<ul style="list-style-type: none"> The learner will understand that food webs show how energy is transferred between producers, consumers, decomposers with an ecosystem. (5.SC.5.LS.1/5.SC.5.LS.3/5.SC.5.LS.4/6-8.SC.6-8.LS.3-1) The learner will understand that when the environment changes the types of animals that live there may also change. (3.SC.3.LS.3) The learner will understand the competitive relationship among organisms and populations with similar requirements for food, water, oxygen, or other resources. (growth of organisms and population increases are limited by access to resources). (6-8.SC.6-8.LS.3-4) 		<ul style="list-style-type: none"> The learner will define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost in a grade 4 standard. (Physical Science) (3-5.SC.3-5.E.1) The learner will describe that the motion of particles is different in gases, liquids, and solids. (*) The learner will explain that for a given object, a larger force causes a larger change in motion. (6-8.SC.6-8.PS.2-1)

Scaled Score values from 2451 - 2550

Life Science	Earth Science	Physical Science
<ul style="list-style-type: none"> The learner will understand that decomposers recycle nutrients from dead plant or animal matter back to soil (terrestrial environment) or water (aquatic environment). (5.SC.5.LS.3/5.SC.5.LS.4/6-8.SC.6-8.LS.3-1) The learner will recognize that fossils provide evidence of environments that existed long ago. (4.SC.4.ESS.3) The learner will understand that biodiversity of an ecosystem can be used to measure the health of an ecosystem. (*) The learner will understand the cause and effect relationships between available resources and the numbers of organisms in ecosystems during periods of abundant and scarce resources. (6-8.SC.6-8.LS.3-5) The learner will understand that adaptation by natural selection acts over generations and is one way in which species change over time in response to environmental changes. (6-8.SC.6-8.LS.3-2) The learner will understand that fossils provide evidence of organisms that lived long ago. (4.SC.4.ESS.3) The learner will explain that cellular respiration in plants and animals involves chemical reactions with oxygen that release stored energy. (6-8.SC.6-8.LS.1-5) The learner will understand that each sense receptor responds to different inputs (electromagnet, mechanical, chemical) and transmits them as signals that travel along nerve cells to the brain. (*) 	<ul style="list-style-type: none"> The learner will understand that the solar system consists of the sun, planets, moons, and asteroids. (*) The learner will understand that earth and its solar system are part of the Milky Way galaxy, which is one of many galaxies in the universe. (*) The learner will use data in tables or graphs to predict what type of weather may happen next in a certain area or at a certain time (average temperature, precipitation, wind direction). (3.SC.3.ESS.1) The learner will understand that maps of ancient land and water patterns, based on investigations of rocks and fossils, make clear how Earth's plates have moved great distances, collided, and spread apart. (6-8.SC.6-8.ESS.2-2) The learner will plan fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved in a grade 3 standard. (Earth Science) (3-5.SC.3-5.E.3) The learner will 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 in a grade 3 standard. (Earth Science) (3-5.SC.3-5.E.2) The learner will use a model to describe the cyclic patterns of eclipses of the sun. (6-8.SC.6-8.ESS.1-1) 	<ul style="list-style-type: none"> The learner will use observations to identify materials based on properties. (*) The learner will describe that light reflects on an object and enters the eye, allowing the object to be seen. (*) The learner will describe how the total number of atoms does not change in a chemical reaction (mass is conserved). (6-8.SC.6-8.PS.1-6) The learner will identify a simple design problem that can be solved by applying ideas about magnets. (*) The learner will 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 in a grade 4 standard. (Physical Science) (3-5.SC.3-5.E.2) The learner will make measurements to identify materials based on properties. (5.SC.5.PS.2) The learner will determine factors that affect the strength of electric forces. (6-8.SC.6-8.PS.2-5) The learner will make measurements on an object's motion to predict future motion. (*) The learner will use observations as evidence to explain that energy can be transferred by light. (*)



Life Science	Earth Science	Physical Science
<ul style="list-style-type: none"> The learner will understand that when the environment changes the types of plants that live there may also change. (3.SC.3.LS.3) The learner will describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways. (4.SC.4.LS.3) The learner will use a model to describe the movement of matter among plants, animals, decomposers, and the environment. (5.SC.5.LS.3) The learner will 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 in a grade 5 standard. (Life Science) (3-5.SC.3-5.E.2) The learner will understand that inherited traits can vary between parent and offspring because of genetic differences that result from chromosomes inherited. (5.SC.5.LS.2/6-8.SC.6-8.LS.2-2) The learner will recognize that traits that support survival and reproduction in new environment become more common, traits that do not become less common, which changes distribution of traits in population. (6-8.SC.6-8.LS.3-2) The learner will understand that patterns in the fossil record/document change of life forms throughout earth's history: chronological order of fossil appearance in the rock layers. (*) The learner will describe how newly introduced species can damage the balance of an ecosystem. (6-8.SC.6-8.LS.3-5) 	<ul style="list-style-type: none"> The learner will obtain and combine information to describe climates in different regions of the world. (*) The learner will understand that humans depend on Earth's land, ocean, atmosphere, and biosphere for many different resources. (*) 	<ul style="list-style-type: none"> The learner will 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 in a grade 5 standard. (Physical Science) (3-5.SC.3-5.E.2) The learner will explain that the size of force between two electrically charged objects not in contact depends on properties of objects and their distance apart. (3.SC.3.PS.2) The learner will explain that energy can be transferred by light. (*) The learner will explain that the motion of object is determined by the sum of forces acting on it. (6-8.SC.6-8.PS.2-2) The learner will use a model to describe that the motion of particles is different in gases, liquids, and solids. (*) The learner will apply Newton's third law to design a solution to a problem involving the motion of two colliding objects. (*) The learner will understand that the gravitational force exerted by earth on an object is directed down (toward earth's center). (*) The learner will use a model to understand that waves can cause objects to move. (*) The learner will use measurements or graphs to provide evidence that matter is conserved when cooling. (5.SC.5.PS.3) The learner will describe how the molecular arrangement of particles is different in gases, liquids, and solids. (*)

Life Science	Earth Science	Physical Science
		<ul style="list-style-type: none"> • The learner will identify kinetic energy as the energy of motion. (*) • The learner will use models to describe the atomic composition of simple molecules. (*) • The learner will predict outcomes about the changes in energy, due to change in speed, when objects collide. (4.SC.4.PS.2) • The learner will explain that gravitational forces are always attractive. (*) • The learner will use models to describe that plants capture sun's energy, and use materials from air and water to convert sun's energy into food energy. (5.SC.5.LS.1)

Scaled Score values from 2551 - 2650

Life Science	Earth Science	Physical Science
<ul style="list-style-type: none"> The learner will explain that animals have variation of traits within a group of similar organisms because they have different inherited information. (*) The learner will understand that decomposition recycles some materials back to the soil. (5.SC.5.LS.3/5.SC.5.LS.4) The learner will explain that plants have internal and external structures that function to support survival, growth, behavior, and reproduction. (*) The learner will define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost in a grade 5 standard. (Life Science) (3-5.SC.3-5.E.1) The learner will explain that variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing. (*) The learner will use information to explain that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories. (*) The learner will 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 in a grade 5 standard. (Life Science) (3-5.SC.3-5.E.3) The learner will understand the relationship of mutually beneficial interactions among organisms and abiotic components of ecosystems, and that mutually beneficial interactions may become interdependent and require the other for survival. (6-8.SC.6-8.LS.3-4) 	<ul style="list-style-type: none"> The learner will use a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity. (6-8.SC.6-8.ESS.2-3) The learner will describe how global movements of water and its changes in form are propelled by sunlight and gravity. (6-8.SC.6-8.ESS.2-3) The learner will use a model to describe that objects of solar system are held in orbit around the sun by sun's gravitational pull on them. (6-8.SC.6-8.ESS.1-2) The learner will use information to describe how human activities in industry have major effects on the land, vegetation, streams, ocean, air, and outer space. (*) The learner will obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment. (4.SC.4.ESS.6) The learner will use a model to describe/explain the influence of the atmosphere on landforms through weather and climate. (*) The learner will use evidence from rock strata to describe extinction of particular living organisms. (*) The learner will analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions. (6-8.SC.6-8.ESS.2-2) 	<ul style="list-style-type: none"> The learner will use observations to identify materials based on properties. (*) The learner will qualitatively describe that waves are transmitted. (6-8.SC.6-8.PS.3-2) The learner will 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. (5.SC.5.LS.1) The learner will plan fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved in a grade 4 standard. (Physical Science) (3-5.SC.3-5.E.3) The learner will describe the path that light travels as straight lines except at surfaces between different transparent materials where the light path bends. (6-8.SC.6-8.PS.3-2) The learner will quantitatively describe that waves are absorbed. (6-8.SC.6-8.PS.3-2) The learner will use models to explain that substances are made from different types of atoms, which combine in various ways. (*) The learner will graph quantities to prove that matter is conserved when mixing substances. (5.SC.5.PS.4) The learner will describe that when light shines on an object, it is reflected, absorbed, or transmitted depending on the objects material and frequency of the light. (6-8.SC.6-8.PS.3-2)

Life Science	Earth Science	Physical Science
<ul style="list-style-type: none"> The learner will understand that biodiversity describes the variety of species found in different ecosystems. (*) The learner will analyze data from tests to determine similarities and differences among design solutions to identify characteristics that can be combined into a new solution to meet the criteria in a middle school standard. (Life Science) (6-8.SC.6-8.E.3) The learner will understand that matter is transferred between producers, consumers, decomposers with an ecosystem. (5.SC.5.LS.1/5.SC.5.LS.3/5.SC.5.LS.4/6-8.SC.6-8.LS.3-1) The learner will understand that some living things are made of many different numbers and types of cells (multicellular). (*) The learner will describe why asexual reproduction results in offspring with identical genetic information. (5.SC.5.LS.2/6-8.SC.6-8.LS.2-2) The learner will explain that all living things are made of cells. (6-8.SC.6-8.LS.1-1) The learner will recognize that in sexual reproduction, each parent contributes half of the offspring's genes. (6-8.SC.6-8.LS.2-2) The learner will describe the function of a cell as a whole and ways parts of cells contribute to the function of the whole cell. (6-8.SC.6-8.LS.1-2) The learner will describe how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in specific environment. (*) 	<ul style="list-style-type: none"> The learner will identify evidence from patterns in rock formations for changes in a landscape over time to support an explanation for changes in a landscape over time. (*) The learner will understand that hazards result from natural processes (earthquakes, floods, tsunamis, and volcanic eruptions). (4.SC.4.ESS.5E) The learner will understand that earth's minerals, fresh water, biosphere resources are limited and many are not renewable or replaceable over human lifetimes. (*) The learner will use a model to describe/explain the influence of the ocean on landform shape. (*) The learner will use evidence to explain how geoscience processes have changed Earth's surface at varying time and spatial scales. (6-8.SC.6-8.ESS.2-6) The learner will construct a scientific explanation based on evidence for how Earth's mineral, energy, and groundwater resources are limited and typically non-renewable, and how their distributions are changing as a result of humans. (*) The learner will explain that water continually cycles among land, ocean, and atmosphere via transpiration, evaporation, condensation and crystallization, and precipitation, as well as downhill flows on land. (6-8.SC.6-8.ESS.2-3) The learner will understand that variations in density due to variations in temperature and salinity drive a global pattern of interconnected ocean currents. (*) 	<ul style="list-style-type: none"> The learner will describe that synthetic materials come from natural resources. (*) The learner will use a wave model of light to explain color. (*) The learner will use a model to describe that light reflects on an object and enters the eye, allowing the object to be seen. (*) The learner will refine devices that convert energy from one form to another. (4.SC.4.PS.3E) The learner will understand the effects of unbalanced forces on the motion of an object. (3.SC.3.PS.1) The learner will determine cause and effect relationship of magnetic interactions between two objects not in contact. (3.SC.3.PS.2) The learner will qualitatively describe that waves are absorbed. (6-8.SC.6-8.PS.3-2) The learner will use evidence to explain that fields exist between objects exerting forces on each other even though the objects are not in contact. (*) The learner will plan fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved in a grade 5 standard. (Physical Science) (3-5.SC.3-5.E.3) The learner will define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost in a grade 3 standard. (Physical Science) (3-5.SC.3-5.E.1)



Life Science	Earth Science	Physical Science
<ul style="list-style-type: none"> The learner will 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 in a grade 3 standard. (Life Science) (3-5.SC.3-5.E.3) The learner will understand technologies that have changed the way humans influence the inheritance of desired traits in organisms. (6-8.SC.6-8.LS.2-5) The learner will define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost in a grade 4 standard. (Life Science) (3-5.SC.3-5.E.1) The learner will understand that a cell is the smallest unit that can be said to be alive. (6-8.SC.6-8.LS.1-1) The learner will describe how organisms can survive only in environments in which their needs are met. (*) The learner will 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 in a grade 3 standard. (Life Science) (3-5.SC.3-5.E.2) The learner will understand that some living things are made of one cell (unicellular). (*) The learner will understand cause and effect relationships between available resources and growth of individual organisms and populations. (6-8.SC.6-8.LS.3-5) 	<ul style="list-style-type: none"> The learner will use evidence from rock strata to describe evolution of particular living organisms. (*) The learner will use evidence to explain that geoscience processes change Earth's surface on large spatial and time scales (such as slow plate motions or the uplift of large mountain ranges). (6-8.SC.6-8.ESS.2-6) 	<ul style="list-style-type: none"> The learner will design a device that converts energy from one form to another. (4.SC.4.PS.3E) The learner will generate multiple solutions that use patterns to transfer information. (*) The learner will understand that electric and magnetic (electromagnetic) forces can be attractive or repulsive. (*) The learner will understand that food provides animals with energy they need for body growth, repair, motion, and to maintain body warmth. (*) The learner will explain that digitized signals are a more reliable way to encode and transmit information than analog signals. (*) The learner will use a model that predicts and describes changes in particle motion, temperature, and/or state of a pure substance when thermal energy is added or removed. (*) The learner will ask questions about the changes in energy, due to change in speed, when objects collide. (4.SC.4.PS.1) The learner will 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. (6-8.SC.6-8.PS.2-3E) The learner will compare multiple solutions that use patterns to transfer information. (*) The learner will use observations as evidence to explain that energy can be transferred by heat. (*)

Life Science	Earth Science	Physical Science
		<ul style="list-style-type: none"> • The learner will use a model to describe how the molecular arrangement of particles is different in gases, liquids, and solids. (*) • The learner will use evidence to understand that gravitational interactions are attractive and depend on the mass of the interacting objects. (*) • The learner will use explain that energy can be transferred by electrical currents. (*) • The learner will use information to describe that synthetic materials impact society. (*) • The learner will use measurements or graphs to provide evidence that matter is conserved when heating. (5.SC.5.PS.3) • The learner will use data to explain that the size of electric and magnetic (electromagnetic) forces depend on magnitude of charges, currents, magnetic strength, and distances. (6-8.SC.6-8.PS.2-5) • The learner will use measurements or graphs to provide evidence that matter is conserved when cooling. (5.SC.5.PS.3) • The learner will understand that some chemical reactions release energy. (*) • The learner will explain that the size of force between two magnets not in contact depends on their orientation relative to one another, properties of the magnets, and their distance apart. (3.SC.3.PS.2) • The learner will explain the relationship between the speed and energy of an object. (4.SC.4.PS.1) • The learner will determine cause and effect relationship of electric interactions between two objects not in contact. (3.SC.3.PS.2)

Life Science	Earth Science	Physical Science
		<ul style="list-style-type: none"> • The learner will use observations as evidence to explain that energy can be transferred by electrical currents. (*) • The learner will identify temperature as the average kinetic energy of particles of matter. (*) • The learner will quantitatively describe that waves are transmitted. (6-8.SC.6-8.PS.3-2) • The learner will determine the relationships among the energy transferred, type of matter, mass, and change in the average kinetic energy of the particles as measured by temperature. (*)

Scaled Score values from 2651 - 2750

Life Science	Earth Science	Physical Science
<ul style="list-style-type: none"> The learner will 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 in a grade 4 standard. (Life Science) (3-5.SC.3-5.E.3) The learner will develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved in a middle school standard. (Life Science) (*) The learner will understand that individuals have two of each chromosome, so two alleles of each gene, one from each parent. (6-8.SC.6-8.LS.2-2) The learner will explain that genetic factors and local conditions affect the growth of adult plants. (*) The learner will use a Punnett square to describe how sexual reproduction results in offspring with genetic variation. (6-8.SC.6-8.LS.2-3) The learner will 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 in a grade 4 standard. (Life Science) (3-5.SC.3-5.E.2) The learner will understand that energy cycles between living/nonliving parts of an ecosystem. (5.SC.5.LS.3/6-8.SC.6-8.LS.3-1) The learner will understand that groups of cells that work together form tissues and organs that are specialized for certain body functions. (6-8.SC.6-8.LS.1-4) 	<ul style="list-style-type: none"> The learner will understand that differential intensity of sunlight on earth, caused by earth's tilt, result in seasons on earth. (*) The learner will use a model to explain the role of gravity in the motions within galaxies. (*) The learner will analyze and interpret data to determine scale properties of objects in the solar system. (5.SC.5.ESS.1) The learner will define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost in a grade 4 standard. (Earth Science) (3-5.SC.3-5.E.1) The learner will explain that weather and climate are influenced by interactions involving sunlight, the ocean, the atmosphere, ice, landforms, and living things. (*) The learner will analyze and interpret data from maps to describe patterns of Earth's features, such as earth's ocean floor. (*) The learner will use a model to describe the cyclic patterns of lunar phases. (6-8.SC.6-8.ESS.1-1) The learner will represent data in graphical displays to describe patterns of daily changes in length and direction of shadows. (5.SC.5.ESS.2) The learner will analyze and interpret data from maps to describe patterns of Earth's features, such as earth's land. (*) 	<ul style="list-style-type: none"> The learner will ask questions to determine cause and effect relationships of magnetic interactions between two objects not in contact with each other. (3.SC.3.PS.2) The learner will use evidence to explain the relationship between the speed of an object and the energy of that object. (4.SC.4.PS.1) The learner will understand that size of electric and magnetic (electromagnetic) forces depend on magnitude of charges, currents, or magnetic strength, and distances. (6-8.SC.6-8.PS.2-5) The learner will evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem in a middle school standard. (Physical Science) (6-8.SC.6-8.E.2) The learner will determine factors that affect the strength of magnetic forces. (6-8.SC.6-8.PS.2-5) The learner will understand that objects in contact exert forces on each other. (*) The learner will understand that gravitational interactions are dependent on the mass of the interacting objects. (*) The learner will predict changes in particle motion of a substance when thermal energy is added/removed. (6-8.SC.6-8.PS.1-4) The learner will identify potential energy as stored energy. (*)

Life Science	Earth Science	Physical Science
<ul style="list-style-type: none"> The learner will explain that plants, algae, and many microorganisms use energy from light to make sugars from carbon dioxide from the atmosphere and water through process of photosynthesis. (6-8.SC.6-8.LS.1-5) The learner will explain that special structures within cells are responsible for certain functions. (6-8.SC.6-8.LS.1-2) The learner will describe the structure/relationship between genes and chromosomes. (6-8.SC.6-8.LS.2-1) The learner will understand that patterns in the fossil record document existence, diversity, and extinction of life forms throughout earth's history. (*) The learner will understand that ecosystems are dynamic and their characteristics can vary over time. (6-8.SC.6-8.LS.3-2) The learner will recognize that artificial selection involves humans influencing certain traits by selective breeding. (6-8.SC.6-8.LS.2-5) The learner will understand that changes in physical/biological components of an ecosystem can lead to changes in all populations within ecosystem. (6-8.SC.6-8.LS.3-2) The learner will explain that plants have variation of traits within a group of similar organisms because they have different inherited information. (*) The learner will describe how food is rearranged through chemical reactions forming new molecules that can support growth and release energy as matter moves through an organism. (6-8.SC.6-8.LS.1-5) 	<ul style="list-style-type: none"> The learner will obtain and combine information about ways individual communities use science ideas to protect Earth's resources and environment. (5.SC.5.ESS.5) The learner will use a model to describe the cyclic patterns of eclipses of the moon. (6-8.SC.6-8.ESS.1-1) The learner will analyze and interpret data to determine orbital radius of objects in solar system. (*) The learner will analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects. (6-8.SC.6-8.ESS.3-4) The learner will use evidence from rock strata to explain significant volcanic eruptions. (*) The learner will understand that interactions among components that influence climate vary with latitude, altitude, and local and regional geography, all of which can affect oceanic and atmospheric flow patterns. (6-8.SC.6-8.ESS.2-5) The learner will analyze and interpret data to determine similarities and differences among solar system objects. (*) The learner will use a model to describe/explain the influence of the atmosphere on ecosystems through weather and climate. (*) The learner will make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by wind. (*) 	<ul style="list-style-type: none"> The learner will plan fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved in a grade 3 standard. (Physical Science) (3-5.SC.3-5.E.3) The learner will describe the atomic composition of simple molecules. (*) The learner will explain that greater mass requires a greater force to achieve same change in motion as a smaller mass. (6-8.SC.6-8.PS.2-1/6-8.SC.6-8.PS.2-2) The learner will use a wave model of light to explain the frequency-dependent bending of light at the surface between media. (6-8.SC.6-8.PS.3-2) The learner will use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved. (6-8.SC.6-8.PS.1-6) The learner will use observations to determine whether mixing of two substances results in new substances. (*) The learner will use a model to describe that waves are reflected, absorbed, or transmitted through various materials. (6-8.SC.6-8.PS.3-2) The learner will describe that energy is spontaneously transferred from hotter regions into colder ones. (*) The learner will describe that synthetic materials impact society. (*) The learner will use measurement or graphs to provide evidence that matter is conserved when mixing substances. (5.SC.5.PS.4)

Life Science	Earth Science	Physical Science
<ul style="list-style-type: none"> The learner will explain that during photosynthesis, carbon dioxide and water combine to form carbon-based organic molecules and oxygen is released. (6-8.SC.6-8.LS.1-5) The learner will explain that the body is a system of interacting subsystems composed of groups of cells. (6-8.SC.6-8.LS.1-4) The learner will compare competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem in a middle school standard. (Life Science) (6-8.SC.6-8.E.2) The learner will describe how organisms obtain gases and water from the environment and release waste matter back into the environment. (*) The learner will describe how gene mutations may affect how proteins are made and may result in harmful, beneficial, or neutral changes to structure/function of an organism and change traits. (*) 	<ul style="list-style-type: none"> The learner will analyze and interpret data to determine surface features (such as volcanoes) and orbital radius. (*) The learner will construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources (such as freshwater, mineral, and energy) impact Earth's systems. (6-8.SC.6-8.ESS.3-2) The learner will analyze data from tests to determine similarities and differences among design solutions to identify characteristics that can be combined into a new solution to meet the criteria in a middle school standard. (Earth Science) (6-8.SC.6-8.E.3) The learner will construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes. (6-8.SC.6-8.ESS.3-1) The learner will use information to describe how human activities in everyday life have major effects on the land, vegetation, streams, ocean, air, and outer space. (*) The learner will understand that mapping the history of natural hazards in a region, combined with an understanding of related geologic forces can help forecast the locations and likelihoods of future events. (6-8.SC.6-8.ESS.3-4) The learner will understand that human activities, such as the release of greenhouse gases from burning fossil fuels, are major factors in the current rise in Earth's mean surface temperature (global warming). (*) 	<ul style="list-style-type: none"> The learner will design a device that minimizes/maximizes thermal energy transfer. (6-8.SC.6-8.PS.3-3E) The learner will use observations to determine whether mixing of two substances results in new substances. (*) The learner will graph quantities to prove that matter is conserved when cooling. (5.SC.5.PS.3) The learner will integrate qualitative scientific and technical information to support the claim that digitized signals (sent as wave pulses) are a more reliable way to encode and transmit information than analog signals. (*) The learner will describe that plants capture sun's energy, and use materials from air and water to convert sun's energy into food energy. (5.SC.5.LS.1) The learner will analyze data from tests to determine similarities and differences among design solutions to identify characteristics that can be combined into a new solution to meet the criteria in a middle school standard. (Physical Science) (6-8.SC.6-8.E.3) The learner will understand that energy can be moved from place to place by moving objects. (*) The learner will use evidence from an investigation to show effects of balanced and unbalanced forces on the motion of an object. (3.SC.3.PS.1) The learner will use a model of waves to describe wave patterns in terms of amplitude and wavelength. (4.SC.4.PS.4)

Life Science	Earth Science	Physical Science
	<ul style="list-style-type: none"> • The learner will use a model to describe/explain the influence of mountain ranges on winds and clouds in the atmosphere. (*) • The learner will use a model to explain that earth's tilt on its axis causes differential intensity of sunlight on different parts of earth during the year. (*) • The learner will use evidence to explain that geoscience processes change Earth's surface on small spatial and time scales (such as rapid landslides or microscopic geochemical reactions). (6-8.SC.6-8.ESS.2-6) • The learner will understand that the geosphere consists of solid and molten rock, soil, and sediments. (*) • The learner will explain that the ocean exerts a major influence on weather and climate by absorbing energy from the sun and releasing it over time, redistributing it through ocean currents. (6-8.SC.6-8.ESS.2-5) • The learner will make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by ice. (*) • The learner will represent data in graphical displays to describe seasonal appearance of some stars in the night sky. (5.SC.5.ESS.2) • The learner will explain that energy flow/matter cycling of earth's materials produce chemical and physical changes in earth's materials. (*) 	<ul style="list-style-type: none"> • The learner will interpret data on the properties of substances before and after they interact to determine if a chemical reaction occurred. (6-8.SC.6-8.PS.1-5) • The learner will use a wave model of light to explain brightness. (*) • The learner will explain that substances are made from different types of atoms, which combine in various ways. (6-8.SC.6-8.PS.1-1) • The learner will explain that in a chemical reaction the atoms in original substances regroup into different substances with different properties. (*) • The learner will quantitatively describe that waves are reflected. (6-8.SC.6-8.PS.3-2) • The learner will use a model to describe that matter is made of particles too small to be seen. (5.SC.5.PS.1) • The learner will use a model to describe that matter is made of particles too small to be seen. (5.SC.5.PS.1)

Life Science	Earth Science	Physical Science
	<ul style="list-style-type: none"> • The learner will identify examples of renewable energy resources such as wind energy, water behind dams, and sunlight. (4.SC.4.ESS.6) • The learner will use a model to describe the cycling of Earth's materials to form minerals and rocks. (6-8.SC.6-8.ESS.2-1) • The learner will evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem in a middle school standard. (Earth Science) (6-8.SC.6-8.E.2) • The learner will make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water. (*) • The learner will describe how water's movements both on the land and underground cause weathering and erosion, which change the land's surface features and create underground formations. (*) • The learner will use information to describe how human activities in agriculture have major effects on the land, vegetation, streams, ocean, air, and outer space. (*) • The learner will understand that climate describes the range of an area's typical weather conditions and the extent to which those conditions vary over years. (*) • The learner will use a model to describe the cycling of Earth's materials and the flow of energy that drives this process. (6-8.SC.6-8.ESS.2-1) • The learner will understand that the hydrosphere consists of water and ice. (*) 	

Scaled Score values from 2751 - 2850

Life Science	Earth Science	Physical Science
<ul style="list-style-type: none"> The learner will describe how the cell membrane forms a boundary that controls what enters and leaves a cell. (6-8.SC.6-8.LS.1-2) The learner will understand that each distinct gene controls the production of specific proteins, which affect the traits of the individual. (6-8.SC.6-8.LS.2-1) The learner will understand that atoms that make up organisms in an ecosystem are cycled between living/nonliving parts of an ecosystem. (6-8.SC.6-8.LS.3-1) The learner will explain that plants get the materials they need for growth chiefly from air and water. (*) The learner will understand that natural selection leads to the predominance of certain traits in a population, and the suppression of other traits. (*) The learner will define the criteria and constraints of a design problem to ensure a solution, taking into account scientific principles and potential impacts that may limit possible solutions in a middle school standard. (Life Science) (6-8.SC.6-8.E.1) The learner will explain that plants reproduce in a variety of ways. (*) The learner will describe the movement of matter among plants, animals, decomposers, and the environment. (5.SC.5.LS.3) The learner will recognize that changes in biodiversity can influence human's resources obtained from an ecosystem (food, energy, medicines) and ecosystem services that humans rely on (water, recycling). (*) 	<ul style="list-style-type: none"> The learner will use a model to describe that patterns of ocean circulation are based on the transfer of heat by the global ocean convection cycle, which is constrained by the Coriolis Effect and the outlines of continents. (6-8.SC.6-8.ESS.2-5) The learner will use a model to describe the cyclic patterns of seasons. (6-8.SC.6-8.ESS.1-1) The learner will understand that solar system is believed to have formed from a disk of dust and gas, drawn together by gravity. (*) The learner will analyze and interpret data to determine sizes of an object's layers (such as crust and atmosphere). (*) The learner will use a model to describe how unequal heating and rotation of Earth cause patterns of atmospheric and oceanic circulation that determine regional climates. (6-8.SC.6-8.ESS.2-5) The learner will identify examples of nonrenewable energy resources such as fossil fuels and fissile materials. (4.SC.4.ESS.6) The learner will use a model to describe/explain the influence of the ocean on ecosystems. (*) The learner will use evidence from rock strata to explain how the geologic time scale is used to organize earth's 4.6-billion-year-old history. (6-8.SC.6-8.ESS.1-5) 	<ul style="list-style-type: none"> The learner will define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost in a grade 5 standard. (Physical Science) (3-5.SC.3-5.E.1) The learner will describe that energy in animal's food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun. (5.SC.5.LS.1) The learner will use measurements or graphs to provide evidence that matter is conserved when heating. (5.SC.5.PS.3) The learner will use models describe the atomic composition of an extended structure such as sodium chloride. (*) The learner will design, test, and/or modify a device that releases or absorbs thermal energy by chemical processes. (*) The learner will predict changes in state of a substance when thermal energy is added/removed. (6-8.SC.6-8.PS.1-4) The learner will model/describe wave patterns in terms of wavelength. (4.SC.4.PS.4) The learner will define the criteria and constraints of a design problem to ensure a solution, taking into account scientific principles and potential impacts that may limit possible solutions in a middle school standard. (Physical Science) (6-8.SC.6-8.E.1)

Life Science	Earth Science	Physical Science
	<ul style="list-style-type: none"> • The learner will use data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions. (6-8.SC.6-8.ESS.2-4) • The learner will understand that typically, as human populations and per-capita consumption of natural resources increase, so do the negative impacts on earth unless the activities and technologies involved are engineered otherwise. (*) • The learner will use evidence to explain that many geoscience processes (such as earthquakes, volcanoes, and meteor impacts) behave gradually but are punctuated by catastrophic events. (6-8.SC.6-8.ESS.2-6) • The learner will develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved in a middle school standard. (Earth Science) (*) • The learner will define the criteria and constraints of a design problem to ensure a solution, taking into account scientific principles and potential impacts that may limit possible solutions in a middle school standard. (Earth Science) (6-8.SC.6-8.E.1) • The learner will represent data in graphical displays to describe patterns of daily changes in day and night. (5.SC.5.ESS.2) • The learner will support an argument that differences in the apparent brightness of the sun compared to other stars is due to their relative distances from earth. (*) 	<ul style="list-style-type: none"> • The learner will use evidence to explain that the motion of object is determined by sum of forces acting on it and the object's mass. (6-8.SC.6-8.PS.2-2)

Life Science	Earth Science	Physical Science
	<ul style="list-style-type: none"> • The learner will explain that energy flow/matter cycling of earth's materials produce chemical and physical changes in earth's living things. (*) • The learner will 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 in a grade 4 standard. (Earth Science) (3-5.SC.3-5.E.2) • The learner will use a model to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact. (5.SC.5.ESS.3) • The learner will understand the biosphere consists of living things, including humans. (*) • The learner will understand that tectonic processes continually generate new ocean sea floor at ridges and destroy old sea floor at trenches. (6-8.SC.6-8.ESS.2-2) • The learner will use evidence from rock strata to explain formation of mountain chains and ocean basins. (6-8.SC.6-8.ESS.2-2) • The learner will define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost in a grade 5 standard. (Earth Science) (3-5.SC.3-5.E.1) • The learner will 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 in a grade 5 standard. (Earth Science) (3-5.SC.3-5.E.3) 	

Life Science	Earth Science	Physical Science
	<ul style="list-style-type: none">The learner will apply scientific principles to design a method for monitoring and minimizing a human impact on the environment. (6-8.SC.6-8.ESS.3-3)	

Scaled Score values from 2851 - 2950

Life Science	Earth Science	Physical Science
<ul style="list-style-type: none"> The learner will recognize that plants have traits inherited from parents. (*) The learner will recognize that animals have traits inherited from parents. (*) 	<ul style="list-style-type: none"> The learner will understand that the complex patterns of the changes and the movement of water in the atmosphere, determined by winds, landforms, and ocean temperatures and currents, are major determinants of local weather patterns. (*) The learner will ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century. (*) The learner will make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by vegetation. (*) The learner will plan fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved in a grade 4 standard. (Earth Science) (3-5.SC.3-5.E.3) The learner will describe and graph the amounts and percentages of water and fresh water in various reservoirs to provide evidence about the distribution of water on earth. (5.SC.5.ESS.4) The learner will 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 in a grade 5 standard. (Earth Science) (3-5.SC.3-5.E.2) The learner will identify evidence from patterns in fossils in rock layers for changes in a landscape over time to support an explanation for changes in a landscape over time. (4.SC.4.ESS.3) 	<ul style="list-style-type: none"> The learner will use measurement or graphs to provide evidence that matter is conserved when mixing substances. (5.SC.5.PS.4) The learner will graph quantities to prove that matter is conserved when heating. (5.SC.5.PS.3)

Scaled Score values 2951 or larger

Life Science	Earth Science	Physical Science
<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> The learner will use a model to describe that patterns of atmospheric circulation are the result of sunlight-driven latitudinal banding, the Coriolis Effect, and resulting prevailing winds. (6-8.SC.6-8.ESS.2-5) 	<ul style="list-style-type: none"> The learner will interpret graphical displays of data to describe the relationships of kinetic energy to the mass of an object and to the speed of an object. (*) The learner will identify that a wave has a repeating pattern with specific wavelength, frequency, and amplitude. (*)