K	1	2	3	4	5	6	7	8	Physical Science	Biology	Introduction to Chemistry	Chemistry	Astronomy	Geology	Anatomy	Physics	Environmental Ecology
Standard 1: Earth and Space																	
Benchmark A: Understand and apply knowledge of properties of earth materials.			Benchmark A:Understand and apply knowledge of properties and uses of earth materials.			Benchmark A: Understand and apply knowledge of the structure and processes of the earth system and the processes that change the earth and its surface. (Earth Systems)			Benchmark A: Understand and apply knowledge of energy in the earth system. (Earth Systems)								
	Recognize that Earth materials consist of solids, liquids and gases.	Use information from several sources to provide evidence that Earth events can occur quickly or slowly. (2-ESS1-1)		Explain how earth materials provide many of the resources that humans use and their affect on the environment. (4-ESS3-1)	Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment. (5-ESS3-1)	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-ESS2-4)		Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process. (MS-ESS2-1)						Develop a model to illustrate how Earth's internal and surface processes operate at different spatial and temporal scales to form continental and ocean-floor features. (HS-ESS2-1)			Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate. (HS-ESS2-4)
		Obtain information to identify where water is found on Earth and that it can be solid or liquid. (2-ESS2-3)				Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects. (MS-ESS3-2)		Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales. (MS-ESS2-2)						Develop a model based on evidence of Earth's interior to describe the cycling of matter by thermal convection. (HS-ESS2-3)			
						Consruct and argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems. (MS-ESS3-4)		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-ESS2-3)						Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate. (HS-ESS2-4)			
								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. (HSESS1-5)									
								Develop a model to illustrate how Earth's internal and surface processes operate at different spatial and temporal scales to form continental and ocean-floor features. (HS-ESS2-1)									
								Develop a model based on evidence of Earth's interior to describe the cycling of matter by thermal convection. (HS-ESS2-3)									
								Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios. (HS-ESS3-2)									
Benchmark B: Understand and apply knowledge of observable information about daily and seasonal weather conditions.			Benchmark B: Understand and apply knowledge of processes and changes on or in the earth's land, oceans, and atmosphere			Benchmark B: Understand and apply knowledge of the water cycle, including consideration of events that impact groundwater quality. (Earth and Human Activity)			Benchmark B: Understand and apply knowledge of Geochemical cycles. (Earth Systems)								
Use and share observations of local weather conditions to describe patterns over time. (K-ESS2-1)		Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land. (2-ESS2-1)		Make observations and determine the effects of weathering or the rate of erosion by water, ice, wind, or vegetation. (4-ESS2-1)	Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact. (5-ESS2-1)	Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment. (MS-ESS3-3)								Develop a quantitative model to describe the cycling of carbon among the hydrosphere, atmosphere, geosphere, and biosphere. (HS-ESS2-6)			Develop a quantitative model to describe the cycling of carbon among the hydrosphere, atmosphere, geosphere, and biosphere. (HS-ESS2-6)
Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather. (K-ESS3-2)				Analyze and interpret data from maps to describe patterns of Earth's features. (4-ESS2-2)	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-ESS2-2)												
Benchmark C: Understand and apply knowledge of events that have repeating patterns.			Benchmark C: Understand and apply knowledge of fossils and the evidence they provide of past life on earth			Benchmark C: Understand and apply knowledge of earth history based on physical evidence			Benchmark C: Understand and apply knowledge of origin and evolution of the earth system. (Earth Systems)								
Understand that seasons of the year, day and night are events that are repeated in regular patterns.	Observe, describe and predict seasonal patterns of sunrise/sunset and phases of the moon. (1-ESS1-1)			Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in landscapes over time. (4-ESS1-1)		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. (MS-ESS3-1)		Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spactial scales. (MS-ESS2-2)	Plan and conduct an investigation of the properties of water and its effects on Earth materials and surface processes. (HS-ESS2-5)				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. (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. (HS-ESS1-5)			Analyze geoscience data and the results from global climate change models to make an evidence based forecast of the current rate of global or regional climate change and associated future impacts to Earth systems. (HS-ESS3-5)

K	1	2	3	4	5	6	7	8	Physical Science	Biology	Introduction to Chemistry	Chemistry	Astronomy	Geology	Anatomy	Physics	Environmental Ecology
	Determine the effect of sunlight on the Earth's surface.(K-PS3-1)												Apply scientific reasoning and evidence from ancient Earth materials, meteorites, and other planetary surfaces to construct an account of Earth's formation and early history. (HS-ESS1-6)	Apply scientific reasoning and evidence from ancient Earth materials, meteorites, and other planetary surfaces to construct an account of Earth's formation and early history. (HS-ESS1-6)			
	Make observations at different times of year to relate the amount of daylight to the time of year. (1-ESS1-2)												Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate. (HS-ESS2-4)	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-ESS2-2)			
														Plan and conduct an investigation of the properties of water and its effects on Earth materials and surface processes. (HS-ESS2-5)			
														Construct an argument based on evidence about the simultaneous coevolution of Earth's systems and life on Earth. (HS-ESS2-7)			
			Benchmark D: Understand and apply knowledge of weather and weather patterns.			Benchmark D: Understand and apply knowledge of the earth's atmospheric properties and how they influence weather and climate.			Benchmark D: Understand and apply knowlege of origin and evolution of the universe. (Earth's Place in the Universe)								
			Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season. (3-ESS2-1)			Collect data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions. (MS-ESS2-5)			Communicate scientific ideas about the way stars, over their life cycle, produce elements. (HS-ESS1-3)				Develop a model based on evidence to illustrate the life span of the sun and the role of nuclear fusion in the sun's core to release energy in the form of radiation. (HS-ESS1-1)				
			Obtain and combine information to describe climates in different regions of the world. (3-ESS2-2)			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. (MS-ESS2-6)			Use mathematical or computational representations to predict the motion of orbiting objects in the solar system. (HS-ESS1-4)				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-ESS1-2)				
			Make a claim about the merit of a solution that reduces the impacts of a weather-related hazard. (3-ESS3-1)			Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century. (MS-ESS3-5)							Communicate scientific ideas about the way stars, over their life cycle, produce elements. (HS-ESS1-3)				
													Use mathematical or computational representations to predict the motion of orbiting objects in the solar system. (HS-ESS1-4)				
			Benchmark E: Understand and apply knowledge of the properties, movements, and location of objects in our solar system. **			Benchmark E: Understand and apply knowledge of the components of our solar system.											
					Support an argument that differences in the apparent brightness of the sun compared to other stars is due to their relative distances from Earth. (5-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. (MS-ESS1-1)											
					Represent data in graphical displays to reveal patterns of daily changes in length and directions of shadows, day and night, and the seasonal appearance of some stars in the night sky. (5-ESS1-2)		Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system. (MS-ESS1-2)											
							Analyze and interpret data to determine scale properties of objects in the solar system. (MS-ESS1-2)											

K	1	2	3	4	5	6	7	8	Physical Science	Biology	Introduction to Chemistry	Chemistry	Astronomy	Geology	Anatomy	Physics	Environmental Ecology
Standard 2: Physical Science																	
Benchmark A: Understand and apply knowledge of observable and measurable properties of objects.			Benchmark A: Understand and apply knowledge of how to describe and identify substances based on characteristic properties.			Benchmark A: Understand and apply knowledge of elements, compounds, mixtures, and solutions based on the nature of their physical and chemical properties. (Matter and its interactions)			Benchmark A: Understand and apply knowledge of the structure of atoms. (Matter & Interaction)								
	Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate. (1-PS4-1)	Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties. (2-PS1-1)			Make observations and measurements to identify materials based on their properties. (5-PS1-3)	Develop models to describe the atomic composition of simple molecules and extended structures. (MS-PS1-1)			Develop models to illustrate the changes in the composition of the nucleus of the atom and the energy relreased during the processes of fission, fusion, and radioactive decay. (HS-PS1-8)		Develop models to illustrate the changes in the composition of the nucleus of the atom and the energy relreased during the processes of fission, fusion, and radioactive decay. (PS1-8)	Develop models to illustrate the changes in the composition of the nucleus of the atom and the energy relreased during the processes of fission, fusion, and radioactive decay. (PS1-8)	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. (PS1-1)	Develop models to illustrate the changes in the composition of the nucleus of the atom and the energy relreased during the processes of fission, fusion, and radioactive decay. (HS-PS1-8)			
	Plan and conduct an investigation to determine the effect of placing objects made with different materials in the path of a beam of light. (1-PS4-3)	Constuct an evidence-based account of how an object made of a small set of pieces can be disassembled and made into a new object. (3-PS1-3)															
Benchmark B: Understand and apply knowledge of characteristics of liquids and solids.			Benchmark B: Understand and apply knowledge of states of matter and changes in states of matter.			Benchmark B: Understand and apply knowledge of physical and chemical changes and their relationship to the conservation of matter and energy.			Benchmark B: Understand and apply knowledge of the structure and properties of matter. (Matter & Interaction)								
	Observe how materials can be changed from one state to another.		Understand that materials can exist in different states (solid, liquid, and gas) and can be changed from one state to another by heating or cooling.		Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total weight of matter is conserved. (5-PS1-2)	Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical interaction has occurred. (MS-PS1-2)			Use the periodic table as a model to predict the relative properites of elements based on the patterns of electrons in the outermost energy level of atoms. (PS1-1)		Use the periodic table as a model to predict the relative properites of elements based on the patterns of electrons in the outermost energy level of atoms. (PS1-1)	Use the periodic table as a model to predict the relative properites of elements based on the patterns of electrons in the outermost energy level of atoms. (PS1-1)					
	Sort materials (solids/liquids) according to their properties.				Conduct an investigation to determine whether the mixing of two or more substances results in new substances. (5-PS1-4)	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. (MS-PS1-5 g/h)			Construct and revise an explanation for the outcome of a simple chemical reaction based on the outermost electron states of atoms, trends in the periodic table, and knowedge of the patterns of chemical properties. (PS1-2)		Construct and revise an explanation for the outcome of a simple chemical reaction based on the outermost electron states of atoms, trends in the periodic table, and knowedge of the patterns of chemical properties. (PS1-2)	Construct and revise an explanation for the outcome of a simple chemical reaction based on the outermost electron states of atoms, trends in the periodic table, and knowedge of the patterns of chemical properties. (PS1-2)					
	Identify the properties of solids and liquids.					Gather and make sense of information to describe that synthetic materials come from natural resources and impact society. (MS-PS1-3)			Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles. (PS1-3)		Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles. (PS1-3)	Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles. (PS1-3)					
Benchmark C: Understand and apply knowledge of the postitions and motions of objects.			Benchmark C: Understand and apply knowledge of the concept of conservation of mass/matter.			Benchmark C: Understand and apply knowledge of forms of energy and energy transfer.			Benchmark C: Understand and apply knowledge of chemical reactions. (Matter & Interaction)								
Investigate to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object. (K-PS2-1)		Describe how an object's movement can be changed based on the properties of the materials involved.			Understand that when something is broken into parts, those parts still have the same total mass.	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-PS1-4)		Use mathematical representations to describe a simple model for waves that includes how the amplitude of a wave is related to the energy in a wave. (MS-PS4-1)	Develop a model to illustrate that the release or absorption of energy from a chemical reaction system depends on the changes in total bond energy. (PS1-4)		Develop a model to illustrate that the release or absorption of energy from a chemical reaction system depends on the changes in total bond energy. (PS1-4)	Develop a model to illustrate that the release or absorption of energy from a chemical reaction system depends on the changes in total bond energy. (PS1-4)					
Analyze data to determine if a design solution works as intended to change the speed or direction of an object with push or a pull. (K-PS2-2)		Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object. (3-PS2-1)				Undertake a design project to construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes. (MS-PS1-6,i)		Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials. (MS-PS4-2)	Apply scientific principles and evidence to provide an explanation about the effects of changing the temperature or concentration of the reacting particles on the rate at which a reaction occurs. (PS1-5)		Apply scientific principles and evidence to provide an explanation about the effects of changing the temperature or concentration of the reacting particles on the rate at which a reaction occurs. (PS1-5)	Apply scientific principles and evidence to provide an explanation about the effects of changing the temperature or concentration of the reacting particles on the rate at which a reaction occurs. (PS1-5)					
		Make observations and/or measurements of an object's motion to provide evidence that a pattern can be used to predict future motion. (3-PS2-2)						Integrate qualitative scientific and technical information to support the claim that digitized signals are a more reliable way to encode and transmit information than analog signals. (MS-PS4-3)	Refine the design of a chemical system by specifying a change in conditions that would produce increased amounts of products at equilibrium. (PS1-6)		Refine the design of a chemical system by specifying a change in conditions that would produce increased amounts of products at equilibrium. (PS1-6)	Refine the design of a chemical system by specifying a change in conditions that would produce increased amounts of products at equilibrium. (PS1-6)					
									Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaciton. (PS1-7)		Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaciton. (PS1-7)	Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaciton. (PS1-7)					
			Benchmark D: Understand and apply knowledge of sound, light, electricity, magnetism, and heat.			Benchmark D: Understand and apply knowledge of motion and forces. (Motion & Stability)			Benchmark D: Understand and apply knowledge of motion and forces. (Motion & Stability)								

K	1	2	3	4	5	6	7	8	Physical Science	Biology	Introduction to Chemistry	Chemistry	Astronomy	Geology	Anatomy	Physics	Environmental Ecology
Standard 2: Physical Science																	
			Ask questions to determine cause and effect relationship of electric or magnetic interactions between two objects not in contact with each other. (3-PS2-3)	Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents. (4-PS3-2)	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-PS3-1)		Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects. (MS-PS2-1,a)	Create a computational model to calculate the change in the energy of one component in a system when the change in energy of the other components and energy flows in and out of the system are known. (HS-PS3-1)	Analyze data to support the claim that Newton's second law of motion describes the mathematical relationship among the net force on a macroscopic object, its mass, and its acceleration. (PS2-1)		Communicate scientific and technical information about why the molecular-level structure is important in the functioning of design materials. (PS2-6)	Communicate scientific and technical information about why the molecular-level structure is important in the functioning of design materials. (PS2-6)	Use mathematical representations of Newton's Law of Gravitation and Coulomb's Law to describe and predict the gravitational and electrostatic forces between objects. (PS2-4)			Analyze data to support the claim that Newton's second law of motion describes the mathematical relationship among the net force on a macroscopic object, its mass, and its acceleration. (PS2-1)	
			Define a simple design problem that can be solved by applying scientific ideas about magnets. (3-PS2-4)	Ask questions and predict outcomes about the changes in energy that occur when objects collide. (4-PS3-3)			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. (MS-PS2-2,b/c)	Develop and use models to illustrate that energy at the macroscopicscale can be accounted for as a comination of energy associated with the motions of particles (objects) and energy associated with the relative position of particles (objects). (HS-PS3-2)	Use mathematical representations to support the claim that the total momentum of a system of objects is conserved when there is no net force on the system. (PS2-2)							Use mathematical representations to support the claim that the total momentum of a system of objects is conserved when there is no net force on the system. (PS2-2)	
				Apply scientific ideas to design, test, and refine a device that converts energy from one form to another. (4-PS3-4)			Ask questions about data to determine the factors that affect the strength of electric and magnetic forces. (MS-PS2-3,d)	Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy. (HS-PS3-3)	Apply scientific and engineering ideas to design, evaluate, and refine a device that minimizes the force on a macroscopic object during a collision. (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. (PS2-3)	
				Develop a model of waves to describe patterns in terms of amplitude and wavelength and that waves can cause objects to move. (4-PS4-1)			Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects. (MS-PS2-4,e)	Plan and conduct an investigation to provide evidence that the transfer of thermal energy when two components of different temperature are combined within a closed system results in a more uniform energy distribution among the components in the system (second law of thermodynamics). (HS-PS3-4)	Use mathematical representations of Newton's Law of Gravitation and Coulomb's Law to describe and predict the gravitational and electrostatic forces between objects. (PS2-4)							Use mathematical representations of Newton's Law of Gravitation and Coulomb's Law to describe and predict the gravitational and electrostatic forces between objects. (PS2-4)	
				Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen. (4-PS4-2)			Conduct an investigation and evaluate the experimental design to provide evidence that fields exist between objects exerting forces on each other even though the objects are not in contact. (MS-PS2-5,f)	Develop and use a model of two objects interacting through electric or magnetic fields to illustrate the forces between objects and the changes in energy of the objects due to the interaction. (HS-PS3-5)	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. (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. (PS2-5)	
				Generate and compare multiple solutions that use patterns to transfer information. (4-PS4-3)													
			Benchmark E: Understand and apply knowledge of how forces are related to an object's motion.						Benchmark E: Understand and apply knowledge of conservation of energy and increase in disorder. (Energy)								
				Use evidence to construct an explanation relating the speed of an object to the energy of that object. (4-PS3-1)					Create a computational model to calculate the change in the energy of one component in a system when the change in energy of the other component(s) and energy flows in and out of the systems are known. (PS3-1)		Create a computational model to calculate the change in the energy of one component in a system when the change in energy of the other component(s) and energy flows in and out of the systems are known. (PS3-1)	Create a computational model to calculate the change in the energy of one component in a system when the change in energy of the other component(s) and energy flows in and out of the systems are known. (PS3-1)				Create a computational model to calculate the change in the energy of one component in a system when the change in energy of the other component(s) and energy flows in and out of the systems are known. (PS3-1)	
					Support an argument that the gravitational force exerted by Earth on objects is directed down. (5-PS2-1)												Develop and use models to illustrate that energy at the macroscopic scale can be accounted for as a combination of energy associated with the motions of particles (objects) and energy associated with the relative positions of particles. (PS3-2)	
																Design, build, and refine a device that works within given constraints to convert one form of energy into anothe form of energy. (PS3-3)	
									Benchmark F: Understand and apply knowledge of interactions of energy and matter (Energy, Matter & Interactions, Waves)								

K	1	2	3	4	5	6	7	8	Physical Science	Biology	Introduction to Chemistry	Chemistry	Astronomy	Geology	Anatomy	Physics	Environmental Ecology
Standard 2: Physical Science																	
									Develp and use a model of two objects interacting through electric or magnetic fields to illustrate the forces between objects and the changes in energy of the objects due to the interaction. (PS3-5)		Plan and conduct an investigation to provide evidence that the transfer of thermal energy when two components of different temperature are combined within a closed system results in a more uniform energy distribution among the components in the system (second law of thermodynamics). (PS3-4)	Plan and conduct an investigation to provide evidence that the transfer of thermal energy when two components of different temperature are combined within a closed system results in a more uniform energy distribution among the components in the system (second law of thermodynamics). (PS3-4)	Evaluate the validity and reliability of claims in published materials of the effects that different frequencies of electromagnetic radiation have when absorbed by matter. (PS4-4)			Develp and use a model of two objects interacting through electric or magnetic fields to illustrate the forces between objects and the changes in energy of the objects due to the interaction. (PS3-5)	
									Use mathematical representations to support a claim regarding relationships among the frequency, wavelength, and speed of waves travling in various media. (PS4-1)		Develp and use a model of two objects interacting through electric or magnetic fields to illustrate the forces between objects and the changes in energy of the objects due to the interaction. (PS3-5)	Develp and use a model of two objects interacting through electric or magnetic fields to illustrate the forces between objects and the changes in energy of the objects due to the interaction. (PS3-5)				Use mathematical representations to support a claim regarding relationships among the frequency, wavelength, and speed of waves travling in various media. (PS4-1)	
									Evalute the claims, evidence, and reasoning behind the idea that electromagnetic radiation can be described either by a wave model or a particle model, and that for some situations one model is more useful than the other. (PS4-3)							Evalute the claims, evidence, and reasoning behind the idea that electrmagnetic radiation can be described either by a wave model or a particle model, and that for some situations one model is more useful than the other. (PS4-3)	
									Evaluate the validity and reliability of claims in published materials of the effects that different frequencies of electromagnetic radiation have when absorbed by matter. (PS4-4)							Evaluate the validity and reliability of claims in published materials of the effects that different frequencies of electromagnetic radiation have when absorbed by matter. (PS4-4)	
									Communicate technical inforamtion about how some technological devices use the principles of wave behavior and wave interactions with matter to transmit and capture information and energy. (PS4-5)								

K	1	2	3	4	5	6	7	8	Physical Science	Biology	Introduction to Chemistry	Chemistry	Astronomy	Geology	Anatomy	Physics	Environmental Ecology
Standard 3: Life Science																	
Benchmark A: Understand and apply knowledge of the characteristics of living things and how living things are both similar to and different from each other and from non-living things.			Benchmark A: Understand and apply knowledge of organisms and their environments.			Benchmark A: Understand and apply knowldge of the basic components and functions of cells, tissues, organs, and organ systems. (Molecules to Organisms: Structures and Processes)			Benchmark A: Understand and apply knowledge of the cell. (Molecules to Organisms)								
Use observations to describe characteristics of living and non-living things.			Construct an argument that some animals form groups that help members survive. (3-LS2-1)	Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction. (4-LS1-1)	Support an argument that plants get the materials they need for growth chiefly from air and water. (5-LS-1-1)		Conduct an investigation to provide evidence that living thigns are made of cells; either one cell or many different numbers and types of cells. (MS-LS1-1)			Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis. (HS-LS1-3)							
			Analyze and interpret data to provide evidence that animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms. (3-LS3-1)	Use a model to 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-LS1-2)	Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment. (5-LS2-1)		Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function. (MS-LS1-2 (b))			Construct and revise an explanation based on evidence for how carbon, hydrogen, and oxygen from sugar molecules may combine with other elements to form amino acids and/or other large carbon-based molecules. (HS-LS1-6)							
			Use evidence to support the explanation that traits can be influenced by the environment. (3-LS3-2)				Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells. (MS-LS1-3 (c))			Use a model to illustrate the role of cellular division(mitosis) and differentiation in producing and maintaining complex organisms. (HS-LS1-4)							
			Use evidence to construct an explanation for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing. (3-LS4-2)				Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories. (MS-LS1-8)			Use a model to illustrate how photosynthesis transforms light energy into stored chemical energy. (HS-LS1-5)							
			Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all. (3-LS4-3)							Develop and use a model to illustrate the hierarchal organization of interacting systems that provide specific functions within multicellular organisms. (HS-LS1-2)							
			Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death. (3-LS1-1)														
Benchmark B: Understand and apply knowledge of life cycles of plants and animals.			Benchmark B: Understand and apply knowledge of environmental stewardship.			Benchmark B: (Understand and apply knowledge of how different organisms pass on traits (heredity). (Molecules to Organisms: Structures and Processes)			Benchmark B: Understand and apply knowledge of the molecular basis of heredity. (Heredity)								
	Explain the function of the parts of a plant.	Describe the major stages in the life cycles of animals/insects.	Make a claim about the merit of a solution to a problem caused when the environment changes and the types of animals that live there may change. (3-LS4-4)	Explain how earth materials provide many of the resources that humans use and their affect on the environment. (4-ESS3-1)	Identify ways humans change environments in ways that can be either beneficial or detrimental to themselves or organisms.		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-LS3-1)	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. (MS-LS3-1)		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. (HS-LS1-1)							
	Observe and describe how plants and animals resemble their parents. (1-LS3-1)						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. (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.(MS-LS3-2)		Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring. (HS-LS3-1)							
										Make and defend a claim based on evidence that inheritable genetic variations may result from: 1) new genetic combinations through meiosis 2) viable errors occuring during replication, and/or 3) mutations caused by environmental factors. (HS-LS3-2)							
										Apply concepts of statistics and probability to explain the variation and distribution of expressed traits in a population. (HS-LS3-3)							

K	1	2	3	4	5	6	7	8	Physical Science	Biology	Introduction to Chemistry	Chemistry	Astronomy	Geology	Anatomy	Physics	Environmental Ecology
Standard 3: Life Science																	
Benchmark C: Understand and apply knowledge of the basic needs of plants and animals and how they interact with each other and their physical environment.			Benchmark C: Understand and apply knowledge of basic human body systems and how they work together.			Benchmark C: Understand and apply knowledge of the complementary nature of structure and function and the commonalities among organisms.(Molecules to Organisms: Structures and Processes / Ecosystems: Interactions, Energy, and Dynamics)			Benchmark C: Understand and apply knowledge of biological evolution. (Biological Evolution)								
	Explain how plants and/or animals survive, grow, and meet their needs. (1-LS1-1)	Make observations of plants and animals to compare the diversity of life in different habitats. (2-LS4-1)	Understand the human organism has systems that interact with each other (circulatory, respiratory, digestive, musculoskeletal, etc.)					Apply scientific ideas to construct an explanation for the anatomical similarities and differences among modern organisms and between modern and fossil organisms to infer evolutionary relationships. (MS-LS4-2)		Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence. (HS-LS4-1)				Construct an argument based on evidence about the simultaneous coevolution of Earth's systems and life on Earth. (HS-ESS2-7)			
								Analyze displays of pictorial data to compare patterns of similarities in the embryological development across multiple species to identify relationships not evident in the fully formed anatomy. (MS-LS4-3)		Apply concepts of statistics and probability to support explanations that organisms with an advantageous heritable trait tend to increase in proportion to organisms lacking this trait. (HS-LS4-3)							
										Contruct an explanation based on evidence that the process of evolution primarily results from 4 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-LS4-2)							
										Contruct an explanation based on evidence for how natural selection leads to adaptations of populations. (HS-LS4-4)							
										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-LS4-5)							
Benchmark D: Understand and apply knowledge of ways to help take care of the environment.			Benchmark D: Understand and apply knowledge of personal health and wellness issues.			Benchmark D: Understand and apply knowledge of interdependency of organisms, changes in enviornmental conditions, and survival of individual and species. (Molecules to Organisms: Structures and Processes)			Benchmark D: Understand and apply knowledge of the interdependence of organisms. (Ecosystems, Earth & Human Activity)								
		Describe how humans depend on their natural and constructed environments.	Analyze behaviors that influence health and body systems.			Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations. (MS-LS2-4)	Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively. (MS-LS1-4)	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-LS4-1)		Contruct and revise an explanation based on evidence for the cycling of matter and flow of energy in aerobic and anaerobic conditions. (HS-LS2-3)				Construct an explanation based on evidence for how availablity of natural resources, occurence of natural hazards, and changes in climate have influenced human activity. (HS-ESS3-1)			Construct an explanation based on evidence for how availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity. (HS-ESS3-1)
			Advocate for personal, family, and community health.			Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem. (MS-LS2-1)	Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms. (MS-LS1-5)	Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment. (MS-LS4-4)		Evaluate the evidence for the role of group behavior on individual and species' chances to survive and reproduce. (HS-LS2-8)				Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios. (HS-ESS3-2)			Create a computational simulation to illustrate the relationships among management of natural resources, the sustainability of human populations and biodiversity. (HS-ESS3-3)

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Standard 3: Life Science																	
		Describe how humans change environments in ways that can be either beneficial or detrimental to themselves or other organisms.					Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms. (MS-LS1-6 (g) (j))	Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time. (MS-LS4-6)						Create a computational simulation to illustrate the relationships among management of natural resources, the sustainability of human populations and biodiversity. (HS-ESS3-3)			Evaluate and refine a technological solution that reduces impacts of human activities on natural systems. (HS-ESS3-4)
							Develop 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-PS1-7 (h) (k))							Evaluate and refine a technological solution that reduces impacts of human activities on natural systems. (HS-ESS3-4)			Use computational representation to illustrate the relationship among Earth systems and how those relationships are being modified due to human activity. (HS-ESS3-6)
																	Construct and revise an explanation based on evidence for the cycling of matter and flow of energy in aerobic and anaerobic conditions. (HS-LS2-3)
																	Use mathematical representations to support claims for the cycling of matter and flow of energy among organisms in an ecosystems. (HS-LS2-4)
																	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-LS2-5)
																	Evaluate the evidence for the role of group behavior on individual and species' chances to survive and reproduce. (HS-LS2-8)
																	Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity. (HS-LS2-7)
																	Create or revise a simulation to test a solution to mitigate adverse impacts of human activity on biodiversity. (HS-LS4-6)
																	Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales. (HS-LS2-1)
Benchmark E: Understand and apply knowledge of basic human body structures (human body parts and their functions).						Benchmark E: Understand and apply knowledge of the cycling of matter and energy in ecosystems.			Benchmark E: Understand and apply knowledge of the interdependence of matter, energy, and organization of living systems. (Ecosystems)								
Describe how humans have distinct body structures for functions (walking, thinking, holding, seeing and talking).						Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem. (MS-LS2-3)				Use a model to illustrate that cellular respiraton is a chemical process whereby the bonds of food molecules and oxygen molecules are broken and the bonds in new compounds are formed resulting in a net transfer of energy. (HS-LS1-7)				Analyze geoscience data and the results from global climate change models to make an evidence based forecast of the current rate of global or regional climate change and associated future impacts to Earth systems. (HS-ESS3-5)			Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales. (HS-LS2-2)

K	1	2	3	4	5	6	7	8	Physical Science	Biology	Introduction to Chemistry	Chemistry	Astronomy	Geology	Anatomy	Physics	Environmental Ecology
Standard 3: Life Science																	
										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-LS4-5)							Evaluate the claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem. (HS-LS2-6)
																	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-LS4-5)
																	Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity. (HS-ESS3-1)
																	Develop a quantitative model to describe the cycling of carbon among the hydrosphere, atmosphere, geosphere, and biosphere. (HS-ESS2-6)
																	Use a model to describe how variations in the flow of energy into and out of Earth's systems results in changes in climate. (HS-ESS2-4)
Benchmark F: Understand and apply knowledge of good health habits.						Benchmark F: (Understand and demonstrate knowledge of the social and personal implications of environmental issues.) From Molecules to Organisms: Structures and Processes			Benchmark F: Understand and apply knowledge of the interdependence of the behavior of organisms.								
Identify influences that affect personal health and health of others. (washing hands, covering mouth, etc.)						Evaluate competing design solutions for maintaining biodiversity and ecosystem services. (MS-LS2-5)		Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms. (MS-LS4-5)							Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms. (HS-LS1-2)		
															Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis. (HS-LS1-3)		
															Applies basic understanding of the skeletal and muscular systems in relationship to kinesiology.		
						Benchmark G: Understand and apply knowledge of the functions and interconnections of the major human body systems including the breakdown in structure or function that disease causes.											
						Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems. (MS-LS2-2)	Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells. (MS-LS1-3 (c))											