Springfield School District
K-2 Science Priority Standards, 2015-2016

Physical Science		
Kindergarten	First Grade	Second Grade
Forces and Interactions: Pushes and Pulls K-PS2-2 Analyze data to determine if a design solution works as intended to change the speed or direction of an object in motion.	**Waves: Sound and Light** 1-PS4-1 Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate. 1-PS4-2 Make observations to construct an evidence-based account that objects in darkness can be seen only when illuminated. 1-PS4-4 Use tools and materials to design and build a device that uses light or sound to solve the problem of communicating over a distance.	**Structure and Properties of Matter** 2-PS1-2 Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose. 2-PS1-3 Make observations to construct an evidence-based account of how an object made of a small set of pieces can be disassembled and made into a new object.

Life Science		
Kindergarten	First Grade	Second Grade
Interdependent Relationships in Ecosystems: Animals, Plants, and Their Environment K-LS1-1 Use observations to describe patterns of what plants and animals need to survive. (include discussion of energy) K-ESS2-2 Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs.	**Structure, Function, and Information Processing** 1-LS1-1 Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow and meet their needs. 1-LS3-1 Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents.	**Interdependent Relationships in Ecosystems** 2-LS4-1 Make observations of plants and animals to compare the diversity of life in different habitats.

Earth and Space Science		
Kindergarten	First Grade	Second Grade
Weather and Climate K-ESS2-1 Use and share observations of local weather conditions to describe patterns over time. K-PS3-1 Make observations to determine the effect of sunlight on Earth's surface.	**Space Systems: Patterns and Cycles** 1-ESS1-1 Use observations of the sun, moon, and stars to describe patterns that can be predicted.	**Processes that Shape the Earth** 2-ESS2-1 Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land. 2-ESS2-2 Develop a model to represent the shapes and kinds of land and bodies of water in an area.

Springfield School District
3-5 Science Priority Standards, 2015-2016

Physical Science		
Third Grade	Fourth Grade	Fifth Grade
Forces and Interactions 3-PS2-1 Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.	**Energy** 4-PS3-4 Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.	**Structure and Properties of Matter** 5-PS1-4 Conduct an investigation to determine whether the mixing of two or more substances results in a new substance.
	Waves and Information 4-PS4-3 Generate and compare multiple solutions that use patterns to transfer information.	

Life Science		
Third Grade	Fourth Grade	Fifth Grade
Interdependent Relationships in Ecosystems 3-LS4-1 Analyze and interpret data from fossils to provide evidence of the organisms and the environment in which they lived long ago. 3-LS4-4 Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.	**Structure, Function, and Information Processing** 4-LS1-1 Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.	**Matter and Energy in Organisms and Ecosystems** 5-LS2-1 Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment. 5-PS3-1 Use models to describe that energy in animals' food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun.
Inheritance and Variation of Traits: Life Cycles and Traits 3-LS1-1 Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death. 3-LS4-2 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.		

Earth and Space Science		
Third Grade	Fourth Grade	Fifth Grade
Weather and Climate 3-ESS2-2 Obtain and combine information to describe climates in different regions of the world. 3-ESS3-1 Make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard.	**Earth and Space Science (Processes that Shape the Earth** 4-ESS1-1 Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time. 4-ESS3-2 Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans. 4-ESS3-1 Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment.	**Earth Systems** 5-ESS2-1 Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact. 5-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.
		Stars and the Solar System 5-PS2-1 Support an argument that the gravitational force exerted by Earth on objects is directed down. 5-ESS1-1 Support an argument that the apparent brightness of the sun and stars is due to their relative distances from Earth.

Springfield School District
6-8 Science Priority Standards, 2015-2016

Physical Science		
Sixth Grade	Seventh Grade	Eighth Grade
Structure and Properties of Matter MS-PS1-1 Develop models to describe the atomic composition of simple molecules and extended structures. MS-PS1-4 Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.	**Waves and Electromagnetic Radiation** MS-PS4-2 Develop and use a model to describe that waves are reflected, absorbed, and transmitted through various materials. MS-PS2-5 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.	**Forces and Interactions** MS-PS2-1 Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects. MS-PS2-2 Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.
Chemical Reactions MS-PS1-5 Develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved. MS-PS1-6 Undertake a design project to construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes.		
Energy MS-PS3-2 Develop a model to describe when the arrangement of objects interacting at a distance changes, different amounts of potential energy are stored in the system. MS-PS3-3 Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.		

Life Science		
Sixth Grade	Seventh Grade	Eighth Grade
Interdependent Relationships in Ecosystems MS-LS2-2 Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.	**Growth, Development, and Reproduction of Organisms** 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-LS4-5 Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms.	**Natural Selection and Adaptations** MS-LS4-1 & MS-LS4-2 Analyze, explain and interpret data from patterns in the fossil record that document the existence, diversity, extinction, and similarities and differences among modern and fossil organisms. MS-LS4-4 Construct an explanation based on evidence that describes how genetic variation of traits in a population increase some individuals probability of surviving and reproducing in a specific environment.
	Structure, Function, and Information Processing MS-LS1-1 Conduct an investigation to provide evidence that living things are made of cells, either one cell or many different numbers and types of cells. MS-LS1-3 Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.	
	Matter and Energy in Organisms and Ecosystems MS-LS2-3 Develop a model to describe the cycling of matter and the flow of energy among the living and nonliving parts of an ecosystem (including the role of photosynthesis and the movement of matter and energy through organisms).	

Earth and Space Science		
Sixth Grade	Seventh Grade	Eighth Grade
Space Systems MS-ESS1-2 Develop and use a model to describe the role of gravity in motions within galaxies and the solar system.	**Earth Systems** MS-ESS2-1 Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process.	**History of Earth** MS-ESS2-2 Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales. MS-ESS2-3 Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions.
		Earth and Space Science (Weather and Climate) MS-ESS2-6 Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates.
		Earth and Space Science (Human Impacts) MS-ESS3-2 Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects. MS-ESS3-3 Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.

Springfield School District
9-12 Science Priority Standards, 2015-2016

Physical Sciences

Ninth Grade – Twelfth Grade

Structure/Properties of Matter, Forces, and Interactions

HS-PS1-1
Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms.

HS-PS1-2
Construct and revise an explanation for the outcome of a simple chemical reaction based on the outermost electron state of atoms, trends in the periodic table, and knowledge of the patterns of chemical properties.

HS-PS1-7
Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction.

HS-PS2-1
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.

HS-PS2-5
Plan and conduct an investigation to provide evidence that an electric current can produce a magnetic field and that a changing magnetic field can produce an electric current.

Energy, Waves, and Electromagnetic Radiation

HS-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 system are known.

HS-PS3-2
Develop and use models to illustrate that energy at the macroscopic scale can be accounted for as either motions of particles or energy stored in fields.

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

HS-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.

Life Sciences

Ninth Grade – Twelfth Grade

Structure, Function, and Information Processing

HS-LS1-1

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

HS-LS1-3

Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.

Matter and Energy in Organisms and Ecosystems

HS-LS2-2

Use mathematical representations to support and revise explanations about factors affecting biodiversity and populations in ecosystems of different scales.

HS-LS2-4

Use mathematical representations to support claims for the cycling of matter and flow of energy among organisms in an ecosystem.

HS-LS2-6

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.

Growth, Development, and Reproduction of Organisms, Natural Selection, and Adaptations

HS-LS3-1

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-LS4-1

Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence.

HS-LS4-4

Construct an explanation based on evidence for how natural selection leads to adaptation of populations.

HS-LS4-5

Evaluate evidence supporting the claims that changes in environmental conditions may result in increases in the number of individuals of some species, the emergence of new species over time, and the extinction of other species.

Earth and Space Science

Ninth Grade – Twelfth Grade

Earth, Space, and the Universe

HS-ESS1-1
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 that eventually reaches Earth in the form of radiation.

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

HS-ESS1-3
Communicate scientific ideas about the way stars, over their life cycle, produce elements.

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.

Earth Systems

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

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

HS-ESS2-6
Develop a quantitative model to describe the cycling of carbon among the hydrosphere, atmosphere, geosphere, and biosphere.

HS-ESS3-1
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-ESS3-5
Analyze geoscience data and the results from global climate models to make an evidence-based forecast of the current rate of global or regional climate change and associated future impacts to Earth systems.

Engineering, Technology, and Application of Science

Ninth Grade – Twelfth Grade

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

HS-LS2-7
Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.*

HS-ESS3-4
Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.*

HS-PS2-6
Communicate scientific and technical information about why the molecular-level structure is important in the functioning of designed materials.*