



Grade K
Earth Science Framework Alignment

Big Idea	Essential Question	Concepts	Competencies	NGSS Performance Expectation	FOSS Next Generation Edition Alignment
The Earth is a complex and dynamic set of interconnected systems that interact over a wide range of temporal and spatial scales.	How and why is Earth constantly changing?	Weather is the combination of sunlight, wind, snow or rain, and temperature in a particular region at a particular time. (ESS2.D)	Use and share observations of local weather conditions to describe patterns over time.	K-ESS2-1	Trees and Weather Investigation 3 Part 1 Investigation 3 Part 2 Investigation 3 Part 3
The Earth is a complex and dynamic set of interconnected systems that interact over a wide range of temporal and spatial scales.	How and why is Earth constantly changing?	Sunlight warms the Earth's surface. (PS3.B)	Make observations to determine the effect of sunlight on the Earth's surface.	K-PS3-1	Trees and Weather Investigation 3 Part 2
The Earth is a complex and dynamic set of interconnected systems that interact over a wide range of temporal and spatial scales.	How and why is Earth constantly changing?	Sunlight warms the Earth's surface. (PS3.B)	Use tools and materials to design and build a structure that will reduce (or increase) the warming effect of sunlight on an area.	K-PS3-2	Materials and Motion Investigation 3 Part 6
The Earth is a complex and dynamic set of interconnected systems that interact over a wide range of temporal and spatial scales.	How and why is Earth constantly changing?	Some kinds of severe weather are more likely than others in a given region. Weather scientists forecast severe weather so that the communities can prepare for and respond to these events. (ESS3.B)	Ask questions to obtain information about the purpose of weather forecasting to prepare for and respond to weather.	K-ESS3-2	Trees and Weather Investigation 3 Part 1 Investigation 3 Part 2 Investigation 3 Part 3



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The Earth is a complex and dynamic set of interconnected systems that interact over a wide range of temporal and spatial scales.	How and why is Earth constantly changing?	Plants and animals can change their environment. (ESS2.E)	Use evidence to show how plants and animals are able to change their environment to meet their needs.	K-ESS2-2	Trees and Weather Investigation 1 Part 1 Investigation 1 Part 5 Investigation 1 Part 5 Investigation 4 Part 1 Investigation 4 Part 6 Animals Two by Two Investigation 3 Part 2 Investigation 3 Part 3 Investigation 4 Part 4
The Earth's surface processes affect and are affected by human activities.	How do Earth's processes and human activities affect each other?	People can make choices to reduce impact on the environment. (ESS3.C)	Describe ways to reduce impact of humans on the land, water, and air.	K-ESS3-3	Materials and Motion Investigation 1 Part 1 Investigation 1 Part 6 Investigation 1 Part 7 Investigation 2 Part 1 Investigation 2 Part 4 Investigation 2 Part 5 Investigation 3 Part 5
The Earth's surface processes affect and are affected by human activities.	How do Earth's processes and human activities affect each other?	Things that people do to live can affect the world around them. (ESS3.C)	Describe and communicate solutions to reduce the impact of humans on land, water, and air.	K-ESS3-3	Materials and Motion Investigation 1 Part 1 Investigation 1 Part 6 Investigation 1 Part 7 Investigation 2 Part 1 Investigation 2 Part 4 Investigation 2 Part 5 Investigation 3 Part 5
The Earth's surface processes affect and are affected by human activities.	How do Earth's processes and human activities affect each other?	Living things need water, air, and resources from the land. Organisms live in places that have the things they need. (ESS3.A)	Using evidence, state an argument how plants and animals can change the environment to meet their needs.	K-ESS3-1	Materials and Motion Investigation 1 Part 1 Investigation 1 Part 6 Investigation 1 Part 7 Investigation 2 Part 1 Investigation 2 Part 4 Investigation 2 Part 5 Investigation 3 Part 5



Grade K
Physical Science Framework Alignment

Big Idea	Essential Question	Concepts	Competencies	NGSS Performance Expectation	FOSS Next Generation Edition Alignment
Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	How can one explain the structure, properties, and interactions of matter?	Different materials are suited to different purposes.	Analyze data from testing objects made from different materials to determine if a proposed object functions as intended.	N/A	Materials and Motion Investigation 1 Part 3 Investigation 1 Part 6 Investigation 1 Part 7 Investigation 2 Part 5 Investigation 3 Part 6
Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	How can one explain the structure, properties, and interactions of matter?	A variety of objects can be built up from small parts.	Design an object built from a small set of pieces to solve a problem and compare solutions designed by peers given the same set of pieces.	N/A	Materials and Motion Investigation 3 Part 6
Interactions between any two objects can cause changes in one or both.	How can one explain and predict interactions between objects within systems?	Pushes and pulls can have different strengths and directions. (PS2.A)	Plan and conduct an investigation to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object.	K-PS2-1 K-PS2-2	Materials and Motion Investigation 4 Part 1 Investigation 4 Part 2 Investigation 4 Part 3 Investigation 4 Part 4
Interactions between any two objects can cause changes in one or both.	How can one explain and predict interactions between objects within systems?	Pushing or pulling on an object can change the speed or direction of its motion and can start or stop it. (PS2.A)	Plan and conduct an investigation to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object.	K-PS2-1 K-PS2-2	Materials and Motion Investigation 4 Part 1 Investigation 4 Part 2 Investigation 4 Part 3 Investigation 4 Part 4
Interactions between any two objects can cause changes in one or both.	How can one explain and predict interactions between objects within systems?	Objects pull or push each other when they collide or are connected and can change motion. (PS2.B)	Analyze data to determine if a design solution works as intended to change the direction or speed of an object with a push or a pull.	K-PS2-1	Materials and Motion Investigation 4 Part 2 Investigation 4 Part 3 Investigation 4 Part 4



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Interactions between any two objects can cause changes in one or both.	How can one explain and predict interactions between objects within systems?	A bigger push or pull makes things speed up or slow down more quickly. (PS3.C)	Plan and conduct a simple test to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object.	K-PS2-1	Materials and Motion Investigation 4 Part 1 Investigation 4 Part 2 Investigation 4 Part 3 Investigation 4 Part 4
Interactions between any two objects can cause changes in one or both.	How can one explain and predict interactions between objects within systems?	When objects touch or collide, they push on one another and can change motion. (PS3.B)	Analyze data to determine if a design solution works as intended to change the speed or direction of an object with a push or pull.	K-PS2-1	Materials and Motion Investigation 4 Part 1 Investigation 4 Part 2 Investigation 4 Part 3 Investigation 4 Part 4
Interactions of objects or systems of objects can be predicted and explained using the concept of energy transfer and conservation.	How is energy transferred and conserved?	The more an object is pushed or pulled makes things speed up or slow down. (PS3.C)	Carry out investigations to provide evidence that energy is being transferred or conserved by objects.	K-PS2-1	Materials and Motion Investigation 4 Part 2 Investigation 4 Part 4
Interactions of objects or systems of objects can be predicted and explained using the concept of energy transfer and conservation.	How is energy transferred and conserved?	The amount and position of mass affect how an object moves. (PS2.A)	Carry out investigations to provide evidence that energy is being transferred or conserved by objects.	K-PS2-1	Materials and Motion Investigation 4 Part 2 Investigation 4 Part 4



Grade K
Life Science Framework Alignment

Big Idea	Essential Question	Concepts	Competencies	NGSS Performance Expectation	FOSS Next Generation Edition Alignment
All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	How do organisms live, grow, respond to their environment, and reproduce?	Animals need food (plants and other animals) and water in order to live and grow. (LS1.C)	Use observations to describe what animals need to survive.	K-LS1-1	Animals Two by Two Investigation 1 Part 2 Investigation 1 Part 5 Investigation 2 Part 3 Investigation 3 Part 1 Investigation 3 Part 2 Investigation 4 Part 1 Investigation 4 Part 4
All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	How do organisms live, grow, respond to their environment, and reproduce?	Plants need water and light in order to live and grow. (LS1.C)	Use observations to describe what plants need to survive.	K-LS1-1	Animals Two by Two Investigation 4 Part 4
All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	How do organisms live, grow, respond to their environment, and reproduce?	Living things need water, air, and resources from the land, and they live in places that have the things they need. (ESS3.A)	Use a model to explain the relationship between the needs of different plants or animals and the places they live.	K-ESS3-1	Animals Two by Two Investigation 1 Part 2 Investigation 1 Part 3 Investigation 1 Part 5 Investigation 2 Part 1 Investigation 2 Part 3 Investigation 3 Part 2 Investigation 4 Part 3 Investigation 4 Part 4
All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	How do organisms live, grow, respond to their environment, and reproduce?	Animals have identifiable structures and behaviors.	Observe and describe structures of organisms and functions of the structures.	N/A	Animals Two by Two Investigation 1 Parts 1-5 Investigation 2 Parts 1-3 Investigation 3 Parts 1-3 Investigation 4 Parts 1 and 2



Grade 1
Earth and Space Framework Alignment

Big Idea	Essential Question	Concepts	Competencies	NGSS Performance Expectation	FOSS Next Generation Edition Alignment
The universe is composed of a variety of different objects, which are organized into systems, each of which develops according to accepted physical processes and laws.	What is the universe, and what is Earth's place in it?	Observable changes and patterns in the sky are caused by motions in the Earth-moon-sun system. (ESS1.A)	Use observations of stars, moon, and sun in the day and night sky to describe patterns that can be predicted.	1-ESS1-1	Air and Weather Investigation 2 Part 4 Investigation 4 Part 1 Investigation 4 Part 2 Investigation 4 Part 3
The universe is composed of a variety of different objects, which are organized into systems, each of which develops according to accepted physical processes and laws.	What is the universe, and what is Earth's place in it?	The motion of the sun, moon, and earth relates to time (days, months, years). (ESS1.B)	Use observations to compare the motion of the sun, earth, and moon as it relates to time.	1-ESS1-1	Air and Weather Investigation 2 Part 4 Investigation 4 Part 1 Investigation 4 Part 2 Investigation 4 Part 3
The universe is composed of a variety of different objects, which are organized into systems, each of which develops according to accepted physical processes and laws.	What is the universe, and what is Earth's place in it?	Observable changes and patterns in the sky are caused by motions in the Earth-moon-sun system. (ESS1.A)	Observe and describe patterns of objects in the sky that are cyclic and can be predicted.	1-ESS1-2	Air and Weather Investigation 2 Part 4 Investigation 4 Part 1 Investigation 4 Part 2 Investigation 4 Part 3
The universe is composed of a variety of different objects, which are organized into systems, each of which develops according to accepted physical processes and laws.	What is the universe, and what is Earth's place in it?	Patterns of the motion of the sun, moon and stars in the sky can be observed, described, and predicted. (ESS1.A)	Observe, describe, and predict patterns of daily change in the appearance and visibility of the moon and sun.	1-ESS1-2	Air and Weather Investigation 2 Part 4 Investigation 4 Part 1 Investigation 4 Part 2 Investigation 4 Part 3



Big Idea	Essential Question	Concepts	Competencies	NGSS Performance Expectation	FOSS Next Generation Edition Alignment
<p>The universe is composed of a variety of different objects, which are organized into systems, each of which develops according to accepted physical processes and laws.</p>	<p>What is the universe, and what is Earth's place in it?</p>	<p>Seasonal patterns of sunrise and set can be observed, described and predicted. (ESS1.B)</p>	<p>Observe, describe, and predict patterns of seasonal change in the timing and position of sunrise and sunset.</p>	<p>1-ESS1-2</p>	<p>Air and Weather Investigation 2 Part 4 Investigation 4 Part 1 Investigation 4 Part 2 Investigation 4 Part 3</p>
<p>The universe is composed of a variety of different objects, which are organized into systems, each of which develops according to accepted physical processes and laws.</p>	<p>What is the universe, and what is Earth's place in it?</p>	<p>Through the use of tools and media objects can be observed more clearly than with the naked eye.</p>	<p>Use scientific tools such as binoculars or telescopes to enhance observations.</p>	<p>N/A</p>	<p>N/A</p>



Grade 1

Physical Science Framework Alignment

Big Idea	Essential Question	Concepts	Competencies	NGSS Performance Expectation	FOSS Next Generation Edition Alignment
Waves are a repeating pattern of motion that transfers energy from place to place without overall displacement of matter.	How are waves used to transfer energy and information?	Sound can make matter vibrate, and vibrating matter can make sound. (PS4.A)	Plan and conduct investigations to provide evidence that vibrating materials can make sound.	1-PS4-1	Sound and Light Investigation 1 Part 1 Investigation 1 Part 2 Investigation 2 Part 1 Investigation 2 Part 2 Investigation 2 Part 4
Waves are a repeating pattern of motion that transfers energy from place to place without overall displacement of matter.	How are waves used to transfer energy and information?	An object can be seen when light reflected from its surface enters the eyes. (PS4.B)	Investigate and explain that for an object to be seen, light must be reflected off the object and enter the eye.	1-PS4-2	Sound and Light Investigation 4 Part 3
Waves are a repeating pattern of motion that transfers energy from place to place without overall displacement of matter.	How are waves used to transfer energy and information?	Light travels from place to place. (PS4.B)	Make observations to construct an evidence-based account that light travels from place to place.	N/A	Sound and Light Investigation 3 Part 3 Investigation 4 Part 1 Investigation 4 Part 2 Investigation 4 Part 4
Waves are a repeating pattern of motion that transfers energy from place to place without overall displacement of matter.	How are waves used to transfer energy and information?	Mirrors can be used to reflect light. (PS4.B)	Plan and conduct an investigation to redirect light beams using mirrors.	1-PS4-3	Sound and Light Investigation 4 Part 1
Waves are a repeating pattern of motion that transfers energy from place to place without overall displacement of matter.	How are waves used to transfer energy and information?	Materials allow light to pass through them in varying degrees. (PS4.B)	Investigate to determine the effect of placing objects made of different materials in a beam of light.	1-PS4-3	Sound and Light Investigation 3 Part 1 Investigation 3 Part 2 Investigation 3 Part 3 Investigation 4 Part 1



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Waves are a repeating pattern of motion that transfers energy from place to place without overall displacement of matter.	How are waves used to transfer energy and information?	Objects can be seen if light is available to illuminate the object or if they give off their own light. (PS4.B)	Make observations to construct an evidence-based account that objects can be seen when illuminated.	1-PS4-2	Sound and Light Investigation 4 Part 3
Waves are a repeating pattern of motion that transfers energy from place to place without overall displacement of matter.	How are waves used to transfer energy and information?	A variety of devices are used to communicate over long distances. (PS4.C)	Use tools and materials to design a device that uses light or sound to solve the problem of communicating over a distance.	1-PS4-4	Sound and Light Investigation 2 Part 4 Investigation 4 Part 4
Waves are a repeating pattern of motion that transfers energy from place to place without overall displacement of matter.	How are waves used to transfer energy and information?	People depend on various technologies in their lives; human lives would be different without technology. (PS4.C)	Design and build a device that uses light to communicate.	1-PS4-4	Sound and Light Investigation 4 Part 4



Grade 1

Life Science Framework Alignment

Big Idea	Essential Question	Concepts	Competencies	NGSS Performance Expectation	FOSS Next Generation Edition Alignment
All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	How do organisms live, grow, respond to their environment, and reproduce?	Organisms have external structures that serve various functions in growth, survival, behavior, and reproduction. (LS1.A)	Observe and categorize living and nonliving things by external characteristics.	1-LS1-1	Plants and Animals Investigation 1 Part 4 Investigation 2 Part 2 Investigation 3 Part 3 Investigation 3 Part 4 Investigation 4 Part 3
All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	How do organisms live, grow, respond to their environment, and reproduce?	Organisms have external structures that help them survive, grow, and meet their needs. (LS1.A)	Make observations and describe the different parts of organisms that help them survive, grow, and meet their needs.	1-LS1-2	Plants and Animals Investigation 1 Parts 1-4 Investigation 2 Parts 1-3 Investigation 3 Parts 1-4 Investigation 4 Parts 1-3
All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	How do organisms live, grow, respond to their environment, and reproduce?	Organisms have external structures that help them survive, grow, and meet their needs. (LS1.A)	Design a model that replicates the function of an organism's structure.	1-LS1-1	Plants and Animals Investigation 3 Part 4
All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	How do organisms live, grow, respond to their environment, and reproduce?	Parents and offspring engage in behaviors that help the offspring to survive. (LS1.B)	Observe and determine patterns in behavior of parents and offspring that will help offspring survive.	1-LS1-2	Plants and Animals Investigation 4 Part 3
Organisms have external structures that help them survive, grow, and meet their needs.	Organisms have external structures that help them survive, grow, and meet their needs.	Organisms have external structures that help them survive, grow, and meet their needs. (LS1.A)	Classify plants and animals according to physical characteristics they share.	1-LS1-1	Plants and Animals Investigation 1 Parts 1-4 Investigation 3 Part 1 Investigation 3 Part 2 Investigation 3 Part 3 Investigation 3 Part 4
Organisms have external structures that help them survive, grow, and meet their needs.	Organisms have external structures that help them survive, grow, and meet their needs.	Every human made product is designed by applying knowledge of the natural world and is built using materials from nature. (LS1.A)	Use materials to design a solution to a human problem by mimicking how plants or animals use their external parts to help them survive, grow, and meet their needs.	1-LS3-1	Plants and Animals Investigation 3 Part 4



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Heredity refers to specific mechanisms by which characteristics or traits are passed from one generation to the next via genes, and explains why offspring resemble, but are not identical to, their parents.	How are the characteristics of one generation passed to the next? How can individuals of the same species and even siblings have different characteristics?	Young animals are very much but not exactly like their parents. Plants also are very much, but not exactly like, their parents. (LS3.A)	Make observations and construct an evidence-based account that young plants and animals are alike but not exactly like their parents.	1-LS3-1	Plants and Animals Investigation 2 Part 1 Investigation 2 Part 2 Investigation 2 Part 3
Heredity refers to specific mechanisms by which characteristics or traits are passed from one generation to the next via genes, and explains why offspring resemble, but are not identical to, their parents.	How are the characteristics of one generation passed to the next? How can individuals of the same species and even siblings have different characteristics?	Adult plants and animals have young. In many kinds of animals, parents and the offspring engage in behaviors that help the offspring to survive. (LS1.B)	Note patterns in characteristics or behaviors that appear in adults and offspring (e.g. hair color, eye color).	1-LS2-1	Plants and Animals Investigation 2 Part 1 Investigation 2 Part 2 Investigation 2 Part 3 Investigation 4 part 3
Heredity refers to specific mechanisms by which characteristics or traits are passed from one generation to the next via genes, and explains why offspring resemble, but are not identical to, their parents.	How are the characteristics of one generation passed to the next? How can individuals of the same species and even siblings have different characteristics?	Offspring resemble their parents, but can also vary in many ways. (LS3.A)	Conduct an investigation (e.g. plant seeds, eggs) and cite evidence of change from young to adult.	1-LS3-1	Plants and Animals Investigation 1 Part 3 Investigation 2 Part 1 Investigation 2 Part 2 Investigation 2 Part 3 Investigation 4 Part 1 Investigation 4 Part 2 Investigation 4 Part 3
Heredity refers to specific mechanisms by which characteristics or traits are passed from one generation to the next via genes, and explains why offspring resemble, but are not identical to, their parents.	How are the characteristics of one generation passed to the next? How can individuals of the same species and even siblings have different characteristics?	Plants and animals have a life cycle.	Observe and compare the stages of life cycles or organisms (plants and animals)	N/A	Plants and Animals Investigation 1 Part 3 Investigation 2 Part 1 Investigation 2 Part 2 Investigation 2 Part 3 Investigation 4 Part 1 Investigation 4 Part 2 Investigation 4 Part 3



Grade 2

Earth and Space Science Framework Alignment

Big Idea	Essential Question	Concepts	Competencies	NGSS Performance Expectation	FOSS Next Generation Edition Alignment
The Earth is a complex and dynamic set of interconnected systems that interact over a wide range of temporal and spatial scales.	How and why is Earth constantly changing?	Earth has changed over time with some changes being rapid and others being slow. Sometimes changes occur over a longer period of time that one may be able to observe. (ESS1.C)	Make observations from multiple sources to provide evidence that Earth's events can occur quickly or slowly.	2-ESS1-1	Pebbles, Sand, and Silt Investigation 2 Part 4
The Earth is a complex and dynamic set of interconnected systems that interact over a wide range of temporal and spatial scales.	How and why is Earth constantly changing?	Wind and water change the shape of the landscape. (ESS2.A)	Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land.	2-ESS2-1	Pebbles, Sand, and Silt Investigation 4 Part 4
The Earth is a complex and dynamic set of interconnected systems that interact over a wide range of temporal and spatial scales.	How and why is Earth constantly changing?	Maps display different land and water features and helps how patterns in the distribution of rocks and other geological and geographical features. (ESS2.B)	Describe kinds and shapes of patterns of landforms and bodies of water.	2-ESS2-2	Pebbles, Sand, and Silt Investigation 2 Part 4 Investigation 4 Part 3 Investigation 4 Part 4
The Earth is a complex and dynamic set of interconnected systems that interact over a wide range of temporal and spatial scales.	How and why is Earth constantly changing?	Maps show where things are located. One can map the shapes and kinds of land and water in an area. (ESS2.B)	Develop a model to represent the shapes and kinds of land and bodies of water in an area.	2-ESS2-2	Pebbles, Sand, and Silt Investigation 2 Part 4 Investigation 4 Part 3 Investigation 4 Part 4



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The Earth is a complex and dynamic set of interconnected systems that interact over a wide range of temporal and spatial scales.	How and why is Earth constantly changing?	Water is found in the ocean, rivers, lakes, ponds, and as groundwater beneath the surface. Water exists as solid ice, in liquid form, and as a vapor. (ESS2.C)	Investigate and represent the various forms of water in their local environment, on Earth, and also on other planets and moons. Use observations to construct explanations that water exists in different forms in natural landscapes.	2-ESS2-3	Pebbles, Sand, and Silt Investigation 4 Part 3
The Earth is a complex and dynamic set of interconnected systems that interact over a wide range of temporal and spatial scales.	How and why is Earth constantly changing?	Water is found in the ocean, rivers, lakes, ponds, and as groundwater beneath the surface. Water exists as solid ice, in liquid form, and as a vapor. (ESS2.C)	Use observations to construct explanations that water exists in different forms in natural landscapes.	2-ESS2-3	Pebbles, Sand, and Silt Investigation 4 Part 3
The Earth's processes affect and are affected by human activities.	How do Earth's processes and human activities affect each other?	All materials, energy, and fuels that humans use are derived from natural sources, and their use affects the environment in multiple ways.	Investigate what resources are used in the construction of buildings, preparation of food, transportation, and other aspects of the community.	N/A	Pebbles, Sand, and Silt Investigation 3 Part 4 Investigation 3 Part 5



Grade 2

Physical Science Framework Alignment

Big Idea	Essential Question	Concepts	Competencies	NGSS Performance Expectation	FOSS Next Generation Edition Alignment
Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	How can one explain the structure, properties, and interactions of matter?	Different kinds of matter exist in various states. (PS1.A)	Observe, describe, and classify matter by properties and uses (e.g., size, shape, weight, solid, liquid, gas).	2-PS1-1	Solids and Liquids Investigation 1 Parts 1-5 Investigation 2 Parts 1-4 Investigation 3 Parts 1-5 Investigation 4 Parts 1-5
Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	How can one explain the structure, properties, and interactions of matter?	Matter can be described and classified by its observable properties. (PS1.A)	Observe, describe, and classify matter by properties and uses (e.g., size, shape, weight, texture, flexibility, weight, texture, hardness, color, etc.)	2-PS1-1	Solids and Liquids Investigation 1 Parts 1-5 Investigation 2 Parts 1-4 Investigation 3 Parts 1-5 Investigation 4 Parts 1-5
Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	How can one explain the structure, properties, and interactions of matter?	Different kinds of matter exist in various states, depending on temperature. (PS1.A)	Plan and carry out investigations to test the idea that warming some materials causes them to change from solid to liquid and cooling causes them to change from liquid to solid.	2-PS1-1	Solids and Liquids Investigation 4 Part 4
Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	How can one explain the structure, properties, and interactions of matter?	Matter can be described and classified by its observable properties. (PS1.B)	Plan and carry out investigations to test the idea that warming some materials causes them to change from solid to liquid and cooling causes them to change from liquid to solid.	2-PS1-4	Solids and Liquids Investigation 4 Part 4
Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	How can one explain the structure, properties, and interactions of matter?	Heating or cooling a substance may cause changes that can be observed. Sometimes these changes are reversible, and sometimes they are not. (PS1.B)	Construct an argument and provide evidence that some changes caused by heating or cooling can be reversed and some cannot.	2-PS1-4	Solids and Liquids Investigation 4 Part 4



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Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	How can one explain the structure, properties, and interactions of matter?	Different properties are suited for different purposes. (PS1.A)	Analyze data from testing objects made from different materials to determine if a proposed object functions as intended.	2-PS1-2	Solids and Liquids Investigation 1 Part 2 Investigation 1 Part 5
Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	How can one explain the structure, properties, and interactions of matter?	A great variety of objects can be built up from a small set of pieces. (PS1.A)	Design an object built from a small set of pieces to solve a problem and compare solutions designed by peers given the same set of pieces.	2-PS1-3	Solids and Liquids Investigation 1 Part 4
Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	How can one explain the structure, properties, and interactions of matter?	A great variety of objects can be built up from a small set of pieces. (PS1.A)	Make observations of how an object made of a small set of pieces can be disassembled and made into a new object.	2-PS1-3	Solids and Liquids Investigation 1 Part 4



Grade 2
Life Science Framework Alignment

Big Idea	Essential Question	Concepts	Competencies	NGSS Performance Expectation	FOSS Next Generation Edition Alignment
Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	How and why do organisms interact within their environment and what are the effects of these interactions?	Animals can move around, but plants cannot, and they often depend on animals for pollination or seed dispersal. (LS2.A)	Develop a model to demonstrate different modes of seed dispersal. Plan and investigate effectiveness of different types of seed dispersal.	2-LS2-2	Insects and Plants Investigation 2 Part 2 Investigation 2 Part 4 Investigation 5 Part 4
Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	How and why do organisms interact within their environment and what are the effects of these interactions?	Different plants survive better in different settings because they have varied needs for water, minerals, and sunlight. (LS2.A)	Plan and carry out investigations to test whether plants from different settings have different needs for water, sunlight, and type of soil.	2-LS2-1	Insects and Plants Investigation 2 Part 4
Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	How and why do organisms interact within their environment and what are the effects of these interactions?	Organisms obtain the materials they need to grow and survive from their environment. (LS2.A)	Obtain, evaluate, and communicate information that in any particular environment, some kinds of organisms survive well and some do not.	2-LS2-2	Insects and Plants Investigation 1 Part 2 Investigation 2 Part 1 Investigation 2 Part 4 Investigation 3 Part 2 Investigation 3 Part 4 Investigation 4 Part 1 Investigation 4 Part 4
Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	How and why do organisms interact within their environment and what are the effects of these interactions?	Plants depend on water and light to grow. (LS2.A)	Plan and conduct an investigation to determine if plants need sunlight and water to grow.	2-LS2-2	Insects and Plants Investigation 2 Part 1 Investigation 2 Part 2 Investigation 2 Part 4



Big Idea	Essential Question	Concepts	Competencies	NGSS Performance Expectation	FOSS Next Generation Edition Alignment
Biological evolution explains both the unity and diversity of species and provides a unifying principle for the history and diversity of life on Earth.	How can there be so many similarities among organisms yet so many different kinds of plants, animals, and microorganisms?	Living things can survive only where their needs are met. (LS4.D)	Construct an explanation about why living things can only survive where their needs are met.	2-LS4-1	Insects and Plants Investigation 1 Part 2 Investigation 2 Part 1 Investigation 2 Part 4 Investigation 3 Part 2 Investigation 3 Part 4 Investigation 4 Part 1 Investigation 4 Part 4
Biological evolution explains both the unity and diversity of species and provides a unifying principle for the history and diversity of life on Earth.	How can there be so many similarities among organisms yet so many different kinds of plants, animals, and microorganisms?	There are many different kinds of living things in any area, and they exist in different places on land and in water. (LS4.D)	Observe and compare the different kinds of living things that are found in different habitats.	2-LS4-1	Insects and Plants Investigation 1 Part 2 Investigation 2 Part 4 Investigation 3 Part 2 Investigation 3 Part 4 Investigation 4 Part 4 Investigation 5 Part 3



Grade 3

Physical Science Framework Alignment

Big Idea	Essential Question	Concepts	Competencies	NGSS Performance Expectation	PA Eligible Content	FOSS Next Generation Edition Alignment
Interactions between any two objects can cause changes in one or both.	How can one explain and predict interactions between objects within systems?	Each force acts on one particular object and has both strength and a direction.	Investigate the variables that may affect how objects move across a floor, down a ramp, etc.	3-PS2-1	S4.C.3.1	Motion and Matter Investigation 2 Part 1 Investigation 2 Part 2 Investigation 2 Part 4 Investigation 3 Part 1 Investigation 3 Part 2 Investigation 3 Part 3 Investigation 3 Part 4
Interactions between any two objects can cause changes in one or both.	How can one explain and predict interactions between objects within systems?	An object at rest typically has multiple forces acting on it, but they add to give zero net force on the object.	Construct an explanation for why an object subjected to multiple pushes and pulls might stay in one place or move.	3-PS2-1	S4.C.3.1	Motion and Matter Investigation 1 Part 1 Investigation 1 Part 2 Investigation 1 Part 3 Investigation 2 Part 1
Interactions between any two objects can cause changes in one or both.	How can one explain and predict interactions between objects within systems?	Forces that do not sum to zero can cause changes in the object's speed or direction of motion.	Through the use of objects, design an investigation and demonstrate that forces can cause changes on an object's speed or direction of motion.	3-PS2-1	S4.A.2.1 S4.A.2.1.4 S4.A.2.2 S4.A.2.2.1 S4.C.3.1 S4.C.3.1.1	Motion and Matter Investigation 1 Investigation 2 Investigation 3
Interactions between any two objects can cause changes in one or both.	How can one explain and predict interactions between objects within systems?	Patterns of an object's motion in various situations can be observed and measured.	Take measurements of objects in motion and represent the movement of objects in multiple representations.	3-PS2-1	S4.A.1.3 S4.A.4 S4.A.1.3.1 S4.C.3.1.3	Motion and Matter Investigation 1 Part 2 Investigation 3 Part 1 Investigation 3 Part 2 Investigation 3 Part 3



Big Idea	Essential Question	Concepts	Competencies	NGSS Performance Expectation	PA Eligible Content	FOSS Next Generation Edition Alignment
Interactions between any two objects can cause changes in one or both.	How can one explain and predict interactions between objects within systems?	When past motion exhibits a regular pattern, future motion can be predicted from it.	Investigate the motion of objects to determine observable and measurable patterns to predict future motions.	3-PS2-2	S4.C.3.1	Motion and Matter Investigation 1 Part 2 Investigation 2 Part 1 Investigation 2 Part 2 Investigation 2 Part 3 Investigation 3 Part 1 Investigation 3 Part 3
Interactions between any two objects can cause changes in one or both.	How can one explain and predict interactions between objects within systems?	When past motion exhibits a regular pattern, future motion can be predicted from it.	Provide evidence that a pattern can be used to predict future motion.	3-PS2-2	S4.C.3.1	Motion and Matter Investigation 1 Part 2
Interactions between any two objects can cause changes in one or both.	How can one explain and predict interactions between objects within systems?	Objects in contact exert forces on each other.	Design and implement an investigation to demonstrate that objects in contact exert forces on each other.	3-PS2-1	S4.A.2.1 S4.A.2.1.4 S4.A.2.2 S4.A.2.2.1 S4.C.3.1 S4.C.3.1.1	Motion and Matter Investigation 1 Part 3



Grade 3

Life Science Framework Alignment

Big Idea	Essential Question	Concepts	Competencies	NGSS Performance Expectation	PA Eligible Content	FOSS Next Generation Edition Alignment
All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	How do organisms live, grow, respond to their environment, and reproduce?	Reproduction is essential to the continued existence of every kind of organism.	Use models to explain how reproduction is essential for every kind of organism.	3-LS1-1	S4.A.3.2 S4.B.1.1.5	Structures of Life Investigation 1 Part 3 Investigation 1 Part 4 Investigation 2 Part 2 Investigation 3 Part 1 Investigation 3 Part 4
All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	How do organisms live, grow, respond to their environment, and reproduce?	Plants and animals have unique and diverse life cycles that include birth, growth, reproduction, and death.	Develop a model to describe the commonalities of life cycles of different organisms.	3-LS2-1	S4.A.3.2 S4.B.1.1.5	Structures of Life Investigation 2 Part 2
Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	How and why do organisms interact with their environment and what are the effects of these interactions?	Animals depend on each other and their surroundings to get what they need, including food, water, shelter, and a stable temperature. Groups serve different functions and vary in size.	Based on observations, construct an argument that some animals form groups that help members survive.	3-LS2-1	S4.A.3.1.2 S4.A.3.1.3 S4.B.2.1.1 S4.B.3.1.1	Structures of Life Investigation 3 Part 3 Investigation 3 Part 5



Big Idea	Essential Question	Concepts	Competencies	NGSS Performance Expectation	PA Eligible Content	FOSS Next Generation Edition Alignment
Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	How and why do organisms interact with their environment and what are the effects of these interactions?	When the environment changes in physical characteristics, temperature, availability of resources, some organisms survive, others move, yet others may die.	Construct an argument with evidence that within a specific habitat, some organisms survive well, some not so well, and others cannot survive at all.	3-LS4-3	S4.B.3.2.1 S4.B.3.2.2 S4.B.3.2.3 S4.A.1.1.1 S4.A.1.3.2 S4.A.1.3.4 S4.A.3.2.1 S4.A.3.3.2	Structures of Life Investigation 2 Part 3 Investigation 3 Part 2 Investigation 3 Part 3 Investigation 3 Part 4
Heredity refers to specific mechanisms by which characteristics or traits are passed from one generation to the next via genes, and explains why offspring resemble, but are not identical to, their parents.	How are the characteristics of one generation passed to the next? How can individuals of the same species and even siblings have different characteristics?	Different organisms vary in how they look and function because they have different inherited information.	Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms.	3-LS3-1 3-LS3-2	S4.A.2.1.3 S4.B.2.2	Structures of Life Investigation 2 Part 2 Investigation 2 Part 3 Investigation 3 Part 1 Investigation 3 Part 2 Investigation 3 Part 3 Investigation 3 Part 4
Heredity refers to specific mechanisms by which characteristics or traits are passed from one generation to the next via genes, and explains why offspring resemble, but are not identical to, their parents.	How are the characteristics of one generation passed to the next? How can individuals of the same species and even siblings have different characteristics?	The environment also affects the traits that an organism develops.	Use evidence to support an explanation that the environment can influence traits.	3-LS3-2	S4.A.2.1.3 S4.B.2.2	Structures of Life Investigation 2 Part 3 Investigation 3 Part 1 Investigation 3 Part 2 Investigation 3 Part 3 Investigation 3 Part 4



Big Idea	Essential Question	Concepts	Competencies	NGSS Performance Expectation	PA Eligible Content	FOSS Next Generation Edition Alignment
Heredity refers to specific mechanisms by which characteristics or traits are passed from one generation to the next via genes, and explains why offspring resemble, but are not identical to, their parents.	How can there be so many similarities among organisms yet so many different kinds of plants, animals, and microorganisms?	Many characteristics involve both inherited traits and environmental factors.	Use evidence to compare characteristics inherited from parents, characteristics caused by the environment, and those resulting from both.	3-LS3-1 3-LS3-2	S4.B.2.1.1 S4.B.2.2.1	Structures of Life Investigation 2 Part 2 Investigation 2 Part 3 Investigation 3 Part 1 Investigation 3 Part 2 Investigation 3 Part 3 Investigation 3 Part 4
Biological evolution explains both the unity and diversity of species and provides a unifying principle for the history and diversity of life on Earth.	How can there be so many similarities among organisms yet so many different kinds of plants, animals, and microorganisms?	Some plants and animals that once lived on earth are no longer found anywhere.	Analyze and interpret data from fossils to provide evidence of the organisms and environments in which they lived long ago.	3-LS4-1	S4.A.2.1.4	Structures of Life Investigation 4 Part 2 Soils, Rocks and Landforms Investigation 2 Part 4
Biological evolution explains both the unity and diversity of species and provides a unifying principle for the history and diversity of life on Earth.	How can there be so many similarities among organisms yet so many different kinds of plants, animals, and microorganisms?	Fossils provide evidence about types of organisms that lived long ago as well as about the nature of the environment.	Analyze and interpret data from fossils to provide evidence of the organisms and environments in which they lived long ago.	3-LS4-1	S4.A.2.1.4	Structures of Life Investigation 4 Part 2 Soils, Rocks and Landforms Investigation 2 Part 4



Big Idea	Essential Question	Concepts	Competencies	NGSS Performance Expectation	PA Eligible Content	FOSS Next Generation Edition Alignment
Biological evolution explains both the unity and diversity of species and provides a unifying principle for the history and diversity of life on Earth.	How can there be so many similarities among organisms yet so many different kinds of plants, animals, and microorganisms?	Changes in an organism’s habitat can be beneficial or harmful to the organism.	Use evidence to argue that when the environment changes in ways that affect a place’s physical characteristics, organisms may survive, move to new locations, or die.	3-LS4-3	S4.B.3.2.1 S4.B.3.2.2 S5.B.3.2.3 S4.A.1.1.1 S4.A.1.3.2 S4.A.1.3.4 S4.A.3.2.1 S4.A.3.3.2	Structures of Life Investigation 3 Part 3 Investigation 3 Part 4
Biological evolution explains both the unity and diversity of species and provides a unifying principle for the history and diversity of life on Earth.	How can there be so many similarities among organisms yet so many different kinds of plants, animals, and microorganisms?	Populations live in a variety of habitats and changes in those habitats impact the organisms living there.	Using evidence, make a claim about merits of solutions to problems caused when the environment changes and types of animals and plants that live there may change.	3-LS4-4	S4.B.3.2.1 S4.B.3.2.2 S4.B.3.2.3 S4.A.1.1.1 S4.A.1.3.2 S4.A.1.3.4 S4.A.3.2.1 S4.A.3.3.2	Structures of Life Investigation 3 Part 3 Investigation 3 Part 4
Biological evolution explains both the unity and diversity of species and provides a unifying principle for the history and diversity of life on Earth.	How can there be so many similarities among organisms yet so many different kinds of plants, animals, and microorganisms?	Sometimes differences in characteristics between individuals of the same species provide advantages in surviving, finding mates, and reproducing.	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	S4.A.1.3.4	Structures of Life Investigation 2 Part 2 Investigation 2 Part 3 Investigation 3 Part 1 Investigation 3 Part 2 Investigation 3 Part 3 Investigation 3 Part 4



Big Idea	Essential Question	Concepts	Competencies	NGSS Performance Expectation	PA Eligible Content	FOSS Next Generation Edition Alignment
Biological evolution explains both the unity and diversity of species and provides a unifying principle for the history and diversity of life on Earth.	How can there be so many similarities among organisms yet so many different kinds of plants, animals, and microorganisms?	Fossils provide evidence about the types of organisms (both visible and microscopic) that lived long ago and also about the nature of their environments.	Use evidence to construct an explanation that some rocks and minerals record the remains of organisms.	3-LS4-1	S4.B.2.1.2	Structures of Life Investigation 4 Part 2 Soils, Rocks and Landforms Investigation 2 Part 4
Biological evolution explains both the unity and diversity of species and provides a unifying principle for the history and diversity of life on Earth.	How can there be so many similarities among organisms yet so many different kinds of plants, animals, and microorganisms?	Fossils provide evidence about the types of organisms (both visible and microscopic) that lived long ago and also about the nature of their environments.	Obtain and communicate information that some organisms that once lived on earth are no longer found anywhere, although other organisms now may resemble them.	3-LS4-1	S4.B.2.1.2	Structures of Life Investigation 4 Part 2 Soils, Rocks and Landforms Investigation 2 Part 4
Biological evolution explains both the unity and diversity of species and provides a unifying principle for the history and diversity of life on Earth.	How can there be so many similarities among organisms yet so many different kinds of plants, animals, and microorganisms?	Fossils can be compared with one another and to living organisms according to their similarities and differences.	Use evidence from fossil records to construct an explanation of the relationship between types of organisms living today and types of organisms that lived in the past.	3-LS4-4	S4.B.2.1.2	Structures of Life Investigation 4 Part 2 Soils, Rocks and Landforms Investigation 2 Part 4
Biological evolution explains both the unity and diversity of species and provides a unifying principle for the history and diversity of life on Earth.	How can there be so many similarities among organisms yet so many different kinds of plants, animals, and microorganisms?	Fossils can be compared with one another and to living organisms according to their similarities and differences.	Use evidence to construct explanations for how environments today may be different from past environments in which fossilized organisms once lived.	3-LS4-4	S4.B.2.1.2	Structures of Life Investigation 4 Part 2 Soils, Rocks and Landforms Investigation 2 Part 4



Big Idea	Essential Question	Concepts	Competencies	NGSS Performance Expectation	PA Eligible Content	FOSS Next Generation Edition Alignment
Biological evolution explains both the unity and diversity of species and provides a unifying principle for the history and diversity of life on Earth.	How can there be so many similarities among organisms yet so many different kinds of plants, animals, and microorganisms?	Sometimes the differences in characteristics between individuals of the same species provides advantages in surviving, finding mates, and reproducing.	Use evidence to explain how some characteristics that vary among individuals of the same kind of organism can provide advantages to survive, find mates, and reproduce.	3-LS4-2	S4.B.3.3.1 S4.B.3.3.2 S4.B.3.3.3 S4.B.3.3.4 S4.B.3.3.5 S4.A.1.1.2 S4.A.1.3.5 S4.A.3.1.4	Structures of Life Investigation 2 Part 2 Investigation 2 Part 3 Investigation 3 Part 1 Investigation 3 Part 2 Investigation 3 Part 3 Investigation 3 Part 4
Biological evolution explains both the unity and diversity of species and provides a unifying principle for the history and diversity of life on Earth.	How can there be so many similarities among organisms yet so many different kinds of plants, animals, and microorganisms?	Humans, like all other organisms, obtain living and nonliving resources from their environments.	Use evidence to demonstrate how humans, like all other organisms, obtain living and non-living resources from their environments.		S4.B.3.3.1 S4.B.3.3.2 S4.B.3.3.3 S4.B.3.3.4 S4.B.3.3.5 S4.A.1.1.2 S4.A.1.3.5 S4.A.3.1.4	Soils, Rocks and Landforms Investigation 1 Part 4 Investigation 4 Part 1 Investigation 4 Part 2 Investigation 4 Part 3



Grade 3

Earth Science Framework Alignment

Big Idea	Essential Question	Concepts	Competencies	NGSS Performance Expectation	PA Eligible Content	FOSS Next Generation Edition Alignment
The Earth is a complex and dynamic set of interconnected systems that interact over a wide range of temporal and spatial scales.	How and why is Earth constantly changing?	Scientists record patterns of the weather across different times and areas of the weather so that they can make predictions about what kind of weather might happen next.	Organize simple weather data sets to record local weather data and identify day-to-day variations, as well as, long-term patterns of weather.	3-ESS2-1	S4.A.1.1 S4.A.1.3 S4.A.1.3.1 S4.A.2.1 S4.A.2.2 S4.A.3.1 S4.A.3.2 S4.A.3.3	Water and Climate Investigation 3 Part 1 Investigation 4 Part 1
The Earth is a complex and dynamic set of interconnected systems that interact over a wide range of temporal and spatial scales.	How and why is Earth constantly changing?	Climate describes a range of an area’s typical weather conditions and the extent to which those conditions vary over a period of many years.	Record and communicate information to describe climates in different regions of the world.	3-ESS2-2	S4.A.1.1 S4.A.1.3 S4.A.2.1 S4.A.2.2 S4.A.3.1 S4.A.1.3.1 S4.A.3.2 S4.A.3.3	Water and Climate Investigation 4 Part 2 Investigation 4 Part 3
The Earth is a complex and dynamic set of interconnected systems that interact over a wide range of temporal and spatial scales.	How and why is Earth constantly changing?	Climate describes a range of an area’s typical weather conditions and the extent to which those conditions vary over a period of many years.	Display simple data sets in tables and graphs to display previous weather conditions to make predictions for future seasons.	3-ESS2-2	S4.A.1.1 S4.A.1.3 S4.A.2.1 S4.A.2.2 S4.A.3.1 S4.A.3.2 S4.A.3.3	Water and Climate Investigation 3 Part 1 Investigation 4 Part 1



Grade 4

Physical Science Framework Alignment

Big Idea	Essential Question	Concepts	Competencies	NGSS Performance Expectation	PA Eligible Content	FOSS Next Generation Edition Alignment
Interactions between any two objects can cause changes in one or both.	How can one explain and predict interactions between objects within systems?	When objects touch or collide, they push on one another and can change motion or shape. Magnets create a magnetic field that can exert an attracting or repelling force on other objects that can affect motion.	Investigate the forces between two or more magnets to identify patterns.	3-PS2-4 3-PS2-2	S4.C.3.1	Energy Investigation 2 Part 1 Investigation 2 Part 2 Investigation 2 Part 3 Investigation 3 Part 1 Investigation 3 Part 2
Interactions between any two objects can cause changes in one or both.	How can one explain and predict interactions between objects within systems?	Magnets create a magnetic field that can exert an attracting or repelling force on other objects that can affect motion.	Investigate the push-and-pull forces between objects not in contact with one another.	3-PS2-3	S4.C.3.1	Energy Investigation 2 Part 1 Investigation 2 Part 2 Investigation 2 Part 3 Investigation 3 Part 1 Investigation 3 Part 2
Interactions between any two objects can cause changes in one or both.	How can one explain and predict interactions between objects within systems?	When objects touch or collide, they push on one another and can change motion or shape. Magnets create a magnetic field that can exert an attracting or repelling force on other objects that can affect motion.	Design and refine solutions to a problem using magnets to move objects not in contact with one another.	3-PS2-3	S4.C.3.1	Energy Investigation 2 Part 1 Investigation 2 Part 2 Investigation 2 Part 3 Investigation 3 Part 1 Investigation 3 Part 2
Interactions between any two objects can cause changes in one or both.	How can one explain and predict interactions between objects within systems?	Materials that allow electricity to flow are conductors; those that do not are insulators.	Investigate and describe conductors and insulators.	4-PS3-1	S4.C.1.1.1 S4.C.2.1.3	Energy Investigation 1 Part 2 Investigation 2 Part 1



Big Idea	Essential Question	Concepts	Competencies	NGSS Performance Expectation	PA Eligible Content	FOSS Next Generation Edition Alignment
Interactions between any two objects can cause changes in one or both.	How can one explain and predict interactions between objects within systems?	Electrical circuits require a complete loop through which an electrical current can pass.	Construct series and parallel circuits and describe the path of electrons in the circuit.	4-PS3-1	S4.C.2.1.3	Energy Investigation 1 Part 1 Investigation 1 Part 2 Investigation 1 Part 3 Investigation 1 Part 4 Investigation 3 Part 1 Investigation 3 Part 2 Investigation 5 Part 3
Interactions between any two objects can cause changes in one or both.	How can one explain and predict interactions between objects within systems?	An open circuit is an incomplete electric pathway; a closed circuit is a complete pathway.	Demonstrate and explain open and closed circuits utilizing switches.	4-PS3-1	S4.C.2.1.3	Energy Investigation 1 Part 2 Investigation 1 Part 3 Investigation 1 Part 4 Investigation 3 Part 3
Interactions between any two objects can cause changes in one or both.	How can one explain and predict interactions between objects within systems?	A core of iron or steel becomes an electromagnet when electricity flows through a coil of insulated wire surrounding it.	Construct an electromagnet and plan an investigation to determine how one can make the electromagnet stronger or weaker.	4-PS3-4 3-PS2-3	S4.A.2.1.3	Energy Investigation 3 Part 1 Investigation 3 Part 2 Investigation 3 Part 3
Interactions between any two objects can cause changes in one or both.	How can one explain and predict interactions between objects within systems?	Electromagnetic forces can be attractive or repulsive, and their sizes depend on the magnitudes of the charges, currents, or magnetic strengths involved and on the distances between the interacting objects.	Plan and carry out the investigation to determine factors that affect the strength of electric and magnetic forces.	4-PS3-4 3-PS2-3	S4.A.2.1.3	Energy Investigation 2 All Investigation 3 All



Big Idea	Essential Question	Concepts	Competencies	NGSS Performance Expectation	PA Eligible Content	FOSS Next Generation Edition Alignment
Interactions between any two objects can cause changes in one or both.	How can one explain and predict interactions between objects within systems?	A system can appear to be unchanging when processes within the system are going on at opposite but equal rates.	Construct an explanation using data why an object subjected to multiple pushes and pulls might stay in one place or move.		S4.C.3.1	Motion and Matter Investigation 1 Part 3
Interactions of objects or systems of objects can be predicted and explained using the concept of energy transfer and conservation.	How is energy transferred and conserved?	Magnets can exert forces on other magnets or on materials, causing energy transfer between them even when the objects are not touching.	Demonstrate the energy transfer between two objects using a magnet and another object.	3-PS2-3	S4.A.1.1 S4.A.1.3.1 S4.A.2.1.4	Energy Investigation 2 Part 1 Investigation 2 Part 2 Investigation 2 Part 3 Investigation 3 Part 1 Investigation 3 Part 2 Investigation 3 Part 3
Interactions of objects or systems of objects can be predicted and explained using the concept of energy transfer and conservation.	How is energy transferred and conserved?	The faster a given object is moving, the more energy it possesses.	Use evidence to construct an explanation for the relationship between speed, energy and motion.	4-PS3-2	S4.C.2.1 S4.A.1.1 S4.A.1.3.1 S4.A.2.1.4	Energy Investigation 4 Part 1 Investigation 4 Part 2 Investigation 4 Part 3
Interactions of objects or systems of objects can be predicted and explained using the concept of energy transfer and conservation.	How is energy transferred and conserved?	Energy can be moved from place to place by moving objects or through sound, light, or electric currents.	Carry out investigations to provide evidence that energy is transferred from place to place by sound, light, heat, electric currents, interacting magnets, and moving or colliding objects.	4-PS3-2	S4.A.1.1 S4.A.1.3.1 S4.A.2.1.4	Energy Investigation 1 All Investigation 2 All Investigation 3 All Investigation 4 All Investigation 5 All



Big Idea	Essential Question	Concepts	Competencies	NGSS Performance Expectation	PA Eligible Content	FOSS Next Generation Edition Alignment
Interactions of objects or systems of objects can be predicted and explained using the concept of energy transfer and conservation.	How is energy transferred and conserved?	Energy can be moved from place to place by moving objects or through sound, light, or electric currents.	Obtain and communicate information for how technology allows humans to concentrate, transport, and store energy for practical use.	4-PS3-4	S4.C.2.1 S4.A.1.1 S4.A.1.3.1 S4.A.2.1.4	Energy Investigation 4 Part 3 Investigation 5 Part 1 Investigation 5 Part 2 Investigation 5 Part 3
Interactions of objects or systems of objects can be predicted and explained using the concept of energy transfer and conservation.	How is energy transferred and conserved?	Energy can be moved from place to place by moving objects or through sound, light, or electric currents.	Design and construct a device that converts energy from one form to another using given design criteria.	4-PS3-4	S4.C.2.1 S4.A.1.1 S4.A.1.3.1 S4.A.2.1.4	Energy Investigation 3 Part 3 Investigation 5 Part 3
Interactions of objects or systems of objects can be predicted and explained using the concept of energy transfer and conservation.	How is energy transferred and conserved?	Energy can be moved from place to place by moving objects or through sound, light, or electric currents.	Design and test a solution to a problem that utilizes the transfer of electric energy in the solution using given design constraints.	4-PS3-4	S4.C.2.1 S4.A.1.1 S4.A.1.3.1 S4.A.2.1.4	Energy Investigation 3 Part 3 Investigation 5 Part 3
Interactions of objects or systems of objects can be predicted and explained using the concept of energy transfer and conservation.	How is energy transferred and conserved?	Energy and fuels that humans use are derived from natural sources, and their use affects the environment in multiple ways. Some resources are renewable over time, and others are not.	Develop a model using examples to explain differences between renewable and non-renewable sources of energy.	4-ESS3-1	S4.C.2.1 S4.A.1.1 S4.A.1.3.1 S4.A.2.1.4	Energy Investigation 5 Part 3



Big Idea	Essential Question	Concepts	Competencies	NGSS Performance Expectation	PA Eligible Content	FOSS Next Generation Edition Alignment
Interactions of objects or systems of objects can be predicted and explained using the concept of energy transfer and conservation.	How is energy transferred and conserved?	Energy can be moved from place to place by moving objects or through sound, light, or electric currents.	Carry out investigations to provide evidence that energy is transferred from place to place by sound, light, heat, electric currents, interacting magnets, and moving or colliding objects.	4-PS3-4	S4.C.3.1 S4.A.1.1 S4.A.1.3.1 S4.A.2.1.4	Energy Investigation 1 All Investigation 2 All Investigation 3 All Investigation 4 All Investigation 5 All
Interactions of objects or systems of objects can be predicted and explained using the concept of energy transfer and conservation.	How is energy transferred and conserved?	Energy can be moved from place to place by moving objects or through sound, light, or electric currents.	Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electrical currents.	4-PS3-2	S4.C.2.1 S4.A.1.1 S4.A.1.3.1 S4.A.2.1.4	Energy Investigation 1 All Investigation 2 All Investigation 3 All Investigation 4 All Investigation 5 All
Interactions of objects or systems of objects can be predicted and explained using the concept of energy transfer and conservation.	How is energy transferred and conserved?	Energy is present whenever there are moving objects, sound, light, or heat.	Construct an explanation for the relationship between energy and motion.	4-PS3-2 4-PS3-3	S4.C.2.1 S4.A.1.1 S4.A.1.3.1 S4.A.2.1.4	Energy Investigation 2 Part 1 Investigation 2 Part 2 Investigation 2 Part 3 Investigation 4 Part 1 Investigation 4 Part 2 Investigation 4 Part 3 Investigation 5 Part 3



Big Idea	Essential Question	Concepts	Competencies	NGSS Performance Expectation	PA Eligible Content	FOSS Next Generation Edition Alignment
Interactions of objects or systems of objects can be predicted and explained using the concept of energy transfer and conservation.	How is energy transferred and conserved?	When objects collide, energy can be transferred from one object to another, thereby changing their motion. In such collisions, some energy is typically also transferred to the surrounding air. As a result, the air gets heated and sound is produced.	Construct an investigation to demonstrate the relationship between energy and motion.	4-PS3-3	S4.C.2.1 S4.A.1.1 S4.A.1.3.1 S4.A.2.1.4	Energy Investigation 4 Part 1 Investigation 4 Part 2 Investigation 4 Part 3
Interactions of objects or systems of objects can be predicted and explained using the concept of energy transfer and conservation.	How is energy transferred and conserved?	When objects collide, the contact forces transfer of energy so as to change the motion of each object.	Ask questions and predict outcomes about the changes in energy that occur when objects collide.	4-PS3-3	S4.C.3.1 S4.A.1.1 S4.A.1.3.1 S4.A.2.1.4	Energy Investigation 4 Part 1 Investigation 4 Part 2 Investigation 4 Part 3
Interactions of objects or systems of objects can be predicted and explained using the concept of energy transfer and conservation.	How is energy transferred and conserved?	The expression “produce energy” typically refers to the conversion of stored energy into a desired form for practical use. It is important to be able to concentrate energy so that it is available for use where and when it is needed.	Obtain and communicate information explaining how technology allows humans to concentrate, transport, and store energy for practical use.	4-PS3-4	S4.C.2.1.1 S4.A.1.1 S4.A.1.3.1 S4.A.2.1.4	Energy Investigation 4 Part 3 Investigation 5 Part 1 Investigation 5 Part 2 Investigation 5 Part 3



Big Idea	Essential Question	Concepts	Competencies	NGSS Performance Expectation	PA Eligible Content	FOSS Next Generation Edition Alignment
Waves are a repeating pattern of motion that transfers energy from place to place without overall displacement of matter.	How are waves used to transfer energy and information?	Waves are regular patterns of motion, and can be made in water by disturbing the surface. When waves move across the surface of deep water, the water goes up and down in place; it does not move horizontally.	Identify the patterns of waves by observing their motion in water.	4-PS4-1	S4.A.1.1 S4.A.1.3.1 S4.A.2.1.4	Energy Investigation 5 Part 1
Waves are a repeating pattern of motion that transfers energy from place to place without overall displacement of matter.	How are waves used to transfer energy and information?	Waves are regular patterns of motion, and can be made in water by disturbing the surface. When waves move across the surface of deep water, the water goes up and down in place; it does not move horizontally.	Provide evidence that waves transfer energy to objects as a wave passes.	4-PS4-1	S4.A.1.1 S4.A.1.3.1 S4.A.2.1.4	Energy Investigation 5 Part 1 Investigation 5 Part 2
Waves are a repeating pattern of motion that transfers energy from place to place without overall displacement of matter.	How are waves used to transfer energy and information?	Waves are regular patterns of motion, and can be made in water by disturbing the surface. When waves move across the surface of deep water, the water goes up and down in place; it does not move horizontally.	Plan data collection methods and make observations to provide evidence that waves transfer energy to objects.	4-PS4-1	S4.A.1.1 S4.A.1.3.1 S4.A.2.1.4	Energy Investigation 5 Part 1 Investigation 5 Part 2



Big Idea	Essential Question	Concepts	Competencies	NGSS Performance Expectation	PA Eligible Content	FOSS Next Generation Edition Alignment
Waves are a repeating pattern of motion that transfers energy from place to place without overall displacement of matter.	How are waves used to transfer energy and information?	Waves of the same type can differ in amplitude (height of the wave) and wavelength (spacing between wave peaks).	Use a model to describe the amplitude and wavelength of waves.	4-PS4-1	S4.A.1.1 S4.A.1.3.1 S4.A.2.1.4	Energy Investigation 5 Part 1
Waves are a repeating pattern of motion that transfers energy from place to place without overall displacement of matter.	How are waves used to transfer energy and information?	Earthquakes cause seismic waves, which are waves of motion in the Earth's crust.	Describe how similar seismic waves are to other types of waves.	4-PS4-1	S4.A.1.1 S4.A.1.3.1 S4.A.2.1.4	None
Waves are a repeating pattern of motion that transfers energy from place to place without overall displacement of matter.	How are waves used to transfer energy and information?	An object can be seen when light reflected from its surface enters the eyes.	Investigate and provide evidence that the color people see depends on the color of the available light sources as well as the properties of the surface of the object reflecting the light.	4-PS4-2	S4.A.1.1 S4.A.1.3.1 S4.A.2.1.4	Energy Investigation 5 Part 2
Waves are a repeating pattern of motion that transfers energy from place to place without overall displacement of matter.	How are waves used to transfer energy and information?	The color people see depends on the color of the available light sources as well as the properties of the surface.	Investigate and provide evidence that the color people see depends on the color of the available light sources as well as the properties of the surface of the object reflecting light.	4-PS4-2	S4.A.1.1 S4.A.1.3.1 S4.A.2.1.4	Energy Investigation 5 Part 2



Big Idea	Essential Question	Concepts	Competencies	NGSS Performance Expectation	PA Eligible Content	FOSS Next Generation Edition Alignment
<p>Waves are a repeating pattern of motion that transfers energy from place to place without overall displacement of matter.</p>	<p>How are waves used to transfer energy and information?</p>	<p>Digitized information can be stored for future recovery or transmitted over long distances without significant degradation. High-tech devices, such as computers or cell phones, can receive and decode information – convert it from digitized form to voice – and vice versa.</p>	<p>Obtain and communicate information about modern devices that are used to transmit and receive digital information.</p>	<p>4-PS4-3</p>	<p>S4.A.1.1 S4.A.1.3.1 S4.A.2.1.4</p>	<p>Energy Investigation 3 Part 3 Investigation 5 Part 1</p>



Grade 4

Life Science Framework Alignment

Big Idea	Essential Question	Concepts	Competencies	NGSS Performance Expectation	PA Eligible Content	FOSS Next Generation Edition Alignment
All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	How do organisms live, grow, and respond to their environment and reproduce?	Plants and animals have internal and external structures that serve various functions to survive.	Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.	4-LS1-1	S4.B.1.1.5	Environments Investigation 1 Part 1 Investigation 1 Part 3 Investigation 2 Part 1 Investigation 2 Part 2 Investigation 2 Part 4 Investigation 3 Part 4 Investigation 4 Part 3



Grade 4

Earth and Space Science Framework Alignment

Big Idea	Essential Question	Concepts	Competencies	NGSS Performance Expectation	PA Eligible Content	FOSS Next Generation Edition Alignment
The Earth is a complex and dynamic set of interconnected systems that interact over a wide range of temporal and spatial scales.	How and why is Earth constantly changing?	Local, regional, and global patterns of rock formations reveal changes over time due to Earth forces, such as earthquakes. The presence and location of certain fossil types indicate the order in which rock layers were formed.	Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time.	4-ESS1-1		Soils, Rocks and Landforms Investigation 2 Part 1 Investigation 2 Part 2 Investigation 2 Part 3 Investigation 2 Part 4 Investigation 3 Part 4
The Earth is a complex and dynamic set of interconnected systems that interact over a wide range of temporal and spatial scales.	How and why is Earth constantly changing?	Rainfall helps to shape the land and affects the types of living things found in a region. Water, ice, wind, living organisms and gravity break rocks, soils, and sediments, into smaller particles and move them around.	Make observations and measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.	4-ESS2-1	S4.D.1.1 S4.A.1.3.3	Soils, Rocks and Landforms Investigation 1 Part 2 Investigation 1 Part 3 Investigation 1 Part 4 Investigation 2 Part 1 Investigation 2 Part 2 Investigation 2 Part 3
The Earth is a complex and dynamic set of interconnected systems that interact over a wide range of temporal and spatial scales.	How and why is Earth constantly changing?	Living things affect the physical characteristics of their regions.	Make observations and document how living things affect the physical characteristics in different regions.	4-ESS2-1		Soils, Rocks and Landforms Investigation 1 Part 1



Big Idea	Essential Question	Concepts	Competencies	NGSS Performance Expectation	PA Eligible Content	FOSS Next Generation Edition Alignment
The Earth is a complex and dynamic set of interconnected systems that interact over a wide range of temporal and spatial scales.	How and why is Earth constantly changing?	The locations of mountain ranges, deep ocean trenches, ocean floor structures, earthquakes, and volcanoes, occur in patterns.	Analyze and interpret data from maps to describe Earth's features.	4-ESS2-3	S4.A.1.1 S4.A.1.3 S4.A.2.1 S4.A.2.2 S4.A.3.1 S4.A.3.2 S4.A.3.3	Soils, Rocks and Landforms Investigation 3 Part 1 Investigation 3 Part 2 Investigation 3 Part 3
The Earth is a complex and dynamic set of interconnected systems that interact over a wide range of temporal and spatial scales.	How and why is Earth constantly changing?	The locations of mountain ranges, deep ocean trenches, ocean floor structures, earthquakes, and volcanoes, occur in patterns.	Analyze and interpret data from maps to describe Earth's features.	4-ESS2-3		Soils, Rocks and Landforms Investigation 3 Part 1 Investigation 3 Part 2 Investigation 3 Part 3
The Earth is a complex and dynamic set of interconnected systems that interact over a wide range of temporal and spatial scales.	How and why is Earth constantly changing?	Water occurs underground, above ground, and in the atmosphere.	Identify various types of water environments in Pennsylvania.	4-ESS2-2	S4.D.1.1.1 S4.D.1.1.2 S4.D.1.1.3	Environments Investigation 2 Part 1 Investigation 2 Part 3
The Earth is a complex and dynamic set of interconnected systems that interact over a wide range of temporal and spatial scales.	How and why is Earth constantly changing?	Many types of rocks and minerals are formed from the remains of organisms or are altered by their activities.	Use fossils as evidence to infer that some rocks were formed from the remains of once living organisms.	4-ESS1-1	S4.A.1.1 S4.A.1.3 S4.A.2.1 S4.A.2.2 S4.A.3.1 S4.A.3.2 S4.A.3.3	Soils, Rocks and Landforms Investigation 2 Part 4



Big Idea	Essential Question	Concepts	Competencies	NGSS Performance Expectation	PA Eligible Content	FOSS Next Generation Edition Alignment
The Earth is a complex and dynamic set of interconnected systems that interact over a wide range of temporal and spatial scales.	How and why is Earth constantly changing?	The presence and location of certain fossil types indicate the order in which rock layers were formed.	Use evidence from patterns in rock formations and fossils in rock layers to support the explanation for a change in landforms and environments over time.	4-ESS1-1	S4.A.1.1 S4.A.1.3 S4.A.2.1 S4.A.2.2 S4.A.3.1 S4.A.3.2 S4.A.3.3	Soils, Rocks and Landforms Investigation 2 Part 1 Investigation 2 Part 2 Investigation 2 Part 3 Investigation 2 Part 4 Investigation 3 Part 4
The Earth's processes affect and are affected by human activities.	How do Earth's processes and human activities affect each other?	Energy that humans use is derived from multiple natural sources and their use affects the environment in many ways.	Research multiple sources to describe ways that energy and fuels are derived from natural resources and their impact.	4-ESS3-1	S4.D.1.2.3	Soils, Rocks and Landforms Investigation 4 Part 1 Investigation 4 Part 2 Investigation 4 Part 3
The Earth's processes affect and are affected by human activities.	How do Earth's processes and human activities affect each other?	A variety of hazards result from natural processes. Humans cannot eliminate the hazards, but can take steps to reduce the impact.	Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.	4-ESS3-2		Soils, Rocks and Landforms Investigation 3 Part 4



Grade 5

Physical Science Framework Alignment

Big Idea	Essential Question	Concepts	Competencies	NGSS Performance Expectation	PA Eligible Content	FOSS Next Generation Edition Alignment
Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	How can one explain the structure, properties, and interactions of matter?	When two or more different substances are mixed, a new substance with different properties may be formed.	Plan and conduct an investigation to determine whether the mixing of two or more substances results in new substances.	5-PS1-4	S8.C.1.1.3 S8.A.1.3 S8.A.2.2 S8.A.2.1	Mixtures and Solutions Investigation 2 Part 3 Investigation 5 Part 1 Investigation 5 Part 2 Investigation 5 Part 3
Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	How can one explain the structure, properties, and interactions of matter?	Matter of any type can be subdivided into particles that are too small to see, but even then the matter still exists and can be detected by other means.	Develop a model to describe that matter is made of particles too small to be seen.	5-PS1-1	S8.C.1.1.2 S8.A.1.3 S8.A.2.2 S8.A.2.1	Mixtures and Solutions Investigation 2 Part 3 Investigation 3 Part 1 Investigation 3 Part 2 Investigation 3 Part 4 Investigation 4 Part 1 Investigation 4 Part 2 Investigation 4 Part 3 Investigation 5 Part 1 Investigation 5 Part 2 Investigation 5 Part 3
Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	How can one explain the structure, properties, and interactions of matter?	Measurement of a variety of properties can be used to identify materials.	Make observations and measurements to identify given materials based on their properties.	5-PS1-3	S8.C.1.1.2 S8.A.1.3 S8.A.2.2 S8.A.2.1	Mixtures and Solutions Investigation 1 Part 2 Investigation 1 Part 3 Investigation 1 Part 4 Investigation 3 Part 4 Investigation 4 Part 3 Investigation 4 Part 4

Big Idea	Essential Question	Concepts	Competencies	NGSS Performance Expectation	PA Eligible Content	FOSS Next Generation Edition Alignment
Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	How can one explain the structure, properties, and interactions of matter?	The amount of matter is conserved when it changes form.	Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total mass of matter is conserved.	5-PS1-2	S8.C.1.1.3 S8.A.1.3 S8.A.2.2 S8.A.2.1	Mixtures and Solutions Investigation 4 Part 1 Investigation 5 Part 3
Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	How can one explain the structure, properties, and interactions of matter?	When two or more different substances are mixed, a new substance with different properties may be formed; such occurrences depend on the substances and the temperature.	Investigate the interaction of two or more substances to provide evidence that when different substances are mixed, one or more new substances with different properties may or may not be formed.	5-PS1-4	S8.C.1.1.1 S8.A.1.3 S8.A.2.2 S8.A.2.1 S8.C.1.1.2 S8.C.1.1.3	Mixtures and Solutions Investigation 2 Part 3 Investigation 5 Part 1 Investigation 5 Part 2 Investigation 5 Part 3
Matter can be understood in terms of the types of atoms present and the interactions both between and within atoms.	How can one explain the structure, properties, and interactions of matter?	No matter what reaction or change in properties occurs, the total mass of the substances does not change.	Plan and carry out investigations to determine the effect on the total mass of a substance when the substance changes shape, phase, and/or is dissolved.	5-PS1-2	S8.C.1.1.3 S8.A.1.3 S8.A.2.2 S8.A.2.1	Mixtures and Solutions Investigation 4 Part 1 Investigation 5 Part 3



Big Idea	Essential Question	Concepts	Competencies	NGSS Performance Expectation	PA Eligible Content	FOSS Next Generation Edition Alignment
Interactions of objects or systems of objects can be predicted and explained using the concept of energy transfer and conservation.	How can one explain and predict interactions between objects within systems?	Gravitational force of Earth acting on another object near Earth's surface pulls that object toward the planet's center.	Construct and support an argument that the gravitational force exerted by Earth on objects is directed down.	5-PS2-1	S8.C.3.1 S8.D.3.1 S8.D.3.1.1 S8.D.3.1.2	Earth and Sun Investigation 2 Part 4
Interactions of objects or systems of objects can be predicted and explained using the concept of energy transfer and conservation.	How is energy transferred and conserved?	Energy released from food was once energy from the sun that was captured by plants in the chemical process that forms plant matter.	Use a model to describe that energy in animals' food was once energy from the Sun.	5-PS3-1	S8.B.3.1.1 S8.B.3.1.2 S8.B.3.1.3 S8.C.2.1 S8.C.2.1.1 S8.C.2.2.1	Living Systems Investigation 1 Part 2 Investigation 1 Part 3 Investigation 1 Part 4 Investigation 2 Part 2 Investigation 2 Part 3



Grade 5

Life Science Framework Alignment

Big Idea	Essential Question	Concepts	Competencies	NGSS Performance Expectation	PA Eligible Content	FOSS Next Generation Edition Alignment
All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	How do organisms live, grow, respond to their environment, and reproduce?	Food provides animals with materials needed for body repair and growth.	Use a model to describe that energy in animal's food was once energy from the Sun.	5-PS3-1	S8.B.3.1.1 S8.B.3.1.3 S8.A.3.2.1 S8.A.3.2.3	Living Systems Investigation 1 Part 2 Investigation 1 Part 3 Investigation 1 Part 4 Investigation 2 Part 2 Investigation 2 Part 3
All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	How do organisms live, grow, respond to their environment, and reproduce?	Food provides animals with materials needed for energy and to maintain body warmth and for motion.	Use a model to describe that energy in animals' food was once energy from the Sun.	5-PS3-1	S8.B.3.1.1 S8.B.3.1.3 S8.B.3.2.1 S8.B.3.2.3	Living Systems Investigation 1 Part 2 Investigation 1 Part 3 Investigation 1 Part 4 Investigation 2 Part 2 Investigation 2 Part 3
All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	How do organisms live, grow, respond to their environment, and reproduce?	Plants acquire their material for growth primarily from air and water.	Using evidence, present an argument that plants get the materials they need for growth primarily from air and water.	5-PS3-1	S8.B.3.1.1 S8.B.3.1.3 S8.B.3.2.1 S8.B.3.2.3	Living Systems Investigation 1 Part 3 Investigation 2 Part 2 Investigation 3 Part 1
All organisms are made of cells and can be characterized by common aspects of their structure and functioning.	How do organisms live, grow, respond to their environment, and reproduce?	Animals and plants alike take in gases and water and release waste matter into the environment; animals must take in food, and plants need light and minerals.	Construct and communicate models of food webs that demonstrate the transfer of matter and energy among organisms within an ecosystem.	5-LS2-1	S8.B.3.1.1 S8.B.3.1.3 S8.B.3.2.1 S8.B.3.2.3	Living Systems Investigation 1 Part 3 Investigation 1 Part 4



Big Idea	Essential Question	Concepts	Competencies	NGSS Performance Expectation	PA Eligible Content	FOSS Next Generation Edition Alignment
Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	How and why do organisms interact with their environment and what are the effects of these interactions?	Organisms can survive only in environments in which their particular needs are met.	Ask researchable questions about the ways organisms obtain matter and energy across multiple and varied ecosystems.	5-LS2-1	S8.B.3.1.1	Living Systems Investigation 1 Part 2 Investigation 1 Part 3 Investigation 1 Part 4 Investigation 2 Part 2 Investigation 2 Part 3
Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	How and why do organisms interact with their environment and what are the effects of these interactions?	A healthy ecosystem is one in which multiple species of different types are each able to meet their needs in a relatively stable web of life.	Construct a model of a food web to demonstrate the transfer of matter and energy among organisms within an ecosystem.	5-LS2-1	S8.B.3.1.1	Living Systems Investigation 1 Part 2 Investigation 1 Part 3 Investigation 1 Part 4 Investigation 2 Part 2 Investigation 2 Part 3
Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	How and why do organisms interact with their environment and what are the effects of these interactions?	Newly introduced species can damage the balance of an ecosystem.	Identify newly introduced species to an ecosystem and provide evidence that it is an invasive species or noninvasive species.	5-LS2-1	S8.B.3.1.1 S8.B.3.1.2 S8.B.3.1.3	None



Big Idea	Essential Question	Concepts	Competencies	NGSS Performance Expectation	PA Eligible Content	FOSS Next Generation Edition Alignment
Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	How and why do organisms interact with their environment and what are the effects of these interactions?	Matter cycles between the air and soil and among plants, animals, and microbes as these organisms live and die.	Use models to trace the cycling of particles of matter between the air and soil and among plants, animals, and microbes.	5-LS2-1	S8.B.3.1.1 S8.B.3.1.2	Living Systems Investigation 1 Part 2 Investigation 1 Part 3 Investigation 1 Part 4 Investigation 4 Part 4
Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	How and why do organisms interact with their environment and what are the effects of these interactions?	Matter cycles between the air and soil and among plants, animals, and microbes as these organisms live and die.	Describe a healthy ecosystem as a system in terms of the components and interactions.	5-LS2-1	S8.B.3.1.1 S8.B.3.1.2 S8.B.3.1.3	Living Systems Investigation 1 Part 2 Investigation 1 Part 3 Investigation 1 Part 4 Investigation 4 Part 4
Organisms grow, reproduce, and perpetuate their species by obtaining necessary resources through interdependent relationships with other organisms and the physical environment.	How and why do organisms interact with their environment and what are the effects of these interactions?	A healthy ecosystem is one in which multiple species of different types are each able to meet their needs in a relatively stable web of life.	Describe a healthy ecosystem as a system in terms of the components and interactions.	5-LS2-1	S8.B.3.1.1 S8.B.3.1.2 S8.B.3.1.3	Living Systems Investigation 1 Part 2 Investigation 1 Part 3 Investigation 1 Part 4 Investigation 4 Part 4



Grade 5

Earth and Space Science Framework Alignment

Big Idea	Essential Question	Concepts	Competencies	NGSS Performance Expectation	PA Eligible Content	FOSS Next Generation Edition Alignment
The universe is composed of a variety of different objects, which are organized into systems each of which develops according to accepted physical processes and laws.	What is the universe, and what is Earth's place in it?	The sun is a star that appears larger and brighter than other stars because it is closer.	Support an argument that the apparent brightness of the sun and stars is due to their relative distances from Earth.	5-ESS1-1	S8.D.3.1 S8.D.3.1.1 S8.D.3.1.3	Earth and Sun Investigation 2 Part 5
The universe is composed of a variety of different objects, which are organized into systems each of which develops according to accepted physical processes and laws.	What is the universe, and what is Earth's place in it?	Stars range greatly in their distance from Earth.	Support an argument that the apparent brightness of the sun and stars is due to their relative distances from Earth.	5-ESS1-1	S8.D.3.1 S8.D.3.1.1 S8.D.3.1.3	Earth and Sun Investigation 2 Part 5
The universe is composed of a variety of different objects, which are organized into systems each of which develops according to accepted physical processes and laws.	What is the universe, and what is Earth's place in it?	The orbits of Earth around the sun and of the moon around Earth, together with rotation of Earth about an axis between its north and south poles, cause observable patterns.	Represent data in graphical displays to reveal patterns of daily changes in the length and direction of shadows, day and night, and seasonal appearances of stars in the sky.	5-ESS1-2	S8.D.3.1 S8.D.3.1.1 S8.D.3.1.3	Earth and Sun Investigation 1 Part 1 Investigation 1 Part 2 Investigation 1 Part 3 Investigation 2 Part 1 Investigation 2 Part 3 Investigation 2 Part 4 Investigation 2 Part 5



Big Idea	Essential Question	Concepts	Competencies	NGSS Performance Expectation	PA Eligible Content	FOSS Next Generation Edition Alignment
<p>The Earth is a complex and dynamic set of interconnected systems that interact over a wide range of temporal and spatial scales.</p>	<p>How and why is Earth constantly changing?</p>	<p>All Earth processes are the result of energy flowing and matter cycling within and among the planet’s systems. The energy is derived from the sun and the earth’s interior. These flows and cycles produce chemical and physical changes in Earth’s materials and living organisms.</p>	<p>Construct and analyze models to describe systems interactions among the geosphere, hydrosphere, atmosphere, and biosphere.</p>	<p>5-ESS2-1</p>	<p>S8.A.1.1 S8.A.1.3 S8.A.2.1 S8.A.2.2 S8.A.3.1 S8.A.3.2 S8.A.3.1.4 S8.D.1.1.1</p>	<p>Living Systems Investigation 1 Part 2</p> <p>Earth and Sun Investigation 4 Part 1 Investigation 5 Part 3</p>
<p>The Earth is a complex and dynamic set of interconnected systems that interact over a wide range of temporal and spatial scales.</p>	<p>How and why is Earth constantly changing?</p>	<p>All Earth processes are the result of energy flowing and matter cycling within and among the planet’s systems. The energy is derived from the sun and the earth’s interior. These flows and cycles produce chemical and physical changes in Earth’s materials and living organisms.</p>	<p>Through the creation of a model, explain that the chemical and physical processes that cycle earth materials and form rocks.</p>	<p>5-ESS2-1</p>	<p>S8.A.1.1 S8.A.1.3 S8.A.2.1 S8.A.2.2 S8.A.3.1 S8.A.3.2 S8.A.3.1.4 S8.D.1.1.1</p>	<p>Living Systems Investigation 1 Part 2</p> <p>Earth and Sun Investigation 3 Part 1 Investigation 5 Part 3</p>



Big Idea	Essential Question	Concepts	Competencies	NGSS Performance Expectation	PA Eligible Content	FOSS Next Generation Edition Alignment
The Earth is a complex and dynamic set of interconnected systems that interact over a wide range of temporal and spatial scales.	How and why is Earth constantly changing?	Earth's major systems are the geosphere, hydrosphere, and biosphere, which interact in multiple ways to affect the Earth's surface materials and processes.	Develop a model to describe the ways the geosphere, hydrosphere, and biosphere interact. This could include the influence of atmosphere on landforms and ecosystems through weather and climate, mountain ranges on winds and clouds, etc.	5-ESS2-1	S8.A.1.1 S8.A.1.3 S8.A.2.1 S8.A.2.2 S8.A.3.1 S8.A.3.2 S8.A.3.1.4 S8.D.1.1.1	<p>Living Systems Investigation 1 Part 2</p> <p>Earth and Sun Investigation 4 Part 1 Investigation 5 Part 3</p>
The Earth is a complex and dynamic set of interconnected systems that interact over a wide range of temporal and spatial scales.	How and why is Earth constantly changing?	The ocean supports a variety of ecosystem and organisms, shapes landforms, and influences climate.	Develop a model to describe the ways the geosphere, hydrosphere, and biosphere interact.	5-ESS2-1	S8.A.1.1 S8.A.1.3 S8.A.2.1 S8.A.2.2 S8.A.3.1 S8.A.3.2 S8.A.3.1.4 S8.D.1.1.1	<p>Living Systems Investigation 1 Part 2</p> <p>Earth and Sun Investigation 4 Part 1 Investigation 5 Part 3</p>
The Earth is a complex and dynamic set of interconnected systems that interact over a wide range of temporal and spatial scales.	How and why is Earth constantly changing?	Winds and clouds in the atmosphere interact with the landforms to determine patterns of weather.	Utilizing observations and data, explain the patterns of weather in a given location.	5-ESS2-1	S8.D.2.1 S8.D.2.1.1 S8.D.2.1.2 S8.D.2.1.3	<p>Earth and Sun Investigation 3 Part 2 Investigation 3 Part 3 Investigation 4 Part 2 Investigation 4 Part 3 Investigation 5 Part 1 Investigation 5 Part 2 Investigation 5 Part 3 Investigation 5 Part 4</p>



Big Idea	Essential Question	Concepts	Competencies	NGSS Performance Expectation	PA Eligible Content	FOSS Next Generation Edition Alignment
The Earth is a complex and dynamic set of interconnected systems that interact over a wide range of temporal and spatial scales.	How and why is Earth constantly changing?	Most fresh water is in glaciers or underground with the remainder in lakes, streams, wetlands, and the atmosphere.	Using real time data, graph amounts of water in various reservoirs to provide evidence about the distribution of water on Earth.	5-ESS2-2	S8.D.1.3 S8.D.1.3.4	Earth and Sun Investigation 5 Part 3
The Earth is a complex and dynamic set of interconnected systems that interact over a wide range of temporal and spatial scales.	How and why is Earth constantly changing?	Water continually cycles among land, ocean, and atmosphere via transpiration, evaporation, condensation, and crystallization, and precipitation as well as downhill flows on land.	Investigate movement of water in the Earth's systems and research and develop models for the cycling of water.		S8.A.1.1 S8.A.1.2 S8.A.1.3 S8.A.2.1 S8.A.2.2 S8.A.3.1 S8.A.3.2 S8.D.1.3.1	Earth and Sun Investigation 5 Part 3
The Earth's processes affect and are affected by human activities.	How do Earth's processes and human activities affect each other?	Human activities in agriculture, industry, and everyday life have had major effects on land, vegetation, streams, ocean and air.	Research and communicate how communities are using science to protect resources and environments.	5-ESS3-1	S8.A.1.1 S8.A.1.3 S8.A.2.1 S8.A.2.2 S8.A.3.1 S8.A.3.2 S8.D.1.1 S8.B.3.3 S8.C.2.2.3	Earth and Sun Investigation 4 Part 3 Investigation 4 Part 4 Investigation 5 Part 4

*Note – All PA Eligible Content connections represented here were taken directly from the PA Curriculum Framework grade specific documents on the PA SAS website.