Kindergarten Science Units

Life Science Plants and Animals

Essential Questions:

How do certain characteristics of plants and animals help them to survive?
How do plants and animals change during their life cycles?
How are animal habitats different from one another and the same?

Know objectives are basic facts, definitions, or procedural knowledge.
Understand objectives are big ideas or essential understandings that are transferrable to other contexts.
To do objectives are skills that students demonstrate using the knowledge from *know* and *understand* objectives.

Know	**Understand**	**Be Able to Do**
-Name the physical characteristics of plants and animals. (**5.3.P.A.1, 5.3.2.B.3)**	-Plants and animals obtain their food from their environment in various ways. **(5.3.P.B.1)** -Each part of a plant serves a specific function. (**5.3.2.B.3).** -There are similarities and differences between living and non-living things. (**5.3.P.A.2)** -Habitats provide basic needs for plants and animals. (**5.3.P.C.1, 5.3.2.C.2.)** -Animals change throughout their life cycles. (**5.3.P.D.1)**	-Categorize animals according to how they obtain food and water. (**5.3.2.B.2)** Observe and describe how natural habitats provide basic needs of plants and animals with respect to shelter, food, water, air, and light (e.g., dig outside in the soil to investigate the kinds of animal life that live in and around the ground). (**5.3.P.C.1)** -Identify similarities and differences between living and non-living things. (**5.3.2.A.1)** -Identify the steps in a life cycle of a living thing. (**5.3.P.D.1)** -Predict which plant will grow fastest in certain conditions. (**5.3.2.B.3)** -Observe the physical changes in plants and

		animals throughout their life cycles. (**5.3.2.D.2)**

Physical Science **Essential Questions:** How is light, sound, and heat observed in our everyday lives? How can objects be sorted and categorized based on their attributes? How and why do different objects move?		
Know	**Understand**	**Be Able to Do**
-Define the terms light, sound, and heat. (**5.2.P.C.1)**	-Liquids and solids undergo change when mixed with different substances and when heated or cooled. (**5.2.P.B.1)**	-Group objects according to attributes (e.g., size, shape, color, texture, and weight). (**5.2.P.A.1, 5.2.2.A.1)** -Investigate sound, light, and heat energy. (**5.2.P.C.1)** **-**Investigate how and why things move (e.g., slide blocks, balance structures, push structures over, use ramps to explore how far and how fast different objects move or roll). (**5.2.P.E.1)**

Earth Science

Essential Questions:

How does recycling benefit the Earth?
How are the characteristics of air, water, soil, and rock the same and different?
Why does the weather change?

Know	**Understand**	**Be Able to Do**
-Define the terms water, soil, and rock. (**5.4.P.C.1)**. -Define weather words (e.g., temperature, rain, sun, clouds, etc). (**5.4.P.F.1)**	-Earth is made of water, soil, rock. (**5.4.P.C.1)** -Reducing and recycling benefits the earth. (**5.4.P.G.1)**	-Observe and record weather. (**5.4.P.F.1)** -Observe and record the characteristics of soil, rocks, water, and air. (**5.4.P.C.1)**

First Grade Science Units

Life Science Plants and Animals

Essential Questions:

How do the characteristics of animals' habitats help them survive?
How are parents and their offspring different and the same?
How do plants and animals obtain energy and use it for survival?
How do humans affect animal habitats?

Know objectives are basic facts, definitions, or procedural knowledge.
Understand objectives are big ideas or essential understandings that are transferrable to other contexts.
To do objectives are skills that students demonstrate using the knowledge from *know* and *understand* objectives.

Know	Understand	Be Able to Do
-Define the terms roots and leaves. (**5.3.2.B.3)** -List the characteristics of living and non-living things. (**5.3.2.A.1)** -Animal habitats provide basic needs. (**5.3.2.C.1)** -Plants and animals need energy to survive. **(5.3.2.B.1)**	-Plants and animals get energy from different sources. (**5.3.2.B.1)** -Organisms depend on one another to survive. **(5.3.2.C.1)** -Humans affect habitats positively and negatively. **(5.3.2.C.3)** - Plants and animals often resemble their parents. (**5.3.2.D.1)** -Animals have various ways of obtaining food and water, and nearly all animals drink water or eat foods that contain water. (**5.3.2.B.2)** -Variations exist within a group of the same kind of organism. (**5.3.2.E.1)** -Plants and animals have features that help them survive in different	-Identify the characteristics of animal habitats. (**5.3.2.C.2)** -Describe the requirements for the care of plants and animals related to meeting their energy needs. (**5.3.2.B.1)** -Describe similarities and differences in observable traits between parents and offspring. **(5.3.2.E.1)** -Describe how similar structures are found in different organisms. (**5.3.2.E.2)**

	environments. (**5.3.2.E.2)**	

Physical Science **Essential Questions**: How are solids, liquids, and gases different from each other? How can objects change when heated or cooled? How can objects be grouped based on their physical properties?		
Know	Understand	Be Able to Do
-Define the terms solids, liquids, and gases. (**5.2.2.A.2)**	-Objects can change by being heated or cooled. **(5.2.2.B.1)** -Many substances can be changed from one state to another by heating or cooling. **(5.2.4.B.1)**	-Identify the difference between solids, liquids, and gases.**(5.2.2.A.2)** -Group objects according to what they are made of. **(5.2.2.A.1)**

Earth Science **Essential Questions:** How does sunlight affect living and nonliving things? How does weather affect our daily lives? How do we use natural resources to make manufactured products? Why is it important to recycle?		
Know	**Understand**	**Be Able to Do**
-Define the terms sun and moon. **(5.4.2.A.1)**	-Sunlight affects the Earth. **(5.4.P.E.1)** -Reducing and recycling benefits the Earth. (**5.4.P.G.1)** -The Earth has natural resources such as trees, water, and minerals. **(5.4.2.G.4)**	-Observe and record weather and how it affects daily life. **(5.4.2.F.1)** -Identify the natural resources used in the process of making various manufactured products. **(5.4.2.G.4)**

	Plants need sunlight to grow. **(5.4.2.E.1)** Organisms have basic needs and they meet those needs within their environment. **(5.4.2.G.3)**	-Explain how recycling benefits the earth. **(5.4.P.G.1)** -Describe the relationship between the sun and plant growth. (**5.4.2.E.1)** Identify and categorize the basic needs of living organisms as they relate to the environment. (**5.4.2.G.3)**

Second Grade Science Units

Life Science Plants and Animals

Essential Questions:

How do animals' unique features help them survive?
How do animals create features to adapt to their habitats?
How do humans affect animal habitats?

Know objectives are basic facts, definitions, or procedural knowledge.
Understand objectives are big ideas or essential understandings that are transferrable to other contexts.
To do objectives are skills that students demonstrate using the knowledge from *know* and *understand* objectives.

Know	**Understand**	**Be Able to Do**
-Plants and animals need energy to survive. (**5.3.2.B.1)** -Organisms depend on one another to survive. **(5.3.2.C.1)** -Name the characteristics of living and nonliving things. (**5.3.2.A.1)**	-Humans affect habitats through pollution and habitat disruption. **(5.3.2.C.3** -Plants and animals often resemble their parents. **(5.3.2.D.1**) -Individuals of the same species may differ in their characteristics, and sometimes these differences give individuals an advantage in surviving and reproducing in different environments. **(5.3.4.E.1**)	-Communicate ways that humans protect habitats and/or improve conditions for the growth of the plants and animals that live there or ways that humans might harm habitats. **(5.3.2.C.3)** -Model an adaptation to a species that would increase its chances of survival, should the environment become wetter, dryer, warmer, or colder over time. **(5.3.4.E.1)**

Physical Science

Essential Questions:

How does matter change state?
How can different objects move?
Why do different surfaces and forces affect the way an object will move?
How does light or no light affect the way an object is seen?

Know	**Understand**	**Be Able to Do**
-Define the terms solids, liquids, and gases. **(5.2.2.A.2)** -Objects can move in many different ways. **(5.2.2.E.1)**	-Objects are grouped into solids, liquids, and gases. **(5.2.2.A.2)** -Sunlight warms land, air, and water. (**5.2.2.C.1)** -Each state of matter has unique properties. **(5.2.4.A.2)** -An object can be seen when light strikes it and is reflected to a viewer's eye. If there is no light, objects cannot be seen. **(5.2.2.C.2)** -When light strikes substances and objects through which it cannot pass, shadows result. **(5.2.2.C.3)** -Batteries supply energy to produce light, sound, or heat. (**5.2.2.D.1)** -A force is a push or a pull. Pushing or pulling can move an object. The speed an object moves is related to how strongly it is pushed or pulled. When an object does not	-Identify common objects as solids, liquids, or gases. (**5.2.2.A.2)** -Plan and carry out an investigation to distinguish among solids, liquids, and gases. (**5.2.4.A.2)** -Compare, citing evidence, the heating of different colored objects placed in full sunlight. (**5.2.2.C.1)** -Apply a variety of strategies to collect evidence that validates the principle that if there is no light, objects cannot be seen. (**5.2.2.C.2)** -Present evidence that represents the relationship between a light source, solid object, and the resulting shadow. (**5.2.2.C.3)** -Investigate and model the various ways that inanimate objects can

	move in response to a push or a pull, it is because another push or pull (friction) is being applied by the environment. **(5.2.2.E.2)** -Some forces act by touching, while other forces can act without touching. (**5.2.2.E.3)** -Magnets can repel or attract other magnets, but they attract all matter made of iron. Magnets can make some things move without being touched. (**5.2.4.E.3)**	move. (**5.2.2.E.1)** -Predict an object's relative speed, path, or how far it will travel using various forces and surfaces. (**5.2.2.E.2)** -Distinguish a force that acts by direct contact with an object (e.g., by pushing or pulling) from a force that can act without direct contact (e.g., the attraction between a magnet and a steel paper clip). (**5.2.2.E.3)** **-**Investigate and categorize materials based on their interaction with magnets. (**5.2.4.E.3)**

Earth Science **Essential Questions:** Why are the sun and moon visible in the sky at certain times and not visible at others? How does water conservation contribute to recycling? Why do Earth materials change temperature? How are evaporation and condensation related?		
Know	**Understand**	**Be Able to Do**
-Define the terms evaporation and condensation. (**5.4.2.G.1)**	-Reducing and recycling benefits the earth. (**5.4.P.G.1)** -Water conservation is important to our daily lives. (**5.4.2.G.2)** -The sun is a star that can only be seen during the day. The moon is not	-Explain the benefits to water conservation and recycling. **(5.4.2.G.2)** -Determine a set of general rules describing when the sun and moon are visible based on actual sky observations. (**5.4.2.A.1)**

	a star and can be seen sometimes at night and sometimes during the day. The moon appears to have different shapes on different days. **(5.4.2.A.1)** -Soils are made of many living and nonliving substances. The attributes and properties of soil (e.g., moisture, kind and size of particles, living/organic elements, etc.) vary depending on location. **(5.4.2.C.1)** -Land, air, and water absorb the sun's energy at different rates. **(5.4.4.E.1)**	-Describe earth materials using appropriate terms, such as hard, soft, dry, wet, heavy, and light. (**5.4.2.C.1)** -Develop a general set of rules to predict temperature changes of earth materials, such as water, soil, and sand, when placed in the sun and in the shade. (**5.4.4.E.1)** -Observe and discuss evaporation and condensation. (**5.4.2.G.1)**

Third Grade Science Units

Life Science Plants and Animals

Essential Questions:

How do the components of an organism's ecosystem affect its survival?
How do organisms depend on each other in an ecosystem?
How are the life cycles of different organisms the same and different?

Know objectives are basic facts, definitions, or procedural knowledge.
Understand objectives are big ideas or essential understandings that are transferrable to other contexts.
To do objectives are skills that students demonstrate using the knowledge from *know* and *understand* objectives.

Know	**Understand**	**Be Able to Do**
-List the characteristics of living things. **(5.4.A.1)**	-Almost all energy (food) and matter can be traced to the sun. **(5.3.4.B.1)** -In any ecosystem, some populations of organisms thrive and grow, some decline, and others do not survive at all. **(5.3.4.E.2**) **-**Organisms can only survive in environments in which their needs are met. Within ecosystems, organisms interact with and are dependent on their physical and living environment. (**5.3.4.C.1)**	-Compare the physical characteristics of the different stages of the life cycle of an individual organism, and compare the characteristics of life stages among species. **(5.3.4.D.1)** **-**Evaluate similar populations in an ecosystem with regard to their ability to thrive and grow. (**5.3.4.E.2)** -Identify sources of energy (food) in a variety of settings (e.g., farm, zoo, ocean, forest). **(5.3.4.B.1)** -Predict the biotic and abiotic characteristics of an unfamiliar organism's habitat. (**5.3.4.C.1)**

Physical Science

Essential Questions:

How is an electrical circuit created and repaired?
How does gravity affect our everyday lives?
How can energy be transferred from one object to another?

Know	**Understand**	**Be Able to Do**
-Define the terms weight and volume. **(5.2.4.A.3)** -Define the term friction. **(5.2.2.E.2)** -Define the term electricity. **(5.2.4.C.1)** -Define the term gravity. **(5.2.4.E.4**)	-Objects vary in the extent to which they absorb and reflect light and conduct heat (thermal energy) and electricity. **(5.2.4.A.4)** -Electrical circuits require a complete loop through conducting materials in which an electrical current can pass. **(5.2.4.D.1)** -Earth pulls down on all objects with a force called gravity. Weight is a measure of how strongly an object is pulled down toward the ground by gravity. With a few exceptions, objects fall to the ground no matter where they are on Earth. (**5.2.4.E.4)** -Heat (thermal energy) results when substances burn, when certain kinds of materials rub against each other, and when electricity flows though wires. Metals are good conductors of heat (thermal energy) and electricity. Increasing the temperature of any substance requires the	-Categorize objects based on the ability to absorb or reflect light and conduct heat or electricity. (**5.2.4.A.4)** -Determine the weight and volume of common objects using appropriate tools. (**5.2.4.A.3)** -Investigate, construct, and generalize rules for the effect that force of gravity has on balls of different sizes and weights. (**5.2.4.E.4)** -Repair an electric circuit by completing a closed loop that includes wires, a battery (or batteries), and at last one other electrical component to produce observable change. (**5.2.4.D.1)** -Compare the flow of heat through metals and nonmetals by taking and analyzing measurements. **(5.2.4.C.2)** -Draw and label diagrams showing several ways that energy can be transferred from one

	addition of energy. **(5.2.4.C.2)** -Energy can be transferred from one place to another. Heat energy is transferred from warmer things to colder things. **(5.2.4.C.3)**	place to another. **(5.2.4.C.3)** -Predict and confirm the brightness of a light, the volume of sounds, or the amount of heat when given the number of batteries, or the size of batteries. **(5.2.2.D.1)**

Earth Science **Essential Questions:** How do the properties of water change throughout the water cycle? How is soil formed? How do different types of clouds produce different kinds of precipitation?		
Know	**Understand**	**Be Able to Do**
-Name types of clouds. **(5.4.4.G.1)** -Name the steps of the water cycle. **(5.4.4.G.3)** -Define the terms rocks and minerals. **(5.4.4.C.2)**	-Earth materials in nature include rocks, minerals, soils, water, and the gases of the atmosphere. Attributes of rocks and minerals assist in their identification. (**5.4.4.C.2)** -Most of Earth's surface is covered by water. Water circulates through the crust, oceans, and atmosphere in what is known as the water cycle. (**5.4.4.G.3)** -Clouds are formed as a part of the water cycle. **(5.4.4.G.1**) -Soil is formed by broken down materials. **(5.4.4.C.1)**	-Trace a path of a drop of water might follow through the water cycle. **(5.4.4.G.3)** -Create a model to represent how soil is formed. (**5.4.4.C.1)** -Observe daily cloud patterns, types of precipitation, and temperature, and categorize the clouds by the conditions that form precipitation. (**5.4.4.G.2)** -Model how the properties of water can change as water moves through the water cycle. (**5.4.4.G.4)**

	-Rain, snow, and other forms of precipitation come from clouds; not all clouds produce precipitation. (**5.4.4.G.2)** -Properties of water depend on where the water is located (e.g., oceans, rivers, lakes, underground sources, and glaciers). (**5.4.4.G.4)**	

Fourth Grade Science Units

Life Science Plants and Animals

Essential Questions:

How do the human body systems interact and function?

Why do ecosystems change?

How do organisms' adaptations help them survive?

Know objectives are basic facts, definitions, or procedural knowledge.

Understand objectives are big ideas or essential understandings that are transferrable to other contexts.

To do objectives are skills that students demonstrate using the knowledge from *know* and *understand* objectives.

Know	**Understand**	**Be Able to Do**
-Define the terms nervous, digestive, and respiratory systems. **(5.3.4.A.3)**	-Some changes in ecosystems occur slowly, while others occur rapidly. Changes can affect life forms, including humans. (**5.3.4.C.2)** -Individuals of the same species may differ in their characteristics, and sometimes these differences give individuals an advantage in surviving and reproducing in different environments. (**5.3.4.E.1)** -Essential functions of the human body are carried out by specialized systems: digestive, circulatory, respiratory, nervous, skeletal, muscular, reproductive. (**5.3.4.A.3)** -In any ecosystem, some populations of organisms thrive and grow, some decline, and others do	-Describe the interactions of systems involved in carrying out everyday life activities. (**5.3.4.A.3)** -Explain the consequences of rapid ecosystem change (e.g., flooding, wind storms, snowfall, volcanic eruptions), and compare them to consequences of gradual ecosystem change (e.g., gradual increase or decrease in daily temperature, change in yearly rainfall). **(5.3.4.C.2)** -Model an adaptation to a species that would increase its chances of survival, should the environment become wetter, dryer, warmer, or colder over time. (**5.3.4.E.1)** -Evaluate similar populations in an ecosystem with regard to

	not survive at all. (**5.3.4.E.2)** -Essential functions required for the well-being of an organism are carried out by specialized structures in plants and animals**.(5.3.4.A.2)**	their ability to thrive and grow. (**5.3.4.E.2)** -Compare and contrast structures that have similar functions in various organisms, and explain how those functions may be carried out by structures that have different physical appearances. **(5.3.4.A.2)**

Physical Science **Essential Questions:** Why do some object absorb light and some objects reflect light? How does the amount of force and type of force used change how an object will move or stop moving? How can weight and volume be used to identify unknown substances?		
Know	**Understand**	**Be Able to Do**
-Define weight and volume. (**5.2.4.A.3)** -Unknown substances can sometimes be identified by their properties. (**5.2.4.A.3)** -Define light. **(5.2.4.C.1)** -Light travels in a straight line. (**5.2.4.C.4)** -Define motion. (**5.2.4.E.1)**	-Objects vary in the extent to which they absorb and reflect light and conduct heat (thermal energy) and electricity. (**5.2.4.A.4)** -Light travels in straight lines. When light travels from one substance to another (air and water), it changes direction. (**5.2.4.C.4)** -Some objects are composed of a single substance; others are composed of more than one substance. (**5.2.4.A.1)**	-Determine the weight and volume of common objects using appropriate tools. (**5.2.4.A.3)** -Categorize objects based on the ability to absorb or reflect light and conduct heat or electricity. (**5.2.4.A.4)** -Identify objects that are composed of a single substance and those that are composed of more than one substance using simple tools found in the classroom. (**5.2.4.A.1)** -Demonstrate through modeling that motion is a

	-There is always a force involved when something starts moving or changes its speed or direction of motion. A greater force can make an object move faster and farther. (**5.2.4.E.2)**	change in position over a period of time. **(5.2.4.E.1)** -Identify the force that starts something moving or changes its speed or direction of motion. **(5.2.4.E.2)**

Earth Science **Essential Questions:** How do the sun and moon's movements and cycles differ? How do weather instruments help give us information about weather patterns? How can observing fossils give us information about organisms that lived long ago?		
Know	**Understand**	**Be Able to Do**
-Define the sun and moon. (**5.4.4.A.1)** -Define lunar cycle. **(5.4.4.A.2)** -Define the term fossils. **(5.4.4.B.1)** -List weather instruments. **(5.4.4.F.1)**	-Objects in the sky have patterns of movement. The sun and moon appear to move across the sky on a daily basis. The shadows of an object on earth change over the course of a day, indicating the changing position of the sun during the day. (**5.4.4.A.1)** -The observable shape of the moon changes from day to day in a cycle that lasts 29.5 days. **(5.4.4.A.2)** -Earth is the third planet from the sun in our solar system, which includes seven other planets. (**5.4.4.A.4)** -Fossils provide evidence about the plants and animals that lived long	-Identify patterns in data collected from basic weather instruments. **(5.4.4.F.1)** -Use data gathered from observations of fossils to argue whether a given fossil is terrestrial or marine in origin. (**5.4.4.B.1)** -Formulate a general description of the daily motion of the sun across the sky based on shadow observations. Explain how shadows could be used to tell the time of day. (**5.4.4.A.1)** -Identify patterns of the moon's appearance and make predictions about its future appearance based on observational data. (**5.4.4.A.2)**

	ago, including whether they lived on the land or in the sea as well as ways species changed over time. **(5.4.4.B.1)** **-**Earth is approximately spherical in shape. Objects fall towards the center of the earth because of the pull of the force of gravity. (**5.4.4.A.3)**	**-**Generate a model with explanatory value that explains both why objects roll down ramps as well as why the moon orbits the earth. **(5.4.4.A.3)** -Analyze and evaluate evidence in the form of data tables and photographs to categorize and relate solar system objects (e.g., planets, dwarf planets, moons, asteroids, and comets). (**5.4.4.A.4)**