New Content Guide 2021-2022

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New Lessons

New lessons are being developed to provide more opportunities for hands-on science instruction and increased NGSS coverage for all K-5 grades. Each lesson (exploration & hands-on activity) is designed to take one hour. Extensions are available for each lesson and offer an opportunity for students to continue their science content learning. They include assessments and a curated collection of additional activity suggestions, online resources, project ideas, and readings.

New Units

The current unit structure for grades 2, 4, and 5 will remain the same between the 2021 and 2022 school year. During the summer of 2022, a few units in grades K, 1, and 3 will be restructured with the intent to create stronger conceptual science frameworks and take-aways at the conclusion of each unit.

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Grade 5	Life Science	Earth and Space Science	Physical Science

Kindergarten: Life Science

Animal Needs Unit (Animal Secrets)

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	Topic & Guiding Question	Student Objectives	NGSS Performance Expectations
Lesson 1 	**Animal Needs: Food** Why do woodpeckers peck wood?	Students obtain information through virtual observations of different animal behaviors. They use this evidence to explain that one of the basic needs of animals is food.	**K-LS1-1.** Use observations to describe patterns of what plants and animals (including humans) need to survive.
Lesson 2 	**Animal Needs: Shelter Read-Along** Where do animals live?	Students obtain information through media about how different animal homes are built. They use this evidence to explain that animals need shelter.	**K-ESS3-1.** Use a model to represent the relationship between the needs of different plants and animals (including humans) and the places they live.
Lesson 3 	**Animal Needs: Safety** How can you find animals in the woods?	Students obtain information through virtual observations of different animal behaviors. They use this evidence to explain that one of the basic needs of animals is shelter.	**K-LS1-1.** Use observations to describe patterns of what plants and animals (including humans) need to survive.
Lesson 4 	**Animals & Changing the Environment Read-Along** How do animals make their homes in the forest?	Students take a nature walk to look for evidence of animal homes.	**K-ESS2-2.** Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs.

Plant & Animal Secrets will be split into **Animal Secrets** and **Plant Secrets** summer 2022

Kindergarten: Life Science

Plant Needs Unit (Plant Secrets)

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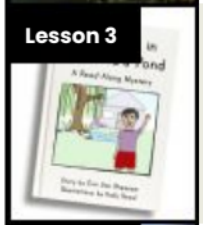
	Topic & Guiding Question	Student Objectives	NGSS Performance Expectations
Lesson 1	**Coming Soon!**	A new lesson is in the works!	**K-LS1-1.** Use observations to describe patterns of what plants and animals (including humans) need to survive.
Lesson 2 	**Plant Needs: Water & Light** How do plants and trees grow?	Students investigate to determine the basic needs of plants. They observe to identify ways young plants resemble the parent plant and how the plant changes as it proceeds through its life cycle.	**K-LS1-1.** Use observations to describe patterns of what plants and animals (including humans) need to survive.
Lesson 3 	**Animal Needs & Changing the Environment Read-Along** Why would you want an old log in your backyard?	Students obtain evidence of living organisms by virtually keeping watch of a log and the living things that visit it.	**K-ESS3-3.** Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment.

Plant & Animal Secrets will be split into **Animal Secrets** and **Plant Secrets** summer 2022

1st Grade: Life Science

Animal Structures And Survival Unit (Animal Superpowers)

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	Topic & Guiding Question	Student Objectives	NGSS Performance Expectations
Lesson 1 	✨New!✨ **Parent & Offspring Traits** How can you help a lost baby animal find its parents?	Students observe the traits of adult and baby animals in order to construct an explanation that most young animals are like, but not exactly like, their parents.	**1-LS3-1.** Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents.
Lesson 2 	**Animal Structures & Survival** Why do birds have beaks?	Students investigate how different bird beaks are well suited for eating different kinds of food. They explain which beak would help a particular bird survive in a particular environment.	**1-LS1-1.** Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.
Lesson 3 	**Animal Behavior & Offspring Survival Read-Along** Why do baby ducks follow their mother?	Students obtain information about the behaviors of animal parents that help their offspring survive.	**1-LS1-2.** Read texts and use media to determine patterns in behavior of parents and offspring that help offspring survive.
Lesson 4 	**Camouflage & Animal Survival** Why are polar bears white?	Students use observations of animal parents and their offspring to construct an explanation about young plants and animals being similar, but not identical, to their parents.	**1-LS1-1.** Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.
Lesson 5 	**Inheritance & Variation of Traits Read-Along** Why do family members look alike?	Students identify parts of plants such as roots, branches, and leaves. They evaluate these plant parts and apply that information to design an umbrella that won't blow down in the wind.	**1-LS3-1.** Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents.

1st Grade: Life Science

Plant Structures And Survival Unit (Plant Superpowers)

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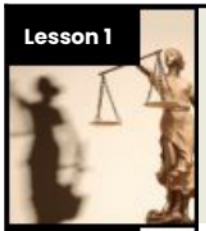
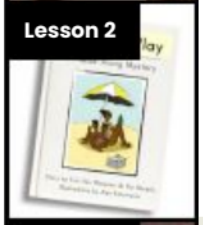
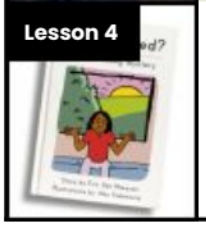
	Topic & Guiding Question	Student Objectives	NGSS Performance Expectations
Lesson 1	**Coming Soon!**	A new lesson is in the works!	**1-LS3-1.** Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents.
Lesson 2 	**Plant Survival & Engineering** Why don't trees blow down in the wind?	Students learn how plants respond to light. They conduct an investigation to compare how the parts of a plant respond to light.	**1-LS1-1.** Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.
Lesson 3 	**Plant Movement & Survival Read-Along** What do sunflowers do when you're not looking?	Students learn how plants respond to light. They conduct an investigation to compare how the parts of a plant respond to light.	**1-LS1-1.** Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.

Plant & Animal Superpowers will be split into **Animal Superpowers** and **Plant Superpowers** summer 2022

1st Grade: Earth and Space Science

Day Patterns Unit (Sun & Shadows)

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	Topic & Guiding Question	Student Objectives	NGSS Performance Expectations
Lesson 1 	**Sun, Shadows, & Daily Patterns** Could a statue's shadow move?	Students observe how shadows change as time passes, or as the Sun moves across the sky. They analyze how to move a light source to change the shape and direction of shadows, constructing an explanation of what causes a shadow to move.	**1-ESS1-1.** Use observations of the sun, moon, and stars to describe patterns that can be predicted.
Lesson 2 	**Sun, Shadows, & Daily Patterns Read-Along** What does your shadow do when you're not looking?	Students conduct an investigation to gather information about how their shadow changes throughout the day.	**1-ESS1-1.** Use observations of the sun, moon, and stars to describe patterns that can be predicted.
Lesson 3 	**Sun & Daily Patterns** How can the Sun help you if you're lost?	Students develop a Sun Finder, a model of the Sun's movement across the sky. They use this model to reason about how the Sun can help guide them during the day.	**1-ESS1-1.** Use observations of the sun, moon, and stars to describe patterns that can be predicted.
Lesson 4 	**Daylight & Seasonal Patterns Read-Along** Why do you have to go to bed early in the summer?	Students obtain information about the seasonal patterns of sunrise and sunset.	**1-ESS1-2.** Make observations at different times of year to relate the amount of daylight to the time of year.

Spinning Sky will be split into **Day Patterns** and **Night Patterns** summer 2022

1st Grade: Earth and Space Science

Night Patterns Unit (Moon & Stars)

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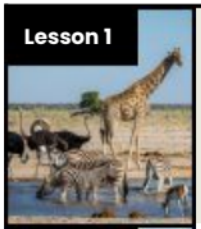
	Topic & Guiding Question	Student Objectives	NGSS Performance Expectations
 Lesson 1	✨New!✨ **Moon Phases & Patterns** When can you see the full moon?	Students record observations of the Moon's shape using a series of photos collected over the course of four weeks. Using this information, students discover that the Moon follows a cyclical pattern, which they can use to predict when a full moon will appear.	**1-ESS1-1.** Use observations of the sun, moon, and stars to describe patterns that can be predicted.
 Lesson 2	**Stars & Daily Patterns** Why do stars come out at night?	Students develop and use a model of the Big Dipper in the night sky. After conducting a simple investigation, students construct an explanation for why stars are only visible in the night sky.	**1-ESS1-1.** Use observations of the sun, moon, and stars to describe patterns that can be predicted.
 Lesson 3	**Stars & Seasonal Patterns Read-Along** How can stars help you if you get lost?	Students develop a Sun Finder, a model of the Sun's movement across the sky. They use this model to reason about how the Sun can help guide them during the day.	**1-ESS1-1.** Use observations of the sun, moon, and stars to describe patterns that can be predicted.

Spinning Sky will be split into **Day Patterns** and **Night Patterns** summer 2022

2nd Grade: Life Science

Animal Biodiversity Unit (Animal Adventures)

mystery science

	Topic & Guiding Question	Student Objectives	NGSS Performance Expectations
Lesson 1 	**Biodiversity & Classification** How many different kinds of animals are there?	Students examine how scientists organize animals into groups based on their characteristics.	**Foundational for 2-LS4-1.** Make observations of plants and animals to compare the diversity of life in different habitats.
Lesson 2 	✨New!✨ **Habitat Diversity** Why would a wild animal visit a playground?	Students observe animals, plants, and the physical characteristics of two different habitats. They analyze this information to create an understanding of how the living and nonliving parts of a habitat support the animals that live there.	**2-LS4-1.** Make observations of plants and animals to compare the diversity of life in different habitats.
Lesson 3 	**Biodiversity, Habitats, & Species** Why do frogs say "ribbit"?	Students identify frogs based on their unique calls and use that information to determine the level of biodiversity within multiple habitats.	**2-LS4-1.** Make observations of plants and animals to compare the diversity of life in different habitats.
Lesson 4 	**Biodiversity & Engineering** How could you get more birds to visit a bird feeder?	Students investigate which kinds of birds are likely to visit a bird feeder based on what they eat and design and build a prototype bird feeder that attracts a specific type of bird.	**2-LS4-1.** Make observations of plants and animals to compare the diversity of life in different habitats.

2nd Grade: Earth and Space Science

Erosion & Earth's Surface Unit (Work of Water)

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	Topic & Guiding Question	Student Objectives	NGSS Performance Expectations
Lesson 1 	**Mapping & Earth's Surface Features** If you floated down a river, where would you end up?	Students develop a model of the Earth's surface and use it to discover an important principle about how rivers work: rivers flow downhill, from high places to low places.	**2-ESS2-2.** Develop a model to represent the shapes and kinds of land and bodies of water in an area. **2-ESS2-3.** Obtain information to identify where water is found on Earth and that it can be solid or liquid.
Lesson 2 	**Rocks, Sand, & Erosion** Why is there sand at the beach?	Students investigate the effects of rocks tumbling in a river. Based on their observations, they construct an explanation for why rocks on the top of mountains are much bigger than the sand at the beach.	**2-ESS2-2.** Develop a model to represent the shapes and kinds of land and bodies of water in an area.
Lesson 3 	✨New!✨ **Mapping & Severe Weather** Where do flash floods happen?	Students use a model (i.e. a map) of Texas to examine the different factors that contribute to flash floods. They use this to predict where flash floods are most likely to happen.	**2-ESS2-2.** Develop a model to represent the shapes and kinds of land and bodies of water in an area **2-ESS1-1.** Use information from several sources to provide evidence that Earth events can occur quickly or slowly.
Lesson 4 	**Erosion, Earth's Surface, & Landforms** What's strong enough to make a canyon?	Students create a model landform and investigate how some Earth events can occur quickly, while others occur slowly.	**2-ESS1-1.** Use information from several sources to provide evidence that Earth events can occur quickly or slowly.
Lesson 5 	**Erosion & Engineering** How can you stop a landslide?	Students compare multiple solutions for preventing erosion.	**2-ESS2-1.** Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land.

2nd Grade: Physical Science

Material Properties Unit (Material Magic)

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	Topic & Guiding Question	Student Objectives	NGSS Performance Expectations
Lesson 1 	**Materials, Properties, & Engineering** Why do we wear clothes?	Students investigate the different properties of matter and use those properties to design and build a hat that protects them from the sun.	**2-PS1-1.** Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties. **2-PS1-2.** Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.
Lesson 2 	**Classify Materials, Insulators, and Properties** Can you really fry an egg on a hot sidewalk?	Students conduct an investigation of different materials in order to determine which are best suited for allowing people to handle hot items.	**2-PS1-1.** Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties. **2-PS1-2.** Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.
Lesson 3 	**Heating, Cooling, & Phases of Matter** Why are so many toys made out of plastic?	Student conduct an investigation of different materials in order to determine which are most and least easily melted.	**2-PS1-2.** Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose. **2-PS1-4.** Construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot.
Lesson 4 	**Inventions & Engineering** What materials might be invented in the future?	Students design a new invention that takes advantage of the unique properties of a futuristic material.	**2-PS1-1.** Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties. **2-PS1-2.** Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.
Lesson 5 	**Materials, Properties, & Engineering** Could you build a house out of paper?	Students construct an evidence- based account of how a structure built of paper can be disassembled and rebuilt in new ways.	**2-PS1-3.** Make observations to construct an evidence-based account of how an object made of a small set of pieces can be disassembled and made into a new object.
Lesson 6 	✨New ✨ **Soil & Properties** How do you build a city out of mud?	Students conduct an investigation where they examine three different soil models. They use this information to determine which type of soil has the properties that will result in the best mud that can be used to build a house.	**2-PS1-1.** Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties. **2-PS1-2.** Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.

3rd Grade: Life Science

Life Cycles Unit (Circle of Life)

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	Topic & Guiding Question	Student Objectives	NGSS Performance Expectations
Lesson 1	**Coming Soon!**	A new lesson is in the works!	**3-LS1-1.** Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death.
Lesson 2 	**Environmental Change & Engineering** What's the best way to get rid of mosquitoes?	Students obtain and evaluate information about mosquitoes from different sources. They analyze and interpret information about the mosquito life cycle to reduce the number of mosquitoes that live in a certain area.	**3-LS4-4.** Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.
Lesson 3	**Coming Soon!**	A new lesson is in the works!	**3-LS1-1.** Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death.

This new unit will be released summer 2022

3rd Grade: Earth and Space Science

Weather & Climate Unit (Stormy Skies)

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	Topic & Guiding Question	Student Objectives	NGSS Performance Expectations
 Lesson 1	**Water Cycle & Phases of Matter** Where do clouds come from?	Students obtain and combine information that water can change from liquid to gas, but that it is always made of tiny drops. Clouds are made of water that has evaporated.	**Foundational for 3-ESS2-1.** Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season.
 Lesson 2	**Local Weather Patterns & Weather Prediction** How can we predict when it's going to storm?	Students make observations of clouds and develop a tool to make predictions about what kind of weather might happen next.	**3-ESS2-1.** Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season.
Lesson 3	**Coming soon!**	A new lesson is in the works!	**3-ESS2-1.** Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season.
 Lesson 4	**Climate, Geography, & Global Weather Patterns** Why are some places always hot?	Students obtain and combine information to describe the different climate regions of the world.	**3-ESS2-2.** Obtain and combine information to describe climates in different regions of the world.
 Lesson 5	**Natural Hazards & Engineering** How can you keep a house from blowing away in a windstorm?	Students design and build solutions that reduce the hazards associated with strong winds that could damage buildings.	**3-ESS3-1.** Make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard.

4th Grade: Earth and Space Science

Earth's Features & Processes Unit (The Birth of Rocks)

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	Topic & Guiding Question	Student Objectives	NGSS Performance Expectations
Lesson 1 	**Volcanoes & Patterns of Earth's Features** Could a volcano pop up where you live?	Students use coordinates to develop a map of volcanoes to discover a pattern of where volcanoes exist on Earth. Students identify the pattern of volcanoes in the "Ring of Fire."	**4-ESS2-2.** Analyze and interpret data from maps to describe patterns of Earth's features.
Lesson 2 	**Volcanoes & Rock Cycle** Why do some volcanoes explode?	Students investigate the properties of thin and thick lava by attempting to create air bubbles. Students realize that thick lava will cause a volcano to explode, while thin lava will not.	**4-ESS1-1.** Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time.
Lesson 3 	**Weathering & Erosion** Will a mountain last forever?	Students make observations of the effects of weathering to discover that rocks will become rounded and break into small pieces when they tumble down a mountain.	**4-ESS2-1.** Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.
Lesson 4	**Coming soon!**	A new lesson is in the works!	**4-ESS1-1.** Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time.
Lesson 5 	**Erosion, Natural Hazards, & Engineering** How could you survive a landslide?	Students generate multiple possible solutions to protect homes from a landslide. Students realize that there are many causes for the erosion that causes rocks to fall in landslides.	**4-ESS3-2.** Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.

5th Grade: Earth and Space Science

Water Cycle & Earth's Systems Unit (Watery Planet)

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	Topic & Guiding Question	Student Objectives	NGSS Performance Expectations
Lesson 1 	**Hydrosphere & The Roles of Water** How much water is in the world?	Students analyze and interpret data from world maps to determine the relative amounts of fresh, salt, and frozen water. Students figure out that while the Earth has a lot of water, most of Earth's water is not fresh or accessible.	**5-ESS2-2.** Describe and graph the amounts of salt water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth.
Lesson 2 	✨New!✨ **Mixtures & Solutions** How much salt is in the ocean?	Students create a model ocean to observe how salt seems to completely vanish when dissolved in water. Students measure and graph quantities to provide evidence that the salt is still in the solution, even though we can't see it.	**5-PS1-2.** Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total weight of matter is conserved.
Lesson 3 	**Groundwater as a Natural Resource** When you turn on the faucet, where does the water come from?	Students learn most people get fresh water from underground sources. Students determine the best place to settle a town by considering features of the landscape & the characteristics of the plants that thrive there.	**5-ESS2-2.** Describe and graph the amounts of salt water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth.
Lesson 4 	**Water Cycle** Can we make it rain?	Students create a model of the ocean and sky to investigate how temperature influences evaporation and condensation. Students figure out that higher ocean temperatures lead to more evaporation, thus leading to more rain.	**5-ESS2-1.** Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.
Lesson 5 	**Natural Disasters & Engineering** How can you save a town from a hurricane?	Students define the problem that a town needs protection from flooding. They design solutions using different types of flood protection. They realize flooding is caused by severe rainfall generated by hurricanes. Hurricanes are created where ocean temperatures are warm.	**5-ESS3-1.** Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.