Grade 3 Planning Guide

Kindergarten Planning Guide | Grade 1 Planning Guide | Grade 2 Planning Guide
Grade 3 Planning Guide | Grade 4 Planning Guide | Grade 5 Planning Guide
Combined K-5 Planning Guide

What is Included in this Document?

Grade Level Pacing Guides
The Pacing Guide is a resource to support your year-long planning. The units can be taught in any order. In most units, the Mysteries build on one another. Therefore, we strongly recommend the Mysteries within each unit are taught in the sequence they are presented. If you have more time, each unit can be extended by using items from the Optional Extras.

Mystery Science - NGSS Alignment
Mystery Science is aligned to the Next Generation Science Standards. Each Mystery is aligned to a topic, performance expectations, science and engineering practices, disciplinary core ideas, and crosscutting concepts. This document explains how each Mystery is aligned to the NGSS standards.

Generate Activity Supply Lists
To make planning easier, you can generate supply lists by grade, classroom, unit, or Mystery using our Supply Calculator.

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Grade 3

Mystery Science recommends teaching the mysteries within each unit in the order they are presented. The units themselves can be taught in any order. The core Mystery (exploration & activity) are designed to take an hour per week, with 2 hours of Optional Extras per Mystery.

	Animals Through Time (8-16 weeks)	Power of Flowers (4-8 weeks)	Stormy Skies (4-8 weeks)	Invisible Forces (5-10 weeks)
Week 1	Mystery 1: Where can you find whales in a desert? ***(3-LS4-1 and 3-LS4-4)*** ****Revision Coming 2019***	Mystery 1: Why do plants grow flowers? ***(3-LS1-1)***	Mystery 1: Where do clouds come from? ***(Foundational 3-ESS2-1)***	Mystery 1: How could you win a tug-of-war against a bunch of adults? ***(3-PS2-1)***
Week 2	Mystery 2: How do we know what dinosaurs looked like? ***(3-LS4-1)***	Mystery 2: Why do plants give us fruit? ***(3-LS1-1)***	Mystery 2: How can we predict when it's going to storm? ***(3-ESS2-1)***	Mystery 2: What makes bridges so strong? ***(3-5-ETS1-1, 3-5-ETS1-2, 3-5-ETS1-3, Foundational 3-PS2-1)***
Week 3	Mystery 3: Can you outrun a dinosaur? ***(3-LS4-1)*** ****Revision Coming 2019***	Mystery 3: Why are some apples red and some green? ***(3-LS3-1)***	Mystery 3: Why are some places always hot? ***(3-ESS2-2)***	Mystery 3: How can you go faster down a slide? ***(3-PS2-1 and 3-PS2-2)***
Week 4	Mystery 4: What kinds of animals might there be in the future? ***(3-LS3-1 and 3-LS4-2)***	Mystery 4: How could you make the biggest fruit in the world? ***(3-LS3-1)***	Mystery 4: How can you keep a house from blowing away in a windstorm? ***(3-ESS3-1, 3-5-ETS1-1, 3-5-ETS1-2, 3-5-ETS1-3)***	Mystery 4: What can magnets do? ***(3-PS2-3 and 3-PS2-4)***
Week 5	Mystery 5: Can selection happen without people? ***(3-LS3-1, 3-LS4-2, 3-LS4-3, 3-LS4-4)***			Mystery 5: How could you unlock a door using a magnet? ***(3-PS2-3, 3-PS2-4, 3-5-ETS1-1, 3-5-ETS1-2, 3-5-ETS1-3)***
Week 6	Mystery 6: Why do dogs wag their tails? ***(3-LS2-1)***			
Week 7	Mystery 7: What's the best way to get rid of mosquitos? ***(3-LS4-3, 3-LS4-4, 3-5-ETS1-2)***			
Week 8	Mystery 8: How long can people (and animals) survive in outer space?***(3-LS3-2)***			

Have extra time? "Optional Extras" are extensions to each Mystery. We recommend you use them during your unit or to extend the length of each unit. They include an informational text reading that builds on the Mystery's topic, assessments, and suggestions for supplemental activities.

More Science each week	Longer Science units	Cross Curricular Integration
Use items from the Optional Extras to extend each Mystery if you have more time.	Add a week after each Mystery to teach items from the Optional Extras.	If you want to extend the Mystery but don't have extra time, use Optional Extras during literacy time.

Animals Through Time (8-16 weeks)

Habitats, Heredity, & Change Over Time

Grade 3 Mystery Science & NGSS Alignment - Life Science (LS)

Profound Perspective: In this unit students will develop an appreciation for how animals and the places they live (their habitats) are not constant—they have changed over time. Fossils give us a window to the animals and habitats of the past. Selective breeding shows us not only how some animals of the past became domesticated, but allows us to imagine how they might look in the future.

Grade 3 Life Science	Performance Expectations	Topics	Disciplinary Core Ideas (DCIs) (Mystery Conceptual Flow)	Scientific & Engineering Practices (SEPs)	Crosscutting Concepts (CCC)
Mystery 1 Where can you find whales in the desert?	3-LS4-1 3-LS4-3	Habitats & Environmental Change	Fossils provide evidence of the types of organisms that lived long ago and also about the characteristics of their habitats. They help tell the story of how the environment, and the things that live in it, have changed over time. As the environment changes, some organisms survive, some adapt, and some die out. **DCIs: LS2.C, LS4.A, LS4.C, LS4.D**	Students **analyze and interpret data** from fossil records to determine how the environment they were found in has changed over time. They use this evidence to **engage in an argument** for which environment an organism survived in based on its characteristics.	Students reason about the **cause and effect** relationship between environment and the type of organism that can survive there. They observe that organisms have body parts (**structure)** that helps them survive in their habitat **(function).** Students also consider the rate of **stability and change** of an environment.
Mystery 2 How do we know what dinosaurs looked like?	3-LS4-1	Structure & Adaptations, Fossil Evidence, Classification	Fossils are clues to the past! They can tell us what an organism looked like on the outside, the habitat it lived in, and even the food it ate. Dinosaur skeletons helped us learn that dinosaurs looked a lot like lizards do today. Fossils of their teeth helped us determine if they were meat or plant-eaters. **DCIs: LS4.A**	Students **analyze and interpret data** from fossil records to determine what type of food an organism ate/eats. They use the fossil evidence to **engage in an argument** for why they chose each food source.	Students consider that fossilized evidence of organism's teeth (**structure**) can determine which type of food they ate (**function**) and the type of environment they inhabited.
Mystery 3 Can you outrun a dinosaur?	3-LS4-1	Fossil Evidence, Behavior	Dinosaur footprints are a type of fossil, meaning they can help us learn about the past. When footprints are farther apart, an organism is moving faster. When footprints are closer together, the organism is moving slower. Some dinosaurs are faster than others and we can use their footprints to figure out how their speeds were different. **DCIs: LS4.A**	Students **carry out an investigation** by comparing the stride length of student runners to the stride length of a comparable sized dinosaur, CeeLo. They use **mathematics and computational thinking** to record stride length, graph the value and determine the speed at which the student was running.	Students explore **quantity** by measuring stride length. They observe the relationship between stride length and speed.

(continued)

Animals Through Time (8-16 weeks)

Habitats, Heredity, & Change Over Time

Grade 3 Mystery Science & NGSS Alignment - Life Science (LS)

Grade 3 Life Science	Performance Expectations	Topics	Disciplinary Core Ideas (DCIs) (Mystery Conceptual Flow)	Scientific & Engineering Practices (SEPs)	Crosscutting Concepts (CCC)
Mystery 4 What kinds of animals might there be in the future?	3-LS3-1 3-LS4-2	Heredity, Variation, & Selection	People want their pets to look a certain way--they want them to have desirable traits. Since many characteristics of organisms are inherited from their parents, people can change organisms to have the traits they want! This is called selection. If people want an animal to have a specific trait -like, a dog to be small - they will breed two of the smallest dogs they can over and over again! **DCIs: LS3.A, LS3.B**	Students **analyze** the traits of parent dogs to determine which puppy they could have. They **construct explanations** about which traits the puppy gets from each parent.	Students recognize **patterns** in traits between parents and offspring.
Mystery 5 Can selection happen without people?	3-LS3-1 3-LS4-2 3-LS4-3 3-LS4-4**	Heredity, Variation, & Selection	It isn't just people that can change the traits of animals over time--nature can too! When the environment changes, like the introduction of a new predator, some organisms survive well and reproduce, some have traits that help them survive less well, and some cannot survive at all. Over time, most offspring will be born with the trait that helps them survive well. This is because offspring inherit their traits from their parents--and the ones that survive well and reproducing! **End of Unit Project in Optional Extras **DCIs: LS2.C, LS3.A, LS3.B, LS4.B, LS4.C, LS4.D**	Students c**arry out an investigation** by using a **model** to simulate the introduction of a predator species on Lizard Island. Students simulate multiple generations of lizards, **analyzing and interpreting the data** after each one. They use this data to **engage in argument from evidence** to support their claim about how the offspring change from the original lizards.	Students recognize the **cause and effect** relationship between a change in the environment and the survival of organisms that inhabit it. They recognize environments as a **system**, made up of interdependent parts that function as a whole. They can be **stable and change** over time at different rates of speed.
Mystery 6 Why do dogs wag their tails?	3-LS2-1	Animal Groups & Survival	Dogs, descendants of wolves, are different than other pets because of how they interact with us. Wolves live in groups, work together, and communicate with one another. Being in a group helps wolves survive because they are able to catch more prey in a pack than when they are alone. There are other types of animals that also live in groups to help them survive. Being part of a group can help animals defend themselves from predators, obtain food, and cope with environmental changes. Animals living alone have a much harder time surviving. **DCIs: LS2.D**	Students carefully observe animals that live in groups in order to **obtain, evaluate, and communicate information** about animal social behavior. Using the **evidence** from their observations, students **engage in an argument** to support their claim that animals form groups to help them survive.	Students recognize the **cause and effect** relationship between animals living in a group and the members of that group surviving.

(continued) **Animals Through Time (8-16 weeks)**

Habitats, Heredity, & Change Over Time

Grade 3 Mystery Science & NGSS Alignment - Life Science (LS)

Grade 3 Life Science	Performance Expectations	Topics	Disciplinary Core Ideas (DCIs) (Mystery Conceptual Flow)	Scientific & Engineering Practices (SEPs)	Crosscutting Concepts (CCC)
Mystery 7 What's the best way to get rid of mosquitoes?	3-LS4-3 3-LS4-4 3-5-ETS1-2	Habitat Change & Engineering	Mosquitoes suck blood and spread diseases. Mosquitoes live all over the world, but there are more in the tropics where the environment is warm and wet. This is because adult mosquitoes lay their eggs in water and need warm weather to survive. When the environment changes with increased rainfall, there will be more mosquitoes because they can survive and reproduce in greater numbers. Scientists and engineers can use this information to design solutions that help reduce the population of mosquitoes in certain areas. When there are fewer mosquitoes, then there will be a reduction in the number of people infected with the diseases that they spread. **DCIs: LS2.C, LS4.C, LS4.D, ETS1.B**	Students **obtain and evaluate information** from different people who live in Pondville, a town with a severe mosquito problem. Then, using this information, students **design solutions** that will reduce the number of mosquitoes that live in Pondville.	Students recognize the **cause and effect** relationship between a change in the environment and the survival of organisms that live there. They recognize environments as a **system**, made up of interdependent parts that function as a whole.
Mystery 8 How long can people (and animals) survive in outer space?	3-LS3-2	Traits & Environment	The environment can influence an organism's physical traits. Consider the effects that living in space can have on an astronaut. Astronauts wear space suits to protect themselves from the extreme temperatures of outer space. But how does the low gravity of space affect our bodies? After a year of living in space, the low gravity of the environment causes a decrease in our arm strength, a reduction in our ability to balance, and even an increase in our height! **DCIs: LS3.A, LS3.B**	Students measure their own physical traits (arm strength, balance, and height) and then make predictions about how these traits would change after living in outer space for a year. Students use this information to **construct an explanation** for how the environment can influence and change physical traits.	Students recognize the **cause and effect** relationship between the environment and its influence on physical traits (physical characteristics).

Power of Flowers (4-8 weeks)

Life Cycle, Traits, & Heredity

Grade 3 Mystery Science & NGSS Alignment - Life Science (LS)

Profound Perspective: This unit develops the idea that by studying how plants reproduce and pass on their traits, we human beings have figured out how to make food plants even more useful to us. Students first discover how plants reproduce by exploring the process of pollination and fruiting. Then students are introduced to the process of plant domestication (selection of traits based on inheritance and variation).

Grade 3 Life Science	Performance Expectations	Topics	Disciplinary Core Ideas (DCIs) (Mystery Conceptual Flow)	Scientific & Engineering Practices (SEPs)	Crosscutting Concepts (CCC)
Mystery 1 Why do plants grow flowers?	3-LS1-1	Flowering & Reproduction	All plants grow from a seed, which is a baby plant. Just like animals, *some* plants--all flowering plants--need two parent plants to create a seed. Flowering plants make seeds through a process called pollination. Pollination happens when pollen from one flower gets transferred to a special part of another flower - the stigma. Flowers make seeds! These plants have a unique life cycle that start with pollination. **DCIs: *Foundational LS1.B***	Students **develop a model** of a flower and bee to simulate pollination. With a partner, they **carry out an investigation** to determine how bees fly between flowers and cause pollination. Students an**alyze their data** and **construct an explanation** for if their flower will produce seeds or not.	Students explore the **pattern** of similarities in life cycles among organisms. Students observe that a plant's stigma (**structure**) is sticky to 'catch' pollen (**function**).
Mystery 2 Why do plants give us fruit?	3-LS1-1	Reproduction	We learned in the last Mystery that pollen travels to the stigma of a flower to make a seed. But it isn't that simple - the pollen travels down the stigma, and into the flower's ovary. Then a seed is made! Some plants grow fruit next. Fruit, a yummy 'container' for seeds, is eaten by animals! They swallow the seeds and excrete them away from the parent plant. This helps the seeds spread to new places and grow new plants. A lot of vegetables have seeds, but to plant scientists they are actually fruits! **DCIs: LS1.B**	Students **carry out an investigation** to determine if a food is a science fruit or vegetable. They cut open each food to determine if there are seeds. Students **analyze this data** to determine if the food is a fruit or vegetable.	Students use **patterns** to sort food as a science fruit or a science vegetable. Students learn that fruit (**structure**) contains seeds and helps them spread (**function**).
Mystery 3 Why are some apples red and some green?	3-LS3-1	Inheritance, Traits, & Selection	Apples, like all living things, inherit their characteristics from their parents. Sweet apples grow from the seeds of sweet apples, and sour apples grow from the seeds of sour apples. While offspring have similar traits as their parents and siblings, they are not *exactly* the same. There are over 2,000 varieties of apples, each with unique traits. Farmers choose people's favorites, plant that type of seed over and over, and grow more of them. This is called selection. **DCIs: LS3.A, LS3.B**	Students **carry out an investigation** to determine the sweetness of different apple varieties.	Students identify the similarities and differences shared between offspring and their parents, or among siblings as a **pattern**.

(continued)

Power of Flowers (4-8 weeks)

Life Cycle, Traits, & Heredity

Grade 3 Mystery Science & NGSS Alignment - Life Science (LS)

Grade 3 Life Science	Performance Expectations	Topics	Disciplinary Core Ideas (DCIs) (Mystery Conceptual Flow)	Scientific & Engineering Practices (SEPs)	Crosscutting Concepts (CCC)
Mystery 4 How could you make the biggest fruit in the world?	3-LS3-1	Fruiting, Reproduction	No two individual offspring are exactly alike! Organisms inherit their traits from their parents which is why they are similar but not identical. Selection is when a desired trait is chosen to reproduce. It is used to change any trait of a plant. Plant-growers watch closely for changes in traits so that they can create new varieties of plants. Many fruits and vegetables we eat today were created through selection. **DCIs: LS3.A, LS3.B**	Students **engage in argument from evidence** about which plants and fruits are related to one another. Students **obtain, evaluate, and communicate information** by sorting plant cards into groups based on similar traits. They determine which plants share wild parents and are varieties of each other.	Students recognize similarities and differences among the traits of different plants as a **pattern**.

Stormy Skies (4-8 weeks)

Weather, Climate, & Water Cycle

Grade 3 Mystery Science & NGSS Alignment - Earth & Space Science (ESS)

Profound Perspective: This unit develops the idea that by paying careful attention to clouds, wind, and other weather clues around us, we can predict the daily weather and make sense of why places on earth look and feel the way they do.

Grade 3 Earth Science	Performance Expectations	Topics	Disciplinary Core Ideas (DCIs) (Mystery Conceptual Flow)	Scientific & Engineering Practices (SEPs)	Crosscutting Concepts (CCC)
Mystery 1 Where do clouds come from?	Foundational for 3-ESS2-1	Water Cycle, Phases of Matter	Clouds may look like white, fluffy, cotton, but they are actually made of water! When liquid water is heated it turns into gas water. This process is called evaporation. Some liquid water from Earth's surface (like oceans and lakes) is heated and turns into invisible water gas. It rises up into the atmosphere and becomes trapped! These trapped water droplets make clouds. **DCIs: *Foundational* ESS2.D**	Students **carry out an investigation** by **using a model** to observe evaporation. They **engage in argument from evidence** using observations from their investigation to explain what clouds are.	Students consider the **cause and effect** relationship between heated liquid water and the evaporation of gas water that forms into clouds.
Mystery 2 How can we predict when it's going to storm?	3-ESS2-1	Local Weather Patterns, Weather Prediction	There are many different types of clouds! Knowing what types of clouds bring stormy weather (and the wind's direction) can help you prepare for a rainstorm. Understanding this patterns help scientists, and you, predict what kind of weather might happen next! **DCIs: ESS2.D**	Students **obtain and communicate information** about different types of clouds by creating a Storm Spotter's Guide. They **engage in argument from evidence** by using this information to analyze multiple scenarios and determine if a storm will occur and why.	Students explore **patterns** of changing clouds as a way to predict weather.
Mystery 3 Why are some places always hot?	3-ESS2-2	Climate, Geography, & Global Weather Patterns	Weather conditions that are predictable and occur over long periods of time are called climates. There are 5 climates--tropical, polar, temperate, mild, and desert. Each climate occurs in a specific part of the world, depending on how much sunlight and rain it gets throughout the year. **DCIs: ESS2.D**	Students **obtain and evaluate information** about multiple location's weather. They **communicate the information** by color coding a map based on climate. Students **analyze and interpret the data** to determine climate patterns across the world.	Students recognize climate across the world as an observable **pattern**.
Mystery 4 How can you keep a house from blowing away in a windstorm?	3-ESS3-1 3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3	Natural Hazards & Engineering	Strong winds can cause different types of natural hazards such as hurricanes, dust storms, and tornadoes. Strong winds can cause a lot of problems--they blow down all kinds of things! Engineers design solutions for the damage strong winds can cause. They identify problems and brainstorm a lot of different ideas until they find a solution. **DCIs: ESS3.B, ETS1.A, ETS1.B, ETS1.C**	Students **define problems** that strong winds cause. They **develop and use a model** of a home in order to **design a solution** that keeps the roof attached to the home and stops the home from blowing away in the wind. They test and improve their prototype.	Students identify the **cause and effect** relationship between strong winds and the problems they cause.

Invisible Forces (5-10 weeks)

Forces & Motion, Magnetism

Grade 3 Mystery Science & NGSS Alignment - Physical Science (PS)

Profound Perspective: This introductory forces unit will give students a new understanding of the invisible pushes and pulls that operate in the world around them. They will realize that understanding forces will let them do surprising things — from building a sturdy bridge from paper to using the pull of a rubber band to send a cardboard "hopper" flying. What students learn in this unit will connect to the world around them, leading them to think about such things as the force of friction as they slide down a playground slide or the the invisible force that makes magnets cling to the refrigerator. Hands-on activities focus on engineering, investigation, and discovery.

Grade 3 Physical Science	Performance Expectations	Topics	Disciplinary Core Ideas (DCIs) (Mystery Conceptual Flow)	Scientific & Engineering Practices (SEPs)	Crosscutting Concepts (CCC)
Mystery 1 How could you win a tug-of-war against a bunch of adults?	3-PS2-1	Forces	Every action is either a push or a pull, or what we call a 'force'. Forces each have a strength and a direction. When objects are in contact, they exert a force on each other. When a force is greater than the opposite force, it causes the object to move in its direction. **DCIs: PS2.A, PS2.B**	Students build a Hopper Popper to **carry out an investigation** about force and motion. They c**onstruct an explanation** for which direction the forces act on the object, causing it to hop.	Students recognize the **cause and effect** relationship between the forces acting on an object and the direction of its motion.
Mystery 2 What makes bridges so strong?	3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3 Foundational for 3-PS2-1	Balance of Forces, Engineering	Engineers build bridges to join two pieces of land that are split by a body of water. Building a bridge is no easy task! Engineers had to try lots of different solutions, most that didn't work, and learn from them. Possible solutions to a problem can be limited by available resources and materials--we call these constraints. All engineers communicate with their peers, test their prototypes, learn from their failures, and improve their designs. Being an engineer is exciting and full of learning! **DCIs: ETS1.A, ETS1.B, ETS1.C, Foundational PS2.A**	Students **define a problem -** designing a bridge that will hold the most weight - and its constraints, it can only be made of paper. They collaborate with peers to **design multiple solutions**. They **carry out investigations** to test each of their prototypes, determine how to improve their design.	Students explore the relationship between the **structure and function** of different bridge designs.
Mystery 3 How can you go faster down a slide?	3-PS2-1 3-PS2-2	Balance of Forces, Friction	A special type of 'push' force is called friction. This force occurs when two objects are in contact and push against each other. When an object has less friction, it moves easier. If an object has more friction, it is moves slower. Objects with smooth surfaces have less friction, and objects with rougher surfaces have more friction. **DCIs: PS2.A, PS2.B**	Students **use a model** of a slide to **carry out an investigation.** They **ask questions** about different materials and weights and test their ideas to explore which combinations move the fastest down the slide. Students then complete a fair test to determine which material has the least friction. They **engage in argument from evidence** to share their findings.	Students consider the **cause and effect** relationship between a material's surface and the amount of friction it has.

(continued) **Invisible Forces (5-10 weeks)**

Forces & Motion, Magnetism

Grade 3 Mystery Science & NGSS Alignment - Physical Science (PS)

Grade 3 Physical Science	Performance Expectations	Topics	Disciplinary Core Ideas (DCIs) (Mystery Conceptual Flow)	Scientific & Engineering Practices (SEPs)	Crosscutting Concepts (CCC)
Mystery 4 What can magnets do?	3-PS2-3 3-PS2-4	Magnets, Forces	Magnetism is another special kind of force. Magnets can pull on things without actually touching them--the force can even go right through a solid object. But not all objects are affected by magnetism, only objects that contain iron. Magnets have a lot of interesting properties. The closer a magnet is to a magnetic object, the stronger its force will be.. Also, magnets have two sides. When two magnets line up at the same side, they will push away from each other. When they are lined up at different sides, they will pull toward each other. **DCIs: PS2.B**	Students **ask questions** about magnets and **develop and carry out investigations** to observe the different properties of them.	Students consider the **cause and effect** relationship between this distance of a magnet and the strength of the force. Students consider the **cause and effect** relationship between which direction two magnets are facing and if they will push or pull on one another.
Mystery 5 How can you unlock a door using a magnet?	3-PS2-3 3-PS2-4 3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3	Magnets & Engineering	We've learned that magnets have a lot of interesting properties! One of them, is that magnets can push and pull on each other. In fact, they can do this even with space or another object between them! Since magnets have many useful properties, they can be used to design solutions to a variety of problems. **DCIs: PS2.B, ETS1.A, ETS1.B, ETS1.C**	Students **design a solution** for a magnetic lock by **developing a model**.	Students consider the **cause and effect** relationship between two magnets as a way to so design solutions using the engineering process.