CURRICULUM ROAD MAP

SCIENCE (K-8)

WALDEN GREEN MONTESSORI

K - 8th Grade		Science Curriculum + Materials/Resources	
K - 1st Grade	2nd - 3rd Grade	4th - 5th Grade	6th - 8th Grade
Mystery Science Units	Mystery Science Units	Mystery Science Units	FOSS Science Units/Kits
Force Olympics	Plant Adventures	Birth of Rocks	Weather and Water
Spinning Sky	Fates of Traits	Spaceship Earth	Diversity of Life
Weather Watching	Work of Water	Energizing Everything	Human Systems Interactions
Light and Sounds	Circle or Life	Web of Life	Chemical Interactions
Plant and Animal Secrets	Material Magic	Human Machine	Populations and Ecosystems
Plant and Animal Superpowers	Stormy Skies	Chemical Magic	Electromagnetic Force
	Animal Adventure	Waves of Sound	Gravity and Kinetic Energy
	Animals Through Time	Watery Planet	Waves
			Planetary Science

Mystery Science Alignment with the Next Generation Science Standards

Mystery Science is a hands-on curriculum that is fully aligned with the Next Generation Science Standards (NGSS).

Mystery Science's units of study contain:

- Hands-on, easy-prep activities with EVERY lesson
- Engaging, real-world investigative phenomena
- Thoughtful discussions to build background knowledge
- Lesson & unit assessments to evaluate comprehension
- Curated, cross-curricular extensions

Mystery Science also offers the Anchor Layer, which enriches the unit with an anchor phenomenon, incorporates anchor connections after each lesson, & concludes the unit with a performance task.

mystery science

Updated 10/10/2023

All Kindergarten Units • Units may be taught in any order

Page 4 • Web Link

NGSS Performance Expectations:

- K-LS1-1
- K-ESS2-2
- K-ESS3-1

Unit Breakdown:

- 4 Lessons & Activities
- 4 Lesson Assessments
- 4 Extension Blocks

Anchor Layer Adds:
- 1 Anchor Phenomena
- 4 Anchor Connections
- 1 Performance Task

Page 5 • Web Link

NGSS Performance Expectations:

- K-LS1-1
- K-ESS3-3

Unit Breakdown:

- 3 Lessons & Activities
- 2 Lesson Assessments
- 3 Extension Blocks

Anchor Layer will be added to this unit in the 2023-2024 school year.

Page 6 • Web Link

NGSS Performance Expectations:

- K-ESS2-1
- K-ESS3-2

Unit Breakdown:

- 3 Lessons & Activities
- 3 Lesson Assessments
- 3 Extension Blocks

Anchor Layer will be added to this unit in the 2023-2024 school year.

Page 7 • Web Link

NGSS Performance Expectations:

- K-ESS2-1
- K-ESS2-2

Unit Breakdown:

- 3 Lessons & Activities
- 3 Lesson Assessments
- 3 Extension Blocks

Anchor Layer Adds:
- 1 Anchor Phenomena
- 3 Anchor Connections
- 1 Performance Task

Page 8 • Web Link

NGSS Performance Expectations:

- K-PS3-1
- K-PS3-2
- K-2-ETS1-1
- K-2-ETS1-3

Unit Breakdown:

- 3 Lessons & Activities
- 3 Lesson Assessments
- 3 Extension Blocks

Anchor Layer will be added to this unit in the 2023-2024 school year.

Page 9 • Web Link

NGSS Performance Expectations:

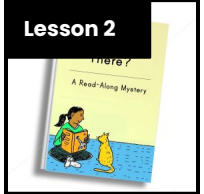
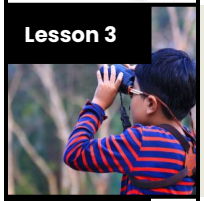
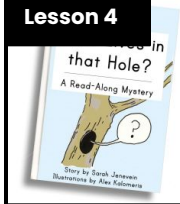
- K-PS2-1
- K-PS2-2
- K-2-ETS1-1
- K-2-ETS1-2
- K-2-ETS1-3

Unit Breakdown:

- 6 Lessons & Activities
- 6 Lesson Assessments
- 6 Extension Blocks

Anchor Layer will be added in the 2023-2024 school year.

Animal Needs Unit (Animal Secrets)

	Topic & Guiding Question	NGSS Performance Expectations (PEs)	Science & Eng. Practices (SEPs)	Disciplinary Core Ideas (DCIs)	Crosscutting Concepts (CCCs)
Lesson 1 	**Animal Needs: Food** Why do woodpeckers peck wood?	**K-LS1-1.** Use observations to describe patterns of what plants and animals (including humans) need to survive.	Obtaining, Evaluating, and Communicating Information Engaging in Argument from Evidence	**LS1.C.** Organization for Matter and Energy Flow in Organisms	Patterns
Lesson 2 	📖 **Animal Needs: Shelter** Where do animals live?	**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.	Obtaining, Evaluating, and Communicating Information	**ESS3.A.** Natural Resources	Patterns Systems and System Models
Lesson 3 	**Animal Needs: Safety** How can you find animals in the woods?	**K-LS1-1.** Use observations to describe patterns of what plants and animals (including humans) need to survive.	Obtaining, Evaluating, and Communicating Information Engage in Argument from Evidence	**LS1.C.** Organization for Matter and Energy Flow in Organisms	Patterns
Lesson 4 	📖 **Animals & Changing the Environment** How do animals make their homes in the forest?	**K-ESS2-2.** Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs	Obtaining, Evaluating, and Communicating Information	**ESS2.E.** Biogeology	Systems and System Models

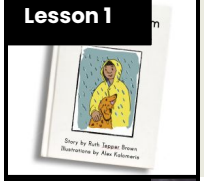
📖 Read-Along Lesson

Plant Needs Unit (Plant Secrets)

	Topic & Guiding Question	NGSS Performance Expectations (PEs)	Science & Eng. Practices (SEPs)	Disciplinary Core Ideas (DCIs)	Crosscutting Concepts (CCCs)
Lesson 1 	**Living & Nonliving** Are plants alive?	**K-LS1-1.** Use observations to describe patterns of what plants and animals (including humans) need to survive.	Analyzing and Interpreting Data	**LS1.C:** Organization for Matter and Energy Flow in Organisms	Patterns
Lesson 2 	**Plant Needs: Water & Light** How do plants and trees grow?	**K-LS1-1.** Use observations to describe patterns of what plants and animals (including humans) need to survive.	Planning and Carrying Out Investigations Analyzing and Interpreting Data	**LS1.C:** Organization for Matter and Energy Flow in Organisms	Patterns Cause and Effect
Lesson 3 	📖 **Human Impacts on the Environment** Why would you want an old log in your backyard?	**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.	Obtaining, Evaluating, and Communicating Information	**ESS3.C:** Human Impacts on Earth Systems	Cause and Effect

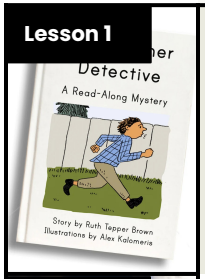
📖 Read-Along Lesson

Severe Weather Unit (Wild Weather)

	Topic & Guiding Question	NGSS Performance Expectations (PEs)	Science & Eng. Practices (SEPs)	Disciplinary Core Ideas (DCIs)	Crosscutting Concepts (CCCs)
Lesson 1 	📖 **Severe Weather & Preparation** How can you get ready for a big storm?	**K-ESS3-2.** Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather.	Obtaining, Evaluating, and Communicating Information	**ESS3.B:** Natural Hazards **ESS2.D:** Weather and Climate	Cause and Effect
Lesson 2 	**Wind & Storms** Have you ever watched a storm?	**K-ESS3-2.** Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather.	Asking Questions and Defining Problems Obtaining, Evaluating, and Communicating Information	**ESS3.B:** Natural Hazards **ESS2.D:** Weather and Climate	Cause and Effect
Lesson 3 	**Weather Conditions** How many different kinds of weather are there?	**K-ESS2-1.** Use and share observations of local weather conditions to describe patterns over time.	Analyzing and Interpreting Data	**ESS2.D:** Weather and Climate	Patterns

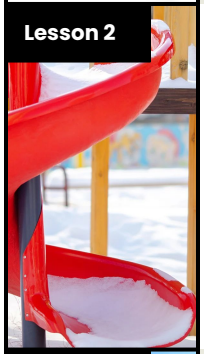
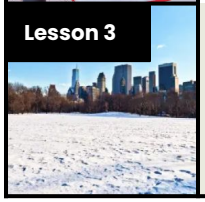
📖 Read-Along Lesson

Weather Patterns Unit (Circle of Seasons)

	Topic & Guiding Question	NGSS Performance Expectations (PEs)	Science & Eng. Practices (SEPs)	Disciplinary Core Ideas (DCIs)	Crosscutting Concepts (CCCs)
Lesson 1 	📖 **Daily Weather Patterns** How do you know what to wear for the weather?	**Foundational for K-ESS2-1.** Use and share observations of local weather conditions to describe patterns over time.	Analyzing and Interpreting Data Obtaining, Evaluating, and Communicating Information Asking Questions and Defining Problems	**ESS2.D:** Weather and Climate	Patterns
Lesson 2 	**Seasonal Weather Patterns** What will the weather be like on your birthday?	**K-ESS2-1.** Use and share observations of local weather conditions to describe patterns over time.	Obtaining, Evaluating, and Communicating Information Engaging in Argument from Evidence	**ESS2.D:** Weather and Climate	Patterns Systems and System Models
Lesson 3 	**Animals Changing their Environment** Why do birds lay eggs in the spring?	**K-ESS2-2.** Construct an argument supported by evidence for how plants & animals (including humans) can change the environment to meet their needs. **K-ESS2-1.** Use and share observations of local weather conditions to describe patterns over time.	Developing and Using Models	**ESS2.D:** Weather and Climate **ESS2.E:** Biogeology	Structure and Function

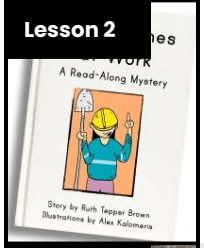
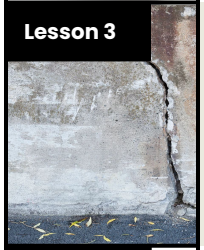
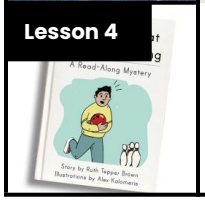
📖 Read-Along Lesson

Sunlight & Warmth Unit (Sunny Skies)

	Topic & Guiding Question	NGSS Performance Expectations (PEs)	Science & Eng. Practices (SEPs)	Disciplinary Core Ideas (DCIs)	Crosscutting Concepts (CCCs)
Lesson 1 	📖 **Sunlight, Heat, & Earth's Surface** How could you walk barefoot across hot pavement without burning your feet?	**K-PS3-1.** Make observations to determine the effect of sunlight on Earth's surface. **K-PS3-2.** Use tools and materials to design and build a structure that will reduce the warming effect of sunlight on an area. **K-2-ETS1-1.** Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.	Asking Questions and Defining Problems Constructing Explanations and Designing Solutions	**PS3.B:** Conservation of Energy and Energy Transfer **ETS1.A:** Defining and Delimiting an Engineering Problem	Cause and Effect Structure and Function
Lesson 2 	**Sunlight, Warming, & Engineering** How could you warm up a frozen playground?	**K-PS3-2.** Use tools and materials to design and build a structure that will reduce the warming effect of sunlight on an area. **K-2-ETS1-1.** Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool. **K-2-ETS1-3.** Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.	Asking Questions and Defining Problems Planning and Carrying Out Investigations Constructing Explanations and Designing Solutions	**PS3.B:** Conservation of Energy and Energy Transfer **ETS1.A:** Defining and Delimiting an Engineering Problem **ETS1.C:** Optimizing the Design Solution	Cause and Effect
Lesson 3 	**Sunlight & Warmth** Why does it get cold in winter?	**K-PS3-1.** Make observations to determine the effect of sunlight on Earth's surface.	Planning and Carrying Out Investigations	**PS3.B:** Conservation of Energy and Energy Transfer	Cause and Effect

📖 Read-Along Lesson

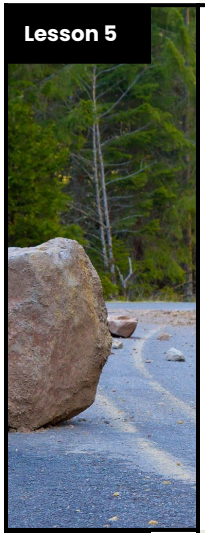
Pushes & Pulls Unit (Force Olympics) • Page 1 of 2

	Topic & Guiding Question	NGSS Performance Expectations (PEs)	Science & Eng. Practices (SEPs)	Disciplinary Core Ideas (DCIs)	Crosscutting Concepts (CCCs)
 **Lesson 1**	**Pushes & Pulls** What's the biggest excavator?	**Foundational for K-PS2-1.** Plan & conduct an investigation to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object.	Constructing Explanations and Designing Solutions	**PS2.A:** Forces and Motion **PS2.B:** Types of Interactions **PS3.C:** Relationship Between Energy and Forces	Cause and Effect
 **Lesson 2**	📖 **Pushes, Pulls, & "Work Words"** Why do builders need so many big machines?	**Foundational for K-PS2-1.** Plan & conduct an investigation to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object.	Obtaining, Evaluating, and Communicating Information	**PS2.A:** Forces and Motion **PS2.B:** Types of Interactions **PS3.C:** Relationship Between Energy and Forces	Cause and Effect
 **Lesson 3**	**Motion, Speed, & Strength** How can you knock down a wall made of concrete?	**K-PS2-1.** Plan & conduct an investigation to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object.	Planning and Carrying Out Investigations Developing and Using Models	**PS2.A:** Forces and Motion **PS2.B:** Types of Interactions **PS3.C:** Relationship Between Energy and Forces	Cause and Effect
 **Lesson 4**	📖 **Speed & Direction of Force** How can you knock down the most bowling pins?	**Foundational for K-PS2-2.** Analyze data to determine if a design solution works as intended to change the speed or direction of an object with a push or a pull.	Planning and Carrying Out Investigations	**PS2.A:** Forces and Motion	Cause and Effect

Continued on next page

📖 Read-Along Lesson

Pushes & Pulls Unit (Force Olympics) • Page 2 of 2

	Topic & Guiding Question	NGSS Performance Expectations (PEs)	Science & Eng. Practices (SEPs)	Disciplinary Core Ideas (DCIs)	Crosscutting Concepts (CCCs)
Lesson 5 	**Direction of Motion & Engineering** How can we protect a mountain town from falling rocks?	**K-PS2-2.** Analyze data to determine if a design solution works as intended to change the speed or direction of an object with a push or a pull. **K-2-ETS1-1.** Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool. **K-2-ETS1-2.** Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem. **K-2-ETS1-3.** Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.	Developing and Using Models Planning and Carrying Out Investigations Constructing Explanations and Designing Solutions	**PS2.A:** Forces and Motion **ETS1.A:** Defining Engineering Problems **ETS1.B:** Developing Possible Solutions **ETS1.C:** Optimizing the Design Solution	Cause and Effect
Lesson 6 	📖 **Forces & Engineering** How could you invent a trap?	**Foundational for K-2-ETS1-2.** Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.	Constructing Explanations and Designing Solutions	**ETS1.B:** Developing Possible Solutions	Structure and Function

📖 Read-Along Lesson

All 1st Grade Units • Units may be taught in any order

Page 12 • Web Link

NGSS Performance Expectations:

- 1-LS1-1
- 1-LS1-2
- 1-LS3-1

Unit Breakdown:

- 5 Lessons & Activities
- 5 Lesson Assessments
- 5 Extension Blocks

Anchor Layer Adds:
- 1 Anchor Phenomena
- 5 Anchor Connections
- 1 Performance Task

Page 13 • Web Link

NGSS Performance Expectations:

- 1-LS1-1
- 1-LS3-1
- K-2-ETS1-1
- K-2-ETS1-2
- K-2-ETS1-3

Unit Breakdown:

- 3 Lessons & Activities
- 3 Lesson Assessments
- 3 Extension Blocks

Anchor Layer Adds:
- 1 Anchor Phenomena
- 3 Anchor Connections
- 1 Performance Task

Page 14 • Web Link

NGSS Performance Expectations:

- 1-ESS1-1
- 1-ESS1-2

Unit Breakdown:

- 4 Lessons & Activities
- 4 Lesson Assessments
- 4 Extension Blocks

Anchor Layer Adds:
- 1 Anchor Phenomena
- 4 Anchor Connections
- 1 Performance Task

Page 15 • Web Link

NGSS Performance Expectations:

- 1-ESS1-1

Unit Breakdown:

- 3 Lessons & Activities
- 3 Lesson Assessments
- 3 Extension Blocks

Anchor Layer Adds:
- 1 Anchor Phenomena
- 3 Anchor Connections
- 1 Performance Task

Page 16 • Web Link

NGSS Performance Expectations:

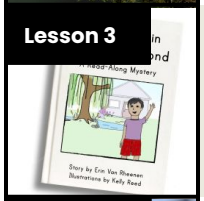
- 1-PS4-1
- 1-PS4-2
- 1-PS4-3
- 1-PS4-4
- K-2-ETS1-2

Unit Breakdown:

- 6 Lessons & Activities
- 6 Lesson Assessments
- 6 Extension Blocks

Anchor Layer Adds:
- 1 Anchor Phenomena
- 6 Anchor Connections
- 1 Performance Task

Animal Traits & Survival Unit (Animal Superpowers)

	Topic & Guiding Question	NGSS Performance Expectations (PEs)	Science & Eng. Practices (SEPs)	Disciplinary Core Ideas (DCIs)	Crosscutting Concepts (CCCs)
Lesson 1 	**Parent & Offspring Traits** How can you help a lost baby animal find its 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.	Constructing Explanations and Designing Solutions	**LS3.A:** Inheritance of Traits **LS3.B:** Variation of Traits	Patterns
Lesson 2 	**Animal Structures & Survival** Why do birds have beaks?	**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.	Developing and Using Models Planning and Carrying Out Investigations Analyzing and Interpreting Data	**LS1.A:** Structure and Function	Patterns Structure and function
Lesson 3 	📖 **Animal Behavior & Offspring Survival** Why do baby ducks follow their mother?	**1-LS1-2.** Read texts and use media to determine patterns in behavior of parents and offspring that help offspring survive.	Obtaining, Evaluating, and Communicating Information	**LS1.B:** Growth and Development of Organisms	Patterns
Lesson 4 	**Camouflage & Animal Survival** Why are polar bears white?	**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.	Developing and Using Models Planning and Carrying Out Investigations Engaging in Argument from Evidence	**LS1.B:** Growth and Development of Organisms	Patterns Structure and function
Lesson 5 	📖 **Inheritance & Variation of Traits** Why do family members look alike?	**Foundational for 1-LS3-1.** Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents.	Constructing Explanations and Designing Solutions	**LS3.A:** Inheritance of Traits **LS3.B:** Variation of Traits	Patterns

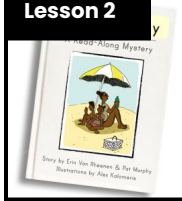
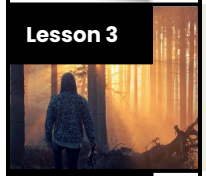
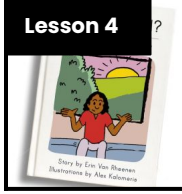
📖 Read-Along Lesson

Plant Traits & Survival Unit (Plant Superpowers)

	Topic & Guiding Question	NGSS Performance Expectations (PEs)	Science & Eng. Practices (SEPs)	Disciplinary Core Ideas (DCIs)	Crosscutting Concepts (CCCs)
Lesson 1 	**Plant Traits & Offspring** What will a baby plant look like when it grows up?	**1-LS3-1.** Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents.	Constructing Explanations and Designing Solutions	**LS3.A:** Inheritance of Traits **LS3.B:** Variation of Traits	Patterns
Lesson 2 	**Plant Survival & Engineering** Why don't trees blow down in the wind?	**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. **K-2-ETS1-1.** Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool. **K-2-ETS1-2.** Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem. **K-2-ETS1-3.** Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.	Developing and Using Models Planning and Carrying Out Investigations Constructing Explanations and Designing Solutions	**LS1.A:** Structure and Function **ETS1.A:** Defining and Delimiting Engineering Problems **ETS1.B:** Developing Possible Solutions **ETS1.C:** Optimizing the Design Solution	Structure and function
Lesson 3 	📖 **Plant Movement & Survival** What do sunflowers do when you're not looking?	**Foundational for 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.	Constructing Explanations and Designing Solutions	**LS1.A:** Structure and Function **LS1.D:** Information Processing	Structure and function

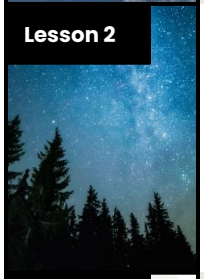
📖 Read-Along Lesson

Day Patterns Unit (Sun & Shadows)

	Topic & Guiding Question	NGSS Performance Expectations (PEs)	Science & Eng. Practices (SEPs)	Disciplinary Core Ideas (DCIs)	Crosscutting Concepts (CCCs)
Lesson 1 	**Sun, Shadows, & Daily Patterns** Could a statue's shadow move?	**1-ESS1-1.** Use observations of the sun, moon, and stars to describe patterns that can be predicted.	Planning and Carrying Out Investigations Analyzing and Interpreting Data	**ESS1.A:** The Universe and its Stars	Patterns
Lesson 2 	📖 **Sun, Shadows, & Daily Patterns** What does your shadow do when you're not looking?	**Foundational for 1-ESS1-1.** Use observations of the sun, moon, and stars to describe patterns that can be predicted.	Analyzing and Interpreting Data	**ESS1.A:** The Universe and its Stars	Patterns
Lesson 3 	**Sun & Daily Patterns** How can the Sun help you if you're lost?	**1-ESS1-1.** Use observations of the sun, moon, and stars to describe patterns that can be predicted.	Developing and Using Models Engaging in Argument from Evidence	**ESS1.A:** The Universe and its Stars	Patterns
Lesson 4 	📖 **Daylight & Seasonal Patterns** Why do you have to go to bed early in the summer?	**1-ESS1-2.** Make observations at different times of year to relate the amount of daylight to the time of year.	Obtaining, Evaluating, and Communicating Information	**ESS1.B:** Earth and the Solar System	Patterns

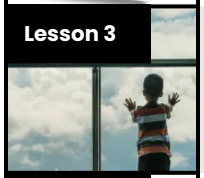
📖 Read-Along Lesson

Night Patterns Unit (Moon & Stars)

	Topic & Guiding Question	NGSS Performance Expectations (PEs)	Science & Eng. Practices (SEPs)	Disciplinary Core Ideas (DCIs)	Crosscutting Concepts (CCCs)
Lesson 1 	**Moon Phases & Patterns** When can you see the full moon?	**1-ESS1-1.** Use observations of the sun, moon, and stars to describe patterns that can be predicted.	Analyzing and Interpreting Data	**ESS1.A:** The Universe and its Stars	Patterns
Lesson 2 	**Stars & Daily Patterns** Why do stars come out at night?	**1-ESS1-1.** Use observations of the sun, moon, and stars to describe patterns that can be predicted.	Developing and Using Models Planning and Carrying Out Investigations Constructing Explanations and Designing Solutions	**ESS1.A:** The Universe and its Stars	Patterns Cause and Effect
Lesson 3 	📖 **Stars & Seasonal Patterns** How can stars help you if you get lost?	**1-ESS1-1.** Use observations of the sun, moon, and stars to describe patterns that can be predicted.	Obtaining, Evaluating, and Communicating Information	**ESS1.A:** The Universe and its Stars	Patterns

📖 Read-Along Lesson

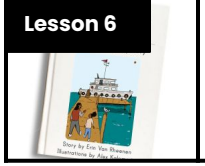
Light, Sound, & Communication Unit (Lights & Sounds) • Page 1 of 2

	Topic & Guiding Question	NGSS Performance Expectations (PEs)	Science & Eng. Practices (SEPs)	Disciplinary Core Ideas (DCIs)	Crosscutting Concepts (CCCs)
Lesson 1 	**Sounds & Vibrations** How do they make silly sounds in cartoons?	**1-PS4-1.** Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate.	Constructing Explanations and Designing Solutions	**PS4.A:** Wave Properties	Cause and Effect
Lesson 2 	📖 **Sounds & Vibrations** Where do sounds come from?	**Foundational for 1-PS4-1.** Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate.	Constructing Explanations and Designing Solutions	**PS4.A:** Wave Properties	Cause and Effect
Lesson 3 	**Light, Materials, Transparent & Opaque** What if there were no windows?	**1-PS4-3.** Plan and conduct an investigation to determine the effect of placing objects made with different materials in the path of a beam of light	Planning and Carrying Out Investigations Engaging in Argument from Evidence	**PS4.B:** Electromagnetic Radiation	Cause and Effect
Lesson 4 	📖 **Light & Illumination** Can you see in the dark?	**1-PS4-2.** Make observations to construct an evidence-based account that objects can be seen only when illuminated.	Planning and Carrying Out Investigations Constructing Explanations and Designing Solutions	**PS4.B:** Electromagnetic Radiation	Cause and Effect

Continued on next page

📖 Read-Along Lesson

Light, Sound, & Communication Unit (Lights & Sounds) • Page 2 of 2

	Topic & Guiding Question	NGSS Performance Expectations (PEs)	Science & Eng. Practices (SEPs)	Disciplinary Core Ideas (DCIs)	Crosscutting Concepts (CCCs)
Lesson 5 	**Light, Communication, & Engineering** How could you send a secret message to someone far away?	**1-PS4-4.** Use tools and materials to design and build a device that uses light or sound to solve the problem of communicating over a distance. **K-2-ETS1-2.** Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.	Constructing Explanations and Designing Solutions	**PS4.C:** Information Technologies and Instrumentation **ETS1.B:** Developing Possible Solutions	Patterns
Lesson 6 	📖 **Lights, Sounds, & Communication** How do boats find their way in the fog?	**Foundational for 1-PS4-4.** Use tools and materials to design and build a device that uses light or sound to solve the problem of communicating over a distance.	Obtaining, Evaluating, and Communicating Information	**PS4.C:** Information Technologies and Instrumentation	Patterns

📖 Read-Along Lesson

All 2nd Grade Units • Units may be taught in any order

Page 19 • Web Link

NGSS Performance Expectations:

- 2-LS4-1
- K-2-ETS1-1
- K-2-ETS1-2
- K-2-ETS1-3

Unit Breakdown:

- 4 Lessons & Activities
- 4 Lesson Assessments
- 4 Extension Blocks
- 1 Unit Assessment

Anchor Layer Adds:
- 1 Anchor Phenomena
- 4 Anchor Connections
- 1 Performance Task

⭐

Page 20 • Web Link

NGSS Performance Expectations:

- 2-LS2-1
- 2-LS2-2
- 2-LS4-1
- K-2-ETS1-2
- K-2-ETS1-3

Unit Breakdown:

- 5 Lessons & Activities
- 4 Lesson Assessments
- 5 Extension Blocks
- 1 Unit Assessment

Anchor Layer Adds:
- 1 Anchor Phenomena
- 4 Anchor Connections
- 1 Performance Task

Page 21 • Web Link

NGSS Performance Expectations:

- 2-ESS1-1
- 2-ESS2-1
- 2-ESS2-2
- 2-ESS2-3
- K-2-ETS1-1
- K-2-ETS1-2
- K-2-ETS1-3

Unit Breakdown:

- 5 Lessons & Activities
- 5 Lesson Assessments
- 5 Extension Blocks
- 1 Unit Assessment

Anchor Layer Adds:
- 1 Anchor Phenomena
- 4 Anchor Connections
- 1 Performance Task

Page 23 • Web Link

NGSS Performance Expectations:

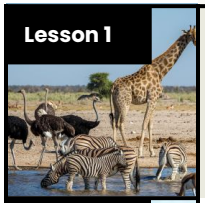
- 2-PS1-1
- 2-PS1-2
- 2-PS1-3
- 2-PS1-4
- K-2-ETS1-1
- K-2-ETS1-2
- K-2-ETS1-3

Unit Breakdown:

- 6 Lessons & Activities
- 6 Lesson Assessments
- 6 Extension Blocks
- 1 Unit Assessment

Anchor Layer Adds:
- 1 Anchor Phenomena
- 6 Anchor Connections
- 1 Performance Task

Animal Biodiversity (Animal Adventures)

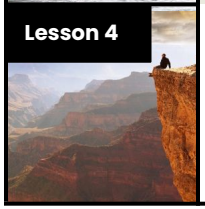
	Topic & Guiding Question	NGSS Performance Expectations (PEs)	Science & Eng. Practices (SEPs)	Disciplinary Core Ideas (DCIs)	Crosscutting Concepts (CCCs)
 Lesson 1	**Biodiversity & Classification** How many different kinds of animals are there?	**Foundational for 2-LS4-1.** Make observations of plants and animals to compare the diversity of life in different habitats.	Obtaining, Evaluating, and Communicating Information	**LS4.D:** Biodiversity and Humans	Patterns
 Lesson 2	**Habitat Diversity** Why would a wild animal visit a playground?	**2-LS4-1.** Make observations of plants and animals to compare the diversity of life in different habitats.	Analyzing and Interpreting Data Planning and Carrying Out Investigations	**LS4.D:** Biodiversity and Humans	Patterns
 Lesson 3	**Biodiversity, Habitats, & Species** Why do frogs say “ribbit”?	**2-LS4-1.** Make observations of plants and animals to compare the diversity of life in different habitats.	Analyzing and Interpreting Data Engaging in Argument from Evidence	**LS4.D:** Biodiversity and Humans	Patterns
 Lesson 4	**Biodiversity & Engineering** How could you get more birds to visit a bird feeder?	**K-2-ETS1-1.** Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool. **K-2-ETS1-2.** Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem. **K-2-ETS1-3.** Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.	Asking Questions and Defining Problems Constructing Explanations and Designing Solutions Developing and Using Models	**LS4.D:** Biodiversity and Humans	Cause and Effect

Plant Adaptations (Plant Adventures)

	Topic & Guiding Question	NGSS Performance Expectations (PEs)	Science & Eng. Practices (SEPs)	Disciplinary Core Ideas (DCIs)	Crosscutting Concepts (CCCs)
Lesson 1 	⭐ **Seed Dispersal** How did a tree travel halfway around the world?	**Foundational for 2-LS2-2.** Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants. **K-2-ETS1-2.** Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem. **K-2-ETS1-3.** Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.	Developing and Using Models Planning and Carrying Out Investigations	**LS2.A:** Interdependent Relationships in Ecosystems	Structure and Function
Lesson 2 	⭐ **Animal Seed Dispersal** Why do seeds have so many different shapes?	**2-LS2-2.** Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.	Developing and Using Models	**LS2.A:** Interdependent Relationships in Ecosystems	Structure and Function
Lesson 3 	**Water, Sunlight, & Plant Growth** Could a plant survive without light?	**2-LS2-1.** Plan and conduct an investigation to determine if plants need sunlight and water to grow.	Planning and Carrying Out Investigations Analyzing and Interpreting Data	**LS2.A:** Interdependent Relationships in Ecosystems	Cause and Effect
Lesson 4 	⭐ **Plant Needs & Habitats** How much water should you give a plant?	**2-LS2-1.** Plan and conduct an investigation to determine if plants need sunlight and water to grow.	Planning and Carrying Out Investigations	**LS2.A:** Interdependent Relationships in Ecosystems	Cause and Effect

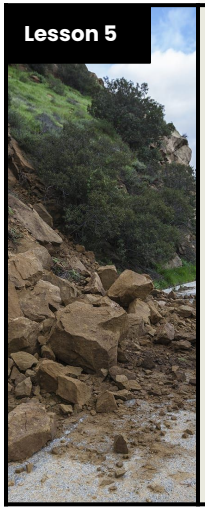
⭐ New Lesson
See all Content Updates

Erosion & Earth's Surface (Work of Water) • Page 1 of 2

	Topic & Guiding Question	NGSS Performance Expectations (PEs)	Science & Eng. Practices (SEPs)	Disciplinary Core Ideas (DCIs)	Crosscutting Concepts (CCCs)
Lesson 1 	**Mapping & Earth's Surface Features** If you floated down a river, where would you end up?	**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.	Developing and Using Models Planning and Carrying Out Investigations	**ESS2.B:** Plate Tectonics and Large-Scale System Interactions **ESS2.C:** The Roles of Water in Erosion & Earth's Surface	Patterns
Lesson 2 	**Rocks, Sand, & Erosion** Why is there 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.	Planning and Carrying Out Investigations Developing and Using Models	**ESS2.B:** Plate Tectonics and Large-Scale System Interactions	Cause and Effect Stability and Change
Lesson 3 	**Mapping & Severe Weather** Where do flash floods happen?	**2-ESS1-1.** Use information from several sources to provide evidence that Earth events can occur quickly or slowly. **2-ESS2-2.** Develop a model to represent the shapes and kinds of land and bodies of water in an area.	Developing and Using Models	**ESS2.B:** Plate Tectonics and Large-Scale System Interactions	Patterns
Lesson 4 	**Erosion, Earth's Surface, & Landforms** What's strong enough to make a canyon?	**2-ESS1-1.** Use information from several sources to provide evidence that Earth events can occur quickly or slowly.	Planning and Carrying Out Investigations Constructing Explanations and Designing Solutions	**ESS1.C:** The History of Planet Earth **ESS2.A:** Earth Materials and Systems	Cause and Effect Stability and Change

Continued on next page

Erosion & Earth's Surface (Work of Water) • Page 2 of 2

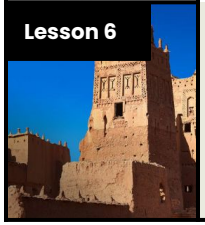
	Topic & Guiding Question	NGSS Performance Expectations (PEs)	Science & Eng. Practices (SEPs)	Disciplinary Core Ideas (DCIs)	Crosscutting Concepts (CCCs)
Lesson 5 	**Erosion & Engineering** How can you stop a landslide?	**2-ESS2-1.** Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land. **K-2-ETS1-1.** Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool. **K-2-ETS1-2.** Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem. **K-2-ETS1-3.** Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.	Asking Questions and Defining Problems Constructing Explanations and Designing Solutions	**ESS1.C:** The History of Planet Earth **ESS2.A:** Earth Materials and Systems **ETS1.A:** Defining and Delimiting Engineering Problems **ETS1.B:** Developing Possible Solutions **ETS1.C:** Optimizing the Design Solution	Stability and Change Structure and Function

Material Properties (Material Magic) • Page 1 of 2

	Topic & Guiding Question	NGSS Performance Expectations (PEs)	Science & Eng. Practices (SEPs)	Disciplinary Core Ideas (DCIs)	Crosscutting Concepts (CCCs)
Lesson 1 	**Material Properties & Engineering** Why do we wear clothes?	**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. **K-2-ETS1-1.** Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool. **K-2-ETS1-2.** Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.	Asking Questions and Defining Problems Planning and Carrying Out Investigations Constructing Explanations and Designing Solutions	**PS1.A:** Structure and Properties of Matter **ETS1.A:** Defining and Delimiting Engineering Problems **ETS1.B:** Developing Possible Solutions	Patterns Cause and Effect
Lesson 2 	**Classify Materials: Insulators** Can you really fry an egg on a hot sidewalk?	**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.	Planning and Carrying Out Investigations Analyzing and Interpreting Data	**PS1.A:** Structure and Properties of Matter	Patterns Cause and Effect
Lesson 3 	**Heating, Cooling, & Phases of Matter** Why are so many toys made out of plastic?	**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.	Planning and Carrying Out Investigations Analyzing and Interpreting Data	**PS1.A:** Structure and Properties of Matter **PS1.B:** Chemical Reactions	Cause and Effect Energy and Matter
Lesson 4 	**Inventions & Engineering** What materials might be invented in the future?	**K-2-ETS1-1.** Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.	Constructing Explanations and Designing Solutions	**ETS1.B:** Developing Possible Solutions	Structure and Function

Continued on next page

Material Properties (Material Magic) • Page 2 of 2

	Topic & Guiding Question	NGSS Performance Expectations (PEs)	Science & Eng. Practices (SEPs)	Disciplinary Core Ideas (DCIs)	Crosscutting Concepts (CCCs)
Lesson 5 	**Materials, Properties, & Engineering** Could you build a house out of paper?	**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. **K-2-ETS1-3.** Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.	Constructing Explanations and Designing Solutions Developing and Using Models	**PS1.A:** Structure and Properties of Matter **ETS1.B:** Developing Possible Solutions **ETS1.C:** Optimizing the Design Solution	Energy and Matter Cause and Effect
Lesson 6 	**Soil Properties** How do you build a city out of mud?	**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.	Planning and Carrying Out Investigations Analyzing and Interpreting Data	**PS1.A:** Structure and Properties of Matter	Patterns

All 3rd Grade Units • Units may be taught in any order. *Note: 3rd Grade underwent a restructuring Summer 2023.*

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Page 26 • Web Link

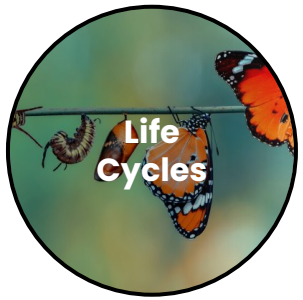
NGSS Performance Expectations:

• 3-LS4-1

Unit Breakdown:

• 3 Lessons & Activities
• 3 Lesson Assessments
• 2 Extension Blocks

Anchor Layer Adds:
• 1 Anchor Phenomena
• 3 Anchor Connections
• 1 Performance Task



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Page 27 • Web Link

NGSS Performance Expectations:

• 3-LS1-1
• 3-LS4-4
• 3-5-ETS1-2

Unit Breakdown:

• 5 Lessons & Activities
• 5 Lesson Assessments
• 5 Extension Blocks

Anchor Layer Adds:
• 1 Anchor Phenomena
• 5 Anchor Connections
• 1 Performance Task

✔ ⭐

Page 28 • Web Link

NGSS Performance Expectations:

• 3-LS2-1
• 3-LS3-1
• 3-LS3-2
• 3-LS4-2
• 3-LS4-3

Unit Breakdown:

• 5 Lessons & Activities
• 5 Lesson Assessments
• 5 Extension Blocks

Anchor Layer will be added to this unit in the 2023-2024 school year.

Page 30 • Web Link

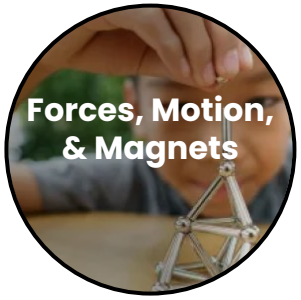
NGSS Performance Expectations:

• 3-ESS2-1
• 3-ESS2-2
• 3-ESS3-1
• 3-5-ETS1-1
• 3-5-ETS1-2
• 3-5-ETS1-3

Unit Breakdown:

• 5 Lessons & Activities
• 5 Lesson Assessments
• 5 Extension Blocks

Anchor Layer Adds:
• 1 Anchor Phenomena
• 5 Anchor Connections
• 1 Performance Task



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Page 32 • Web Link

NGSS Performance Expectations:

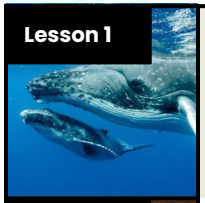
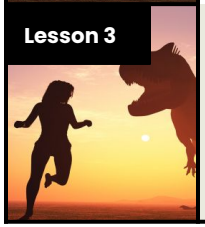
• 3-PS2-1
• 3-PS2-2
• 3-PS2-3
• 3-PS2-4
• 3-5-ETS1-1
• 3-5-ETS1-2
• 3-5-ETS1-3

Unit Breakdown:

• 6 Lessons & Activities
• 6 Lesson Assessments
• 6 Extension Blocks

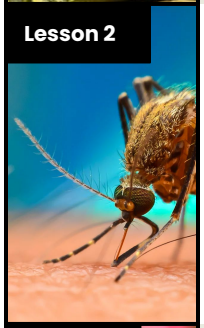
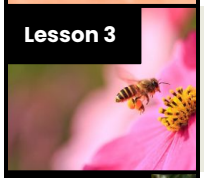
Anchor Layer Adds:
• 1 Anchor Phenomena
• 6 Anchor Connections
• 1 Performance Task

✔ Fossils & Changing Environments Unit (Animals Through Time)

	Topic & Guiding Question	NGSS Performance Expectations (PEs)	Science & Eng. Practices (SEPs)	Disciplinary Core Ideas (DCIs)	Crosscutting Concepts (CCCs)
	**Habitats, Fossils, & Environments Over Time** Where can you find whales in a desert?	**3-LS4-1.** Analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago.	Analyzing and Interpreting Data	**LS4.A:** Evidence of Common Ancestry and Diversity	Scale, Proportion, and Quantity
	⭐ **Fossil Evidence & Dinosaurs** How do we know what dinosaurs looked like?	**3-LS4-1.** Analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago.	Analyzing and Interpreting Data Engaging in Argument from Evidence	**LS4.A:** Evidence of Common Ancestry and Diversity	Structure and Function Patterns
	**Trace Fossil Evidence & Animal Movement** Can you outrun a dinosaur?	**3-LS4-1.** Analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago.	Using Mathematics and Computational Thinking Planning and Carrying Out Investigations	**LS4.A:** Evidence of Common Ancestry and Diversity	Patterns

⭐ New Lesson
✔ Unit Restructured for the 2023-2024 School Year
See all Content Updates

✔ Life Cycles Unit (Circle of Life) • Page 1 of 2

	Topic & Guiding Question	NGSS Performance Expectations (PEs)	Science & Eng. Practices (SEPs)	Disciplinary Core Ideas (DCIs)	Crosscutting Concepts (CCCs)
 Lesson 1	**Animal Life Cycles** How is your life like an alligator's life?	**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.	Developing and Using Models	**LS1.B:** Growth and Development of Organisms	Patterns
 Lesson 2	**Environmental Change & Engineering** What's the best way to get rid of mosquitoes?	**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. **3-5-ETS1-2.** Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.	Obtaining, Evaluating, and Communicating Information Constructing Explanations and Designing Solutions	**LS4.D** Biodiversity and Humans **LS2.C:** Ecosystem Dynamics, Functioning, & Resilience **ETS1.B:** Developing Possible Solutions	Cause and Effect Systems and System Models
 Lesson 3	**Pollination & Plant Reproduction** Why do plants grow flowers?	**Foundational for 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.	Developing and Using Models Analyzing and Interpreting Data	**LS1.B:** Growth and Development of Organisms	Patterns Structure and Function
 Lesson 4	**Fruit, Seeds, & Plant Reproduction** Why do plants give us fruit?	**Foundational for 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.	Analyzing and Interpreting Data	**LS1.B:** Growth and Development of Organisms	Patterns Structure and Function
 Lesson 5	**Plant Life Cycles** Why are there so many different kinds of flowers?	**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.	Developing and Using Models	**LS1.B:** Growth and Development of Organisms	Patterns

✔ Unit Restructured for the 2023-2024 School Year
See all Content Updates

✔⭐ Heredity, Survival, & Selection Unit (Fates of Traits) • Page 1 of 2

	Topic & Guiding Question	NGSS Performance Expectations (PEs)	Science & Eng. Practices (SEPs)	Disciplinary Core Ideas (DCIs)	Crosscutting Concepts (CCCs)
Lesson 1 	**Trait Variation, Inheritance, & Artificial Selection** How could you make the biggest fruit in the world?	**3-LS3-1.** 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.	Analyzing and Interpreting Data	**LS3.A:** Inheritance of Traits **LS3.B:** Variation of Traits	Patterns
Lesson 2 	**Trait Variation, Inheritance, & Artificial Selection** What kinds of animals might there be in the future?	**3-LS3-1.** 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.	Constructing Explanations and Designing Solutions	**LS3.A:** Inheritance of Traits **LS3.B:** Variation of Traits	Patterns
Lesson 3 	**Trait Variation, Natural Selection, & Survival** Can selection happen without people?	**3-LS3-1.** 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-LS4-2.** Use evidence to construct an explanation for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing. **3-LS4-3.** Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.	Planning and Carrying Out Investigations Analyzing and Interpreting Data Engaging in Argument from Evidence	**LS3.A:** Inheritance of Traits **LS3.B:** Variation of Traits **LS4.B:** Natural Selection **LS4.C:** Adaptation	Cause and Effect Systems and System Models Stability and Change

Continued on next page

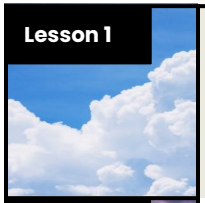
⭐ New Unit
✔ Unit Restructured for the 2023-2024 School Year
See all Content Updates

✔⭐ Heredity, Survival, & Selection Unit (Fates of Traits) • Page 2 of 2

	Topic & Guiding Question	NGSS Performance Expectations (PEs)	Science & Eng. Practices (SEPs)	Disciplinary Core Ideas (DCIs)	Crosscutting Concepts (CCCs)
Lesson 4 	**Animal Groups & Survival** Why do dogs wag their tails?	**3-LS2-1.** Construct an argument that some animals form groups that help members survive.	Obtaining, Evaluating, and Communicating Information Engaging in Argument from Evidence	**LS2.D:** Social Interactions and Group Behavior	Cause and Effect
Lesson 5 	**Traits & Environmental Variation** How long can people (and animals) survive in outer space?	**3-LS3-2.** Use evidence to support the explanation that traits can be influenced by the environment.	Constructing Explanations and Designing Solutions	**LS3.A:** Inheritance of Traits **LS3.B:** Variation of Traits	Cause and Effect

⭐ New Unit
✔ Unit Restructured for the 2023-2024 School Year
See all Content Updates

Weather & Climate Unit (Stormy Skies) • Page 1 of 2

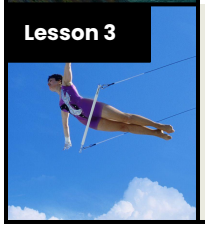
	Topic & Guiding Question	NGSS Performance Expectations (PEs)	Science & Eng. Practices (SEPs)	Disciplinary Core Ideas (DCIs)	Crosscutting Concepts (CCCs)
 **Lesson 1**	**Water Cycle & States of Matter** Where do clouds come from?	**Foundational for 3-ESS2-1.** Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season.	Planning and Carrying Out Investigations Developing and Using Models	**ESS2.D:** Weather and Climate	Structure and Function Stability and Change
 **Lesson 2**	**Local Weather Patterns & Weather Prediction** How can we predict when it's going to storm?	**Foundational for 3-ESS2-1.** Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season.	Analyzing and Interpreting Data	**ESS2.D:** Weather and Climate	Patterns
 **Lesson 3**	**Seasonal Weather Patterns** Where's the best place to build a snow fort?	**3-ESS2-1.** Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season.	Analyzing and Interpreting Data	**ESS2.D:** Weather and Climate	Patterns

Continued on next page

Weather & Climate Unit (Stormy Skies) • Page 2 of 2

	Topic & Guiding Question	NGSS Performance Expectations (PEs)	Science & Eng. Practices (SEPs)	Disciplinary Core Ideas (DCIs)	Crosscutting Concepts (CCCs)
Lesson 4 	**Climate & Global Weather Patterns** Why are some places always hot?	**3-ESS2-2.** Obtain and combine information to describe climates in different regions of the world. **3-ESS2-1.** Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season.	Obtaining, Evaluating, and Communicating Information Analyzing and Interpreting Data	**ESS2.D:** Weather and Climate	Patterns
Lesson 5 	**Natural Hazards & Engineering** How can you keep a house from blowing away in a windstorm?	**3-ESS3-1.** Make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard. **3-5-ETS1-1.** Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost. **3-5-ETS1-2.** Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem. **3-5-ETS1-3.** Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.	Asking Questions and Defining Problems Constructing Explanations and Designing Solutions Analyzing and Interpreting Data	**ESS3.B:** Natural Hazards **ETS1.A:** Defining and Delimiting Engineering Problems **ETS1.B:** Developing Possible Solutions **ETS1.C:** Optimizing the Design Solution	Cause and Effect

Forces, Motion, & Magnets Unit (Invisible Forces) • Page 1 of 2

	Topic & Guiding Question	NGSS Performance Expectations (PEs)	Science & Eng. Practices (SEPs)	Disciplinary Core Ideas (DCIs)	Crosscutting Concepts (CCCs)
 Lesson 1	**Balanced & Unbalanced Forces** How could you win a tug-of-war against a bunch of adults?	**3-PS2-1.** Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.	Planning and Carrying Out Investigations Constructing Explanations and Designing Solutions	**PS2.A:** Forces and Motion **PS2.B:** Types of Interactions	Cause and Effect
 Lesson 2	**Balanced Forces & Engineering** What makes bridges so strong?	**3-5-ETS1-1.** Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost. **3-5-ETS1-2.** Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem. **3-5-ETS1-3.** Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.	Asking Questions and Defining Problems Constructing Explanations and Designing Solutions	**ETS1.A:** Defining and Delimiting Engineering Problems **ETS1.B:** Developing Possible Solutions **ETS1.C:** Optimizing the Design Solution	Structure and Function
 Lesson 3	⭐ **Patterns of Motion, Gravity, & Friction** How high can you swing on a flying trapeze?	**3-PS2-2.** Make observations and/or measurements of an object's motion to provide evidence that a pattern can be used to predict future motion.	Developing and Using Models Planning and Carrying Out Investigations	**PS2.A:** Forces and Motion	Patterns Cause and Effect

Continued on next page

⭐ New Lesson
See all Content Updates

Forces, Motion, & Magnets Unit (Invisible Forces) • Page 2 of 2

	Topic & Guiding Question	NGSS Performance Expectations (PEs)	Science & Eng. Practices (SEPs)	Disciplinary Core Ideas (DCIs)	Crosscutting Concepts (CCCs)
 **Lesson 4**	**Magnets & Forces** What can magnets do?	**3-PS2-3.** Ask questions to determine cause and effect relationships of electric or magnetic interactions between two objects not in contact with each other.	Asking Questions and Defining Problems	**PS2.B:** Types of Interactions	Cause and Effect
 **Lesson 5**	**Magnets & Engineering** How can you unlock a door using a magnet?	**3-PS2-4.** Define a simple design problem that can be solved by applying scientific ideas about magnets. **3-5-ETS1-1.** Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost. **3-5-ETS1-2.** Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem. **3-5-ETS1-3.** Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.	Asking Questions and Defining Problems Constructing Explanations and Designing Solutions	**PS2.B:** Types of Interactions **ETS1.A:** Defining and Delimiting Engineering Problems **ETS1.B:** Developing Possible Solutions **ETS1.C:** Optimizing the Design Solution	Cause and Effect

All 4th Grade Units • Units may be taught in any order

Page 35 • Web Link

NGSS Performance Expectations:

- 4-LS1-1
- 4-LS1-2
- 4-PS4-2

Unit Breakdown:

- 4 Lessons & Activities
- 4 Lesson Assessments
- 4 Extension Blocks
- 1 Unit Assessment

Anchor Layer Adds:
- 1 Anchor Phenomena
- 4 Anchor Connections
- 1 Performance Task

Page 36 • Web Link

NGSS Performance Expectations:

- 4-ESS1-1
- 4-ESS2-1
- 4-ESS2-2
- 4-ESS3-2
- 3-5-ETS1-2

Unit Breakdown:

- 5 Lessons & Activities
- 5 Lesson Assessments
- 5 Extension Blocks
- 1 Unit Assessment

Anchor Layer Adds:
- 1 Anchor Phenomena
- 5 Anchor Connections
- 1 Performance Task

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Page 37 • Web Link

NGSS Performance Expectations:

- 4-PS4-1
- 4-PS4-3
- 3-5-ETS1-2
- 3-5-ETS1-3

Unit Breakdown:

- 4 Lessons & Activities
- 3 Lesson Assessments
- 3 Extension Blocks
- 1 Unit Assessment

Anchor Layer Adds:
- 1 Anchor Phenomena
- 3 Anchor Connections
- 1 Performance Task

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Page 38 • Web Link

NGSS Performance Expectations:

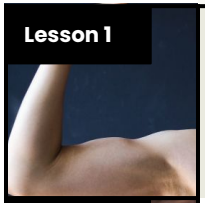
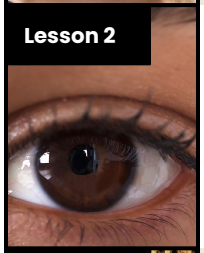
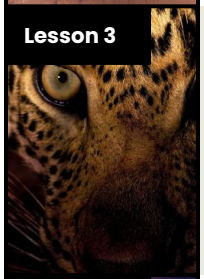
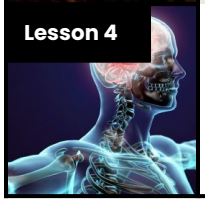
- 4-PS3-1
- 4-PS3-2
- 4-PS3-3
- 4-PS3-4
- 4-ESS3-1
- 3-5-ETS1-1
- 3-5-ETS1-2
- 3-5-ETS1-3

Unit Breakdown:

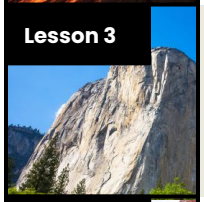
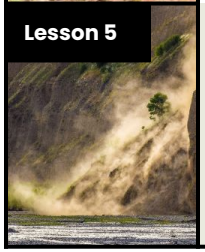
- 8 Lessons & Activities
- 8 Lesson Assessments
- 8 Extension Blocks
- 1 Unit Assessment

Anchor Layer Adds:
- 1 Anchor Phenomena
- 6 Anchor Connections
- 1 Performance Task

Human Body, Vision, & The Brain Unit (Human Machine)

	Topic & Guiding Question	NGSS Performance Expectations (PEs)	Science & Eng. Practices (SEPs)	Disciplinary Core Ideas (DCIs)	Crosscutting Concepts (CCCs)
 Lesson 1	**Muscles & Skeleton** Why do your biceps bulge?	**4-LS1-1.** Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.	Developing and Using Models Constructing Explanations and Designing Solutions	**LS1.A:** Structure and Function	Systems and System Models Cause and Effect
 Lesson 2	**Light, Eyes, & Vision** What do people who are blind see?	**4-LS1-1.** Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction. **4-PS4-2.** Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen.	Developing and Using Models Constructing Explanations and Designing Solutions	**LS1.A:** Structure and Function **PS4.B:** Electromagnetic Radiation	Systems and System Models Cause and Effect
 Lesson 3	**Structure & Function of Eyes** How can some animals see in the dark?	**4-LS1-1.** Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction. **4-PS4-2.** Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen.	Planning and Carrying Out Investigations Developing and Using Models Constructing Explanations and Designing Solutions	**LS1.A:** Structure and Function **PS4.B:** Electromagnetic Radiation	Systems and System Models Cause and Effect
 Lesson 4	**Brain, Nerves, & Information Processing** How does your brain control your body?	**4-LS1-2.** Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways.	Planning and Carrying Out Investigations Analyzing and Interpreting Data	**LS1.D:** Information Processing	Systems and System Models

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

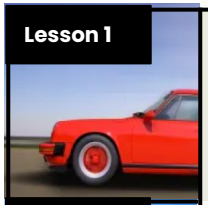
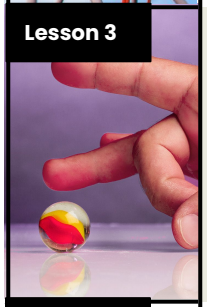
	Topic & Guiding Question	NGSS Performance Expectations (PEs)	Science & Eng. Practices (SEPs)	Disciplinary Core Ideas (DCIs)	Crosscutting Concepts (CCCs)
 Lesson 1	**Volcanoes & Patterns of Earth's Features** Could a volcano pop up where you live?	**4-ESS2-2.** Analyze and interpret data from maps to describe patterns of Earth's features.	Analyzing and Interpreting Data Engaging in Argument from Evidence	**ESS2.B:** Plate Tectonics and Large-Scale System Interactions	Patterns
 Lesson 2	**Volcanoes & Rock Cycle** Why do some volcanoes explode?	**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.	Constructing Explanations and Designing Solutions	**ESS1.C:** The History of Planet Earth	Cause and Effect
 Lesson 3	**Weathering & Erosion** Will a mountain last forever?	**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.	Planning and Carrying Out Investigations Analyzing and Interpreting Data	**ESS2.A:** Earth Materials and Systems **ESS2.E:** Biogeology	Cause and Effect
 Lesson 4	**Sedimentary Rock & Fossils** What did your town look like 100 million years ago?	**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.	Constructing Explanations and Designing Solutions Developing and Using Models	**ESS1.C:** The History of Planet Earth	Patterns
 Lesson 5	**Erosion, Natural Hazards, & Engineering** How could you survive a landslide?	**4-ESS3-2.** Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans. **3-5-ETS1-2.** Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.	Constructing Explanations and Designing Solutions	**ESS3.B:** Natural Hazards **ETS1.B:** Designing Solutions to Engineering Problems	Cause and Effect

Sound, Waves, & Communication Unit (Waves of Sound)

	Topic & Guiding Question	NGSS Performance Expectations (PEs)	Science & Eng. Practices (SEPs)	Disciplinary Core Ideas (DCIs)	Crosscutting Concepts (CCCs)
 Lesson 1	⭐ **Pattern Transfer & Technology** How do you send a secret code?	**4-PS4-3.** Generate and compare multiple solutions that use patterns to transfer information. **3-5-ETS1-3.** Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.	Constructing Explanations and Designing Solutions	**PS4.C:** Information Technologies and Instrumentation **ETS1.C:** Optimizing the Design Solution	Patterns
 Lesson 2	**Sound, Vibration, & Engineering** How far can a whisper travel?	**Foundational for 4-PS4-1.** Develop a model of waves to describe patterns in terms of amplitude and wavelength and that waves can cause objects to move. **3-5-ETS1-2.** Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.	Developing and Using Models Planning and Carrying Out Investigations	**PS4.A:** Wave Properties **ETS1.B:** Developing Possible Solutions	Patterns
 Lesson 3	**Sound & Vibrations** What would happen if you screamed in outer space?	**4-PS4-1.** Develop a model of waves to describe patterns in terms of amplitude and wavelength and that waves can cause objects to move.	Developing and Using Models	**PS4.A:** Wave Properties	Patterns
 Lesson 4	**Sound Waves & Wavelength** Why are some sounds high and some sounds low?	**4-PS4-1.** Develop a model of waves to describe patterns in terms of amplitude and wavelength and that waves can cause objects to move.	Developing and Using Models	**PS4.A:** Wave Properties	Patterns

⭐ New Lesson
See all Content Updates

Energy, Energy Transfer, & Electricity Unit (Energizing Everything) • Page 1 of 3

	Topic & Guiding Question	NGSS Performance Expectations (PEs)	Science & Eng. Practices (SEPs)	Disciplinary Core Ideas (DCIs)	Crosscutting Concepts (CCCs)
 Lesson 1	**Speed & Energy** How is your body similar to a car?	**4-PS3-1.** Use evidence to construct an explanation relating the speed of an object to the energy of that object.	Analyzing and Interpreting Data Constructing Explanations and Designing Solutions	**PS3.A:** Definitions of Energy	Energy and Matter Systems and System Models
 Lesson 2	**Gravitational Energy, Speed, & Collisions** What makes roller coasters go so fast?	**4-PS3-1.** Use evidence to construct an explanation relating the speed of an object to the energy of that object. **4-PS3-3.** Ask questions and predict outcomes about the changes in energy that occur when objects collide.	Developing and Using Models Analyzing and Interpreting Data	**PS3.A:** Definitions of Energy	Energy and Matter Systems and System Models
 Lesson 3	⭐ **Collisions & Energy Transfer** How can marbles save the world?	**4-PS3-3.** Ask questions and predict outcomes about the changes in energy that occur when objects collide.	Asking Questions and Defining Problems	**PS3.A:** Definitions of Energy **PS3.B:** Conservation of Energy and Energy Transfer **PS3.C:** Relationship Between Energy and Forces	Energy and Matter
 Lesson 4	**Energy Transfer & Engineering** Could you knock down a building using only dominoes?	**4-PS3-4.** Apply scientific ideas to design, test, and refine a device that converts energy from one form to another **3-5-ETS1-1.** Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.	Developing and Using Models	**PS3.B:** Conservation of Energy and Energy Transfer **PS3.C:** Relationship Between Energy and Forces **ETS1.A:** Defining and Delimiting Engineering Problems	Energy and Matter

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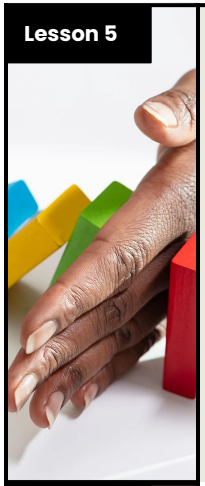
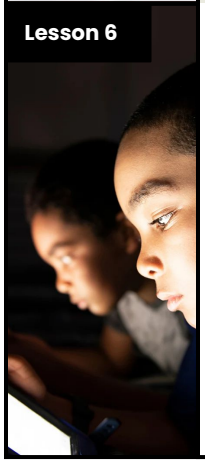
⭐ New Lesson
See all Content Updates

Energy, Energy Transfer, & Electricity Unit (Energizing Everything) • Page 2 of 3

	Topic & Guiding Question	NGSS Performance Expectations (PEs)	Science & Eng. Practices (SEPs)	Disciplinary Core Ideas (DCIs)	Crosscutting Concepts (CCCs)
Lesson 5 	**Energy Transfer & Engineering** Can you build a chain reaction machine?	**4-PS3-4.** Apply scientific ideas to design, test, and refine a device that converts energy from one form to another **3-5-ETS1-1.** Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost. **3-5-ETS1-2.** Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem. **3-5-ETS1-3.** Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.	Developing and Using Models	**PS3.A:** Definitions of Energy **PS3.C:** Relationship Between Energy and Forces **ETS1.A:** Defining and Delimiting Engineering Problems **ETS1.B:** Developing Possible Solutions **ETS1.C:** Optimizing the Design Solution	Energy and Matter
Lesson 6 	**Electrical Energy** What if there were no electricity?	**4-PS3-2.** Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents. **4-PS3-4.** Apply scientific ideas to design, test, and refine a device that converts energy from one form to another. **3-5-ETS1-1.** Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost. **3-5-ETS1-3.** Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.	Constructing Explanations and Designing Solutions Developing and Using Models	**PS3.D:** Energy in Chemical Processes and Everyday Life **ETS1.A:** Defining and Delimiting Engineering Problems **ETS1.B:** Developing Possible Solutions **ETS1.C:** Optimizing the Design Solution	Energy and Matter

Continued on next page

Energy, Energy Transfer, & Electricity Unit (Energizing Everything) • Page 3 of 3

	Topic & Guiding Question	NGSS Performance Expectations (PEs)	Science & Eng. Practices (SEPs)	Disciplinary Core Ideas (DCIs)	Crosscutting Concepts (CCCs)
Lesson 7 	**Heat Energy & Energy Transfer** How long did it take to travel across the country before cars and planes?	**4-PS3-2.** Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents. **4-PS3-4.** Apply scientific ideas to design, test, and refine a device that converts energy from one form to another	Planning and Carrying Out Investigations	**PS3.B:** Conservation of Energy and Energy Transfer **PS3.D:** Energy in Chemical Processes and Everyday Life	Energy and Matter
Lesson 8 	**Renewable Energy & Natural Resources** Where does energy come from?	**4-ESS3-1.** Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment.	Obtaining, Evaluating, and Communicating Information Using Mathematics and Computational Thinking	**ESS3.A:** Natural Resources	Energy and Matter Cause and Effect

mystery science

All 5th Grade Units • Units may be taught in any order

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Page 42 • Web Link

NGSS Performance Expectations:

- 5-LS1-1
- 5-LS2-1
- 5-ESS3-1
- 5-PS3-1

Unit Breakdown:

- 7 Lessons & Activities
- 7 Lesson Assessments
- 7 Extension Blocks
- 1 Unit Assessment

Anchor Layer Adds:
- 1 Anchor Phenomena
- 7 Anchor Connections
- 1 Performance Task

Page 44 • Web Link

NGSS Performance Expectations:

- 5-ESS2-1
- 5-ESS2-2
- 5-PS1-2
- 3-5-ETS1-1
- 3-5-ETS1-2
- 3-5-ETS1-3

Unit Breakdown:

- 5 Lessons & Activities
- 5 Lesson Assessments
- 5 Extension Blocks
- 1 Unit Assessment

Anchor Layer Adds:
- 1 Anchor Phenomena
- 5 Anchor Connections
- 1 Performance Task

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Page 45 • Web Link

NGSS Performance Expectations:

- 5-ESS1-1
- 5-ESS1-2
- 5-PS2-1

Unit Breakdown:

- 8 Lessons & Activities
- 8 Lesson Assessments
- 8 Extension Blocks
- 1 Unit Assessment

Anchor Layer Adds:
- 1 Anchor Phenomena
- 8 Anchor Connections
- 1 Performance Task

Page 47 • Web Link

NGSS Performance Expectations:

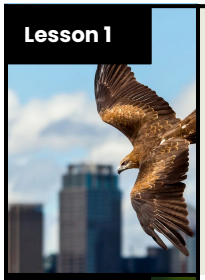
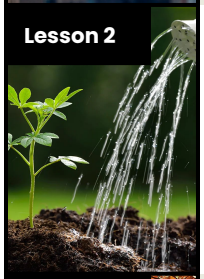
- 5-PS1-1
- 5-PS1-2
- 5-PS1-3
- 5-PS1-4

Unit Breakdown:

- 5 Lessons & Activities
- 5 Lesson Assessments
- 5 Extension Blocks
- 1 Unit Assessment

Anchor Layer Adds:
- 1 Anchor Phenomena
- 5 Anchor Connections
- 1 Performance Task

Ecosystems & The Food Web Unit (Web of Life) • Page 1 of 2

	Topic & Guiding Question	NGSS Performance Expectations (PEs)	Science & Eng. Practices (SEPs)	Disciplinary Core Ideas (DCIs)	Crosscutting Concepts (CCCs)
 Lesson 1	**Food Chains, Producers, & Consumers** Why would a hawk move to New York City?	**5-LS2-1.** Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.	Developing and Using Models	**LS2.A:** Interdependent Relationships in Ecosystems **LS2.B:** Cycles of Matter and Energy Transfer in Ecosystems	Energy and Matter Systems and System Models
 Lesson 2	**Matter & Plant Growth** What do plants eat?	**5-LS1-1.** Support an argument that plants get the materials they need for growth chiefly from air and water. **Foundational for 5-LS2-1.** Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.	Planning and Carrying Out Investigations Analyzing and Interpreting Data Constructing Explanations and Designing Solutions	**LS1.C.** Organization for Matter and Energy Flow in Organisms **LS2.B:** Cycles of Matter and Energy Transfer in Ecosystems	Cause and Effect Energy and Matter
 Lesson 3	**Decomposers & Matter Cycle** Where do fallen leaves go?	**5-LS2-1.** Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.	Planning and Carrying Out Investigations	**LS2.A:** Interdependent Relationships in Ecosystems **LS2.B:** Cycles of Matter and Energy Transfer in Ecosystems	Energy and Matter

Continued on next page

Ecosystems & The Food Web Unit (Web of Life) • Page 2 of 2

	Topic & Guiding Question	NGSS Performance Expectations (PEs)	Science & Eng. Practices (SEPs)	Disciplinary Core Ideas (DCIs)	Crosscutting Concepts (CCCs)
 Lesson 4	**Decomposers, Nutrients, & Matter Cycle** Do worms really eat dirt?	**5-LS2-1.** Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.	Planning and Carrying Out Investigations	**LS2.A:** Interdependent Relationships in Ecosystems **LS2.B:** Cycles of Matter and Energy Transfer in Ecosystems	Energy and Matter
 Lesson 5	**Ecosystems & Matter Cycle** Why do you have to clean a fish tank but not a pond?	**5-LS2-1.** Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.	Developing and Using Models	**LS2.A:** Interdependent Relationships in Ecosystems **LS2.B:** Cycles of Matter and Energy Transfer in Ecosystems	Systems and System Models Energy and Matter
 Lesson 6	⭐ **Protecting Environments** How can we protect Earth's environments?	**5-ESS3-1.** Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.	Obtaining, Evaluating, and Communicating Information	**ESS3.C:** Human Impacts on Earth Systems	Systems and System Models
 Lesson 7	**Food Webs & Flow of Energy** Why did the dinosaurs go extinct?	**5-PS3-1.** Use models to describe that energy in animals' food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun.	Developing and Using Models Constructing Explanations and Designing Solutions	**PS3.D:** Energy in Chemical Processes and Everyday Life **LS1.C.** Organization for Matter and Energy Flow in Organisms	Energy and Matter Systems and System Models

⭐ New Lesson
See all Content Updates

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

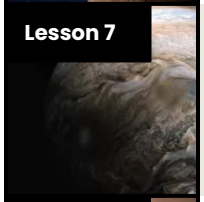
	Topic & Guiding Question	NGSS Performance Expectations (PEs)	Science & Eng. Practices (SEPs)	Disciplinary Core Ideas (DCIs)	Crosscutting Concepts (CCCs)
Lesson 1 	**Hydrosphere & Water Distribution** How much water is in the world?	**5-ESS2-2.** Describe and graph the amounts and percentages of water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth.	Analyzing and Interpreting Data Using Mathematics and Computational Thinking	**ESS2.C:** The Roles of Water in Earth's Surface Processes	Scale, Proportion, and Quantity
Lesson 2 	**Mixtures & Solutions** How much salt is in the ocean?	**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.	Developing and Using Models Using Mathematics and Computational Thinking	**PS1.A**: Structure and Properties of Matter	Scale, Proportion, and Quantity
Lesson 3 	**Groundwater as a Natural Resource** When you turn on the faucet, where does the water come from?	**5-ESS2-2.** Describe and graph the amounts and percentages of water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth.	Obtaining, Evaluating, and Communicating Information Engaging in Argument from Evidence	**ESS2.C:** The Roles of Water in Earth's Surface Processes	Patterns
Lesson 4 	**Water Cycle** Can we make it rain?	**5-ESS2-1.** Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.	Developing and Using Models Planning and Carrying Out Investigations	**ESS2.A:** Earth Materials and Systems	Systems and System Models
Lesson 5 	**Natural Disasters & Engineering** How can you save a town from a hurricane?	**3-5-ETS1-1.** Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost. **3-5-ETS1-2.** Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem. **3-5-ETS1-3.** Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.	Asking Questions and Defining Problems Obtaining, Evaluating, and Communicating Information Using Mathematics and Computational Thinking	**ETS1.A:** Defining and Delimiting Engineering Problems **ETS1.B:** Developing Possible Solutions **ETS1.C:** Optimizing the Design Solution	Systems and System Models

Stars & The Solar System Unit (Spaceship Earth) • Page 1 of 2

	Topic & Guiding Question	NGSS Performance Expectations (PEs)	Science & Eng. Practices (SEPs)	Disciplinary Core Ideas (DCIs)	Crosscutting Concepts (CCCs)
 Lesson 1	**Day, Night, & Earth's Rotation** How fast does the Earth spin?	**5-ESS1-2.** Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky.	Developing and Using Models Using Mathematics and Computational Thinking	**ESS1.B:** Earth and the Solar System	Patterns Cause and Effect
 Lesson 2	**Earth's Rotation & Daily Shadow Patterns** Who set the first clock?	**5-ESS1-2.** Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky.	Planning and Carrying Out Investigations Analyzing and Interpreting Data	**ESS1.B:** Earth and the Solar System	Patterns Cause and Effect
 Lesson 3	**Seasonal Changes & Shadow Length** How can the Sun tell you the season?	**5-ESS1-2.** Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky.	Analyzing and Interpreting Data Engaging in Argument from Evidence	**ESS1.B:** Earth and the Solar System	Patterns Cause and Effect
 Lesson 4	**Seasonal Patterns & Earth's Orbit** Why do the stars change with the seasons?	**5-ESS1-2.** Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky.	Developing and Using Models Constructing Explanations and Designing Solutions	**ESS1.B:** Earth and the Solar System	Patterns Cause and Effect

Continued on next page

Stars & The Solar System Unit (Spaceship Earth) • Page 2 of 2

	Topic & Guiding Question	NGSS Performance Expectations (PEs)	Science & Eng. Practices (SEPs)	Disciplinary Core Ideas (DCIs)	Crosscutting Concepts (CCCs)
 **Lesson 5**	**Moon Phases, Lunar Cycle** Why does the Moon change shape?	**5-ESS1-2.** Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky.	Developing and Using Models Planning and Carrying Out Investigations	**ESS1.B:** Earth and the Solar System	Patterns Cause and Effect
 **Lesson 6**	⭐ **Solar System & Sun Brightness** How can the Sun help us explore other planets?	**5-ESS1-1.** Support an argument that differences in the apparent brightness of the sun compared to other stars is due to their relative distances from Earth.	Developing and Using Models Engaging in Argument from Evidence	**ESS1.A:** The Universe and its Stars	Scale, Proportion, and Quantity Systems and System Models
 **Lesson 7**	**Gravity** Why is gravity different on other planets?	**5-PS2-1.** Support an argument that the gravitational force exerted by Earth on objects is directed down.	Using Mathematics and Computational Thinking Analyzing and Interpreting Data	**PS2.B:** Types of Interactions	Patterns Cause and Effect
 **Lesson 8**	**Star Brightness & Habitable Planets** Could there be life on other planets?	**5-ESS1-1.** Support an argument that differences in the apparent brightness of the sun compared to other stars is due to their relative distances from Earth.	Obtaining, Evaluating, and Communicating Information Engaging in Argument from Evidence	**ESS1.A:** The Universe and its Stars	Scale, Proportion, and Quantity

⭐ New Lesson
See all Content Updates

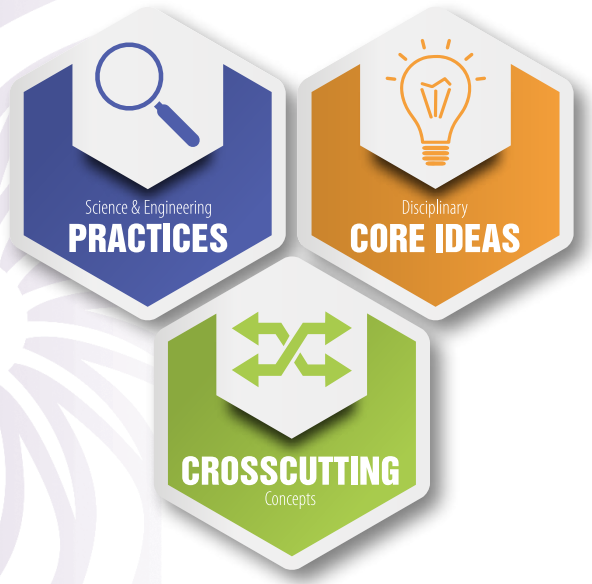
Chemical Reactions & Properties of Matter Unit (Chemical Magic)

	Topic & Guiding Question	NGSS Performance Expectations (PEs)	Science & Eng. Practices (SEPs)	Disciplinary Core Ideas (DCIs)	Crosscutting Concepts (CCCs)
 Lesson 1	**Conservation of Matter** Are magic potions real?	**Foundational for 5-PS1-1.** Develop a model to describe that matter is made of particles too small to be seen. **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.	Planning and Carrying Out Investigations Constructing Explanations and Designing Solutions	**PS1.A**: Structure and Properties of Matter **PS1.B:** Chemical Reactions	Cause and Effect Scale, Proportion, and Quantity
 Lesson 2	**Dissolving & Particulate Nature of Matter** Could you transform something worthless into gold?	**Foundational for 5-PS1-1.** Develop a model to describe that matter is made of particles too small to be seen. **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.	Planning and Carrying Out Investigations Using Mathematics and Computational Thinking	**PS1.A**: Structure and Properties of Matter **PS1.B:** Chemical Reactions	Energy and Matter Scale, Proportion, and Quantity
 Lesson 3	**Properties of Matter: Acids** What would happen if you drank a glass of acid?	**5-PS1-3.** Make observations and measurements to identify materials based on their properties.	Planning and Carrying Out Investigations Analyzing and Interpreting Data	**PS1.A**: Structure and Properties of Matter	Cause and Effect
 Lesson 4	**Chemical Reactions** What do fireworks, rubber, and Silly Putty have in common?	**5-PS1-4.** Conduct an investigation to determine whether the mixing of two or more substances results in new substances.	Planning and Carrying Out Investigations Constructing Explanations and Designing Solutions	**PS1.B:** Chemical Reactions	Cause and Effect
 Lesson 5	**Gases & Particle Models** Why do some things explode?	**5-PS1-1.** Develop a model to describe that matter is made of particles too small to be seen.	Planning and Carrying Out Investigations Developing and Using Models	**PS1.A**: Structure and Properties of Matter	Scale, Proportion, and Quantity

FOSS® Next Generation™
NGSS Alignment Overview

Middle School

Three-dimensional active science for the Next Generation



June 2017

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The Next Generation of
NGSS Alignment

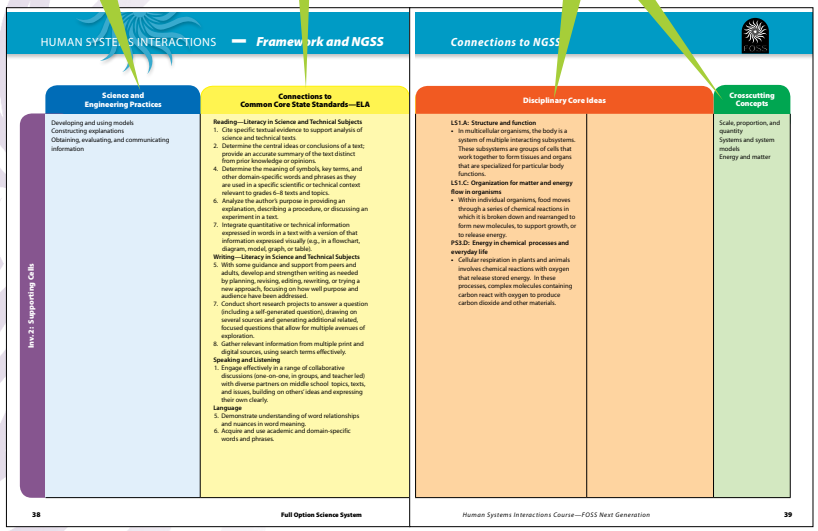
FOSS Next Generation fulfills the vision of the *Framework* and the NGSS in three key ways:

1. **FOSS is designed around learning as a developmental progression**—FOSS provides experiences that allow students to continually build and develop more complex science and engineering ideas.
2. **FOSS focuses on core ideas**—FOSS chooses depth over superficial coverage and addresses core ideas at multiple grade levels in evermore complex ways.
3. **FOSS integrates scientific knowledge with the practices of science and engineering**—FOSS investigations provide students with engaging firsthand experiences and sense-making activities.

Science and engineering practices have always been a critical part of FOSS investigations.

Rigorous **ELA connections** build literacy skills through science.

Every FOSS investigation integrates both **disciplinary core ideas** and **crosscutting concepts.**



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FOSS Instructional Design

FOSS is designed around active investigations that provide engagement with science concepts and science and engineering practices. Surrounding and supporting those firsthand investigations are experiences that help build student understanding of core science concepts and deepen scientific habits of mind.

SCIENCE NOTEBOOKS
Students organize data and thinking to create a personalized record of learning.

FORMATIVE ASSESSMENT
Ongoing assessment monitors student progress and drives future instruction.

SCIENCE-CENTERED LANGUAGE DEVELOPMENT
Using the connections between science and language arts, students read, write, and discuss their experiences.

REAL-WORLD APPLICATIONS
Engineering and problem solving challenges make connections to everyday life.

READING INFORMATIONAL TEXT
Students analyze informational text to extend and enrich their experiences.

INTEGRATED TECHNOLOGY
Online activities review and provide application opportunities for each investigation.

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FOSS Next Generation

Physical Science Performance Expectations

		Chemical Interactions	Waves	Electro-magnetic Force	Gravity and Kinetic Energy	Variables and Design
MS-PS1-1	Develop models to describe the atomic composition of simple molecules and extended structures.	✔				
MS-PS1-2	Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.	✔				
MS-PS1-3	Gather and make sense of information to describe that synthetic materials come from natural resources and impact society.	✔				
MS-PS1-4	Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.	✔				
MS-PS1-5	Develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved.	✔				
MS-PS1-6	Undertake a design project to construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes.*	✔				
MS-PS2-1	Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects.*				✔	
MS-PS2-2	Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.			✔	✔	
MS-PS2-3	Ask questions about data to determine the factors that affect the strength of electric and magnetic forces.			✔		
MS-PS2-4	Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects.				✔	
MS-PS2-5	Conduct an investigation and evaluate the experimental design to provide evidence that fields exist between objects exerting forces on each other even though the objects are not in contact.			✔	✔	
MS-PS3-1	Construct and interpret graphical displays of data to describe the relationships of kinetic energy to the mass of an object and to the speed of an object.				✔	
MS-PS3-2	Develop a model to describe that when the arrangement of objects interacting at a distance changes, different amounts of potential energy are stored in the system.			✔	✔	
MS-PS3-3	Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.*	✔				
MS-PS3-4	Plan an investigation to determine the relationships among the energy transferred, the type of matter, the mass, and the change in the average kinetic energy of the particles as measured by the temperature of the sample.	✔				
MS-PS3-5	Construct, use, and present arguments to support the claim that when the motion energy of an object changes, energy is transferred to or from the object.	✔		✔	✔	✔
MS-PS4-1	Use mathematical representations to describe a simple model for waves that includes how the amplitude of a wave is related to the energy in a wave.		✔			
MS-PS4-2	Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.		✔			
MS-PS4-3	Integrate qualitative scientific and technical information to support the claim that digitized signals (sent as wave pulses) are a more reliable way to encode and transmit information.		✔			
	Additional performance expectations addressed:		HS-ESS2-3	MS-ESS3-3 MS-ESS3-4	MS-ESS1-2	

Courses in grey have not yet been published.
Anticipated performance expectation coverage is shown.

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FOSS Next Generation

Physical Science Performance Expectations *continued*

		Chemical Interactions	Waves	Electro-magnetic Force	Gravity and Kinetic Energy	Variables and Design
MS-ETS-1	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.	✔	✔	✔	✔	✔
MS-ETS-2	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.	✔	✔	✔	✔	✔
MS-ETS-3	Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.	✔	✔	✔	✔	✔
MS-ETS-4	Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.	✔	✔	✔	✔	✔

Physical Science Core Ideas

		Chemical Interactions	Waves	Electro-magnetic Force	Gravity and Kinetic Energy	Variables and Design
PS1.A	Structures of Matter and Nuclear Processes	✔				
PS1.B	Chemical Reactions	✔				
PS2.A	Forces and Motion			✔	✔	
PS2.B	Types of Interactions			✔	✔	
PS3.A	Definitions of Energy	✔		✔	✔	
PS3.B	Conservation of Energy and Energy Transfer	✔		✔	✔	
PS3.C	Relationship between Energy and Forces			✔	✔	
PS3.D	Energy in Chemical Processes and Everyday Life					
PS4.A	Wave Properties		✔			
PS4.B	Electromagnetic Radiation		✔			
PS4.C	Information Technologies in Instrumentation		✔			
ETS1.A	Defining and Delimiting Engineering Problems	✔	✔	✔	✔	
ETS1.B	Developing Possible Solutions	✔	✔	✔	✔	
ETS1.C	Optimizing the Design Solution	✔	✔	✔	✔	

Courses in grey have not yet been published.
Anticipated performance expectation coverage is shown.

FOSS Next Generation

Earth Science Performance Expectations

		Weather and Water	Earth History	Planetary Science
MS-ESS1-1	Develop and use a model of the Earth-sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons.	✔		✔
MS-ESS1-2	Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system.			✔
MS-ESS1-3	Analyze and interpret data to determine scale properties of objects in the solar system.			✔
MS-ESS1-4	Construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earth's 4.6-billion-year-old history.		✔	✔
MS-ESS2-1	Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process.		✔	
MS-ESS2-2	Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales.		✔	✔
MS-ESS2-3	Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions.		✔	
MS-ESS2-4	Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.	✔		✔
MS-ESS2-5	Collect data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions.	✔		
MS-ESS2-6	Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates.	✔		
MS-ESS3-1	Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.		✔	✔
MS-ESS3-2	Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.	✔	✔	
MS-ESS3-3	Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.	✔	✔	✔
MS-ESS3-4	Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.	✔	✔	✔
MS-ESS3-5	Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.	✔	✔	
	Additional performance expectations addressed:	PS1-4, PS3-3, PS3-4, PS3-5	LS4-1	PS2-4, PS4-1, PS4-2, ETS1-1

FOSS Next Generation

Earth Science Core Ideas

		Weather and Water	Earth History	Planetary Science
ESS1.A	The Universe and Its Stars			✔
ESS1.B	Earth and the Solar System	✔		✔
ESS1.C	The History of Planet Earth		✔	✔
ESS2.A	Earth's Materials and Systems		✔	✔
ESS2.B	Plate Tectonics and Large-Scale System Interactions		✔	
ESS2.C	The Roles of Water in Earth's Surface Processes	✔	✔	✔
ESS2.D	Weather and Climate	✔		
ESS3.A	Natural Resources		✔	✔
ESS3.B	Natural Hazards	✔	✔	
ESS3.C	Human Impacts on Earth Systems	✔	✔	✔
ESS3.D	Global Climate Change	✔	✔	
	Additional core ideas addressed:	**PS1.A, PS3.A, PS3.B, ETS1.A, ETS1.B, ETS1.C**	**LS4.A**	**PS2.B, PS4.A, PS4.B, ETS1.A**

FOSS Next Generation

Life Science Performance Expectations

		Diversity of Life	Populations and Ecosystems	Heredity and Adaptation	Human Systems Interactions
MS-LS1-1	Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells.	✔			✔
MS-LS1-2	Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function.	✔			
MS-LS1-3	Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.	✔			✔
MS-LS1-4	Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively.	✔			
MS-LS1-5	Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.	✔			
MS-LS1-6	Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms.	✔	✔		
MS-LS1-7	Develop a model to describe how food is rearranged through chemical reactions forming new molecules that support growth and/or release energy as this matter moves through an organism.	✔	✔		✔
MS-LS1-8	Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories.				✔
MS-LS2-1	Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.		✔		
MS-LS2-2	Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.		✔		
MS-LS2-3	Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.		✔		
MS-LS2-4	Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.		✔		
MS-LS2-5	Evaluate competing design solutions for maintaining biodiversity and ecosystem services.*		✔		
MS-LS3-1	Develop and use a model to describe why structural changes to genes (mutations) located on chromosomes may affect proteins and may result in harmful, beneficial, or neutral effects to the structure and function of the organism.			✔	
MS-LS3-2	Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation.	✔		✔	
MS-LS4-1	Analyze and interpret data for patterns in the fossil record that document the existence, diversity, extinction, and change of life forms throughout the history of life on Earth under the assumption that natural laws operate today as in the past.			✔	
MS-LS4-2	Apply scientific ideas to construct an explanation for the anatomical similarities and differences among modern organisms and between modern and fossil organisms to infer evolutionary relationships.			✔	

Courses in grey have not yet been published.
Anticipated performance expectation coverage is shown.

FOSS Next Generation

Life Science Performance Expectations *continued*

		Diversity of Life	Populations and Ecosystems	Heredity and Adaptation	Human Systems Interactions
MS-LS4-3	Analyze displays of pictorial data to compare patterns of similarities in the embryological development across multiple species to identify relationships not evident in the fully formed anatomy.			✔	
MS-LS4-4	Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment.			✔	
MS-LS4-5	Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms.			✔	
MS-LS4-6	Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time.			✔	
	Additional performance expectations addressed		ESS3.3, ESS3.4, ETS1.1, ETS1.2		

Life Science Core Ideas

		Diversity of Life	Populations and Ecosystems	Heredity and Adaptation	Human Systems Interactions
LS1.A	Structure and Function	✔			✔
LS1.B	Growth and Development of Organisms	✔	✔		
LS1.C	Organization for Matter and Energy Flow in Organisms	✔	✔		✔
LS1.D	Information Processing				✔
LS2.A	Interdependent Relationships in Ecosystems		✔		
LS2.B	Cycles of Matter and Energy Transfer in Ecosystems		✔		
LS2.C	Ecosystems Dynamics, Functioning, and Resilience	✔	✔		
LS3.A	Inheritance of Traits			✔	
LS3.B	Variation of Traits			✔	
LS4.A	Evidence of Common Ancestry and Diversity			✔	
LS4.B	Natural Selection			✔	
LS4.C	Adaptation			✔	
LS4.D	Biodiversity and Humans		✔		
	Additional core ideas addressed:		PS3.D, ESS3.C, ETS1.B		PS3.D

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Anticipated performance expectation coverage is shown.

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Science and Engineering Practices	Chemical Interactions	Waves	Electromagnetic Force	Gravity and Kinetic Energy	Variables and Design	Weather and Water	Earth History	Planetary Science	Diversity of Life	Populations and Ecosystems	Heredity and Adaptation	Human Systems Interactions
Asking Questions and Defining Problems	✔	✔	✔	✔		✔	✔	✔	✔	✔	✔	✔
Developing and Using Models	✔	✔	✔	✔		✔	✔	✔	✔	✔	✔	✔
Planning and Carrying Out Investigations	✔	✔	✔	✔		✔	✔	✔	✔	✔	✔	✔
Analyzing and Interpreting Data	✔	✔	✔	✔		✔	✔	✔	✔	✔	✔	✔
Using Mathematics and Computational Thinking	✔	✔	✔	✔		✔	✔	✔	✔	✔	✔	✔
Constructing Explanations and Designing Solutions	✔	✔	✔	✔		✔	✔	✔	✔	✔	✔	✔
Engaging in Argument From Evidence	✔	✔	✔	✔		✔	✔	✔	✔	✔	✔	✔
Obtaining, Evaluating, and Communicating Information	✔	✔	✔	✔		✔	✔	✔	✔	✔	✔	✔

Crosscutting Concepts

Patterns	✔	✔	✔	✔		✔	✔	✔	✔	✔	✔	✔
Cause and Effect	✔	✔	✔	✔		✔	✔	✔	✔	✔	✔	✔
Scale, Proportion, and Quantity	✔	✔	✔	✔		✔	✔	✔	✔	✔	✔	✔
Systems and System Models	✔	✔	✔	✔		✔	✔	✔	✔	✔	✔	✔
Energy and Matter	✔	✔	✔	✔		✔	✔	✔	✔	✔		✔
Structure and Function	✔	✔	✔	✔		✔	✔	✔	✔		✔	✔
Stability and Change	✔	✔	✔	✔		✔	✔	✔	✔	✔	✔	

*Courses in grey have not yet been published. Visit **deltaeducation.com/fossng** for the latest version of this document.*

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	Chemical Interactions	Earth History	Populations and Ecosystems
	Electromagnetic Force* Variables and Design*	Weather and Water	Diversity of Life

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