

First Grade STEM Scopes Pacing Guide 2018-2019

Quarter 1	Quarter 2	Quarter 3	Quarter 4
Sound 13 teaching days	Patterns in Space 19 teaching days	Parts of Animals 10 teaching days	Parts of Plants 14 teaching days
Behavior of Light 15 teaching days	Seasonal Patterns 19 teaching days	Animal Survival 10 teaching days	Plant Survival 15 teaching days
Communication 9 teaching days		Protecting the Young 10 teaching days	Plant Trait Inheritance and Variation 15 teaching days
		Animal Traits Inheritance and Variation 10 teaching days	



Unit Title: Sound Quarter 1

Approximate Teaching Dates	(13 teaching days)
Domain(s)	Physical Science (PS); Engineering, Technology, & Applications of Science (ETS)
Performance Expectations	<p>Students who demonstrate understanding can:</p> <p>Physical Science</p> <ul style="list-style-type: none"> ● 1-PS4-1 Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate. <p>Engineering, Technology, & Applications of Science</p> <ul style="list-style-type: none"> ● 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.
Science and Engineering Practices	<p>Planning and Carrying Out Investigations- Collaborative Investigation Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question.</p>
Disciplinary Core Ideas	<p>Wave Properties PS4.A: Sound can make matter vibrate, and vibrating matter can make sound.</p>
Cross Cutting Concepts	<p>Cause and Effect-Simple Tests Simple tests can be designed to gather evidence to support or refute student ideas about causes.</p>
Required Investigations	Activity 1- Sound Stations Activity 2- Rock Out
Required Summative Assessment(s)	Argue- Claim, Evidence, Reasoning (Formative) Open Ended Response Assessment (Formative) Multiple-Choice Assessment (Summative)

*Additional Explain and Elaborate Extension Activities Planned at each Teacher's Discretion

Unit Title: Behavior of Light

Quarter 1

Teaching Dates	(15 teaching days)
Domain	Physical Science (PS)
Performance Expectations	<p>Students who demonstrate understanding can:</p> <p>Physical Science</p> <ul style="list-style-type: none"> ● 1-PS4-2 Make observations to construct an evidence-based account that objects can be seen only when illuminated. ● 1-PS4-3 Plan and conduct investigations to determine the effect of placing different objects made with different materials in the path of a beam of light.
Science and Engineering Practices	<p>Constructing Explanations and Designing Solutions- Make Observations</p> <p>Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena.</p>
Disciplinary Core Idea	<p>Electromagnetic Radiation</p> <ul style="list-style-type: none"> ● PS4.B Objects can be seen if light is available to illuminate them or if they give off their own light. ● PS4.B Electromagnetic Radiation: Some materials allow light to pass through them, others allow only some light through and others block all the light and create a dark shadow on any surface beyond them, where the light cannot reach. Mirrors can be used to redirect a light beam. (Boundary: The idea that light travels from place to place is developed through experiences with light sources, mirrors, and shadows, but no attempt is made to discuss the speed of light.)
Cross Cutting Concept	<p>Cause and Effect- Simple Tests</p> <p>Simple tests can be designed to gather evidence to support or refute student ideas about causes.</p>
Required Investigations	<p>Activity 1- What do I see?</p> <p>Activity 2- Star Quality</p> <p>Activity 3- What do you see?</p>
Required Assessments	<p>Explain- Communicate- Whole Class Dialogue (Formative)</p> <p>Argue- Claim, Evidence, Reasoning (Formative)</p> <p>Open Ended Response Assessment (Formative)</p> <p>Multiple-Choice Assessment (Summative)</p>

*Additional Explain and Elaborate Extension Activities Planned at each Teacher's Discretion

Unit Title: Communication Quarter 1

Approximate Teaching Dates	(9 teaching days)
Domain(s)	Physical Science (PS), Engineering, Technology, & Applications of Science (ETS)
Performance Expectations	<p>Students who demonstrate understanding can:</p> <p>Physical Science</p> <ul style="list-style-type: none"> • 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.. <p>Engineering, Technology, & Applications of Science</p> <ul style="list-style-type: none"> • 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.
Science and Engineering Practices	<p>Constructing Explanations and Designing Solutions- Specific Problems Use tools and/or materials to design and/or build a device that solves a specific problem or a solution to a specific problem.</p>
Disciplinary Core Ideas	<p>Information Technologies and Instrumentation PS4.C People also use a variety of devices to communicate (send and receive information) over long distances.</p>
Cross Cutting Concepts	None Specified.
Required Investigations	<p>Activity 1- Talking With Lights Activity 2- Did You Hear What I Said?</p>
Required Summative Assessment(s)	<p>Argue- Claim, Evidence, Reasoning (Formative) Open Ended Response Assessment (Formative) Multiple-Choice Assessment (Summative) Performance Expectation Task (Unit Assessment)</p>

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Unit Title: Patterns in Space Quarter 2

Approximate Teaching Dates	(19 teachers days)
Domain(s)	Earth and Space Science
Performance Expectations	<p>Students who demonstrate understanding can:</p> <p>Space Science 1-ESS1-1 Use observations of the sun, moon, and stars to describe patterns that can be predicted.</p> <p>Engineering Design K-2-ETS1-1 Ask questions, making 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.</p>
Science and Engineering Practices	<p>Analyzing and Interpreting Data Use observations (firsthand or from media) to describe patterns and/or relationships in the natural and designed world(s) in order to answer scientific questions and solve problems.</p>
Disciplinary Core Ideas	<p>The Universe and its Stars ESS1.A Patterns of the motion of the sun, moon, and stars in the sky can be observed, described, and predicted.</p>
Cross Cutting Concepts	<p>Patterns Patterns in the natural and human designed world can be observed, used to describe phenomena, and used as evidence.</p>
Required Investigations	<p>Science Investigation 1-Observing Objects in the Sky Activity 2-Moon Phases</p>
Required Summative Assessment(s)	<p>Argue- Claim, Evidence, Reasoning (Formative) Open Ended Response Assessment (Formative) Multiple-Choice Assessment (Summative) Performance Expectation Task (Unit Assessment)</p>

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Unit Title: Seasonal Patterns Quarter 2

Approximate Teaching Dates	(19 teachers days)
Domain(s)	Earth and Space Science
Performance Expectations	Students who demonstrate understanding can: Earth and the Solar System 1-ESS1-2 Use observations of the sun, moon, and stars to describe patterns that can be predicted.
Science and Engineering Practices	Planning and Carrying out Investigations Make observations (firsthand or from media) and/or measurements to collect data that can be used to make comparisons.
Disciplinary Core Ideas	Earth and the Solar System ESS1.A Seasonal patterns of sunrise and sunset can be observed, described, and predicted.
Cross Cutting Concepts	Patterns Patterns in the natural and human designed world can be observed, used to describe phenomena, and used as evidence.
Required Investigations	Science Investigation 1-Length of the Day Research 2-Seasons and Day and Night Diorama
Required Summative Assessment(s)	Argue- Claim, Evidence, Reasoning (Formative) Open Ended Response Assessment (Formative) Multiple-Choice Assessment (Summative) Performance Expectation Task (Unit Assessment)

*Additional Explain and Elaborate Extension Activities Planned at each Teacher's Discretion

Unit Title: Parts of Animals Quarter 3

Approximate Teaching Dates	(10 days)
Domain(s)	Life Science
Performance Expectations	Students who demonstrate understanding can: 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.
Science and Engineering Practices	Constructing Explanations and Designing Solutions- Specific Problems Use tools and/or materials to design and/or build a device that solves a specific problem or a solution to a specific problem.
Disciplinary Core Ideas	Structure and Function LS1-1 All organisms have external parts. Different animals use their body parts in different ways to see, hear, grasp objects, protect themselves, move from place to place, and seek, find, and take in food, water and air.
Cross Cutting Concepts	Structure and Function The shape and stability of structures of natural and designed objects are related to their function(s).
Required Investigations	Activity 1-Zoo Scavenger Hunt Activity 2-Super Animal Activity 3-Animal Inventions
Required Summative Assessment(s)	Argue- Claim, Evidence, Reasoning (Formative) Open Ended Response Assessment (Formative) Multiple-Choice Assessment (Summative) Performance Expectation Task (Unit Assessment)

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Unit Title: Animal Survival Quarter 3

Approximate Teaching Dates	(10 days)
Domain(s)	Life Science
Performance Expectations	Students who demonstrate understanding can: 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.
Science and Engineering Practices	Constructing Explanations and Designing Solutions- Specific Problems Use tools and/or materials to design and/or build a device that solves a specific problem or a solution to a specific problem.
Disciplinary Core Ideas	Information Processing: 1-LS1D Animals have body parts that capture and convey different kinds of information needed for growth and survival. Animals respond to these inputs with behaviors that help them survive.
Cross Cutting Concepts	Structure and Function The shape and stability of structures of natural and designed objects are related to their function(s).
Required Investigations	Activity 1- Hmm...I'm Hungry Activity 2-Build a Bed
Required Summative Assessment(s)	Argue- Claim, Evidence, Reasoning (Formative) Open Ended Response Assessment (Formative) Multiple-Choice Assessment (Summative) Performance Expectation Task (Unit Assessment)

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Unit Title: Protecting the Young Quarter 3

Approximate Teaching Dates	(10 days)
Domain(s)	Life Science
Performance Expectations	<p>Students who demonstrate understanding can:</p> <p>Structure, Function, and Information Processing 1-LS1-2 Read texts and use media to determine patterns in behavior of parents and offspring that help offspring survive.</p> <p>Engineering Design 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.</p>
Science and Engineering Practices	<p>Obtaining, Evaluating, and Communicating Information Read grade-appropriate texts and/or use media to obtain scientific and/or technical information to determine patterns in and/or evidence about the natural and designed world(s).</p>
Disciplinary Core Ideas	<p>Growth and Development of Organisms: 1-LS1.B Adult plants and animals can have young. In many kinds of animals, parents and the offspring themselves engage in behaviors that help the offspring to survive.</p>
Cross Cutting Concepts	<p>Patterns Patterns in the natural and human designed world can be observed, used to describe phenomena, and used as evidence.</p>
Required Investigations	Activity 1-My Needs Charades Engineering Solution-Helping My Herd
Required Summative Assessment(s)	Argue- Claim, Evidence, Reasoning (Formative) Open Ended Response Assessment (Formative) Multiple-Choice Assessment (Summative) Performance Expectation Task (Unit Assessment)

*Additional Explain and Elaborate Extension Activities Planned at each Teacher's Discretion

Unit Title: Animal Traits Inheritance and Variation Quarter 3

Approximate Teaching Dates	(10 days)
Domain(s)	Life Science
Performance Expectations	Students who demonstrate understanding can: Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents.
Science and Engineering Practices	Constructing Explanations and Designing Solutions 1-LS3-1 Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena.
Disciplinary Core Ideas	Inheritance of Traits 1-LS3.A Young animals are very much, but not exactly like their parents. Variation of Traits 1-LS3.B Individuals of the same kind of animal are recognizable as similar but can also vary in many ways.
Cross Cutting Concepts	Patterns 1-LS1-2, 1-LS3-1 Patterns in the natural and human designed world can be observed, used to describe phenomena, and used as evidence.
Required Investigations	Activity 1-Bugs Activity 2-Are you my Parents?
Required Summative Assessment(s)	Argue- Claim, Evidence, Reasoning (Formative) Open Ended Response Assessment (Formative) Multiple-Choice Assessment (Summative) Performance Expectation Task (Unit Assessment)

*Additional Explain and Elaborate Extension Activities Planned at each Teacher's Discretion

Unit Title: Parts of Plants Quarter 4

Approximate Teaching Dates	(14 teaching days)
Domain(s)	Life Science
Performance Expectations	<p>Students who demonstrate understanding can:</p> <p>Structure, Function, and Information Processing: 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.</p> <p>Engineering Design 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.</p>
Science and Engineering Practices	<p>Constructing Explanations and Designing Solutions Use tools and/or materials to design and/or build a device that solves a specific problem or a solution to a specific problem.</p>
Disciplinary Core Ideas	<p>Structure and Function Plants also have different parts (roots, stems, leaves, flowers, fruits) that help them survive and grow.</p>
Cross Cutting Concepts	<p>Structure and Function The shape and stability of structures of natural and designed objects are related to their function(s).</p>
Required Investigations	<p>Activity 1-Dinner Time Activity 2-Humans Mimicking Plants Engineering Solutions 3-Helpful Parts</p>
Required Summative Assessment(s)	<p>Argue- Claim, Evidence, Reasoning (Formative) Open Ended Response Assessment (Formative) Multiple-Choice Assessment (Summative) Performance Expectation Task (Unit Assessment)</p>

*Additional Explain and Elaborate Extension Activities Planned at each Teacher's Discretion

Unit Title: Plant Survival Quarter 4

Approximate Teaching Dates	(15 teaching days)
Domain(s)	Life Science
Performance Expectations	Students who demonstrate understanding can: 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.
Science and Engineering Practices	Constructing Explanations and Designing Solutions Use tools and/or materials to design and/or build a device that solves a specific problem or a solution to a specific problem.
Disciplinary Core Ideas	Information Processing Plants also respond to some external inputs.
Cross Cutting Concepts	Structure and Function The shape and stability of structures of natural and designed objects are related to their function(s).
Required Investigations	Science Investigation 1-Growing Sideways Engineering Solutions 2-Solar Energy
Required Summative Assessment(s)	Argue- Claim, Evidence, Reasoning (Formative) Open Ended Response Assessment (Formative) Multiple-Choice Assessment (Summative) Performance Expectation Task (Unit Assessment)

*Additional Explain and Elaborate Extension Activities Planned at each Teacher's Discretion

Unit Title: Plant Trait Inheritance and Variation Quarter 4

Approximate Teaching Dates	(15 teaching days)
Domain(s)	Life Science
Performance Expectations	Students who demonstrate understanding can: Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents
Science and Engineering Practices	Constructing Explanations and Designing Solutions: Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena.
Disciplinary Core Ideas	Inheritance of Traits Plants are also very, much but not exactly, like their parents.
Cross Cutting Concepts	Patterns Patterns in the natural and human designed world can be observed, used to describe phenomena, and used as evidence.
Required Investigations	Activity 1-Plant Sort Scientific Investigation 2-Plant Babies Activity 3-Who are my Parents?
Required Summative Assessment(s)	Argue- Claim, Evidence, Reasoning (Formative) Open Ended Response Assessment (Formative) Multiple-Choice Assessment (Summative) Performance Expectation Task (Unit Assessment)

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