



Totowa Public Schools

Science

Grade 3

Aligned to NJSL Standards

BOE Adopted: 08/31/2002

Units of Study & Pacing Guide

<u>Unit of Study</u>	<u>Timeline</u>	<u>Notes</u>
Unit 1 Climate and Weather	12 Weeks	Science shares time with Social Studies. Lessons in this unit satisfy Climate Change mandate.
Unit 2: Forces and Motion & Electrical and Magnetic Forces	12 Weeks	Science shares time with Social Studies.
Unit 3: Traits, Organisms, and the Environment	8 Weeks	Science shares time with Social Studies.
Unit 4: Continuing the Cycle	4 Weeks	Science shares time with Social Studies.
		Curricular Mandate List

Title	Climate and Weather
Unit Duration	12 Weeks
Unit Summary & Rationale	<i>In this unit of study, students organize and use data to describe typical weather conditions expected during a particular season. By applying their understanding of weather-related hazards, students are able to make a claim about the merit of a design solution that reduces the impacts of such hazards. The crosscutting concepts of patterns, cause and effect, and the influence of engineering, technology, and science on society and the natural world are called out as organizing concepts for these disciplinary core ideas. Students demonstrate grade-appropriate proficiency in asking questions and defining problems, analyzing and interpreting data, engaging in argument from evidence, and obtaining, evaluating, and communicating information. Students are also expected to use these practices to demonstrate understanding of the core ideas. Students will also explore and learn about climate change over the world. Students will learn about the effects and changes of climate change. Lessons in this unit satisfy the climate change mandate.</i>
Unit Goals	
Essential Questions	<ul style="list-style-type: none"> • What is typical weather in different parts of the world and during different times of the year? • How can the impact of weather-related hazards be reduced?
Enduring Understandings	<ul style="list-style-type: none"> • Students are expected to apply their understanding of weather-related hazards. • Students are expected to understand weather in different parts of the world during different times of the year. • Scientists record patterns of the weather across different times and areas so that they can make predictions about what kind of weather might happen next. • Climate describes a range of an area's typical weather conditions and the extent to which those conditions vary over years.

	<ul style="list-style-type: none"> • Cause and effect relationships are routinely identified, tested, and used to explain change.
Learning Outcomes	<ul style="list-style-type: none"> • Represent data in tables and graphical displays • Describe typical weather conditions expected during particular seasons • Obtain and combine information to describe climates in different regions of the world. • Explore how weather is predicted and measured. • Learn about the difference between weather and climate. • Identify the impact of severe weather on society and nature. • Identify and understand the basic concept of insurance and how it helps reduce financial risk when a catastrophe happens. • Justify reasons to have insurance. • Discuss climate change and possible solutions. • Investigate a persistent local or global issue, such as climate change, and collaborate with individuals with diverse perspectives to improve upon current actions designed to address the issue. • What the word climate means and explore the world’s five major climates. • Explore careers related to weather.

Assessment Evidence	
Formative	Teacher observations, Class discussions, Lab Activities, Key concepts and vocabulary quizzes, Science Starter’s/Do Nows, Open Ended Responses, Modeling, Simulations, Innovators Monthly Research, Lab Activities, Vocabulary Responses, Exit Questions, Interactive Digital Assessments embedded in Exploring Science Digital Book
Summative	Projects, Tests, Quizzes, lab skills demonstrations, projects, and vocabulary quizzes.
Alternative and Benchmark	<p>Alternative - Read to the student and chart oral responses. Word banks, sentence frames, oral responses, graphic organizers, observations, portfolios of student work, orally administered assessments, and anecdotal notes.</p> <p>Benchmark – LinkIt Benchmark Assessment, Teacher Generated Assessments</p> <p>Formative, Summative, Alternative and Benchmark Assessments</p>

Resources to Promote Learning

Resources & Equipment Needed

Smartboard, Computers, Websites and digital interactives/models, Multi-media presentations, Video Streaming, Brain Pop, Middle School Science, Generation Genius Digital Curriculum, Mystery Science Digital Curriculum, Amplify Digital Curriculum, Microsoft 365, Primary and Secondary Source Documents, Assorted lab materials. [Approved Class Resource List](#)

Content & Interdisciplinary Standards

NJ 2020 SLS: Science

Standards

3-ESS2-1., Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season. [Clarification Statement: Examples of data could include average temperature, precipitation, and wind direction.]

[Assessment Boundary: Assessment of graphical displays is limited to pictographs and bar graphs. Assessment does not include climate change.]

3-ESS2-2., Obtain and combine information to describe climates in different regions of the world.

3-ESS3-1., Make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard.* [Clarification Statement: Examples of design solutions to weather-related hazards could include barriers to prevent flooding, wind resistant roofs, and lightning rods.]

Science and Engineering Practices

Analyzing and Interpreting Data - Analyzing data in 3–5 builds on K–2 experiences and progresses to introducing quantitative approaches to collecting data and conducting multiple trials of qualitative observations. When possible and feasible, digital tools should be used.

- Represent data in tables and various graphical displays (bar graphs and pictographs) to reveal patterns that indicate relationships. (3-ESS2-1)

Engaging in Argument from Evidence - Engaging in argument from evidence in 3–5 builds on K–2 experiences and progresses to critiquing the scientific explanations or solutions proposed by peers by citing relevant evidence about the natural and designed world (s).

- Make a claim about the merit of a solution to a problem by citing relevant evidence about how it meets the criteria and constraints of the problem. (3-ESS3-1)

Obtaining, Evaluating, and Communicating Information - Obtaining, evaluating, and communicating information in 3–5 builds on K–2 experiences and progresses to evaluating the merit and accuracy of ideas and methods.

- Obtain and combine information from books and other reliable media to explain phenomena. (3-ESS2-2)

Disciplinary Core Ideas (DCI)

ESS2.D: Weather and Climate

- Scientists record patterns of the weather across different times and areas so that they can make predictions about what kind of weather might happen next. (3-ESS2-1)
- Climate describes a range of an area's typical weather conditions and the extent to which those conditions vary over years. (3-ESS2-2)

ESS3.B: Natural Hazards

- A variety of natural hazards result from natural processes. Humans cannot eliminate natural hazards but can take steps to reduce their impacts. (3-ESS3-1) (Note: This Disciplinary Core Idea is also addressed by 4-ESS3-2.)

Crosscutting Concepts

Patterns	<ul style="list-style-type: none"> • Patterns of change can be used to make predictions. (3-ESS2-1),(3-ESS2-2)
Cause and Effect	<ul style="list-style-type: none"> • Cause and effect relationships are routinely identified, tested, and used to explain change. (3-ESS3-1)
Influence of Engineering, Technology, and Science on Society and the Natural World	<ul style="list-style-type: none"> • Engineers improve existing technologies or develop new ones to increase their benefits (e.g., better artificial limbs), decrease known risks (e.g., seatbelts in cars), and meet societal demands (e.g., cell phones). (3-ESS3-1)
Science is a Human Endeavor	<ul style="list-style-type: none"> • Science affects everyday life. (3-ESS3-1)

NJ: 2016 SLS: English Language Arts

- RI.3.1 Ask and answer questions, and make relevant connections to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.
- RI.3.3 Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text , using language that pertains to time , sequence and cause/effect.
- RI.3.8 Describe the logical connection between particular sentences and paragraphs in a text (eg.,comparison, cause/effect, first/second/third in a sequence) to support specific points the author makes in a text
- W.3.7 Conduct short research projects that build knowledge about a topic.

- W.3.1, Write opinion pieces on topics or texts, supporting a point of view with reasons.
- W.3.4. With guidance and support from adults, produce writing in which the development and organization are appropriate to task and purpose. (Grade-specific expectations for writing types are defined in standards 1–3 above.)
- W.3.7. Conduct short research projects that build knowledge about a topic.
- W.3.8 Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories.
- SL.3.3. Ask and answer questions about information from a speaker, offering appropriate elaboration and detail.
- SL.3.4. Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.
- SL.3.6. Speak in complete sentences when appropriate to task and situation in order to provide requested detail or clarification.

NJ: 2016 SLS: Mathematics

- MP.2 Reason abstractly and quantitatively.
- MP.5 Use appropriate tools strategically.
- 3.MD.A.2, Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.
- 3.MD.B.3, Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step “how many more” and “how many less” problems using information presented in bar graphs.

2020 SLS: Computer Science & Design Thinking

NJSLS Performance Expectations (By the end of 5th Grade)

- 8.2.5.EC.1: Analyze how technology has contributed to or reduced inequities in local and global communities and determine its short- and long-term effects.
- 8.1.5.DA.4: Organize and present climate change data visually to highlight relationships or support a claim.

2020 SLS: Career Readiness, Life Literacies, and Key Skills

NJSLS Performance Expectations (By the end of 5th Grade)

- 9.4.5.CT.1: Identify and gather relevant data that will aid in the problem-solving process
- 9.4.5.CT.2: Identify a problem and list the types of individuals and resources
- 9.4.5.CT.3: Describe how digital tools and technology may be used to solve problems.

- 9.4.5.CT.4: Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global.
- 9.4.5.CI.2: Investigate a persistent local or global issue, such as climate change, and collaborate with individuals with diverse perspectives to improve upon current actions designed to address the issue.
- 9.4.5.CI.1: Use appropriate communication technologies to collaborate with individuals with diverse perspectives about a local and/or global climate change issue and deliberate about possible solutions

Interdisciplinary/21st Century Connections

21st Century Connections	<ul style="list-style-type: none"> • Creativity and Innovation • Information and Media Literacy • Critical Thinking and Problem Solving • Technology Literacy
Social Studies	<ul style="list-style-type: none"> • 6.1.5.GeoPP.2: Describe how landforms, climate and weather, and availability of resources have impacted where and how people live and work in different regions of New Jersey and the United States. • 6.3.5.CivicsPD.1: Develop an action plan that addresses issues related to climate change and share with school and/or community members. • 6.3.5.GeoHE.1: Plan and participate in an advocacy project to inform others about the impact of climate change at the local or state level and propose possible solutions. • 6.3.5.GeoGI.1: Use technology to collaborate with others who have different perspectives to examine global issues, including climate change and propose possible solutions.
SEL	<ul style="list-style-type: none"> • Self- Awareness • Recognize one’s personal traits, strengths, and limitations • Recognize the importance of self-confidence in handling daily tasks and challenges

Title	Unit 2: Forces and Motion & Electrical and Magnetic Forces
Unit Duration	12 Weeks
Unit Summary & Rationale	<i>How do equal and unequal forces on an object affect the object? Students are able to determine the effects of balanced and unbalanced forces on the motion of an object. The crosscutting concepts of patterns and cause and effect are identified as organizing concepts for these disciplinary core ideas. In the third-grade performance expectations, students are expected to demonstrate grade-appropriate proficiency by planning and carrying out investigations. Students are expected to use these practices to demonstrate understanding of the core ideas.</i>
Unit Goals	
Essential Questions	<ul style="list-style-type: none"> • What are forces? • What forces act from a distance? • What is motion? • What are some patterns in motion? • How can you unlock a door using a magnet? • What do magnets do?
Enduring Understandings	<ul style="list-style-type: none"> • Understand the strength and direction of a force can change the motion of an object • Understand balanced and unbalanced forces. • Understand the forces of objects when they are not in contact with each other. • Understand that unbalanced forces affect the motion of an object.
Learning Outcomes	<ul style="list-style-type: none"> • Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object. • Include an unbalanced force on one side of a ball can make it start moving; and, balanced forces pushing on a box from both sides will not produce any motion at all. • Determine cause and effect relationships of magnetic interactions between two objects not in contact with each other. • Understand when a net force of zero happens (balanced force). • Understand when there will not be a net force of zero (unbalanced force). • Make observations and/or measurements of an object's motion to provide evidence that a pattern can be used to predict future motion.

- Identify motion with a predictable pattern.
- Explain magnetic attraction and repulsion.
- How to explain that friction is an invisible contact force that opposes motion or makes it difficult for an object to travel across a surface.
- Engage in the engineering design process to test and improve designs
- Explore careers related to science and engineering.

Assessment Evidence	
Formative	Teacher observations, Class discussions, Lab Activities, Key concepts and vocabulary quizzes, Science Starter's/Do Nows, Open Ended Responses, Modeling, Simulations, Innovators Monthly Research, Lab Activities, Vocabulary Responses, Exit Questions, Interactive Digital Assessments embedded in Exploring Science Digital Book
Summative	Projects, Tests, Quizzes, lab skills demonstrations, projects, and vocabulary quizzes.
Alternative and Benchmark	<p>Alternative - Read to the student and chart oral responses. Word banks, sentence frames, oral responses, graphic organizers, observations, portfolios of student work, orally administered assessments, and anecdotal notes.</p> <p>Benchmark – LinkIt Benchmark Assessment, Teacher Generated Assessments</p> <p>Formative, Summative, Alternative and Benchmark Assessments</p>
Resources to Promote Learning	
Resources & Equipment Needed	Smartboard, Computers, Websites and digital interactives/models, Multi-media presentations, Video Streaming, Brain Pop, Middle School Science, Generation Genius Digital Curriculum, Mystery Science Digital Curriculum, Amplify Digital Curriculum, Microsoft 365, Primary and Secondary Source Documents, Assorted lab materials. Approved Class Resource List
Content & Interdisciplinary Standards	
NJ 2020 SLS: Science	
<i>Standards</i>	
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. [Clarification Statement: Examples could include an unbalanced force on one side of a ball can make it start moving; and, balanced forces pushing on a box from both sides will not produce any motion at all.] [Assessment Boundary: Assessment is	

limited to one variable at a time: number, size, or direction of forces. Assessment does not include quantitative force size, only qualitative and relative. Assessment is limited to gravity being addressed as a force that pulls objects down.]

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. [Clarification Statement: Examples of motion with a predictable pattern could include a child swinging in a swing, a ball rolling back and forth in a bowl, and two children on a see-saw.] [Assessment Boundary: Assessment does not include technical terms such as period and frequency.]

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. [Clarification Statement: Examples of an electric force could include the force on hair from an electrically charged balloon and the electrical forces between a charged rod and pieces of paper; examples of a magnetic force could include the force between two permanent magnets, the force between an electromagnet and steel paperclips, and the force exerted by one magnet versus the force exerted by two magnets. Examples of cause and effect relationships could include how the distance between objects affects strength of the force and how the orientation of magnets affects the direction of the magnetic force.] [Assessment Boundary: Assessment is limited to forces produced by objects that can be manipulated by students, and electrical interactions are limited to static electricity.]

3-PS2-4., Define a simple design problem that can be solved by applying scientific ideas about magnets.* [Clarification Statement: Examples of problems could include constructing a latch to keep a door shut and creating a device to keep two moving objects from touching each other.]

Science and Engineering Practices

Asking Questions and Defining Problems - Asking questions and defining problems in grades 3–5 builds on grades K–2 experiences and progresses to specifying qualitative relationships.

- Ask questions that can be investigated based on patterns such as cause and effect relationships. (3-PS2-3)
- Define a simple problem that can be solved through the development of a new or improved object or tool. (3-PS2-4)

Planning and Carrying Out Investigations - Planning and carrying out investigations to answer questions or test solutions to problems in 3–5 builds on K–2 experiences and progresses to include investigations that control variables and provide evidence to support explanations or design solutions.

- Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence, using fair tests in which variables are controlled and the number of trials considered. (3-PS2-1)

- Make observations and/or measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon or test a design solution. (3-PS2-2)

Connections to Nature of Science - Science Knowledge is Based on Empirical Evidence

- Science findings are based on recognizing patterns. (3-PS2-2)

Scientific Investigations Use a Variety of Methods

- Science investigations use a variety of methods, tools, and techniques. (3-PS2-1)

Disciplinary Core Ideas (DCI)

PS2.A: Forces and Motion

- Each force acts on one particular object and has both strength and a direction. An object at rest typically has multiple forces acting on it, but they add to give zero net force on the object. Forces that do not sum to zero can cause changes in the object’s speed or direction of motion. (Boundary: Qualitative and conceptual, but not quantitative addition of forces are used at this level.) (3-PS2-1)
- The patterns of an object’s motion in various situations can be observed and measured; when that past motion exhibits a regular pattern, future motion can be predicted from it. (Boundary: Technical terms, such as magnitude, velocity, momentum, and vector quantity, are not introduced at this level, but the concept that some quantities need both size and direction to be described is developed.) (3-PS2-2)

PS2.B: Types of Interactions

- Objects in contact exert forces on each other. (3-PS2-1)
- Electric, and magnetic forces between a pair of objects do not require that the objects be in contact. The sizes of the forces in each situation depend on the properties of the objects and their distances apart and, for forces between two magnets, on their orientation relative to each other. (3-PS2-3),(3-PS2-4)

Crosscutting Concepts

Patterns	Patterns of change can be used to make predictions. (3-PS2-2)
Cause and Effect	Cause and effect relationships are routinely identified. (3-PS2-1) Cause and effect relationships are routinely identified, tested, and used to explain change. (3-PS2-3)
Interdependence of Science, Engineering, and Technology	Scientific discoveries about the natural world can often lead to new and improved technologies, which are developed through the engineering design process. (3-PS2-4)

NJ: 2016 SLS: English Language Arts

- RI.3.1 Ask and answer questions, and make relevant connections to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.
- RI.3.3 Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text , using language that pertains to time , sequence and cause/effect.
- RI.3.8 Describe the logical connection between particular sentences and paragraphs in a text (eg.,comparison, cause/effect, first/second/third in a sequence) to support specific points the author makes in a text
- W.3.7 Conduct short research projects that build knowledge about a topic.
- W.3.1, Write opinion pieces on topics or texts, supporting a point of view with reasons.
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NJ: 2016 SLS: Mathematics

- MP.2 Reason abstractly and quantitatively.
- MP.5 Use appropriate tools strategically.
- 3.MD.A.2, Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.
- 3.MD.B.3, Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step “how many more” and “how many less” problems using information presented in bar graphs.

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NJSLS Performance Expectations (By the end of 5th Grade)

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9.4.5.CT.2: Identify a problem and list the types of individuals and resources

9.4.5.CT.3: Describe how digital tools and technology may be used to solve problems.

9.4.5.CT.4: Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global.

Interdisciplinary/21st Century Connections

21st Century Connections

- Creativity and Innovation
- Information and Media Literacy
- Critical Thinking and Problem Solving
- Technology Literacy

SEL

- Self-awareness
- Recognize one’s personal traits, strengths, and limitations • Recognize the importance of self-confidence in handling daily tasks and challenges

Title	Traits and Organisms and their Environment
Unit Duration	8 Weeks
Unit Summary & Rationale	<i>Students will acquire an understanding that organisms have different inherited traits and that the environment can also affect the traits that an organism develops. The crosscutting concepts of patterns and cause and effect are called out as organizing concepts for these disciplinary core ideas. Students are expected to demonstrate grade-appropriate proficiency in analyzing and interpreting data, constructing explanations, and designing solutions. Students are also expected to use these practices to demonstrate understanding of the core ideas.</i>
Unit Goals	

Essential Questions	<ul style="list-style-type: none"> • How is matter transformed, and energy transferred/transformed in living systems? • How are organisms of the same kind different from each other? • How does this help them reproduce and survive? • How do fossils help explain about organisms from the past? • Why do plants grow flowers? • Why do plants give us fruit? • Why are some apples red and some green? • How could you make the biggest fruit in the world?
Enduring Understandings	<ul style="list-style-type: none"> • All organisms transfer matter and convert energy from one form to another. • Both matter and energy are necessary to build and maintain structures within the organism. • Organisms are grouped in taxonomy based upon similarity. • Understand the cause and effect of adaptations. • Living organisms have systems and structures that function to support life. • Living organisms experience cycles that vary over the span of their lives.
Learning Outcomes	<ul style="list-style-type: none"> • Be able to recognize plant and animal traits and where they from. • Be able to recognize how the environment affects traits • Be able to explain how adaptations help organisms survive • Be able to explain how an organism’s characteristics and how being a member of a group help it survive and reproduce

Assessment Evidence

Formative	Teacher observations, Class discussions, Lab Activities, Key concepts and vocabulary quizzes, Science Starter’s/Do Nows, Open Ended Responses, Modeling, Simulations, Innovators Monthly Research, Lab Activities, Vocabulary Responses, Exit Questions, Interactive Digital Assessments embedded in Exploring Science Digital Book
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[Formative, Summative, Alternative and Benchmark Assessments](#)

Resources to Promote Learning

Resources & Equipment Needed

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Content & Interdisciplinary Standards

NJ 2020 SLS: Science

Standards

3-LS2-1. Construct an argument that some animals form groups that help members survive.

3-LS4-1. Analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago. [Clarification Statement: Examples of data could include type, size, and distributions of fossil organisms. Examples of fossils and environments could include marine fossils found on dry land, tropical plant fossils found in Arctic areas, and fossils of extinct organisms.] [Assessment Boundary: Assessment does not include identification of specific fossils or present plants and animals. Assessment is limited to major fossil types and relative ages.]

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. [Clarification Statement: Examples of evidence could include needs and characteristics of the organisms and habitats involved. The organisms and their habitat make up a system in which the parts depend on each other.]

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.* [Clarification Statement: Examples of environmental changes could include changes in land characteristics, water distribution, temperature, food, and other organisms.] [Assessment Boundary: Assessment is limited to a single environmental change. Assessment does not include the greenhouse effect or climate change.]

Science and Engineering Practices

Analyzing and Interpreting - Data Analyzing data in 3–5 builds on K–2 experiences and progresses to introducing quantitative approaches to collecting data and conducting multiple trials of qualitative observations. When possible and feasible, digital tools should be used.

- Analyze and interpret data to make sense of phenomena using logical reasoning. (3-LS4-1)

Engaging in Argument from Evidence - Engaging in argument from evidence in 3–5 builds on K–2 experiences and progresses to critiquing the scientific explanations or solutions proposed by peers by citing relevant evidence about the natural and designed worlds.

- Construct an argument with evidence, data, and/or a model. (3-LS2-1)
- Construct an argument with evidence. (3-LS4-3)
- Make a claim about the merit of a solution to a problem by citing relevant evidence about how it meets the criteria and constraints of the problem. (3-LS4-4)

Disciplinary Core Ideas (DCI)

PS2.A: Forces and Motion

- Each force acts on one particular object and has both strength and a direction. An object at rest typically has multiple forces acting on it, but they add to give zero net force on the object. Forces that do not sum to zero can cause changes in the object’s speed or direction of motion. (Boundary: Qualitative and conceptual, but not quantitative addition of forces are used at this level.) (3-PS2-1)
- The patterns of an object’s motion in various situations can be observed and measured; when that past motion exhibits a regular pattern, future motion can be predicted from it. (Boundary: Technical terms, such as magnitude, velocity, momentum, and vector quantity, are not introduced at this level, but the concept that some quantities need both size and direction to be described is developed.) (3-PS2-2)

PS2.B: Types of Interactions

- Objects in contact exert forces on each other. (3-PS2-1)
- Electric, and magnetic forces between a pair of objects do not require that the objects be in contact. The sizes of the forces in each situation depend on the properties of the objects and their distances apart and, for forces between two magnets, on their orientation relative to each other. (3-PS2-3),(3-PS2-4)

Crosscutting Concepts

Patterns	<ul style="list-style-type: none"> • Patterns of change can be used to make predictions. (3-PS2-2)
Cause and Effect	<ul style="list-style-type: none"> • Cause and effect relationships are routinely identified. (3-PS2-1) • Cause and effect relationships are routinely identified, tested, and used to explain change. (3-PS2-3)
Interdependence of Science, Engineering, and Technology	<ul style="list-style-type: none"> • Scientific discoveries about the natural world can often lead to new and improved technologies, which are developed through the engineering design process. (3-PS2-4)

RI.3.1 Ask and answer questions, and make relevant connections to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.

RI.3.3 Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text , using language that pertains to time , sequence and cause/effect.

RI.3.8 Describe the logical connection between particular sentences and paragraphs in a text (eg.,comparison, cause/effect, first/second/third in a sequence) to support specific points the author makes in a text

W.3.7 Conduct short research projects that build knowledge about a topic.

W.3.1, Write opinion pieces on topics or texts, supporting a point of view with reasons.

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W.3.8 Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories.

SL.3.3. Ask and answer questions about information from a speaker, offering appropriate elaboration and detail.

SL.3.4. Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.

SL.3.6. Speak in complete sentences when appropriate to task and situation in order to provide requested detail or clarification.

NJ: 2016 SLS: Mathematics

MP.2 Reason abstractly and quantitatively.

MP.5 Use appropriate tools strategically.

3.MD.A.2, Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.

3.MD.B.3, Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step “how many more” and “how many less” problems using information presented in bar graphs.

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Interdisciplinary/21st Century Connections

21st Century Connections

- Creativity and Innovation
- Information and Media Literacy
- Critical Thinking and Problem Solving
- Technology Literacy

SEL

- Recognize one’s personal traits, strengths, and limitations.
- Recognize the importance of self-confidence in handling daily tasks and challenges

Title	Continuing the Cycles
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Unit Duration	4 Weeks
Unit Summary & Rationale	<i>Students develop an understanding of the similarities and differences in organisms' life cycles. In addition, students 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. The crosscutting concepts of patterns and cause and effect are called out as organizing concepts for these disciplinary core ideas. Students demonstrate grade-appropriate proficiency in developing and using models and constructing explanations and designing solutions.</i>
Unit Goals	
Essential Questions	<ul style="list-style-type: none"> • How can you describe the stages of an animal's life cycle? • How can you describe the stages of a plant life cycle? • What are inherited plant and animal traits?
Enduring Understandings	<ul style="list-style-type: none"> • All organisms go through transformations. • Many characteristics of organisms are inherited from their parents. • Different organisms vary in how they look and function because they have different inherited information
Learning Outcomes	<ul style="list-style-type: none"> • Be able to develop a model to describe the stages of an animal's life cycle • Be able to develop a model to describe a plant's life cycle

Assessment Evidence	
Formative	Teacher observations, Class discussions, Lab Activities, Key concepts and vocabulary quizzes, Science Starter's/Do Nows, Open Ended Responses, Modeling, Simulations, Innovators Monthly Research, Lab Activities, Vocabulary Responses, Exit Questions, Interactive Digital Assessments embedded in Exploring Science Digital Book
Summative	Projects, Tests, Quizzes, lab skills demonstrations, projects, and vocabulary quizzes.
Alternative and Benchmark	Formative, Summative, Alternative and Benchmark Assessments
Resources to Promote Learning	

Resources & Equipment Needed	Smartboard, Computers, Websites and digital interactives/models, Multi-media presentations, Video Streaming, Brain Pop, Middle School Science, Generation Genius Digital Curriculum, Mystery Science Digital Curriculum, Amplify Digital Curriculum, Microsoft 365, Primary and Secondary Source Documents, Assorted lab materials. Approved Class Resource List
Content & Interdisciplinary Standards	
NJ 2020 SLS: Science	
<i>Standards</i>	
<p>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. [Clarification Statement: Examples of evidence could include needs and characteristics of the organisms and habitats involved. The organisms and their habitat make up a system in which the parts depend on each other.]</p> <p>3-LS2-1. Construct an argument that some animals form groups that help members survive.</p> <p>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. [Clarification Statement: Patterns are the similarities and differences in traits shared between offspring and their parents, or among siblings. Emphasis is on organisms other than humans.] [Assessment Boundary: Assessment does not include genetic mechanisms of inheritance and prediction of traits. Assessment is limited to non-human examples.]</p>	
<i>Science and Engineering Practices</i>	
<p>Engaging in Argument from Evidence Engaging in argument from evidence in 3–5 builds on K–2 experiences and progresses to critiquing the scientific explanations or solutions proposed by peers by citing relevant evidence about the natural and designed worlds.</p> <ul style="list-style-type: none"> • Construct an argument with evidence, data, and/or a model. (3-LS2-1) • Construct an argument with evidence. (3-LS4-3) <p>Analyzing and Interpreting Data Analyzing data in 3–5 builds on K–2 experiences and progresses to introducing quantitative approaches to collecting data and conducting multiple trials of qualitative observations. When possible and feasible, digital tools should be used.</p> <ul style="list-style-type: none"> • Analyze and interpret data to make sense of phenomena using logical reasoning. (3-LS3-1) 	
<i>Disciplinary Core Ideas (DCI)</i>	
S4.C: Adaptation	

- For any particular environment, some kinds of organisms survive well, some survive less well, and some cannot survive at all. (3-LS4-3)

LS2.D: Social Interactions and Group Behavior

- Being part of a group helps animals obtain food, defend themselves, and cope with changes. Groups may serve different functions and vary dramatically in size. (Note: Moved from K–2) (3-LS2-1)

LS3.A: Inheritance of Traits

- Many characteristics of organisms are inherited from their parents. (3-LS3-1)
- Other characteristics result from individuals’ interactions with the environment, which can range from diet to learning. Many characteristics involve both inheritance and environment. (3- LS3-2)

LS3.B: Variation of Traits

- Different organisms vary in how they look and function because they have different inherited information. (3-LS3-1)
- The environment also affects the traits that an organism

Crosscutting Concepts

Patterns

- Similarities and differences in patterns can be used to sort and classify natural phenomena. (3-LS3-1) Patterns of change can be used to make predictions. (3-LS1-1)

Cause and Effect

- Cause and effect relationships are routinely identified and used to explain change. (3-LS2- 1),(3-LS4-3)

NJ: 2016 SLS: English Language Arts

- RI.3.1 Ask and answer questions, and make relevant connections to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.
- RI.3.3 Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text , using language that pertains to time , sequence and cause/effect.
- RI.3.8 Describe the logical connection between particular sentences and paragraphs in a text (eg.,comparison, cause/effect, first/second/third in a sequence) to support specific points the author makes in a text
- W.3.1, Write opinion pieces on topics or texts, supporting a point of view with reasons.
- W.3.2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
- W.3.4. With guidance and support from adults, produce writing in which the development and organization are appropriate to task and purpose. (Grade-specific expectations for writing types are defined in standards 1–3 above.)
- W.3.7. Conduct short research projects that build knowledge about a topic.

- W.3.8 Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories.
- SL.3.3. Ask and answer questions about information from a speaker, offering appropriate elaboration and detail.
- SL.3.4. Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.
- SL.3.6. Speak in complete sentences when appropriate to task and situation in order to provide requested detail or clarification.

NJ: 2016 SLS: Mathematics

- MP.2 Reason abstractly and quantitatively.
- MP.4 Model with mathematics.
- MP.5 Use appropriate tools strategically.
- 3.MD.A.2, Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.
- 3.MD.B.3, Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step “how many more” and “how many less” problems using information presented in bar graphs.
- 3.NBT Number and Operations in Base Ten
- 3.NF Number and Operations—Fractions
- 3.MD.B.3 Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step “how many more” and “how many less” problems using information presented in scaled bar graphs.
- 3.MD.B.4 Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units—whole numbers, halves, or quarters.

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Interdisciplinary/21st Century Connections

21st Century Connections	<ul style="list-style-type: none"> • Creativity and Innovation • Information and Media Literacy • Critical Thinking and Problem Solving • Technology Literacy
Visual and Performing Art	<ul style="list-style-type: none"> • 1.5.5.Cr1a: Brainstorm and curate ideas to innovatively problem solve during artmaking and design projects.
Social Studies	<ul style="list-style-type: none"> • 6.1.5.GeoPP.2: Describe how landforms, climate and weather, and availability of resources have impacted where and how people live and work in different regions of New Jersey and the United States.

Accommodations & Modifications

Special Education Students, 504 students, English Language Learners, Students at-Risk Based on Students' Individual Needs

Time/General	Processing	Comprehension
<ul style="list-style-type: none"> • Allow extra time • Repeat and clarify directions • Provide breaks in between tasks • Have student verbalize directions • Provide timelines/due dates for reports and projects 	<ul style="list-style-type: none"> • Provide extra response time • Have student verbalize steps • Repeat directions • Provide small group instruction • Include partner work 	<ul style="list-style-type: none"> • Provide reading material on student's level • Have student underline important points • Assist student on how to use context clues to identify words/phrases • Ensure short manageable tasks

<p style="text-align: center;">Tests/Quizzes/Grading</p> <ul style="list-style-type: none"> • Provide extended time • Provide study guides • Limit number of responses 	<p style="text-align: center;">Behavior/Attention</p> <ul style="list-style-type: none"> • Establish classroom rules • Write a contract with the student specifying expected behaviors • Provide preferential seating • Re-focus student as needed • Reinforce student for staying on task 	<p style="text-align: center;">Organization</p> <ul style="list-style-type: none"> • Monitor the student and provide reinforcement of directions • Verify the accurateness of homework assignments • Display a written agenda
ELL, Enrichment, Gifted & Talented Strategies		
<p>Accommodations Based on Students' Individual Needs</p> <p>ELL Strategies</p> <ul style="list-style-type: none"> • Provide explicit, systematic instruction in vocabulary. • Ensure that ELLs have ample opportunities to talk with both adults and peers and provide ongoing feedback and encouragement. • Expose ELLs to rich language input. • Scaffolding for ELLs language learning. • Encourage continued L1 language development. • Alphabet knowledge 		

- Phonological awareness
- Print awareness
- Design instruction that focuses on all of the foundational literacy skills.
- Recognize that many literacy skills can transfer across languages.
- English literacy development by helping ELLs make the connection between what they know in their first language and what they need to know in English.
- Graphic organizers
- Modified texts
- Modified assessments
- Written/audio instruction
- Shorter paragraph/essay length
- Homogeneously grouped by level

Accommodations Based on Students' Individual Needs:

Enrichment Strategies

- Evaluate vocabulary
- Elevate Text Complexity
- Incorporate inquiry based assignments and projects
- Extend curriculum
- Balance individual, small group and whole group instruction
- Provide tiered/multi-level activities
- Include purposeful learning centers
- Provide open-ended activities and projects
- Offer opportunities for heterogeneous grouping to work with age and social peers as well as homogeneous grouping to provide time to work with individual peers
- Provide pupils with experiences outside the 'regular' curriculum
- Alter the pace the student uses to cover regular curriculum in order to explore topics of interest in greater depth/breadth within their own grade level

- Require a higher quality of work than the norm for the given age group
- Promote higher level of thinking and making connections.
- Focus on process learning skills such as brainstorming, decision making and social skills
- Use supplementary materials in addition to the normal range of resources.
- Encourage peer to peer mentoring
- Integrate cross-curricular lessons
- Incorporate real-world problem solving activities
- Facilitate student-led questioning and discussions

Gifted & Talented Strategies

- More elaborate, complex, and in-depth study of major ideas, problems, and themes that integrate knowledge within and across systems of thought.
- Development and application of productive thinking skills to enable students to reconceptualize existing knowledge and/or generate new knowledge.
- Explore constantly changing knowledge and information and develop the attitude that knowledge is worth pursuing in an open world.
- Encourage exposure to, selection, and use of appropriate and specialized resources.
- Promote self-initiated and self-directed learning and growth.
- Provide for the development of self-understanding and the understanding of one's relationship to persons, societal institutions, nature, and culture.
- Flexible pacing
- Use of more advanced or complex concepts, abstractions, and materials
- Encourage students to move through content areas at their own pace. If they master a particular unit, they need to be provided with more advanced learning activities, not more of the same activity.
- Questions that require a higher level of response and/or open-ended questions that stimulate inquiry, active exploration, and discovery.
- Encourage students to think about subjects in more abstract and complex ways
- Activity selection based on student interests, that encourage self-directed learning
- Group interaction and simulations

- Guided self-management
- Encourage students to demonstrate what they have learned in a wide variety of forms that reflect both knowledge and the ability to manipulate ideas.
- Engage students in active problem-finding and problem-solving activities and research.
- Provide students opportunities for making connections within and across systems of knowledge by focusing on issues, themes, and ideas.