



# BURCH CHARTER SCHOOL OF EXCELLENCE

2020-2021

3<sup>rd</sup> Grade Science

Approved by the Burch Charter School of Excellence Board of Trustees

August 2020

## **MISSION STATEMENT OF BURCH CHARTER SCHOOL OF EXCELLENCE:**

Burch Charter School of Excellence (BCSE) was founded in September, 2008. Our primal mission is to enable students to reach their intellectual and personal potential. We strive to instill integrity and respect in our students' in partnership with families and the community. We maintain a blended learning environment that enhances positive character traits that ensures our students become productive 21st century world citizens. The Burch Charter School of Excellence, a public school, is committed to providing best practices for educating our students in an environment that enables them to develop into critical thinkers that evolve into digital, life-long learners. Our curriculum emphasizes literacy and mathematics infused with technology.

We believe:

- Our students will be effective communicators, quality producers, self-directed lifelong learners, community contributors, collaborative workers and complex thinkers;
- All students are entitled to opportunities to maximize their talents and abilities;
- Our ethnic and cultural diversity is our strength and prepares students for success in a global society;
- Setting high expectations for students, teachers and administrators ensures that our students successfully meet or exceed the New Jersey Student Learning Standards.
- Parents are essential partners in the education of their children;
- Maintaining a strong partnership with the Irvington community is integral to student success;
- Understanding, implementing and responding to current trends in technology is intrinsic to success in a 21<sup>st</sup> century world; In ensuring that the district has a well-trained, highly qualified and competent staff; In maintaining a safe and secure learning environment.

The underlying values and principles that drive our mission and vision are our personal responsibility, a strong work ethic, cooperation, respect for others, honesty, integrity and the firm belief that every child can learn.

**Burch Charter School of Excellence**  
**3rd Grade Science Model Curriculum Overview**

**Unit 1: Weather and Climate**

**Instructional Days: 15**

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.

This unit is based on 3-#WW2-1, 3-ESS2-2, 3-ESS3-1, and 3-5-ETS1-1.

**Unit 2: Force and Motion**

**Instructional Days: 15**

In this unit of study, students determine the effects of balanced and unbalanced forces on the motion of an object. 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 *planning and carrying out investigations*. Students are also expected to use these practices to demonstrate understanding of the core ideas.

This unit is based on 3-PS2-1 and 3-PS2-2.

### **Unit 3: Electrical and Magnetic Forces**

**Instructional Days: 15**

In this unit of study, students determine the effects of balanced and unbalanced forces on the motion of an object and the cause-and-effect relationships of electrical or magnetic interactions to define a simple design problem that can be solved with magnets. The crosscutting concept of *cause and effect*, and the *interdependence of science, engineering, and technology, 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 are expected to demonstrate grade-appropriate proficiency in *asking questions and defining problems*. Students are also expected to use these practices to demonstrate understanding of the core ideas.

This unit is based on 3-PS2-3, 3-PS2-4, and 3-5-ETS1-1.

### **Unit 4: Traits**

**Instructional Days: 15**

In this unit of study, students 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.

This unit is based on 3-LS3-1 and 3-LS3-2.

### **Unit 5: Continuing the Cycle**

**Instructional Days: 10**

In this unit of study, 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*. Students are also expected to use these practices to demonstrate understanding of the core ideas.

This unit is based on 3-LS1-1 and 3-LS4-2.

### **Unit 6: Organisms and the Environment**

**Instructional Days: 15**

In this unit of study, students develop an understanding of the idea that when the environment changes, some organisms survive and reproduce, some move to new locations, some move into the transformed environment, and some die. The crosscutting concepts of *cause and effect* and the *interdependence of science, engineering, and technology* are called out as organizing concepts for these disciplinary core ideas. Students demonstrate grade-appropriate proficiency in *engaging in argument from evidence*. Students are also expected to use this practice to demonstrate understanding of the core ideas.

This unit is based on 3-LS2-1 and 3-LS4-3.

### **Unit 7: Using Evidence to Understand Change in Environments**

**Instructional Days: 15**

In this unit of study, students develop an understanding of the types of organisms that lived long ago and also about the nature of their environments. Students develop an understanding of the idea that when the environment changes, some organisms survive and reproduce, some move to new locations, some move into the transformed environment, and some die. The crosscutting concepts of *systems and system models; scale, proportion, and quantity; 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 are expected to demonstrate grade-appropriate proficiency in *asking questions and defining problems, analyzing and interpreting data, and engaging in argument from evidence*. Students are also expected to use these practices to demonstrate understanding of the core ideas.

This unit is based on 3-LS4-1, 3-LS4-4, and 3-5-ETS1-1.

**Note:** *The number of instructional days is an estimate based on the information available at this time. 1 day equals approximately 42 minutes of seat time. Teachers are strongly encouraged to review the entire unit of study carefully and collaboratively to determine whether adjustments to this estimate need to be made.*

<b>Grade: 3</b>		<b>Content: Science</b>
<b>Unit 1: Weather and Climate</b>		<b>Time Frame: 15 Days</b>
<b>Next Generation Science Standards</b>	<b>Skills</b>	<b>I Can Statements</b>
<p><b>3SS2-1:</b> Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season.</p> <p><b>Essential Question:</b></p> <ul style="list-style-type: none"> <li>❖ <i>Can we predict the kind of weather that we will see in the spring, summer, autumn, or winter?</i></li> </ul>	<ul style="list-style-type: none"> <li>❖ Patterns of change can be used to make predictions.</li> <li>❖ People record patterns of the weather across different times and areas so that they can make predictions about what kind of weather might happen next.</li> </ul>	<ul style="list-style-type: none"> <li>❖ I can make predictions using patterns of change.</li> <li>❖ I can represent data in tables, bar graphs, and pictographs to reveal patterns that indicate relationships.</li> <li>❖ I can represent data in tables and graphical displays to describe typical weather conditions expected during a particular season.</li> </ul>
<p><b>3-ESS2-2:</b> <b>Obtain and combine information to describe climates in different regions of the world.</b></p> <p><b>Essential Question:</b></p> <ul style="list-style-type: none"> <li>❖ <i>How can climates in different regions of the world be described?</i></li> </ul>	<ul style="list-style-type: none"> <li>❖ Cause-and-effect relationships are routinely identified, tested, and used to explain change.</li> <li>❖ Science affects everyday life.</li> <li>❖ People’s needs and wants change over time, as do their demands for new and improved technologies.</li> <li>❖ Engineers improve 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).</li> </ul>	<ul style="list-style-type: none"> <li>❖ I can obtain and combine information from books and other reliable media to explain phenomena.</li> <li>❖ I can Identify and test cause-and-effect relationships to explain change.</li> </ul>

<p><b>3-ESS3-1:</b> Make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard.</p> <p><b>Essential Question:</b></p> <ul style="list-style-type: none"> <li>❖ <i>How can we protect people from natural hazards such as flooding, fast wind, or lightning?</i></li> </ul>	<ul style="list-style-type: none"> <li>❖ Possible solutions to a problem are limited by available materials and resources (constraints). The success of a designed solution is determined by considering the desired features of a solution (criteria).</li> <li>❖ A variety of natural hazards result from natural processes (e.g., <i>flooding, fast wind, or lightning</i>).</li> <li>❖ Humans cannot eliminate natural hazards but can take steps to reduce their impacts.</li> </ul>	<ul style="list-style-type: none"> <li>❖ I can 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.</li> <li>❖ I can make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard. Examples of design solutions to weather-related hazards could include: <ul style="list-style-type: none"> <li>✓ Barriers to prevent flooding</li> <li>✓ Wind-resistant roofs</li> <li>✓ Lightning rods</li> </ul> </li> </ul>
<p><b>3-5-ETS1-1:</b> Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.</p> <p><b>Essential Question:</b></p> <ul style="list-style-type: none"> <li>❖ <i>What is a design for?</i></li> <li>❖ <i>What are the criteria and constraints of a successful solution?</i></li> </ul>	<ul style="list-style-type: none"> <li>❖ The success of a designed solution is determined by considering the desired features of a solution (criteria).</li> <li>❖ Different proposals for solutions can be compared on the basis of how well each one meets the specified criteria for success or how well each takes the constraints into account.</li> </ul>	<ul style="list-style-type: none"> <li>❖ I can define a simple design problem that can be solved through the development of an object, tool, process, or system and includes several criteria for success and constraints on materials, time, or cost.</li> <li>❖ I can define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.</li> </ul>
<b>Resources</b>		
<p><a href="#">Weather Science content for Kids and Teens:</a> The National Weather Service has several education resources available at this website.</p>		
<p><a href="#">NOAA Education Resources:</a> The National Oceanic and Atmospheric Administration (NOAA) provides education resources at this website.</p>		
<p><a href="https://www.savvasrealize.com/index.html#/">Pearson Realize:</a> <a href="https://www.savvasrealize.com/index.html#/">https://www.savvasrealize.com/index.html#/</a></p>		

### Connections to NJSLS – English Language Arts

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

**RI.3.9:** Compare and contrast the most important points and key details presented in two texts on the same topic.

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

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

**W.3.9:** Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories.

### Connections to NJSLS – Math

**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.



<b>Grade: 3</b>		<b>Content: Science</b>
<b>Unit 2: Force and Motion</b>		<b>Time Frame: 15 Days</b>
<b>Next Generation Science Standards</b>	<b>Skills</b>	<b>I Can Statements</b>
<p><b>3-PS2-1:</b> Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.</p> <p><b>Essential Question:</b></p> <ul style="list-style-type: none"> <li>❖ <i>How do equal and unequal forces on an object affect the object?</i></li> </ul>	<ul style="list-style-type: none"> <li>❖ Science investigations use a variety of methods, tools, and techniques.</li> <li>❖ Cause-and-effect relationships are routinely identified.</li> <li>❖ Objects in contact exert forces on each other.</li> <li>❖ Each force that acts on a particular object has both strength and a direction.</li> <li>❖ An object at rest typically has multiple forces acting on it, but they add to zero net force on the object.</li> <li>❖ Forces that do not sum to zero can cause changes in the object's speed or direction of motion.</li> </ul>	<ul style="list-style-type: none"> <li>❖ I can identify cause-and-effect relationships.</li> <li>❖ I can plan and conduct investigations collaboratively to produce data to serve as the basis for evidence.</li> <li>❖ I can use fair tests in which variables are controlled and the number of trials considered.</li> <li>❖ I can plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object</li> </ul>
<p><b>3-PS2-2:</b> Make observations and/or measurements of an object's motion to provide evidence that a pattern can be used to predict future motion.</p> <p><b>Essential Question:</b></p> <ul style="list-style-type: none"> <li>❖ <i>Can we use patterns that we observed to predict the future?</i></li> </ul>	<ul style="list-style-type: none"> <li>❖ Science findings are based on recognizing patterns.</li> <li>❖ Patterns of change can be used to make predictions.</li> <li>❖ The patterns of an object's motion in various situations can be observed and measured.</li> <li>❖ When past motion exhibits a regular pattern, future motion can be predicted from it.</li> </ul>	<ul style="list-style-type: none"> <li>❖ I can make predictions using patterns of change.</li> <li>❖ I can make observations and/or measurements to produce data to serve as the basis of evidence for an explanation of a phenomenon.</li> <li>❖ I can make observations and/or measurements of an object's motion to provide evidence that a pattern can be used to predict future motion</li> </ul>
<b>Resources</b>		

**Puffing Forces:** Students will predict and observe what happens when a force is applied to an object, and compare the relative effects of a force of the same strength on objects of different weights by using a straw to gently puff air at a ping pong ball then a golf ball and measuring the distance the ball travels with a ruler. Students will repeat this procedure using a harder puff. This lesson was adapted from the Utah Education Network <http://www.uen.org/Lessonplan/preview?LPid=14858>

**Robo Arm:** This fun activity is one of five in a series of space based engineering challenges developed by NASA and Design Squad where students are engaged in implementing the Engineering Design process to build a robotic arm that can lift a cup off a table using cardboard strips, brass fasteners, paper clips, straw, string, tape and a cup. The activity includes an instructor's guide, questioning techniques, discussion questions, extension activity, a rubric, and 3 short video clips that enhance the purpose of the activity and its relevance to NASA.

**Pearson Realize:** <https://www.savvasrealize.com/index.html#/>

### **Connections to NJSLs – English Language Arts**

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

**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.

### **Connections to NJSLs – Math**

**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.

<b>Grade: 3</b>		<b>Content: Science</b>
<b>Unit 3: Electrical and Magnetic Forces</b>		<b>Time Frame: 15 Days</b>
<b>Next Generation Science Standards</b>	<b>Skills</b>	<b>I Can Statements</b>
<p><b>3-PS2-3:</b> Ask questions to determine cause and effect relationships of electric or magnetic interactions between two objects not in contact with each other.</p> <p><b>Essential Question:</b></p> <ul style="list-style-type: none"> <li>❖ <i>What are the relationships between electrical and magnetic forces?</i></li> </ul>	<ul style="list-style-type: none"> <li>❖ Cause-and-effect relationships are routinely identified, tested, and used to explain change.</li> <li>❖ Electric and magnetic forces between a pair of objects do not require that the objects be in contact.</li> <li>❖ 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.</li> </ul>	<ul style="list-style-type: none"> <li>❖ I can identify and test cause-and-effect relationships in order to explain change.</li> <li>❖ I can ask questions that can be investigated based on patterns such as cause-and-effect relationships.</li> <li>❖ I can ask questions to determine cause-and-effect relationships in electric or magnetic interactions between two objects not in contact with each other.</li> </ul>
<p><b>3-PS2-4:</b> Define a simple design problem that can be solved by applying scientific ideas about magnets.</p> <p><b>Essential Question:</b></p> <ul style="list-style-type: none"> <li>❖ <i>How can we use our understandings about magnets be used to solve problems?</i></li> </ul>	<ul style="list-style-type: none"> <li>❖ Scientific discoveries about the natural world can often lead to new and improved technologies, which are developed through the engineering design process.</li> <li>❖ People’s needs and wants change over time, as do their demands for new and improved technologies.</li> <li>❖ Electric and magnetic forces between a pair of objects do not require that the objects be in contact.</li> <li>❖ The sizes of the forces in each situation depend on the properties of the objects and their distances apart.</li> <li>❖ For forces between two magnets, the size of the force depends on their orientation relative to each other.</li> <li>❖ Possible solutions to a problem are limited by available materials and resources (constraints).</li> </ul>	<ul style="list-style-type: none"> <li>❖ Define a simple problem that can be solved through the development of a new or improved object or tool.</li> <li>❖ Define a simple design problem that can be solved by applying scientific ideas about magnets (e.g., constructing a latch to keep a door shut or creating a device to keep two moving objects from touching each other).</li> </ul>

<p><b>3-5-ETS1-1:</b> Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.</p> <p><b>Essential Question:</b></p> <ul style="list-style-type: none"> <li>❖ <i>What is a design for?</i></li> <li>❖ <i>What are the criteria and constraints of a successful solution?</i></li> </ul>	<ul style="list-style-type: none"> <li>❖ The success of a designed solution is determined by considering the desired features of a solution (criteria).</li> <li>❖ Different proposals for solutions can be compared on the basis of how well each one meets the specified criteria for success or how well each takes the constraints into account.</li> </ul>	<ul style="list-style-type: none"> <li>❖ I can define a simple design problem that can be solved through the development of an object, tool, process, or system and includes several criteria for success and constraints on materials, time, or cost.</li> <li>❖ I can define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.</li> </ul>
---	---	---

**Resources**

**Investigating the Magnetic Force Field: Calculating the Magnetic Pull of a Magnet by Varying Distances:** Students will investigate the magnetic pull of a bar magnet at varying distances with the use of paper clips. Students will hypothesize, conduct the experiment, collect the data, and draw conclusions. As a class, students will then compare each team’s data and their interpretation of the results

**Pearson Realize:** <https://www.savvasrealize.com/index.html#/>

**Connections to NJSLs – English Language Arts**

**RI.3.1:** Ask and answer questions 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 (e.g., comparison, cause/effect, first/second/third in a sequence).

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

<b>Grade: 3</b>		<b>Content: Science</b>
<b>Unit 4: Traits</b>		<b>Time Frame: 15 Days</b>
<b>Next Generation Science Standards</b>	<b>Skills</b>	<b>I Can Statements</b>
<p><b>3-LS3-1:</b> 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.</p> <p><b>Essential Question:</b> ❖ <i>What kinds of traits are passed on from parent to offspring?</i></p>	<ul style="list-style-type: none"> <li>❖ Similarities and differences in patterns can be used to sort and classify natural phenomena (e.g., inherited traits that occur naturally).</li> <li>❖ Many characteristics of organisms are inherited from their parents.</li> <li>❖ Different organisms vary in how they look and function because they have different inherited information.</li> </ul>	<ul style="list-style-type: none"> <li>❖ I can sort and classify natural phenomena using similarities and differences.</li> <li>❖ I can analyze and interpret data to make sense of phenomena using logical reasoning.</li> <li>❖ I can 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</li> </ul>
<p><b>3-LS3-2:</b> Use evidence to support the explanation that traits can be influenced by the environment.</p> <p><b>Essential Question:</b> ❖ <i>What environmental factors might influence the traits of a specific organism?</i></p>	<ul style="list-style-type: none"> <li>❖ Cause-and-effect relationships are routinely identified and used to explain change.</li> <li>❖ Other characteristics, which can range from diet to learning, result from individuals' interaction with the environment.</li> <li>❖ Many characteristics involve both inheritance and environment.</li> <li>❖ The environment also affects the traits that an organism develops.</li> </ul>	<ul style="list-style-type: none"> <li>❖ I can identify cause-and-effect relationships in order to explain change.</li> <li>❖ I can use evidence (e.g., observations, patterns) to support an explanation.</li> <li>❖ I can use evidence to support the explanation that traits can be influenced by the environment.</li> </ul>
<b>Resources</b>		

**Guppies Galore:** Groups of students set up a small freshwater aquarium (made from gallon jars) that feature a male guppy, a female guppy, and a green plant. After the female guppy goes through her pregnancy and gives birth, the students will then observe, over time, the development of the fry into male and female guppies with characteristics similar to the parents.

**Pearson Realize:** <https://www.savvasrealize.com/index.html#/>

### **Connections to NJSLS – English Language Arts**

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

**RI.3.2:** Determine the main idea of a text; recount the key details and explain how they support the main idea.

**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.

**W.3.2:** Write informative/explanatory texts to examine a topic and convey ideas and information clearly.

**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.

### **Connections to NJSLS – Math**

**MP.2:** Reason abstractly and quantitatively.

**MP.4:** Model with mathematics.

**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.

<b>Grade: 3</b>		<b>Content: Science</b>
<b>Unit 5: Continuing the Cycle</b>		<b>Time Frame: 10 Days</b>
<b>Next Generation Science Standards</b>	<b>Skills</b>	<b>I Can Statements</b>
<p><b>3-LS1-1:</b> Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death.</p> <p><b>Essential Question:</b></p> <ul style="list-style-type: none"> <li>❖ <i>Do all living things have the same life cycle?</i></li> </ul>	<ul style="list-style-type: none"> <li>❖ Science findings are based on recognizing patterns.</li> <li>❖ Similarities and differences in patterns can be used to sort and classify natural phenomena.</li> <li>❖ Patterns of change can be used to make predictions.</li> <li>❖ Reproduction is essential to the continued existence of every kind of organism.</li> <li>❖ Plants and animals have unique and diverse life cycles.</li> </ul>	<ul style="list-style-type: none"> <li>❖ I can sort and organisms (inherited traits) using similarities and differences in patterns.</li> <li>❖ I can make predictions using patterns of change.</li> <li>❖ I can develop models to describe phenomena.</li> <li>❖ I can develop models to describe that organisms I can have unique and diverse life cycles but all have in common birth, growth, reproduction, and death. (I.e., Changes organisms go through during their life form a pattern.)</li> </ul>
<p><b>3-LS4-2:</b> 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.</p> <p><b>Essential Question:</b></p> <ul style="list-style-type: none"> <li>❖ <i>Are there advantages to being different?</i></li> </ul>	<ul style="list-style-type: none"> <li>❖ Cause-and-effect relationships are routinely identified and used to explain change.</li> <li>❖ Sometimes the differences in characteristics between individuals of the same species provide advantages in surviving, finding mates, and reproducing.</li> </ul>	<ul style="list-style-type: none"> <li>❖ I can identify cause-and-effect relationships in order to explain change.</li> <li>❖ I can use evidence (e.g., observations, patterns) to construct an explanation.</li> <li>❖ I can 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. Examples of cause-and-effect relationships could include: <ul style="list-style-type: none"> <li>✓ Plants that have larger thorns than other plants may be less likely to be eaten by</li> </ul> </li> </ul>

predators.

- ✓ Animals that have better camouflage coloration than other animals may be more likely to survive and therefore more likely to leave offspring.

### Resources

#### [Let's Hear It For Ladybugs!](#)

This article describes a ladybug life cycle unit that incorporates language arts and science concepts. Students build on their prior knowledge of butterflies as they explore the metamorphosis of ladybugs. To create their final project, clay life cycle models, students synthesize what they learned from live observation and nonfiction texts.

#### [Simply Butterflies!](#)

This article gives suggestions for building a simple walk-in classroom butterfly observatory and using the observatory to hatch out Painted Lady butterflies as part of a four-week unit on life cycle stages.

**Pearson Realize:** <https://www.savvasrealize.com/index.html#/>



### Connections to NJSLs – English Language Arts

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

**RI.3.2:** Determine the main idea of a text; recount the key details and explain how they support the main idea.

**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.3.7:** Use information gained from illustrations (e.g., maps, photographs) and the words in a text to demonstrate understanding of the text (e.g., where, when, why, and how key events occur).

**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.3.5:** Create engaging audio recordings of stories or poems that demonstrate fluid reading at an understandable pace; add visual displays when appropriate to emphasize or enhance certain facts or details.

**W.3.2:** Write informative/explanatory texts to examine a topic and convey ideas and information clearly.

### Connections to NJSLs – Math

**MP.2:** Reason abstractly and quantitatively.

**MP.4:** Model with mathematics.

**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.

<b>Grade: 3</b>		<b>Content: Science</b>
<b>Unit 6: Organisms and the Environment</b>		<b>Time Frame: 15 Days</b>
<b>Next Generation Science Standards</b>	<b>Skills</b>	<b>I Can Statements</b>
<b>3-LS2-1:</b> Construct an argument that some animals form groups that help members survive.  <b>Essential Question:</b> <ul style="list-style-type: none"> <li>❖ <i>Why do animals form groups?</i></li> <li>❖ <i>How do groups help animals survive?</i></li> </ul>	<ul style="list-style-type: none"> <li>❖ Cause-and-effect relationships are routinely identified and used to explain change.</li> <li>❖ Knowledge of relevant scientific concepts and research findings is important in engineering.</li> </ul>	<ul style="list-style-type: none"> <li>❖ I can identify cause-and-effect relationships in order to explain change.</li> <li>❖ I can construct an argument with evidence.</li> </ul>
<b>3-LS4-3:</b> 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.  <b>Essential Question:</b> <ul style="list-style-type: none"> <li>❖ <i>In a particular habitat, why do some organisms survive well, some survive less well, and some not survive at all?</i></li> </ul>	<ul style="list-style-type: none"> <li>❖ For any particular environment, some kinds of organisms survive well, some survive less well, and some cannot survive at all.</li> <li>❖ Organisms and their habitat make up a system in which the parts depend on each other.</li> </ul>	<ul style="list-style-type: none"> <li>❖ I can construct an argument with evidence (e.g., needs and characteristics of the organisms and habitats involved) that in a particular habitat, some organisms can survive well, some can survive less well, and some cannot survive at all.</li> </ul>
<b>Resources</b>		

[Muskox Maneuvers](#): In this activity, students create a physical model showing how muskoxen work together as a group to protect their young from predators (wolves).

[Musk Ox Save Calf from Wolves Video](#): In this short video, Arctic wolves attack a musk ox calf on Canada's Ellesmere Island, but the herd rushes to its defense by forming a defensive circle around the calves.

[Insects That Work Together](#): This nonfiction book summarizes how some insects work together to increase their chances of survival. Details are provided on four types of insects: honeybees, hive wasps (hornets, yellow jackets, and paper wasps), termites, and ants. A short section on insect migration and building a hive model are also included.

[Battle at Kruger: Water Buffalo Save Calf from Lions Video](#): This short video captures student imagination and elicits ideas about how groups of organisms work together for survival. The video contains real footage of a pack of lions attack on a water buffalo calf. The footage filmed by amateur tourists features a surprising plot twist (featuring a crocodile), and exciting finale with the water buffalo herd rescues the calf and chases off the lions.

[A Walk in the Desert \(Biomes of North America\)](#): This nonfiction text describes the climate, soil, plants and animals of the North American deserts. It provides detailed information on how plants and animals adapt and survive there.

[A Walk in the Deciduous Forest \(Biomes of North America\)](#): This nonfiction text describes the climate, soil, plants and animals of the North American deciduous forests. It provides detailed information on how plants and animals adapt and survive there.

[A Walk in the Rain Forest \(Biomes of North America\)](#): This nonfiction text describes the climate, soil, plants and animals of the North American rain forests. It provides detailed information on how plants and animals adapt and survive there.

[A Walk in the Prairie \(Biomes of North America\)](#): This nonfiction text describes the climate, soil, plants and animals of the North American prairies. It provides detailed information on how plants and animals adapt

**Pearson Realize:** <https://www.savvasrealize.com/index.html#/>

### Connections to NJSLS – English Language Arts

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

**RI.3.2:** Determine the main idea of a text; recount the key details and explain how they support the main idea.

**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.

**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.

**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.

### Connections to NJSLS – Math

**MP.4:** Model with mathematics.

**3. NBT:** Number and Operations in Base Ten.

<b>Grade: 3</b>		<b>Content: Science</b>
<b>Unit 7: Using Evidence to Understand Change in Environments</b>		<b>Time Frame: 15 Days</b>
<b>Next Generation Science Standards</b>	<b>Skills</b>	<b>I Can Statements</b>
<p><b>3-LS4-1:</b> Analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago.</p> <p><b>Essential Question:</b></p> <ul style="list-style-type: none"> <li>❖ <i>What do fossils tell us about the organisms and the environments in which they lived?</i></li> </ul>	<ul style="list-style-type: none"> <li>❖ Observable phenomena exist from very short to very long periods of time.</li> <li>❖ Science assumes consistent patterns in natural systems.</li> <li>❖ Some kinds of plants and animals that once lived on Earth are no longer found anywhere.</li> <li>❖ Fossils provide evidence about the types of organisms that lived long ago, and also about the nature of their environments.</li> </ul>	<ul style="list-style-type: none"> <li>❖ I can observe that phenomena exist from very short to very long periods of time.</li> <li>❖ I can analyze and interpret data to make sense of phenomena using logical reasoning.</li> <li>❖ I can analyze and interpret data from fossils (e.g., type, size, distributions of fossil organisms) to provide evidence of the organisms and the environments in which they lived long ago.</li> </ul>
<p><b>3-LS4-4:</b> 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.</p> <p><b>Essential Question:</b></p> <ul style="list-style-type: none"> <li>❖ <i>What happens to the plants and animals when the environment changes?</i></li> </ul>	<ul style="list-style-type: none"> <li>❖ A system can be described in terms of its components and their interactions.</li> <li>❖ People’s needs and wants change over time, as do their demands for new and improved technologies.</li> <li>❖ Populations live in a variety of habitats, and change in those habitats affects the organisms living there.</li> <li>❖ When the environment changes in ways that affect a place’s physical characteristics, temperature, or availability of resources, some organisms survive and reproduce, others move to new locations, others move into the transformed environment, and some die.</li> <li>❖ Possible solutions to a problem are limited by available</li> </ul>	<ul style="list-style-type: none"> <li>❖ I can describe a system in terms of its components and interactions.</li> <li>❖ I can 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 a problem.</li> <li>❖ I can 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. (Assessment is limited to a single environmental change and does not include</li> </ul>

	materials and resources (constraints).	the greenhouse effect or climate change.)
--	--	---

<p><b>3-5-ETS1-1:</b> Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.</p> <p><b>Essential Question:</b></p> <ul style="list-style-type: none"> <li>❖ <i>What is a design for?</i></li> <li>❖ <i>What are the criteria and constraints of a successful solution?</i></li> </ul>	<ul style="list-style-type: none"> <li>❖ The success of a designed solution is determined by considering the desired features of a solution (criteria).</li> <li>❖ Different proposals for solutions can be compared on the basis of how well each one meets the specified criteria for success or how well each takes the constraints into account.</li> </ul>	<ul style="list-style-type: none"> <li>❖ I can define a simple design problem that can be solved through the development of an object, tool, process, or system and includes several criteria for success and constraints on materials, time, or cost.</li> <li>❖ I can define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.</li> </ul>
---	---	---

**Resources**

**Mass Environmental Change:** In this lesson, students explore what happens to organisms when they cannot meet their needs due to changes in the environment. They categorize scenario cards representing different changes to an environment, then discuss in a whole group. Using what they have learned, they write about how changes to the environment can affect organisms. The resource link takes you to a full unit titled Effects of Changes in an Environment on the Survival of Organisms, of which Mass Environmental Change is a lesson.

**Pearson Realize:** <https://www.savvasrealize.com/index.html#/>

### Connections to NJSLS – English Language Arts

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

**RI.3.2:** Determine the main idea of a text; recount the key details and explain how they support the main idea.

**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.

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

**W.5.7:** Conduct short research projects that use several sources to build knowledge through investigation of different aspects of a topic.

**W.5.8:** Recall relevant information from experiences or gather relevant information from print and digital sources; summarize or paraphrase information in notes and finished work, and provide a list of sources.

**W.5.9:** Draw evidence from literary or informational texts to support analysis, reflection, and research.

**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.

### Connections to NJSLS – Math

**MP.2:** Reason abstractly and quantitatively.

**MP.4:** Model with mathematics.

**MP.5:** Use appropriate tools strategically.

**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.

**3-5.OA:** Operations and Algebraic Thinking

**Differentiated Instruction**  
*(content, process, product and learning environment)*

**At Risk Students**

**Modifications for Classroom**

- Pair visual prompts with verbal presentations
- Use of lab or experiments to give visual representation of concept
- Ask students to restate information, directions, and assignments.
- Work within group or partners
- Repetition and practice
- Model skills / techniques to be mastered.
- Use metacognitive work
- Extended time to complete class work
- Provide copy of class notes
- Student may request to use a computer to complete assignments.
- Use manipulatives to examine concepts
- Assign a peer helper in the class setting
- Provide oral reminders and check student work during independent work time

**English Language Learners**

**Modifications for Classroom**

- Native Language Translation  
(peer, online assistive technology, translation device, bilingual dictionary)
- Preteach vocabulary
- Use graphic organizers or other visual models
- Use of manipulatives to visualize concept
- Highlight key vocabulary-chart or vocabulary bank
- Use of nonverbal responses  
(thumbs up/down)
- Use sentence frames
- Design questions for different proficiency levels
- Utilize partners and partner talk

**Special Education**

**Gifted and Talented**



**Modifications for Classroom**

Pair visual prompts with verbal presentations

Use of lab or experiments to give visual representation of concept

Ask students to restate information, directions, and assignments.

Preteach vocabulary

Repetition and practice

Model skills / techniques to be mastered.

Use manipulatives and visual representation to examine  
Breakdown large assignments  
into smaller tasks

Extended time to complete  
class work

Provide copy of class notes

Preferential seating to be mutually determined by the student and  
teacher

Use of online component of book

Extra textbooks for home. Student may request books on tape / CD /  
digital media, as available and appropriate.

Assign a peer helper in the class setting

Provide oral reminders and check student work during independent  
work time

Assist student with long and short term planning of assignments

**Extension Activities**

Conduct research and provide presentation of cultural topics.

Design surveys to generate and analyze data to be used in discussion.

Use of Higher Level  
Questioning Techniques

Provide assessments at a  
higher level of thinking

Create alternative assessment which requires writing,  
research and presentation