

Grade 3 Science

Content Area: Science

Grade Level(s) : Grade 3

Date Developed/Revised July, 2019

Date Adopted _____

Course Description: Grade 3 Science

Unit 1 Engineering Processes: In this unit, students will define problems and design solutions to those problems; test solutions and make improvements to solutions.

Unit 2 Forces: In this unit, students will explore how forces work; discover different types of forces; learn about forces that act from a distance.

Unit 3 Motion: In this unit, students will explore types of forces and motion; learn about the relationship between forces and motion; identify forces in motion.

Unit 4 Life Cycles and Inherited Traits: In this unit, students will explore the life cycle of plants and animals; discover inherited plant and animal traits.

Unit 5 Organisms and their Environment: In this unit, students will explore inheritance and variation of traits and organisms; discover how different organisms adapt to their environment; identify the cause and effect of how organisms change when environments change.

Unit 6: Fossils: In this unit, students will explore fossils; discover what fossils can tell us about animals that lived long ago.

Unit 7 : Weather and Patterns: In this unit, students will 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.

Total Number of Units: 7

Pacing Guide

Unit	Week	Standard (NJSL)	Skill What we want students to “DO”
1: Engineering Processes	5 days	3-5-ETS1-1	Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
	5 days	3-5-ETS1-2	Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
	5 days	3-5-ETS1-3	Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

2: Forces	5 days	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.
	5 days	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.
	5 days	3-PS2-4	Define a simple design problem that can be solved by applying scientific ideas about magnets.
3: Motion	5 days	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.
	5 days	3-PS2-2	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.

4: Life Cycles and Inherited Traits	10 days	3-LS1-1	Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death.
	15 days	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.
5: Organisms and Their Environments	5 days	3-LS2-1	Construct an argument that some animals form groups that help members survive.
	5 days	3-LS3-2	Use evidence to support the explanation that traits can be influenced by the environment.
	5 days	3-LS4-2	Use evidence to construct an explanation for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing.

	<p>5 days</p> <p>10 days</p>	<p>3-LS4-3</p> <p>3-LS4-4</p>	<p>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.</p> <p>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>
6: Fossils	15 days	3-LS4-1	Analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago.
7: Weather and Patterns	10 days	3-ESS2-1	Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season.
	8 days	3-ESS2-2	Obtain and combine information to describe climates in different regions of the world.

	10 days	3-ESS3-1	Make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard.
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Unit 1 Title: Engineering Processes	
Time Frame: 15 days	
Essential Questions	
<ul style="list-style-type: none"> ● How do we define a problem? ● How do we design a solution? ● How do we test and improve a solution? 	
Standards NJSL	
Standards / CPIs (cumulative Progress Indicators) taught and assessed:	
<u>PERFORMANCE EXPECTATION</u>	
<p>3-5-ETS1-1 Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.</p> <p>3-5-ETS1-2 Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.</p> <p>3-5-ETS1-3 Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.</p>	
<u>DISCIPLINARY CORE IDEAS</u>	
<ul style="list-style-type: none"> ● ETS1.A Defining and Delimiting Engineering Problems 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). 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.

- **ETS1.B** Developing Possible Solutions Research on a problem should be carried out before beginning to design a solution. Testing a solution involves investigating how well it performs under a range of likely conditions. Developing Possible Solutions At whatever stage, communicating with peers about proposed solutions is an important part of the design process, and shared ideas can lead to improved designs.
- **ETS1.C** Optimizing the Design Solution Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and the constraints.

SCIENCE and ENGINEERING PRACTICES

Asking Questions and Defining Problems

- 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.

Constructing Explanations and Designing Solutions

- Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design problem.

Planning and Carrying Out Investigations

- 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.

CROSS CUTTING CONCEPTS

Influence of Science, Engineering, and Technology on Society and the Natural World

- Engineers improve existing technologies or develop new ones to increase their benefits, decrease known risks, and meet societal demands.

CONNECTIONS TO MATH

3.MD.A.2 Solve problems involving measurement and estimation

3.OA Operations and Algebraic Thinking

MP.2 Reason abstractly and quantitatively

MP4 Model with mathematics

MP5 Use appropriate tools strategically

CONNECTIONS TO ELA

RL.3.2 Ask and answer questions

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

SL 3.4 Report on a topic

W3.2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly

W3.8 Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories

Technology:

8.1.5.A.1 Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems.

8.1.5.A.2 Format a document using a word processing application to enhance text and include graphics, symbols and/ or pictures.

Highlighted Career Ready Practices:

CRP4. Communicate clearly and effectively and with reason.

CRP6. Demonstrate creativity and innovation

CRP7. Employ valid and reliable research strategies

CRP8. Utilize critical thinking to make sense of problems and persevere in solving them

CRP9. Model integrity, ethical leadership and effective management.

CRP11. Use technology to enhance productivity.

CRP12. Work productively in teams while using cultural global competence.

SEL Practices & Competencies:

Self-Management

Social Awareness

Responsible Decision-Making

Relationship Skills

<p>Overall Goal (What is the big idea?) Students integrate prior problem-solving experience with the engineering concepts of criteria and constraints to learn how engineers solve problems.</p>
<p>Pre-Assessment: Unit 1 Pretest Engineering Process</p>

Please include interdisciplinary connections resources and plan in each activity

Standards/ (SLO) Student Learning Objectives	Student Learning Strategies	Formative Assessment ***suggested but not limited to the following***	Activities ***suggested but not limited to the following***	Modifications & Reflections ***suggested but not limited to the following***
<p>3-5-ETS1-1</p> <p>We are learning to Identify a design and engineering problem...</p>	<p>Essential Vocabulary: constraint, criteria, design, engineer, engineering</p> <p>- given a problem scenario, integrate prior problem-solving experience - write a detailed description of a problem students wish to solve</p>	<p>Lesson 1 Apply What You Know Lesson 1 Check Lesson 1 Self Check Lesson 1 Roundup</p>	<p>Exploration 1: NJSLs RL.3.2, 3.MD.A.2, MP2 Defining Engineering Problems With a partner, find three human-made products in the classroom. Decide which needs they meet. Students write and share their ideas.</p>	<p>RTI/Extra Support: Exploration 1: Defining Engineering Problems Use a simple graphic organizer. Ask students to make a graphic organizer with the materials list they need and the steps they need to solve a problem.</p> <p>ELL/ELD Strategy: Exploration 1: Defining Engineering Problems</p>

	<p><u>Instructional Strategies:</u></p> <ul style="list-style-type: none"> - evidence notebooks - think pair share - cooperative learning - KWL chart - question-answer relationship (QAR) 		<p>Hands-On Activity: NJSLS RL.3.2 <u>What's in the Way?</u> Work in small groups to select the supplies needed to take on a backpacking trip taking into consideration a weight limit and then re-evaluate the list with a budget constraint.</p> <p>Exploration 2 NJSLS W3.8, W3.2 <u>Exploring the Limits of Problem Solving</u> Students learn to identify limits and the role they play in problem-solving and</p>	<p>Review multiple meaning words : <i>criteria, constraint</i> Provide preprinted pros and cons graphic organizer.</p> <p>Extension: Hands-OnActivity What's on the Way? Extend the activity by having students identify other materials needed when camping, such as food, water, and extra clothes. Have students set new weight limit to account for the additional materials. Have students create trading cards to swap cards to reach new weight limit.</p> <p>Extension: Exploration 2: Exploring the limits on Problem Solving Using NASA references, have students build a two or three dimensional model (diagram, drawing, diorama, or physical</p>
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			<p>determining constraints by exploring how NASA engineers think about constraints to make decisions.</p>	<p>replica) of the International Space Station.</p> <p>Suggested Strategies for Students with Special Needs</p> <ul style="list-style-type: none">-Keep instructions and directions <u>'chunked'</u>. Provide one step at a time, don't overload the student on too many pieces of information at once.- Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community.-Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling)
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<p><u>3-5-ETS1-2</u></p> <p>We are learning to research and design possible solutions to a problem, while communicating and comparing those solutions with others...</p>	<p><u>Essential Vocabulary:</u> constraint, criteria</p> <ul style="list-style-type: none"> -research and develop possible solutions -communicate and compare ideas -develop testing criteria -examine ways engineering solves problems <p><u>Instructional Strategies:</u></p> <ul style="list-style-type: none"> - evidence notebooks - think pair share - cooperative learning - KWL chart - question-answer relationship (QAR) 	<p>Lesson 2</p> <p>Apply What You Know</p> <p>Lesson 2 Lesson Check</p> <p>Lesson 2 Self Check</p> <p>Lesson 2 Roundup</p>	<p>Exploration 1: NJSLS W3.8, W3.2 <u>Water Movers</u> Sometimes the best way to solve a new problem is to look at how others have solved similar problems. Students look at different irrigation systems discussing which ones they think use the most water. Discuss and share which system would be best for a classroom garden.</p> <p>Exploration 2: NJSLS W.3.2.B, RI.3.1 <u>How Dry Am I?</u> You know that plants need water to survive. Compare the amount of water of different indoor plants. Students complete a data chart and explain how learning more details about needs help them think about solutions.</p>	<p>ELL/ELD Strategy: Exploration 1: Water Movers: Students learning English may struggle with terms <i>cloudy and damp</i> and weather that is <i>sunny and dry</i>. Have students draw two quick pictures to allow for further clarification.</p> <p>Suggested Strategies for Students with Special Needs</p> <ul style="list-style-type: none"> -Keep instructions and directions '<u>chunked</u>'. Provide one step at a time, don't overload the student on too many pieces of information at once. - Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community. -Provide students with multiple choices for how they can represent their understandings (e.g. multisensory
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				techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling)
<p><u>3-5-ETS1-3</u></p> <p>We are learning to develop an understanding of the role of research...</p> <p>We are learning to develop an understanding of criteria and constraints for a design solution...</p>	<p><u>Essential Vocabulary:</u> constraint, criteria, design, engineer, engineering, prototype</p> <p>-investigate prototype options and refinements of a solution - brainstorm ways to refine their solution for possible improvements</p> <p><u>Instructional Strategies:</u> - evidence notebooks - think pair share - cooperative learning - KWL chart - question-answer relationship (QAR)</p>	<p>Lesson 3 Apply What You Know Lesson 3 Lesson Check Lesson 3 Self Check Lesson 3 Roundup</p>	<p><u>Hands-On Activity:</u> <u>Chill Out</u> How do people keep cold things cold? Have students design a cup cooler to keep a drink cold. Discuss how insulating materials keep our homes, people, and objects warm. Have students generate a list of different situations. Review with students how to read a thermometer. Students design a method and a brief description on how to assemble the cooler. Provide students with cups of water as well as insulating materials. Then they should assemble and test the cup cooler. As a control, there should be a second cup of water and thermometer to gauge</p>	<p>RTI/Extra Support: Hands-On Activity: Chill Out Have students recall the aspects of engineering design that were learned previously. explain that they will be building on that information.</p> <p>EXTENSION: Hands-On Activity Chill Out Challenge students to think of other tasks that could be accomplished by developing a different Rube Goldberg device. Have them work as a group to research and identify the task and list three possible failures.</p> <p>Suggested Strategies for Students with Special Needs -Keep instructions and directions '<u>chunked</u>'.</p>

			<p>the normal amount of warming the cup goes through.</p> <p><u>Exploration 1:</u> <u>What Could Possibly Go Wrong?</u> NJSLs RI.3.1 Students look at a picture of a Rube Goldberg Device garage opener. They determine and explain some ways that it could break or not work properly.</p>	<p>Provide one step at a time, don't overload the student on too many pieces of information at once.</p> <ul style="list-style-type: none"> - Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community. - Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling)
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21st Century Theme Targeted – Global Awareness: Using 21st century skills to understand and address global issues.

21st Century Skills Targeted

Creativity & Innovation	Information Literacy	Media Literacy	Critical Thinking & Problem Solving	Communication & Collaboration	Life & Careers
<u>Rube Goldberg Ideas: Tasks and Materials to Make Your Own Machine</u>	Leveled Readers: <u>How Does The Design Process Help Us?</u>	<u>The Engineering Process: Crash Course Kids</u> <u>How an Irrigation System Works</u>	Unit Project: <u>Building a Better Backpack</u>	Students work in teams to answer the essential question and then use post-it notes during the <u>Gallery Walk strategy</u>	<u>What's an Engineer? Crash Course Kids</u>

Summative Assessments: (include rubrics & exemplars)

Unit 1 Summative [Engineering Process Assessment](#)

Unit 1 Performance Task: [The Benefits of Research](#)

Unit 1 Performance Task Scoring [Rubric](#)

Students obtain information and use it to design a solution to make an improvement and solve a problem. They will demonstrate an understanding of ETS1-B in support of ETS1-2.

Unit 2 Title: Forces

Time Frame: 15 days

Essential Questions

- **What are forces?**
- **What are some types of forces?**
- **What forces act from a distance?**

Standards NJSL

Standards / CPIs (cumulative Progress Indicators) taught and assessed:

PERFORMANCE EXPECTATION

- 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.
- 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.
- 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.
- 3-PS2-4** Define a simple design problem that can be solved by applying scientific ideas about magnets.

DISCIPLINARY CORE IDEAS

- **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.
- **PS2.B Types of Interactions** Objects in contact exert forces on each other.

- **PS2.B Types of Interactions** 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.

SCIENCE and ENGINEERING PRACTICES

Planning and Carrying Out Investigations

- Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question.

Science Knowledge is Based on Empirical Evidence

- Science findings are based on recognizing patterns.

Scientific Investigations

- Use a Variety of Methods Science investigations use a variety of methods, tools, and techniques.

Asking Questions and Defining Problems

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

CROSS CUTTING CONCEPTS

Cause and Effect

- Cause and effect relationships are routinely identified.

Patterns

- Patterns of change can be used to make predictions.

CONNECTIONS TO MATH

3.NF.A.3 Explain equivalence of fraction in special case, and compare fractions by reasoning about size.

3.OA.D.8 Solve problems using the four operations

3.MD.A.2 Measure and estimate liquid volumes and masses of objects

MP2 Reason abstractly and quantitatively

MP5 Use appropriate tools strategically.

CONNECTIONS TO ELA

RI.3.1 Ask and answer questions to demonstrate understanding of text

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

RI.3.7 Use information from illustrations

RI.3.8 Describe logical connections

W3.7 Conduct short research projects that build knowledge about a subject.

W3.8 Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories

Technology:

8.1.5.A.1 Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems.

8.1.5.A.2 Format a document using a word processing application to enhance text and include graphics, symbols and/ or pictures.

Highlighted Career Ready Practices:

CRP4. Communicate clearly and effectively and with reason.

CRP6. Demonstrate creativity and innovation.

CRP7. Employ valid and reliable research strategies.

CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.

CRP12. Work productively in teams while using cultural global competence.

SEL Practices & Competencies:

Self-Management

Social Awareness

Responsible Decision-Making

Relationship Skills

Overall Goal (What is the big idea?)

Students will explore how forces work; discover different types of forces; learn about forces that act from a distance.

Pre-Assessment: Unit 2 Pretest [Forces](#)

Please include interdisciplinary connections resources and plan in each activity

Standards/ (SLO) Student Learning Objectives	Student Learning Strategies	Formative Assessment ***suggested but not limited to the following***	Activities ***suggested but not limited to the following***	Modifications & Reflections ***suggested but not limited to the following***
<p><u>3-PS2-1</u></p> <p>We are learning to demonstrate how the strength and direction of a force can change the motion of an object...</p>	<p><u>Essential Vocabulary:</u> force, gravity, net force,</p> <ul style="list-style-type: none"> - recognize a force as a push or pull -demonstrate how the strength and direction of a force can be changed -identify the cause-and-effect relationship between the speed and direction of an object and the strength and direction of the force applied to it. <p><u>Instructional Strategies:</u></p> <ul style="list-style-type: none"> - evidence notebooks - think pair share - cooperative learning - KWL chart 	<p>Lesson 1 Apply What You Know Lesson 1 Check Lesson 1 Self Check Lesson 1 Roundup</p>	<p>Exploration 1 NJSLS W3.7, RI.3.1 <u>Forces Everywhere</u> Students investigate forces as a push or pull that are found in their community. Then students apply what they have learned to determine the best way for a dog sled team to move cargo.</p>	<p>Extension Activity: Exploration 1: Forces Everywhere Students prepare a one minute report based on research about some other technologies related to dog sled racing.</p> <p>Suggested Strategies for ELL/ELD Students</p> <ul style="list-style-type: none"> -Differentiate and use different modalities. -Lessons that involve writing, speaking, drawing, and listening, give students <u>four opportunities to deepen their understanding</u> -Additional engagements also provide a little breathing room so they can work through the language barrier.

	<p>- question-answer relationship (QAR)</p>		<p>Exploration 2: NJSLS W3.8 3.NF.A.3, MP.2 <u>Hands-On Activity Demonstrate How Forces Affect Motion</u> Pairs of students are given a toy truck, masking tape, meter stick and a stopwatch. Mark start and finish line 1 meter apart with tape. Students apply different levels of force and time how long it takes the truck to get over the finish line. They will determine how the amount of force affects the motion.</p>	<p>Suggested Strategies for Students with Special Needs</p> <ul style="list-style-type: none"> -Keep instructions and directions '<u>chunked</u>'. Provide one step at a time, don't overload the student on too many pieces of information at once. - Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community. -Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling)
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<p>3-PS2-3</p> <p>We are learning to plan and conduct an investigation about balanced and unbalanced forces...</p>	<p>Essential Vocabulary: balanced and unbalanced forces</p> <p>-develop an understanding how contact and non-contact forces act on objects -plan and carry out and investigation of balanced and unbalanced forces -recognize the cause-and-effect relationship between forces and changes in motion</p> <p><u>Instructional Strategies:</u> - evidence notebooks - think pair share - cooperative learning - KWL chart - question-answer relationship (QAR)</p>	<p>Lesson 2 Apply What You Know Lesson 2 Check Lesson 2 Self Check Lesson 2 Roundup</p>	<p>Exploration 1: NJSLs 3.OA.D.8 <u>Touchy Touchy</u> Students construct explanations about multiple forces acting on objects and explore balanced and unbalanced forces. Students explore how balanced forces cause no motion.</p> <p>Exploration 2: NJSLs W3.8 <u>What Are Everyday Forces?</u> Students ask questions about forces and motion to describe various forces in the natural world. They explore friction and gravity.</p>	<p>ELL/ELD Strategy: Exploration 1: Touchy Touchy Prefixes Point out that the prefix un-means “not”. So the term unbalanced means “not balanced”</p> <p>RTI/Extra Support Exploration 2: What Are Everyday Forces? Brainstorm with students sets of similar objects that have low and high friction if they were to slide them across a desk.</p> <p>Suggested Strategies for Students with Special Needs -Keep instructions and directions '<u>chunked</u>'. Provide one step at a time, don't overload the student on too many pieces of information at once.</p>
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				<p>- Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community.</p> <p>-Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling)</p>
<p>3-PS2-3 3-PS2-4</p> <p>We are learning to identify magnetism and static electricity as forces that can act on objects without touching them...</p>	<p><u>Essential Vocabulary:</u> magnetic, nonmagnetic, attract, repel, static electricity</p> <p>-ask and answer questions about forces between objects that are not in contact with each other.</p> <p><u>Instructional Strategies:</u> - evidence notebooks - think pair share</p>	<p>Lesson 3 Apply What You Know Lesson 3 Check Lesson 3 Self Check Lesson 3 Roundup</p>	<p>Exploration 1 NJSLS RI.3.8 <u>Magnets Everywhere</u> Students investigate items that contain magnets. They investigate what pulls to the poles on a magnet. They investigate how poles attract and repel.</p>	<p>RTI/Extra Support & ELL/ELD Strategies: Exploration 1: Magnets Everywhere If students are confused about how to answer have them draw arrows in the direction the iron filings are moving.</p>

	<ul style="list-style-type: none"> - cooperative learning - KWL chart - question-answer relationship (QAR) 		<p>Exploration 1 NJSLs RI.3.3 <u>Hands On Activity:</u> <u>A Big Charge!</u> Have students plan and conduct an investigation to determine which materials produce the greatest static charge. Students predict which will attract more confetti, wool, plastic and plastic 8cm squares.</p>	<p>EXTENSION: Exploration 1: A Big Charge! Provide one magnet with labeled poles and one magnet with unlabeled poles. Have students identify the north and south pole on the magnet that is not labeled.</p> <p>Suggested Strategies for Students with Special Needs</p> <ul style="list-style-type: none"> -Keep instructions and directions '<u>chunked</u>'. Provide one step at a time, don't overload the student on too many pieces of information at once. - Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community. -Provide students with multiple choices for how they can represent their understandings (e.g. multisensory
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				techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling)
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21st Century Theme Targeted – Global Awareness: Using 21st century skills to understand and address global issues

21st Century Skills Targeted

Creativity & Innovation	Information Literacy	Media Literacy	Critical Thinking & Problem Solving	Communication & Collaboration	Life & Careers
Students work in pairs to create their own playground using common classroom materials labeling how each piece of equipment shows force.	Leveled Readers: How Do We Use Machines? Building With Machines.	Fun with Magnets! Forces Can Push or Pull The Sticky Balloon Trick! Physics for Kids The science of static electricity	Unit Project: Balanced Forces		Take It Further Careers in Science & Engineering: Safety Engineer

Summative Assessments: (include rubrics & exemplars)
Unit 2 Summative [Forces Assessment](#)
Unit 2 Performance Task: [Moved Without Touching](#)
Unit 2 Performance Task Scoring [Rubric](#)
 Students are provided with materials to work in small groups to design a maze through which they can move an object without touching it. This supports building mastery of 3-PS2-1, 3-PS2-3 and 3-PS2-4.

Unit 3 Title: Motion

Time Frame: 10 days

Essential Questions

- **What is motion?**
- **What are some patterns in motion?**

Standards NJSL

Standards / CPIs (cumulative Progress Indicators) taught and assessed:

PERFORMANCE EXPECTATION

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.

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.

DISCIPLINARY CORE IDEAS

- **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.
- **PS2.A Forces and Motion** 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.
- **PS2.B Types of Interactions** Objects in contact exert forces on each other.

SCIENCE and ENGINEERING PRACTICES

Planning and Carrying Out Investigations

- Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question.

Science Knowledge is Based on Empirical Evidence

- Science findings are based on recognizing patterns.

Scientific Investigations

- Use a Variety of Methods Science investigations use a variety of methods, tools, and techniques.

Asking Questions and Defining Problems

- Ask questions that can be investigated based on patterns such as cause and effect relationships.

CROSS CUTTING CONCEPTS

Cause and Effect

- Cause and effect relationships are routinely identified.

Patterns

- Patterns of change can be used to make predictions.

CONNECTIONS TO MATH

3.OA.D.8 Solve problems using the four operations

3.MD.A.1 Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects

MP2 Reason abstractly and quantitatively

MP5 Use appropriate tools strategically.

CONNECTIONS TO ELA

RI.3.1 Ask and answer questions to demonstrate understanding of text

SL.3.3 Ask and answer questions about information from a speaker.

W3.2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly

W3.7 Conduct short research projects that build knowledge about a product.

W3.8 Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories

Technology:

8.1.5.A.1 Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems.

Highlighted Career Ready Practices:

CRP4. Communicate clearly and effectively and with reason.

CRP6. Demonstrate creativity and innovation

CRP7. Employ valid and reliable research strategies

CRP8. Utilize critical thinking to make sense of problems and persevere in solving them

CRP12. Work productively in teams while using cultural global competence.

SEL Practices & Competencies:

Self-Management

Social Awareness

Responsible Decision-Making

Relationship Skills

Overall Goal (What is the big idea?)

Students will explore types of forces and motion; learn about the relationship between forces and motion; identify patterns in motion.

Pre-Assessment: Unit 3 Pretest [Motion](#)

Please include interdisciplinary connections resources and plan in each activity

Standards/ (SLO) Student Learning Objectives	Student Learning Strategies	Formative Assessment ***suggested but not limited to the following***	Activities ***suggested but not limited to the following***	Modifications & Reflections ***suggested but not limited to the following***
<p><u>3-PS2-1</u></p> <p>We are learning to describe ways that unbalanced forces affect the motion of an object...</p>	<p>Essential Vocabulary: position, motion, force, speed, balanced, unbalanced, frame of reference</p> <p>-determine whether an object is in motion -explain how the speed of an object is determined -describe how unbalanced forces affect the motion of an object (speed up, slow down, change direction)</p> <p>Instructional Strategies:</p> <ul style="list-style-type: none"> - evidence notebooks - think pair share - cooperative learning - KWL chart 	<p>Lesson 1 Apply What You Know Lesson 1 Check Lesson 1 Self Check Lesson 1 Roundup</p>	<p>Exploration 1 NJSLS RI.3.1 <u>Hands On Apply What You Know: Frame of Reference Flipbook</u> <i>Each student will need a stack of paper and a pencil. Explain that flipbook images begin on the very bottom sheet of the pile and work towards the top.</i> Make a flipbook that shows a stick person moving past a tree. Then flip the pages to see how the stick person's position changes. Hint: On each page of your flipbook, the tree is your <i>frame of reference</i>. It should always be in the same spot. Share your</p>	<p>RTI/Extra Support Exploration 1: Frame of Reference Flipbook If students are unclear about <i>north, south, east</i> and <i>west</i>, as direction words, show them a map and relate the terms to <i>left, right, up</i> and <i>down</i>.</p> <p>Suggested Strategies for ELL/ELD Students</p> <ul style="list-style-type: none"> -Differentiate and use different modalities. -Lessons that involve writing, speaking, drawing, and listening, give students <u>four opportunities to deepen their understanding</u> -Additional engagements also provide a little breathing room so they can work through the language barrier.

	<p>- question-answer relationship (QAR)</p>		<p>flipbook with a classmate.</p> <p>Exploration 2 NJSLS 3.OA.D.8, MP2 <u>Hands-On Activity</u> <u>Slow Walk, Fast Walk</u> Students collaborate to measure and describe walking speeds. <i>Materials Needed:</i> <i>meter stick, masking tape, stopwatch, data table.</i></p> <p>Students use a meter stick and masking tape to mark off a distance of 10 meters. Students use a stopwatch to measure how many seconds it takes each person in the group to walk the distance slowly. Then walk as quickly as possible and collect the data again. Calculate the speed in meters per second (m/sec). Students complete a data table and analyze their results for both slow and fast walking.</p>	<p>RTI/Extra Support Exploration 2: Slow Walk, Fast Walk. Some students will have a difficult time grasping how to turn their measurements into averages. If this is the case, provide them with the actual formula: $\text{distance} \div \text{time} = \text{speed}$</p> <p>Suggested Strategies for Students with Special Needs -Keep instructions and directions '<u>chunked</u>'. Provide one step at a time, don't overload the student on too many pieces of information at once. - Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community. -Provide students with multiple choices for how they can represent their</p>
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			Students discuss why it is helpful to know an object's actual speed instead of just saying that it moved fast or slow.	understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling)
<p><u>3-PS2-2</u></p> <p>We are learning to provide evidence that patterns can be used to predict future motion...</p>	<p>Essential Vocabulary: balanced and unbalanced forces,</p> <p>-develop an understanding of regular patterns of motion and how future motion can be predicted -plan and carry out an investigation to predict the motion of a pendulum - use the motion of a pendulum to discover patterns of change and how these can be used to make predictions.</p> <p>Instructional Strategies: - evidence notebooks - think pair share - cooperative learning</p>	<p>Lesson 2 Apply What You Know Lesson 2 Check Lesson 2 Self Check Lesson 2 Roundup</p>	<p>Exploration 1: NJSLS W.3.8, W3.2 <u>Back and Forth, Up and Down</u> Students explore patterns of motion, back and forth, spinning, up and down, and zigzag. Students also explore ways of moving as well as making predictions based on patterns. Students make predictions about motion they experience in everyday life.</p> <p>Exploration 1: <u>Hands-On Activity Tick Tock</u> <i>Materials Needed:</i> <i>scissors, string, meter</i></p>	<p>ELL/ELD Strategy: Exploration 1: Back and Forth, Up and Down Use realia. Students learning English may struggle understanding the word <i>zigzag</i>. Bring in a piece of fabric or wrapping paper with the zigzag pattern and have students trace the pattern with their finger. Explain that a zigzag line is a line with lots of sharp turns. The line looks like a "Z" written over and over.</p> <p>RTI/Extra Support Exploration 1: Tick Tock Explain that a <i>prediction</i> is what someone thinks will happen. Sometimes predictions are based on</p>

	<p>- KWL chart - question-answer relationship (QAR)</p>		<p><i>stick, small metal washer, large metal washer, timer.</i> Students work in pairs to plan and carry out an investigation and make observations and take measurements (produce data) to serve as the basis for evidence for an explanation of whether variables, such as length and weight, affect the speed of movement of a pendulum.</p>	<p>feelings or some experience and may or not be accurate. But other predictions are more scientific. They are based on observation and sometimes measurement and are mostly accurate.</p> <p>Suggested Strategies for Students with Special Needs -Keep instructions and directions <u>'chunked'</u>. Provide one step at a time, don't overload the student on too many pieces of information at once. - Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community. -Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures,</p>
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				illustrations, graphs, charts, data tables, multimedia, modeling)
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21st Century Theme Targeted – Global Awareness: Using 21st century skills to understand and address global issues					
21st Century Skills Targeted					
Creativity & Innovation	Information Literacy	Media Literacy	Critical Thinking & Problem Solving	Communication & Collaboration	Life & Careers
Unit project: Motion Detectives	Leveled Readers: How Do We Use Machines? Building With Machines.	Motion in a Straight Line: Crash Course Physics #1 PBS: What Is Motion?		Interview a Guest Speaker from American Physical Therapy Association https://www.apta.org/ to explain how biomechanics affects all aspects of life	Take It Further Careers in Science & Engineering: Biomechanist The Biomechanics of Basketball
Summative Assessments: (include rubrics & exemplars) Unit 3 Summative Motion Assessment Unit 3 Performance Task: Hunting For Treasure Unit 3 Performance Task Scoring Rubric Students use compasses to investigate directions. They will apply concepts of patterns in the form of directions to demonstrate understanding of PS2.A in support of 3-PS2-1 and 3-PS2-2.					

Unit 4 Title: Life Cycles and Inherited Traits

Time Frame: 25 days

Essential Questions

- **What are some plant life cycles?**
- **What are some animal life cycles?**
- **What are inherited plant and animal traits?**

Standards NJSLA

Standards / CPIs (cumulative Progress Indicators) taught and assessed:

PERFORMANCE EXPECTATION

3-LS1-1 Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction and death.

3-LS3-1Analyze 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.

DISCIPLINARY CORE IDEAS

- **LS1.B Growth and Development of Organisms** Reproduction is essential to the continued existence of every kind of organism. Plants and animals have unique and diverse life cycles.
- **LS3.A Inheritance of Traits** Many characteristics of organisms are inherited from their parents.
- **LS3.B Variation of Traits** Different organisms vary in how they look and function because they have different inherited information.

SCIENCE and ENGINEERING PRACTICES

Developing and Using Models

- Develop models to describe phenomena.

Scientific Knowledge is Based on Empirical Evidence

- Science findings are based on recognizing patterns.

Analyzing and Interpreting Data

- Analyze and interpret data to make sense of phenomena using logical reasoning.

CROSS CUTTING CONCEPTS

Patterns

- Patterns of change can be used to make predictions.

Cause and Effect

- Cause and effect relationships are routinely identified.

CONNECTIONS TO MATH

3.NBT Number and Operations in Base Ten

3.NF Number and Operations - Fractions

3.MD.B.4 Show data by making a line plot, where the horizontal scale is marked by appropriate units- whole numbers, halves, or quarters

MP.2 Reason abstractly and quantitatively

MP.4 Model with mathematics

CONNECTIONS TO ELA

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 events occur).

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

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).

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

W3.7 Conduct short research projects that build knowledge and a topic.

RF.3.3.C Decode multisyllable words.

Technology:

8.1.5.A.1 Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems.

8.1.5.A.3 Use a graphic organizer to organize information about a problem or issue.

8.1.5.A.4 Graph data using a spreadsheet, analyze and produce a report that explains the analysis of the data.

8.1.5.A.5 Create and use a database to answer basic questions.

8.1.5.A.6 Export data from a database into a spreadsheet; analyze and produce a report that explains the analysis of the data.

Highlighted Career Ready Practices:

CRP4. Communicate clearly and effectively and with reason.

CRP6. Demonstrate creativity and innovation

CRP7. Employ valid and reliable research strategies

CRP8. Utilize critical thinking to make sense of problems and persevere in solving them

CRP9. Model integrity, ethical leadership and effective management.

CRP11. Use technology to enhance productivity.

CRP12. Work productively in teams while using cultural global competence.

SEL Practices & Competencies:

Self-Management

Social Awareness

Responsible Decision-Making

Relationship Skills

Overall Goal (What is the big idea?)

Students will explore the life cycles of plants and animals, then discover inherited plant and animal traits.

Pre-Assessment: Unit 4 Pretest [Life Cycles and Inherited Traits](#)

Please include interdisciplinary connections resources and plan in each activity

Standards/ (SLO) Student Learning Objectives	Student Learning Strategies	Formative Assessment ***suggested but not limited to the following***	Activities ***suggested but not limited to the following***	Modifications & Reflections ***suggested but not limited to the following***
<p><u>3-LS1-1</u></p> <p>We are learning to develop a model to describe a plant’s life cycle...</p>	<p>Essential Vocabulary: life cycle</p> <ul style="list-style-type: none"> -identify and recognize the common patterns of various life cycles of plants -build models of plant life cycles -understand that a given plant’s life cycle always happens in the same order -a plant’s life cycle can be disrupted <p>Instructional Strategies:</p> <ul style="list-style-type: none"> - evidence notebooks - think pair share - cooperative learning - KWL chart - question-answer relationship (QAR) 	<p>Lesson 1 Apply What You Know Lesson 1 Check Lesson 1 Self Check Lesson 1 Roundup</p>	<p>Exploration 1 NJSLS RI.3.7, 3.NBT1 <u>So Many Stages!</u> Students read about the life stages of a dandelion and then place the pictures in the correct order. Students then explore dispersive forces. Finally, students create a <i>Full Bloom Layered Flipbook</i> using each section to describe the stages of the flowering plant’s life cycle.</p> <p>Hands-On Activity NJSLS 3.NF <u>How Do Plants Grow?</u> Students collaborate with a team to plant some seeds and observe the life cycle as they</p>	<p>RTI/Extra Support Exploration 1: So Many Stages You may want to have students number photographs that represent the stages. Have students highlight the stage of the cycle that represents the restart of the cycle (seed).</p> <p>Suggested Strategies for ELL/ELD Students</p> <ul style="list-style-type: none"> -Differentiate and use different modalities. -Lessons that involve writing, speaking, drawing, and listening, give students <u>four opportunities to deepen their understanding</u> -Additional engagements also provide a little breathing room so they can work through the language barrier.

			<p>germinate. They will analyze their results and draw conclusions and cite evidence based on what was observed.</p> <p>Exploration 2 NJSLS RI.3.7, RI.3.2 <u>How Do Life Cycles Differ?</u> Students examine and identify examples of differences to construct explanations about life cycles of different plant types, including patterns among different groups.</p> <p>Exploration 3 NJSLS S.L.3.5 <u>Broken Cycles</u> Students examine and discuss the many factors that can interrupt a plant's life cycle. Students also analyze what they learn to show patterns about negative effects of interrupting plant life cycles.</p>	<p>RTI/Extra Support Exploration 2: How Do Life Cycles Differ? If students struggle with comparing types of trees allow them to make a Venn Diagram to compare the two plant, using the text and illustrations to help them.</p> <p>Extension Exploration 3: Broken Cycles Students may wish to explore scientist who work with plants, known as botanists. They can research online and make a fact sheet about their botanist. Then share the information with a partner.</p>
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				<p>Suggested Strategies for Students with Special Needs</p> <ul style="list-style-type: none"> -Keep instructions and directions 'chunked'. Provide one step at a time, don't overload the student on too many pieces of information at once. - Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community. -Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling)
<p>3-LS1-1</p> <p>We are learning to develop a model to describe the stages of an animal's life cycle...</p>	<p>Essential Vocabulary: life cycle, birth, death, reproduction, growth, tracking</p> <p>-identify and recognize patterns in the various</p>	<p>Lesson 2 Apply What You Know Lesson 2 Check Lesson 2 Self Check Lesson 2 Roundup</p>	<p>Exploration 1 NJSLS RI.3.8 Stage by Stage Students use simple models to represent and connect the correct</p>	<p>ELL/ELD Exploration 1: Stage by Stage Use realia. Use feathers to make connections that are real for students so that they can see how feathers</p>

	<p>stages of the life cycles of different animals -develop and use models to describe the unique and diverse life cycles of different animals -learn about technology that enables scientists to find patterns in data to show how reproduction is essential to the continued existence of every organism.</p> <p><u>Instructional Strategies:</u></p> <ul style="list-style-type: none"> - evidence notebooks - think pair share - cooperative learning - KWL chart - question-answer relationship (QAR) 		<p>order of stages of animal life cycles.</p> <p>Hands-On Activity NJSLS RF.3.3.C <u>Observing Mealworm Metamorphosis</u> Students work in groups to develop the ideal conditions in which to observe the life cycle stages of a mealworm. Students will document and record the changes in a mealworm as it goes through its life cycle.</p>	<p>birds learn to keep warm, fly, swim or hunt for food. Have students observe, touch, and draw a variety of feather types.</p> <p>Suggested Strategies for Students with Special Needs</p> <ul style="list-style-type: none"> -Keep instructions and directions '<u>chunked</u>'. Provide one step at a time, don't overload the student on too many pieces of information at once. - Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community. -Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling)
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<p><u>3-LS3-1</u></p> <p>We are learning to recognize plant and animal traits and where they come from...</p>	<p><u>Essential Vocabulary:</u> organism, trait, offspring</p> <ul style="list-style-type: none"> -study images of organisms -collect and interpret data -find patterns in inherited traits -note similarities and differences in the organisms. <p><u>Instructional Strategies:</u></p> <ul style="list-style-type: none"> - evidence notebooks - think pair share - cooperative learning - KWL chart - question-answer relationship (QAR) 	<p>Lesson 3</p> <p>Apply What You Know</p> <p>Lesson 3 Check</p> <p>Lesson 3 Self Check</p> <p>Lesson 3 Roundup</p>	<p>Exploration 1 NJSLS RI.3.9, RI.3.2 3.MD.B.4, MP2 MP4 <u>Plants Have Parents</u> Students collect and interpret data from photos of plants. They note the similarities and differences in leaves, flowers, shape, height, and other traits. Students will find and describe patterns in the plants' inherited traits.</p> <p>Exploration 2 NJSLS RI.3.2 <u>Do Animals Look Like Their Parents?</u> Students will interpret data from photos of animals and their offspring. Students will</p>	<p>RTI/ Extra Support Exploration1: Plants Have Parents Help students break the problem down in steps. Ask: -What do the colors tell you about the parents? -Does a yellow flower need two yellow parents? -Could one yellow parent be enough? -Can you rule out any of the parents based on the shape of the petals?</p> <p>ELL/ELD Strategy Exploration 1: Plants Have Parents Discuss opposite meanings of words by acting out up/down, open/shut and yes/no.</p> <p>RTI/Extra Support Exploration 2: Do Animals Look Like Their Parents? Discuss what the parents of male and female parents would look like.</p>
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			<p>note similarities and differences in color and other traits. They will find patterns in the animals' inherited traits.</p>	<p>Suggested Strategies for Students with Special Needs</p> <ul style="list-style-type: none">-Keep instructions and directions 'chunked'. Provide one step at a time, don't overload the student on too many pieces of information at once.- Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community.-Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling)
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21st Century Theme Targeted – Global Awareness: Using 21st century skills to understand and address global issues

21st Century Skills Targeted

Creativity & Innovation	Information Literacy	Media Literacy	Critical Thinking & Problem Solving	Communication & Collaboration	Life & Careers
<p>Unit Project: <u>Life Cycle Model</u></p>	<p>NEWSELA: <u>Scientists use computers to study spot patterns on giraffes</u></p> <p>Leveled Readers: <u>How Do Living Things Change and Grow?</u></p> <p><u>Surprising Adaptations</u></p>	<p><u>Bill Nye The Science Guy S5E06 - Life Cycles</u></p>		<p><u>Skype a Scientist</u></p>	<p><u>Take It Further Careers in Science & Engineering: Genetics Specialist</u></p>

Summative Assessments: (include rubrics & exemplars)

Unit 4 Summative [Life Cycles and Inherited Traits](#)

Unit 4 Performance Task: [Cool Beans! \(And Warm, and Hot Ones Too!\)](#)

Unit 4 Performance Task Scoring [Rubric](#)

Students develop a plan for growing beans by looking for observable patterns that can tell them how beans will grow in different types of soil to demonstrate understanding of LS1.B in support of 3-LS1-1

Unit 5 Title: Organisms and Their Environments

Time Frame: 30 days

Essential Questions

- **How Does the Environment Affect Traits?**
- **What are Adaptations?**
- **How Can Organisms Succeed in Their Environments?**
- **What Happens when Environments Change?**

Standards NJSL

Standards / CPIs (cumulative Progress Indicators) taught and assessed:

PERFORMANCE EXPECTATION

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

3-LS3-2 Use evidence to support the explanation that traits can be influenced by the environment.

3-LS4-2 Use evidence to construct an explanation for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing.

3-LS4-3 Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well and some cannot survive at all.

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.

DISCIPLINARY CORE IDEAS

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.

LS3.A Inheritance of Traits

- Other characteristics result from individuals' interactions with the environment, which can range from diet to learning. Many characteristics involve both inheritance and environment.

LS3.B Variation of Traits

- The environment also affects the traits that an organism develops.

LS4.B Natural Selection

- Sometimes the differences in characteristics between individuals of the same species provide advantages in surviving, finding mates, and reproducing.

LS4.C Adaptation

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

LS2.C Ecosystem Dynamics, Functioning, and Resilience

- 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, yet others move into the transformed environment, and some die.

LS4.D Biodiversity and Humans

- Populations live in a variety of habitats, and change in those habitats affects the organisms living there.

SCIENCE and ENGINEERING PRACTICES**Engaging in Argument from Evidence**

- Construct an argument with evidence, data, and/or a model.
- 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.

Constructing Explanations and Designing Solutions

- Use evidence (e.g., observations, patterns) to support an explanation.

Engaging in Argument from Evidence

- Constructing Explanations and Designing Solutions Use evidence (e.g., observations, patterns) to support an explanation.

CROSS CUTTING CONCEPTS**Cause and Effect**

- Cause and effect relationships are routinely identified and used to explain change.

Patterns

- Patterns of change can be used to make predictions.

Scientific Knowledge Assumes an Order and Consistency in Natural Systems

- Science assumes consistent patterns in natural systems.

Scale, Proportion, and Quantity

- Observable phenomena exist from very short to very long time periods.

Systems and System Models

- A system can be described in terms of its components and their interactions.

Interdependence of Engineering, Technology, and Science on Society and the Natural World

- Knowledge of relevant scientific concepts and research findings is important in engineering.

CONNECTIONS TO MATH

3.MD.B.4 Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show data by making a line plot, where the horizontal scale is marked off in appropriate units - whole numbers, halves, or quarters.

3.MD.B.3 Draw a scaled picture graph and a scaled bar graph to represent a data set with categories

MP2 Reason abstractly and quantitatively

MP4 Model with mathematics

MP5 Use appropriate tools strategically.

CONNECTIONS TO ELA

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.

SL.3.4 Report on a topic using appropriate facts or descriptive details

W3.1 Write opinion pieces... supporting a point of view with reasons

RI.3.7 Use information from illustrations

RI.3.8 Describe logical connections

W3.7 Conduct short research projects that build knowledge about a subject.

W3.8 Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories

Technology:

8.1.5.A.1 Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems.

8.1.5.A.2 Format a document using a word processing application to enhance text and include graphics, symbols and/ or pictures.

8.1.5.A.3 Use a graphic organizer to organize information about a problem or issue.

8.1.5.A.4 Graph data using a spreadsheet, analyze and produce a report that explains the analysis of the data.

Highlighted Career Ready Practices:

CRP4. Communicate clearly and effectively and with reason.

CRP6. Demonstrate creativity and innovation

CRP8. Utilize critical thinking to make sense of problems and persevere in solving them

CRP12. Work productively in teams while using cultural global competence.

SEL Practices & Competencies:

Self-Management

Social Awareness

Responsible Decision-Making

Relationship Skills

Overall Goal (What is the big idea?)

Students will explore inheritance and variation of traits in organisms; discover how different organisms adapt to their environment; identify the cause and effect of how organisms change when environments change.

Pre-Assessment: Unit 5 Pretest [Organisms and Their Environments](#)

Please include interdisciplinary connections resources and plan in each activity

Standards/ (SLO) Student Learning Objectives	Student Learning Strategies	Formative Assessment ***suggested but not limited to the following***	Activities ***suggested but not limited to the following***	Modifications & Reflections ***suggested but not limited to the following***
<p>3-LS3-2</p> <p>We are learning to explain how the environment may affect organisms...</p>	<p>Essential Vocabulary: environment, traits</p> <p>-use evidence to construct an explanation of cause-and-effect relationships between the environment and the inheritance variation of traits in living things.</p> <p>Instructional Strategies:</p> <ul style="list-style-type: none"> - evidence notebooks - think pair share - cooperative learning - KWL chart - question-answer relationship (QAR) 	<p>Lesson 1 Apply What You Know Lesson 1 Check Lesson 1 Self Check Lesson 1 Roundup</p>	<p>Exploration 1 NJSLS RI.3.3 Plants and the Environment Students examine and identify examples of cause-and-effect relationships to then construct explanations by obtaining information about characteristics and variation of traits in relation to plant and the environment.</p>	<p>ELL/ELD Strategy: Exploration 1: Plants and the Environment Modeling Have students model the motion of the Arctic poppies. Use a picture of the sun or a paper plate or other circular object to model the sun. Have students turn and their heads and bodies to follow the motion of the model sun as you move it from one part of the classroom to another</p> <p>Extension Activity: Exploration 1: Plants and the Environment Challenge students to build a model or prototype of their greenhouse design using readily available materials. Encourage</p>

			<p>Exploration 2 NJSLs RI.3.2 <u>Animals and the Environment.</u> Students examine and identify examples of cause-and -effect relationships to construct explanations of how animals differ based on their interactions with the environment.</p>	<p>them to test their model and identify possible improvements based on their testing.</p> <p>RTI/Extra Support Exploration 2: Animals and the Environment If students struggle with the amount of information on a page, have them use blank paper to cover all but one image and its caption at a time. Have students read the caption and examine the image thoroughly before moving on to the next image.</p> <p>Suggested Strategies for Students with Special Needs -Keep instructions and directions '<u>chunked</u>'. Provide one step at a time, don't overload the student on too many pieces of information at once. - Structure lessons around questions that are authentic, relate to students' interests, social/family background</p>
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				<p>and knowledge of their community.</p> <p>-Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling)</p>
<p><u>3-LS4-3</u></p> <p>We are learning to explain how adaptations help organisms survive...</p>	<p><u>Essential Vocabulary:</u> adapt, adaptations, physical, behavioral habitat, camouflage, mimicry</p> <p>-develop an understanding of how characteristics can affect the survival and reproduction of an animal</p> <p>-explore the systems that lead to causes and effects related to the survival of the animal.</p> <p>-engage in arguments from evidence to support claims and opinions</p>	<p>Lesson 2 Apply What You Know Lesson 2 Check Lesson 2 Self Check Lesson 2 Roundup</p>	<p>Exploration 1 NJSLs SL.3.4 <u>Organisms Adapt</u> Students identify the adaptations that help organisms (plants and animals) survive. Students then collaborate to create a matching game that includes behavioral or physical adaptations.</p> <p>Exploration 2 NJSLs RI.3.3 <u>Adaptation and the Environment</u> Students explore the traits that help organisms survive in</p>	<p>RTI/Extra Support: Exploration 1:Organisms Adapt If students struggle with the parts of a plant, review the fruit, leaves,stem and roots. It may be helpful to show students an actual plant and point out the plant parts.</p> <p>Extension Exploration 2: Adaptation and the Environment Challenge students to expand their lists of organisms that have adaptations similar to</p>

	<p><u>Instructional Strategies:</u></p> <ul style="list-style-type: none"> - evidence notebooks - think pair share - cooperative learning - KWL chart - question-answer relationship (QAR) 		<p>their environment. They apply knowledge of adaptations by drawing models of animals in their natural habitats. They then describe the cause and effect relationship between an organism's adaptations and its environment.</p> <p>Hands-On Activity <u>Just Pecking?</u></p> <p>Students use models of bird beaks to investigate how different adaptations are suited to different conditions within environments. How are birds adapted to getting food in their environments?</p>	<p>those shown. Students conduct research about the organisms on their lists. They can download or draw pictures of the organisms and write captions describing their unique adaptations.</p> <p>Suggested Strategies for ELL/ELD Students</p> <ul style="list-style-type: none"> -Differentiate and use different modalities. -Lessons that involve writing, speaking, drawing, and listening, give students four opportunities to deepen their understanding -Additional engagements also provide a little breathing room so they can work through the language barrier. <p>Suggested Strategies for Students with Special Needs</p> <ul style="list-style-type: none"> -Keep instructions and directions 'chunked'. Provide one step at a time, don't overload the student
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				<p>on too many pieces of information at once.</p> <ul style="list-style-type: none"> - Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community. -Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling)
<p><u>3-LS2-1</u></p> <p>We are learning to explain how an organism's characteristics help it survive and reproduce...</p> <p>We are learning to explain how being a member of a group helps an organism</p>	<p><u>Essential Vocabulary:</u> traits, adapt, adaptations</p> <p><u>Instructional Strategies:</u></p> <ul style="list-style-type: none"> - evidence notebooks - think pair share - cooperative learning - KWL chart - question-answer relationship (QAR) 	<p>Lesson 3</p> <p>Apply What You Know</p> <p>Lesson 3 Check</p> <p>Lesson 3 Self Check</p> <p>Lesson 3 Roundup</p>	<p>Exploration 1</p> <p>NJSLS W.3.1.C</p> <p><u>Differences That Win</u></p> <p>Students explore how organisms can survive in their environments. Students will compare and discuss animal and plant characteristics for survival and reproduction.</p>	<p>RTI/Extra Support:</p> <p>Exploration 1: Differences That Win</p> <p>Ask student pairs to model the actions of a pitcher plant. They may cup their hands to show the pitcher, with outstretched fingers mimicking the lid and spikes that help the plant trap and hold an insect. Another student's hand can play an insect trying to escape.</p>

<p>survive and reproduce...</p>			<p>Hands-On Activity NJSLS 3.MD.3.B <u>Battle of the Beans!</u> Using thirty dry white beans, thirty dry black beans and five dry red beans, students investigate the effect of background color, relating it to an animal's body color and environment.</p> <p>Exploration 2 NJSLS RI3.2 <u>Better Together</u> There is safety in numbers. Students investigate and examine which characteristics help organisms survive when living in groups. Each student on a group is given an item to draw. The specimens will be of the same plant or animal. Students make drawings as detailed as</p>	<p>RTI/ Extra Support Hands-On Activity: Battle of the Beans Demonstrate the activity, modeling how to scatter the beans, pick them up, and time the activity. Have students explain what you are doing as you perform each action.</p> <p>RTI/Extra Support Exploration 2: Better Together Have students perform a simple extension to reinforce "safety in numbers". Partners work together, first placing one object on a piece of paper. One student shakes the paper, while his or her partner tries to pick up the single object in a matter of seconds. They repeat the procedure with five or more objects. Guide students to the conclusion</p>
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			<p>possible. Then mix the drawings up and students attempt to match it to the specimen others were assigned to draw.</p>	<p>that it is more difficult for a predator to hunt a group of animals. This is one example of safety in numbers.</p> <p>Suggested Strategies for ELL/ELD Students</p> <ul style="list-style-type: none">-Differentiate and use different modalities.-Lessons that involve writing, speaking, drawing, and listening, give students four opportunities to deepen their understanding-Additional engagements also provide a little breathing room so they can work through the language barrier. <p>Suggested Strategies for Students with Special Needs</p> <ul style="list-style-type: none">-Keep instructions and directions 'chunked'. Provide one step at a time, don't overload the student on too many pieces of information at once.- Structure lessons around questions that are authentic, relate to
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				<p>students' interests, social/family background and knowledge of their community.</p> <p>-Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling)</p>
<p>3-LS4-4</p> <p>We are learning to explain what happens to plants and animals when their sources for food, water and shelter change...</p>	<p>Essential Vocabulary: population, environmental changes</p> <ul style="list-style-type: none"> -explore populations that live in a variety of environments -examine how changes in environments affect organisms -recognize cause-and-effect patterns in natural systems both large and small -come up with explanations and solutions for effects 	<p>Lesson 4 Apply What You Know Lesson 4 Check Lesson 4 Self Check Lesson 4 Roundup</p>	<p>Exploration 1 NJSLS RI.3.3 Everything Changes Students recognize ways that living and nonliving things interact in different habitats. They recognize that the changes in these habitats affect both living and nonliving things.</p>	<p>EXTENSION: Exploration 1: Everything Changes Have students research additional human activities that can change the environment. Tell them to download or draw examples of each activity and include a brief explanation describing how it affects living things. students can complete their work into a booklet to share with the class.</p>

	<p>caused by human activity</p> <p><u>Instructional Strategies:</u></p> <ul style="list-style-type: none"> - evidence notebooks - think pair share - cooperative learning - KWL chart - question-answer relationship (QAR) 		<p>Exploration 2 NJSLS RI.3.1</p> <p><u>Staying Alive</u></p> <p>Students will describe how populations change when their habitats change. They will construct an explanation about how changes in an environment may affect organisms that live there because organisms are components of the system.</p> <p>Hands-On Apply What You Know NJSLS 3.MD.B.3, MP4</p> <p><u>Dear Deer</u></p> <p>Have two lines of students face away from each other so the deer and the factors cannot see each other, On the count of three, tell students to turn around and face the other group. They should find a match as quickly as they can. As a class, record how many deer are left at</p>	<p>ELL/ELD Strategy Exploration 2: Staying Alive</p> <p>Students may wonder what it means for something to be “members of a certain kind of plant or animal”. Discuss the concept of species. Explain that a species can have distinct populations in different locations.</p> <p>RTI/Extra Support & ELL/ELD Strategies: Hands-On Dear Deer</p> <p>Use a graphic organizer to clarify the cause-and-effect relationship between the change in deer population and the availability of resources. Draw two boxes with an arrow pointing from the first box to the second. Write “Cause” under the first box and “Effect” under the second.</p>
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			<p>the end of each round. They should play at least two more rounds. On the fourth round introduce the environmental factor, unknown to anyone, of a flood. On this round, all of the food and shelter deer and factors will go to the environmental factor line. Record the number of deer still alive after this round. Discuss how the flood affected the deer population. Have students make a bar graph that shows how the deer population changed after each round.</p> <p>Exploration 3 NJSLS RI.3.1, W3.7 Moving On Upstream Students explore the cause-and effect relationship between human activities and the environment.. They will identify those changes and explain how they affect plants and animals. Students design a solution to an</p>	<p>Have students complete the graphic organizer in their evidence notebook identifying the cause (lack of resources) and the effect (decrease in deer population)</p> <p>RTI/Extra Support & ELL/ELD Strategies Exploration 3: Moving On Upstream Make sure students understand why people build dams. Explain that dams help control flooding and can be used to produce energy from moving water. Also be sure that students visualize the size of the dam in comparison to salmon-you</p>
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			<p>environmental change caused by building a dam.</p>	<p>may want to show them additional pictures or videos of dams.</p> <p>Suggested Strategies for Students with Special Needs</p> <ul style="list-style-type: none">-Keep instructions and directions <u>'chunked'</u>. Provide one step at a time, don't overload the student on too many pieces of information at once.- Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community.-Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling)
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21st Century Theme Targeted – Global Awareness : Using 21st century skills to understand and address global issues.

21st Century Skills Targeted

Creativity & Innovation	Information Literacy	Media Literacy	Critical Thinking & Problem Solving	Communication & Collaboration	Life & Careers
	<p>Leveled Readers: How Are Living Things to Their Ecosystems? Rain Forest Adventures</p>	<p>Adaptations by Nature Works PBS BrainPop: Floods BrainPop: Dams</p>	<p>Unit Project: Lucky Layers</p>	<p>Invite or write to representatives from EPA REGION 2 to discuss NJ environmental concerns</p>	<p>Take It Further Careers in Science: Wildlife Expert What is a Zoologist?</p>

Summative Assessments: (include rubrics & exemplars)

Unit 5 [Summative Organisms and Their Environment Assessment](#)

Unit 5 Performance Task: [Change It Up](#)

Unit 5 Performance Task Scoring [Rubric](#)

Students analyze and interpret data as a way to explain the cause and effect of plants' ability to adapt or not adapt to environmental changes. This demonstrates the understanding of LS4.C in support of 3-LS4-3

Unit 6 Title: Fossils

Time Frame: 15 days

Essential Questions

- **What is a fossil?**
- **What do fossils tell us about the past?**

Standards NJSL

Standards / CPIs (cumulative Progress Indicators) taught and assessed:

PERFORMANCE EXPECTATION

3-LS4-1 Analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago.

DISCIPLINARY CORE IDEAS

LS4.A Evidence of Common Ancestry and Diversity

- Some kinds of plants and animals that once lived on Earth are no longer found anywhere.

Evidence of Common Ancestry and Diversity

- Fossils provide evidence about the types of organisms that lived long ago and also about the nature of their environments.

SCIENCE and ENGINEERING PRACTICES

Analyzing and Interpreting Data

- Analyze and interpret data to make sense of phenomena using logical reasoning.

CROSS CUTTING CONCEPTS

Scientific Knowledge Assumes an Order and Consistency in Natural Systems

- Science assumes consistent patterns in natural systems.

Scale, Proportion, and Quantity

- Observable phenomena exist from very short to very long time periods.

CONNECTIONS TO MATH

3.MD.B.4 Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show data by making a line plot, where the horizontal scale is marked off in appropriate units - whole numbers, halves, or quarters.

3.MD.B.3 Draw a scaled picture graph and a scaled bar graph to represent a data set with categories

MP2 Reason abstractly and quantitatively

MP4 Model with mathematics

MP5 Use appropriate tools strategically.

CONNECTIONS TO ELA

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 from illustrations

RI.3.8 Describe logical connections

SL.3.4 Report on a topic using appropriate facts or descriptive details

W3.7 Conduct short research projects that build knowledge about a subject.

W3.8 Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories

Technology:

8.1.5.A.1 Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems.

8.1.5.A.2 Format a document using a word processing application to enhance text and include graphics, symbols and/ or pictures.

8.1.5.A.3 Use a graphic organizer to organize information about a problem or issue.

8.1.5.A.4 Graph data using a spreadsheet, analyze and produce a report that explains the analysis of the data.

Highlighted Career Ready Practices:

CRP4. Communicate clearly and effectively and with reason.

CRP6. Demonstrate creativity and innovation

CRP8. Utilize critical thinking to make sense of problems and persevere in solving them

CRP12. Work productively in teams while using cultural global competence.

SEL Practices & Competencies:

Self-Management
Social Awareness
Responsible Decision-Making
Relationship Skills

Overall Goal (What is the big idea?)

Students will explore fossils; discover what fossils can tell us about animals that lived long ago

Pre-Assessment: Unit 6 Pretest [Fossils](#)

Please include interdisciplinary connections resources and plan in each activity

Standards/ (SLO) Student Learning Objectives	Student Learning Strategies	Formative Assessment ***suggested but not limited to the following***	Activities ***suggested but not limited to the following***	Modifications & Reflections ***suggested but not limited to the following***
<p>3-LS4-1</p> <p>We are learning to identify different types of fossils...</p> <p>We are learning to explain what fossils can tell us about organisms from the past...</p>	<p>Essential Vocabulary: fossil, extinct, trace fossil</p> <p>-analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago. -students will be able to -define fossil</p>	<p>Lesson 1 Apply What You Know Lesson 1 Check Lesson 1 Self Check Lesson 1 Roundup</p>	<p>Exploration 1 NJSLS W3.7, W3.8 What Are Fossils? Students analyze and interpret pictures for evidence of organisms that lived long ago and look for patterns among those fossils. Students describe some types of fossils and explain what</p>	<p>RTI/Extra Support Exploration 1 What Are Fossils? Provide side-by-side before and after photos of a fossilized object, such as a shell or a tree.</p> <p>Suggested Strategies for ELL/ELD Students -Differentiate and use different modalities.</p>

	<p>-identify some types of fossils -explain that fossils represent plants and animals from the past -recognize that fossils take substantial time to form and thus, are very old.</p> <p><u>Instructional Strategies:</u></p> <ul style="list-style-type: none"> - evidence notebooks - think pair share - cooperative learning - KWL chart - question-answer relationship (QAR) 		<p>fossils tell us about living things.</p> <p>Hands-On Activity: NJSL 3.MD.B.4, MP4 <u>Walk This Way</u> Students collaborate with a partner to make a model and observe how trace fossils can provide evidence about a once-living organism. <i>Students will need modeling clay, a rolling pin, chopsticks, chopstick holder, and a metric ruler.</i> Students predict then record how the length of the chopsticks will relate to the length of the <i>stride</i>, or distance between steps.</p> <p>Exploration 2 NJSL RI.3.7, 3.MD.B.4, MP4, <u>Clues From Fossils</u> Sometimes it's hard to tell how large an organism was by just</p>	<p>-Lessons that involve writing, speaking, drawing, and listening, give students four opportunities to deepen their understanding</p> <p>-Additional engagements also provide a little breathing room so they can work through the language barrier.</p> <p>RTI/Extra Support Exploration 2 Clues From Fossils Students may become confused by the abstract photo subjects in this activity. It may make more</p>
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			<p>looking at the fossil. In this activity students look at pictures(very helpful if you use the student online component to compare more closely) to compare how organisms of the past compared in size.</p>	<p>sense if they pair up and take photos of each other, first from a distance and then up close. The model can hold up a pencil or other object in the second set of photos.</p> <p>Suggested Strategies for Students with Special Needs</p> <ul style="list-style-type: none"> -Keep instructions and directions 'chunked'. Provide one step at a time, don't overload the student on too many pieces of information at once. - Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community. -Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling
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<p><u>3-LS4-1</u></p> <p>We are learning to use fossils as evidence to explain what an organism's environment was like...</p>	<p>Essential Vocabulary: organism, aquatic, terrestrial, fossil</p> <p>-analyze fossils to determine the types of organisms they represent -use their analysis to determine the environment in which the organism lived.</p> <p>Instructional Strategies:</p> <ul style="list-style-type: none"> - evidence notebooks - think pair share - cooperative learning - KWL chart - question-answer relationship (QAR) 	<p>Lesson 2</p> <p>Apply What You Know</p> <p>Lesson 2 Check</p> <p>Lesson 2 Self Check</p> <p>Lesson 2 Roundup</p>	<p>Exploration 1</p> <p>NJSLS W.3.8</p> <p><u>Wet or Dry?</u></p> <p>Students analyze terrestrial and aquatic animals in the natural habitat. Students use descriptions to identify animals that are no longer found on Earth. They notice and observe consistent patterns that help them understand whether an animal is aquatic or terrestrial.</p> <p>Hands-On Activity</p> <p><u>What Can You Learn from Studying a Fossil?</u></p> <p>Students collaborate to make observations about fossils. Based on your observations, you will describe the type of environment your fossilized organisms most likely lived in.</p> <p><i>Materials needed: fossil kit, hand lens, drawing paper, crayons or colored pencils.</i></p>	<p>ELL/ELD Strategy</p> <p>Exploration 1</p> <p>Wet or Dry?</p> <p>Ask students about the atmosphere or climate in the area they are from. Have them explain, or draw what kind of animals live there.</p> <p>RTI/ Extra Support</p> <p>Hands-On Activity What Can You Learn from Studying a Fossil?</p> <p>If students struggle with drawing the fossilized environment, have them use the internet or other sources to print out pictures to help them.</p>
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			<p>Exploration 3 NJSLs W.3.8 <u>How'd That Get There?</u> Students explore the steps scientists take when there are no animals alive today that are like the fossil organism. They look for evidence of order and consistency between the fossil record and current organisms that might inform understanding about organisms of the past.</p>	<p>Extension: Exploration 3 How'd That Get There? Have students research a current organism and then work backwards to find out how the organism changed over time. In some cases they may find that their animal has changed enough that it has moved from land environment to an aquatic environment.</p> <p>Suggested Strategies for ELL/ELD Students -Differentiate and use different modalities. -Lessons that involve writing, speaking, drawing, and listening, give students <u>four opportunities to deepen their understanding</u> -Additional engagements also provide a little breathing room so they can work through the language barrier.</p> <p>Suggested Strategies for Students with Special Needs</p>
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				<p>-Keep instructions and directions 'chunked'. Provide one step at a time, don't overload the student on too many pieces of information at once.</p> <p>- Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community.</p> <p>-Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling)</p>
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21st Century Theme Targeted – Global Awareness : Using 21st century skills to understand and address global issues.

21st Century Skills Targeted

Creativity & Innovation	Information Literacy	Media Literacy	Critical Thinking & Problem Solving	Communication & Collaboration	Life & Careers
	<p>Leveled Readers How Are Living Things Connected to Their Ecosystem? Rain Forest Adventure</p>	<p>SciShow Kids Dig In To Paleontology BrainPOP: Fossils</p>	<p>Unit Project: A Window To The Past Khan Academy: What Is a Fossil?</p>	<p>Learn more about fossils by interviewing a paleontologist Skype a Scientist</p>	<p>Take It Further Careers in Science: Meet the Paleontologist</p>

Summative Assessments: (include rubrics & exemplars)

Unit 6 Summative Fossils [Assessment](#)

Unit 6 Performance Task: [Past or Present?](#)

Unit 6 Performance Task Scoring [Rubric](#)

Unit 7 Title: Weather and Patterns

Time Frame: 28 days

Essential Questions

- **How can we predict the weather?**
- **How is weather measured?**
- **What are some severe weather impacts?**
- **What are some types of climate?**

Standards NJSLS

Standards / CPIs (cumulative Progress Indicators) taught and assessed:

PERFORMANCE EXPECTATION

- 3-ESS2-1** Represent data in tables and graphological displays to describe typical weather conditions expected during a particular season.
- 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.

DISCIPLINARY CORE IDEAS

- **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.
- **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.

SCIENCE and ENGINEERING PRACTICES

Analyzing and Interpreting Data

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

Obtaining, Evaluating, and Communicating Information

- Obtain and combine information from books and other reliable media to explain phenomena.

Engaging in Argument from Evidence

- 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.

CROSS CUTTING CONCEPTS

Patterns

- Patterns of change can be used to make predictions.

CONNECTIONS TO MATH

3.MD.A.2 Measure and estimate liquid volumes

3.MD.B.3 Draw a scaled picture graph and a scaled bar graph to represent a data set with categories

MP2 Reason abstractly and quantitatively

MP4 Model with mathematics

MP5 Use appropriate tools strategically.

CONNECTIONS TO ELA

RI3.1 Ask and answer questions to demonstrate understanding of text

RI3.7 Use information from illustrations

RI3.8 Describe logical connections

W3.7 Conduct short research projects that build knowledge about a subject.

W3.8 Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories

SL 3.4 Report on a topic using appropriate facts or descriptive details

Technology:

8.1.5.A.1 Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems.

8.1.5.A.2 Format a document using a word processing application to enhance text and include graphics, symbols and/ or pictures.

8.1.5.A.3 Use a graphic organizer to organize information about a problem or issue.

8.1.5.A.4 Graph data using a spreadsheet, analyze and produce a report that explains the analysis of the data.

Highlighted Career Ready Practices:

CRP4. Communicate clearly and effectively and with reason.

CRP6. Demonstrate creativity and innovation

CRP8. Utilize critical thinking to make sense of problems and persevere in solving them

CRP12. Work productively in teams while using cultural global competence.

SEL Practices & Competencies:

Self-Management

Social Awareness

Responsible Decision-Making

Relationship Skills

Overall Goal (What is the big idea?)

Students will 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.

Pre-Assessment: Unit 7 Pretest [Weather and Patterns](#)

Please include interdisciplinary connections resources and plan in each activity

Standards/ (SLO) Student Learning Objectives	Student Learning Strategies	Formative Assessment ***suggested but not limited to the following***	Activities ***suggested but not limited to the following***	Modifications & Reflections ***suggested but not limited to the following***
<p><u>3-ESS2-1</u></p> <p>We are learning to identify types of weather...</p> <p>We are learning to identify some tools used to measure weather conditions...</p>	<p>Essential Vocabulary: weather, atmosphere, precipitation, rain gauge, wind vane, thermometer</p> <p>- learn how scientists measure and record weather data - interpret weather maps and graphs -examine patterns of weather</p> <p>Instructional Strategies: - evidence notebooks - think pair share - cooperative learning - KWL chart - question-answer relationship (QAR)</p>	<p>Lesson 1 Apply What You Know Lesson 1 Check Lesson 1 Self Check Lesson 1 Roundup</p>	<p>Exploration 2 NJSLS W.3.8,W.3.7 3.MD.B.3, 3.MD.A.2 MP2 Weather Gadgets: Students explore weather tools and their measurements. Students observe weather conditions and analyze the data.</p> <p>Extra Hands-On Activity: Determining Wind Direction. Can you figure out which way the wind blows? Pairs of students are given a thin dowel or a straightened clothes hanger and a loose nylon or sock. *Plastic</p>	<p>RTI/Extra Support: Exploration 2: Weather Gadgets With students, make a list on the board of different forms of precipitation they have experienced, such as rain, snow, hail, fog, and sleet. Have students describe each one.</p> <p>Suggested Strategies for ELL/ELD Students -Differentiate and use different modalities. -Lessons that involve writing, speaking, drawing, and listening, give students four opportunities to deepen their understanding -Additional engagements</p>

			<p>grocery bags work but make sure they are secured to the rod/hanger. Ask students to figure out how to use the materials provided as a tool for finding the direction the wind is blowing.</p> <p>Exploration 3 NJSL 3.MD.B.3 Weather Everywhere Students observe weather maps and tools. Students read temperature and precipitation maps.</p>	<p>also provide a little breathing room so they can work through the language barrier.</p> <p>Extension Activity: Exploration 3: Weather Everywhere Have students research the weather in their city during a specific week and graph the results to share with the class.</p> <p>Suggested Strategies for Students with Special Needs -Keep instructions and directions 'chunked'. Provide one step at a time, don't overload the student on too many pieces of information at once. - Structure lessons around questions that are authentic, relate to students' interests,</p>
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				<p>social/family background and knowledge of their community.</p> <p>-Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling)</p>
<p><u>3-ESS2-1</u></p> <p>We are learning to we can analyze data to predict weather...</p>	<p><u>Essential Vocabulary:</u> weather, precipitation, temperature</p> <p>-analyze and interpret data about weather condition patterns -observe patterns of change that can be used to make weather predictions</p> <p><u>Instructional Strategies:</u></p> <ul style="list-style-type: none"> - evidence notebooks - think pair share - cooperative learning - KWL chart 	<p>Lesson 2 Apply What You Know Lesson 2 Check Lesson 2 Self Check Lesson 2 Roundup</p>	<p><u>Exploration 1:</u> NJSLS RI.3.7, 3.MD.A.2, 3.MD.B3, MP.2 <u>Time and Temperature</u> Students examine evidence about temperature and precipitation to make predictions.</p> <p><u>Exploration 3:</u> NJSLS RI.3.1, 3.MD.B3 <u>Predicting Weather</u> Students use temperature patterns</p>	<p><u>RTI/Extra Support:</u> Exploration 1: Time and Temperature If reading the temperature and precipitation for each month confuses students, have them look at the icons to understand the pattern if changes in weather.</p> <p><u>ELL/ELD Strategy:</u> Exploration 3: Predicting Weather Have students work with a partner to review responses.</p>

	- question-answer relationship (QAR)		from a monthly average temperature data chart to predict the missing data for each city.	<p>Suggested Strategies for Students with Special Needs</p> <ul style="list-style-type: none"> -Keep instructions and directions 'chunked'. Provide one step at a time, don't overload the student on too many pieces of information at once. - Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community. -Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling)
<p>3-ESS2-1</p> <p>We are learning to identify hazardous weather...</p>	<p>Essential Vocabulary: hazard, Tornado Alley, profile</p> <p>-identify hazardous weather characteristics</p>	<p>Lesson 3 Apply What You Know Lesson 3 Check Lesson 3 Self Check Lesson 3 Roundup</p>	<p>Exploration 1: NJSLS W.3.1 Cause and Effect Weather. Students look closely at damage caused by</p>	<p>ELL/ELD Strategy: Exploration 1: Cause and Effect Weather Use realia. Students learning English may struggle with the term</p>

<p>We are learning to explore natural hazards and their relationship with people and the environment...</p> <p>We are learning to examine solutions to problems caused by the weather...</p>	<p>-explain the cause-and-effect relationship between hazardous weather and the damage it causes</p> <p>-explore how scientists use data to predict where severe weather occur</p> <p>-evaluate the designs of others and describe their benefits and drawbacks.</p> <p><u>Instructional Strategies:</u></p> <ul style="list-style-type: none"> - evidence notebooks - think pair share - cooperative learning - KWL chart - question-answer relationship (QAR) 		<p>severe weather and based on evidence determine the particular type of weather that caused them.</p> <p>Exploration 2: NJSLS W.3.7 <u>Using the Data</u></p> <p>Students explore how scientists use data to predict severe weather. Students then name the type of severe weather experienced in two different American cities.</p> <p>Hands On Activity: <u>Smashing Floods</u></p> <p>Carry out an investigation to plan a way to control the impact of flooding. In pairs, students determine the problem they need to solve. They</p>	<p>“<i>Tornado Alley</i>” show them a picture of an alley and help them define an alley as a narrow path, lane or passageway. Then show them a map showing where tornadoes occur most often in the United States.</p> <p>RTI/Extra Support: Exploration 2: Using Data Lesson vocabulary support. What are profiles? Tell students that they will be reading weather profiles, or an overview of weather, for three cities.</p> <p>Suggested Strategies for ELL/ELD Students</p> <ul style="list-style-type: none"> -Differentiate and use different modalities. -Lessons that involve writing, speaking, drawing, and listening, give students four opportunities to deepen their understanding -Additional engagements also provide a little
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			<p>list their criteria for success and describe any constraints. Students will sketch at least two designs and choose to build the one they think is the best. Write about how you can test the design. Use the results of the test to identify how the design can be improved. Finally, reflect by analyzing the results.</p> <p>Exploration 3: NJSL3 W3.1 <u>Reducing Risk</u> We cannot stop severe weather but people can design solutions that protect people and property. Students examine different solutions to severe weather and identify the cause and effect the objects solve.</p>	<p>breathing room so they can work through the language barrier.</p> <p>Suggested Strategies for Students with Special Needs</p> <ul style="list-style-type: none"> -Keep instructions and directions '<u>chunked</u>'. <p>Provide one step at a time, don't overload the student on too many pieces of information at once.</p> <ul style="list-style-type: none"> - Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community. -Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling)
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<p><u>3-ESS2-1</u> <u>3-ESS2-2</u></p> <p>We are learning to recognize weather patterns from different parts of the world...</p>	<p>Essential Vocabulary: climate</p> <ul style="list-style-type: none"> -identify and evaluate characteristics of climate and weather patterns -explain how animals survive climate and weather patterns <p>Instructional Strategies:</p> <ul style="list-style-type: none"> - evidence notebooks - think pair share - cooperative learning - KWL chart - question-answer relationship (QAR) 	<p>Lesson 4 Apply What You Know Lesson 4 Check Lesson 4 Self Check Lesson 4 Roundup</p>	<p>Exploration 1 NJSLS W.3.8, RI.3.1 Out of Place Students compare and contrast blue penguins and emperor penguins habitats. Discuss how different temperatures can affect material and environments.</p> <p>Hands On Activity: Looking for a new home. Students collaborate to determine a new location for blue penguins. In small groups students analyze data to determine patterns in an area with a climate suitable for blue penguins.</p>	<p>ELL/ELD Strategy: Exploration 1: Out of Place Have English language learners work with a student proficient in English to identify words that describe climate.</p> <p>EXTENSION: Exploration 1: Out of Place Challenge students to describe the weather patterns for your local area.</p> <p>Suggested Strategies for ELL/ELD Students -Differentiate and use different modalities. -Lessons that involve writing, speaking, drawing, and listening, give students <u>four opportunities to deepen their understanding</u> -Additional engagements also provide a little breathing room so they can work through the language barrier.</p>
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			<p>Exploration 2 NJSLS 3.MD.B.3 <u>Something Different</u> Sometimes people want to grow plants where the climate does not naturally support them. For those places, engineers can design artificial climates that supply plants with what they need. Students apply their knowledge of climate types and native plants to identify and evaluate the patterns necessary for plants to thrive.</p>	<p>RTI/Extra Support Exploration 2: Something Different Pair students and have them discuss the features in each image, working together write about what plants might need, such as water and light. Help students connect this information as they answer the question.</p> <p>Suggested Strategies for Students with Special Needs -Keep instructions and directions '<u>chunked</u>'. Provide one step at a time, don't overload the student on too many pieces of information at once. - Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community. -Provide students with multiple choices for how they can represent their understandings (e.g. multisensory</p>
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				techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling)
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21st Century Theme Targeted – Global Awareness : Using 21st century skills to understand and address global issues.					
21st Century Skills Targeted					
Creativity & Innovation	Information Literacy	Media Literacy	Critical Thinking & Problem Solving	Communication & Collaboration	Life & Careers
<u>Which Way Does The Wind Blow? A Weather Vane Can Show You!</u>	Leveled Readers: <u>How Can We Describe Weather?</u> Double Danger: <u>Thunderstorms and Tornadoes.</u>	Severe Weather: <u>Crash Course Kids #28.2</u> Weather vs. Climate: <u>Crash Course Kids #28.1</u>	Unit Project: <u>Safety Plan</u>	<u>Skype a scientist to learn more about weather.</u>	Take It Further Careers in Science: <u>Meteorologist Pam Heinselman</u>
Summative Assessments: (include rubrics & exemplars) Unit 7 Summative <u>Assessment</u> Unit 7 Performance Task: <u>A New Job?</u> Unit 7 Performance Task Scoring <u>Rubric</u> Students study patterns to make predictions about weather to show an understanding of ESS2.D in support of 3-ESS2-1 and 3-ESS2-2.					