

**FAIRFIELD TOWNSHIP SCHOOL**  
**Science Curriculum Guide Grade 3**

Subject: Science	Grade Level: 3
Unit: Interdependent Relationships in Ecosystems	Pacing: 8 weeks
Essential Questions	Enduring Understandings
<ul style="list-style-type: none"> <li>● How is interdependence essential to maintain life on Earth?</li> <li>● How do environmental changes affect plants and animal's survival and reproduction?</li> <li>● What are the advantages of group living?</li> <li>● What are the disadvantages of group living?</li> <li>● How do animal groups differ from one another?</li> <li>● How and why a habitat of an organism can affect its survival over time?</li> <li>● What is the difference between biotic and abiotic factors?</li> <li>● What are examples of adaptations to increase survival?</li> <li>● What happens to a species if it cannot survive</li> </ul>	<p><b>S2.C: Ecosystem Dynamics, Functioning, and Resilience</b></p> <ul style="list-style-type: none"> <li>● When the environment changes in ways that affect a place's physical characteristics, temperature, and availability of resources, some organisms survive and reproduce, others move to new locations, yet others move in the environment, and some die. (secondary to 3-LS4-4)</li> </ul> <p><b>LS2.D: Social Interactions and Group Behavior</b></p> <ul style="list-style-type: none"> <li>● 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. (3-LS2-1) (RI.3.1) (RI.3.3) (MP.4) (3.NPT)</li> </ul> <p><b>LS4.A: Evidence of Common Ancestry and Diversity</b></p> <ul style="list-style-type: none"> <li>● Some kinds of plants and animals that once lived on Earth are no longer found anywhere. (3-LS4-1) (RI.3.1) (RI.3.2) (RI.3.3) (W.3.1) (W.3.2) (W.3.3) (W.3.8) (MP.2) (MP.4) (MP.5) (3.MD.B.4)</li> <li>● Fossils provide evidence about the types of organisms that lived long ago and also about the nature of their environments. (3-LS4-1) (RI.3.1) (RI.3.2) (RI.3.3) (W.3.1) (W.3.2) (W.3.3) (W.3.8) (MP.2) (MP.4) (MP.5) (3.MD.B.4)</li> </ul> <p><b>LS4.C: Adaptation</b></p> <ul style="list-style-type: none"> <li>● For any particular environment, some kinds of organisms survive well, some survive less well, and some cannot survive at all. (3-LS4-3) (RI.3.1) (RI.3.2) (RI.3.3) (W.3.1) (W.3.2) (SL.3.4) (MP.2) (MP.4) (3.MD.B.3)</li> </ul> <p><b>LS4.D: Biodiversity and Humans</b></p> <ul style="list-style-type: none"> <li>● Populations live in a variety of habitats, and change in those habitats affects the organisms living there. (3-LS4-4) (RI.3.1) (RI.3.2) (RI.3.3) (W.3.1) (W.3.2) (SL.3.4) (MP.2) (MP.4)</li> </ul>

<p>changes in the environment?</p> <ul style="list-style-type: none"> <li>• How can we study extinct species?</li> <li>• What information about the environment can we learn from fossils?</li> </ul>	
<p>NJSL Standards</p>	<p>Classroom Applications</p>
<p>3-LS2-1. Construct an argument that some animals form groups that help members survive.</p> <p>3-LS4-1. Analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago.</p> <ul style="list-style-type: none"> <li>• Examples of data could include type, size, and distributions of fossil organisms. Examples of fossils and environments could include marine fossils found on dry land, tropical plant fossils found in Arctic areas, and fossils of extinct organisms.]</li> <li>• [Assessment Boundary: Assessment is limited to major fossil types and relative ages.]</li> </ul>	<p>Objectives:</p> <p>Construct an argument with evidence, data, and/or a model. (3-LS2-1) (RI.3.1) (RI.3.3) (MP.4) (3.NPT)</p> <ul style="list-style-type: none"> <li>• Based on created groups, animals protect each other from predators and prey.</li> <li>• Animals form groups to help them survive.</li> </ul> <p>Analyze and interpret data to make sense of phenomena using logical reasoning. (3-LS4-1) (RI.3.1) (RI.3.2) (RI.3.3) (W.3.1) (W.3.2) (W.3.3) (W.3.8) (MP.2) (MP.4) (MP.5) (3.MD.B.4)</p> <ul style="list-style-type: none"> <li>• Analyze and interpret data from fossils to provide evidence of organisms and environment in which they lived long ago.</li> <li>• Choose a site in New Jersey to research that supports the following evidence:</li> <li>• Organism found</li> <li>• Past and Present characteristics within the environment</li> <li>• Based on research create graphs, tables, and charts that include type size and distribution of fossils.</li> </ul> <p>Construct an argument with evidence. (3-LS4-3) (RI.3.1) (RI.3.2) (RI.3.3) (W.3.1) (W.3.2) (SL.3.4) (MP.2) (MP.4) (3.MD.B.3)</p> <ul style="list-style-type: none"> <li>• Label specific traits of forest, desert, freshwater and marine ecosystems.</li> <li>• Compare and Contrast using Venn diagrams to identify similarities and differences in ecosystems.</li> <li>• Using this information create a diorama of a habitat to show animal adaptations to demonstrate animal adaptations of survival.</li> </ul> <p>Make a claim about the merit of a solution to a problem by citing relevant evidence about how it meets the criteria and constraints of the problem. (3-LS4-4) (RI.3.1) (RI.3.2) (RI.3.3) (W.3.1) (W.3.2) (SL.3.4)</p>

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

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

3-LS4-4.  
Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.

- Examples of environmental changes could include changes in land characteristics, water distribution, temperature, food, and other organisms.
- [Assessment Boundary:

(MP.2) (MP.4)

- Based on created groups, animals protect each other from predators and prey.
- Animals form groups to help them survive.
- Create a model to represent numbers in groups provide higher rates of survival.

Teaching Strategies/Materials:

Lesson Structure: Anticipatory Set, Mini-Lesson, Whole Group, Small Group, Independent Work, Closure

Strategies: Think-Pair-Share, Read Aloud, Jigsaw, Investigations, Guided Explorations, Projects

Materials: Mentor Texts, DVDs, Internet, Technology (Smart Board, student computers/laptops, PowerPoint, Websites, etc.), supplemental books, visual aids, manipulatives, supplemental materials for investigations

Differentiation Strategies/Modifications

SWD/ Students at risk of failure: 1:1 teacher redirect / re-teach, peer helper, visual aids, modified tests/quizzes, modified homework

Gifted/Enrichment: computer-based research, high level task, class presentation

Assessment is limited to a single environmental change. Assessment does not include the greenhouse effect or climate change.]

Connections to other content areas, including 21<sup>st</sup> Century Skills:

ELA/Literacy —

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

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

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

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

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

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

SL.3.4

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

Mathematics —

MP.2 Reason abstractly and quantitatively.

MP.4 Model with mathematics.

MP.5 Use appropriate tools strategically.

3.NBT Number and Operations in Base Ten.

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

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

21<sup>st</sup> Century Skills –

9.2.4.A.1 Identify reasons why people work, different types of work, and how work can help a person achieve personal and professional goals.

9.2.4.A.2 Identify various life roles and civic and work- related activities in the school, home, and community.

9.2.4.A.3 Investigate both traditional and nontraditional careers and relate information to personal likes and dislikes.

9.2.4.A.4 - Explain why knowledge and skills acquired in the elementary grades lay the foundation for future academic and career success.

#### Unit Resources:

Pearson Realize Interactive Science for Third Grade, Chapter 5: Ecosystems (Lesson 1: What is an Ecosystem? Lesson 2: How do living things get energy? Lesson 3: How do ecosystems change? Lesson 4: What can we learn from fossils?)

Chapter 4: Living Things (Lesson 2: How are offspring like their parents? Lesson 3: What are the life cycles of some animals?)

Chapter 3: Plants (Lesson 4: How do plants use flowers or cones to reproduce?)

#### Hands-on & Virtual Labs

#### STEM Quest PBL

- Websites:

- PBS Learning Media
- The Concord Consortium
- cK-12.org
- eGFI
- Earth Science Week
- Education Place
- <http://studyjams.scholastic.com/studyjams/jams/science/ecosystems/changes-ecosystems.htm>
- <http://youathezoo.org/videos-and-teacher-resources.html>
- <http://www.slideshare.net/MMoiraWhitehouse/interdependencyplants-and-animals-teach>

#### Unit Assessment Opportunities:

- Journal Entries and Response Sheets
- Observations, Questioning, and discussions
- Comprehension Checks in literature
- Class Webs
- Presentations
- Collaboration
- Projects
- Rubrics (<http://www.nextgenscience.org/resources>)
- Unit Test

- Lesson Check
- Lesson Quiz
- Performance Expectations Activities
- Chapter Test

**FAIRFIELD TOWNSHIP SCHOOL**  
**Science Curriculum Guide Grade 3**

Subject: Science	Grade Level: 3
Unit: Inheritance and	Pacing: 8 weeks (2 months)

Variation of Traits: Life Cycles and Traits	
Essential Questions	Enduring Understandings
<ul style="list-style-type: none"> <li>• What characteristic do organisms have and how does the environment provide advantages for the continuation of the species?</li> <li>• Why do organisms look similar and different among generations?</li> <li>• How does the environment affect genetic inheritance?</li> </ul>	<p>LS1.B: Growth and Development of Organisms</p> <ul style="list-style-type: none"> <li>• Reproduction is essential to the continued existence of every kind of organism. Plants and animals have unique and diverse life cycles. (3-LS1-1) (RI.3.7) (SL.3.5) (MP.4) (3.NBT) (3.NF)</li> </ul> <p>LS3.A: Inheritance of Traits</p> <ul style="list-style-type: none"> <li>• Many characteristics of organisms are inherited from their parents. (3-LS3-1) (RI.31) (RI.3.2) (RI.3.3) (W.3.2) (SL.3.4) (MP.2) (MP.4) (3.MD.B.4)</li> <li>• Other characteristics result from individuals' interactions with the environment, which can range from diet to learning. Many characteristics involve both inheritance and environment. (3-LS3-2) (RI.31) (RI.3.2) (RI.3.3) (W.3.2) (SL.3.4) (MP.2) (MP.4) (3.MD.B.4)</li> </ul> <p>LS3.B: Variation of Traits</p> <ul style="list-style-type: none"> <li>• Different organisms vary in how they look and function because they have different inherited information. (3-LS3-1) (RI.31) (RI.3.2) (RI.3.3) (W.3.2) (SL.3.4) (MP.2) (MP.4) (3.MD.B.4)</li> <li>• The environment also affects the traits that an organism develops. (3-LS3-2) (RI.31) (RI.3.2) (RI.3.3) (W.3.2) (SL.3.4) (MP.2) (MP.4) (3.MD.B.4)</li> </ul> <p>LS4.B: Natural Selection</p> <ul style="list-style-type: none"> <li>• Sometimes the differences in characteristics between individuals of the same species provide advantages in surviving, finding mates, and reproducing. (3-LS4-2) (RI.3.1) (RI.3.2) (RI.3.3) (W.3.2) (SL.3.4) (MP.2) (MP.4) (3.MD.B.3)</li> </ul>
NJSL Standards	Classroom Applications
<p>3-LS1-1.</p> <p>Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death.</p>	<p>Objectives:</p> <p>Develop models to describe phenomena. (3-LS1-1) (RI.3.7) (SL.3.5) (MP.4) (3.NBT) (3.NF)</p> <ul style="list-style-type: none"> <li>• Describe life cycle of plants and animals</li> <li>• Describe birth, growth, reproduction and death of specific plant and animal groups.</li> </ul> <p>Analyze and interpret data to make sense of phenomena using logical reasoning. (3-LS3-1) (RI.31) (RI.3.2) (RI.3.3) (W.3.2) (SL.3.4) (MP.2) (MP.4) (3.MD.B.4)</p>

<ul style="list-style-type: none"> <li>• Changes organisms go through during their life form a pattern.</li> <li>• [Assessment Boundary: Assessment of plant life cycles is limited to those of flowering plants. Assessment does not include details of human reproduction.]</li> </ul> <p>3-LS3-1. Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms.</p> <ul style="list-style-type: none"> <li>• Patterns are the similarities and differences in traits shared between offspring and their parents, or among siblings. Emphasis is on organisms other than humans.</li> <li>• [Assessment Boundary: Assessment does not include genetic mechanisms of inheritance and prediction of traits. Assessment is</li> </ul>	<ul style="list-style-type: none"> <li>• Use geography to show the contributions of the environment to the success of individuals' needs for life cycle reproductions.</li> </ul> <p>Use evidence (e.g., observations, patterns) to support an explanation. (3-LS3-2) (RI.3.1) (RI.3.2) (RI.3.3) (W.3.2) (SL.3.4) (MP.2) (MP.4) (3.MD.B.4)</p> <ul style="list-style-type: none"> <li>• Create an experiment that shows the life cycle with affecting variables (i.e.- lack of water, light, etc.) Determine and discuss the impact of the different variables using cause and effect</li> </ul> <p>Use evidence (e.g., observations, patterns) to construct an explanation. (3-LS4-2) (RI.3.1) (RI.3.2) (RI.3.3) (W.3.2) (SL.3.4) (MP.2) (MP.4) (3.MD.B.3)</p> <p>Teaching Strategies/Materials:</p> <p>Lesson Structure: Anticipatory Set, Mini-Lesson, Whole Group, Small Group, Independent Work, Closure</p> <p>Strategies: Think-Pair-Share, Read Aloud, Jigsaw, Investigations, Guided Explorations, Projects</p> <p>Materials: Mentor Texts, DVDs, Internet, Technology (Smart Board, student computers/laptops, PowerPoint, Websites, etc.), supplemental books, visual aids, manipulatives, supplemental materials for investigations</p> <p>Differentiation Strategies/Modifications</p> <p>SWD/ Students at risk of failure: 1:1 teacher redirect / re-teach, peer helper, visual aids, modified tests/quizzes, modified homework</p> <p>Gifted/Enrichment: computer-based research, high level task, class presentation</p> <p>ELL: vocabulary support</p>
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limited to non-human examples.]

3-LS3-2.

Use evidence to support the explanation that traits can be influenced by the environment.

- Examples of the environment affecting a trait could include normally tall plants grown with insufficient water are stunted; and, a pet dog that is given too much food and little exercise may become overweight.

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.

- Examples of cause and effect relationships could be plants that have larger thorns than other plants may be less likely to be eaten by predators;

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

Connections to other content areas, including 21<sup>st</sup> Century Skills:

Common Core State Standards Connections:

ELA/Literacy —

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

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

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

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

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

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

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

Mathematics —

MP.2 Reason abstractly and quantitatively.

MP.4 Model with mathematics.

3.NBT Number and Operations in Base Ten

3.NF Number and Operations—Fractions

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

3.MD.B.4

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

21<sup>st</sup> Century Skills –

9.2.4.A.1 Identify reasons why people work, different types of work, and how work can help a person achieve personal and professional goals.

9.2.4.A.2 Identify various life roles and civic and work-related activities in the school, home, and community.

9.2.4.A.3 Investigate both traditional and nontraditional careers and relate information to personal likes and dislikes.

9.2.4.A.4 - Explain why knowledge and skills acquired in the elementary grades lay the foundation for future academic and career success.

Unit Resources:

Pearson Realize Interactive Science for Third Grade, Chapter 3: Plants (Lesson 1: How can you classify plants? Lesson 2: How do plants use leaves to make food? Lesson 3: How do plants use roots and stems to grow? Lesson 4: How do plants use flowers or cones to reproduce? Lesson 5: What are the life cycles of some plants?)

Chapter 4: Living Things (Lesson 1: How can you classify animals? Lesson 2: How are offspring like their parents? Lesson 3: What are the life cycles of some animals?)

Hands-on & Virtual Labs

STEM Quest PBL

Websites:

- PBS Learning Media
- The Concord Consortium
- cK-12.org
- eGFI
- Earth Science Week
- Education Place
- <http://studyjams.scholastic.com/studyjams/jams/science/animals/animal-adaptations.htm>
- <http://studyjams.scholastic.com/studyjams/jams/science/plants/plant-adaptations.htm>
- <http://studyjams.scholastic.com/studyjams/jams/science/animals/animal-life-cycles.htm>

Unit Assessment Opportunities:

- Journal Entries and Response Sheets
- Observations, Questioning, and discussions
- Comprehension Checks in literature
- Class Webs

- Presentations
- Collaboration
- Projects
- Rubrics (<http://www.nextgenscience.org/resources>)
- Unit Test
- Lesson Check
- Lesson Quiz
- Performance Expectations Activities
- Chapter Test

**FAIRFIELD TOWNSHIP SCHOOL**  
**Science Curriculum Guide Grade 3**

Subject: Science	Grade Level: 3
Unit: Forces and Interactions	Pacing: 8 weeks
Essential Questions	Enduring Understandings
<ul style="list-style-type: none"> <li>● How do the basic principles of forces, motion, and movement</li> </ul>	PS2.A: Forces and Motion <ul style="list-style-type: none"> <li>● 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.</li> </ul>

<p>interrelate?</p> <ul style="list-style-type: none"> <li>• What types of interactions are caused by forces?</li> </ul>	<p>Forces that do not sum to zero can cause changes in the object's speed or direction of motion. (Boundary: Qualitative and conceptual, but not quantitative additions of forces are used at this level.) (3-PS2-1) (RI.3.1) (W.3.7) (W.3.8) (MP.2) (MP.5) (3.MD.A.2)</p> <ul style="list-style-type: none"> <li>• The patterns of an object's motion in various situations can be observed and measured; when that past motion exhibits a regular pattern, future motion can be predicted from it. (Boundary: Technical terms, such as magnitude, velocity, momentum, and vector quantity, are not introduced at this level, but the concept that some quantities need both size and direction to be described is developed.) (3-PS2-2) (W.3.7) (W.3.8)</li> </ul> <p>PS2.B: Types of Interactions</p> <ul style="list-style-type: none"> <li>• Objects in contact exert forces on each other. (3-PS2-1) (RI.3.1) (W.3.7) (W.3.8) (MP.2) (MP.5) (3.MD.A.2)</li> <li>• Electric, and magnetic forces between a pair of objects do not require that the objects be in contact. The sizes of the forces in each situation depend on the properties of the objects and their distances apart and, for forces between two magnets, on their orientation relative to each other. (3-PS2-3), (3-PS2-4) (RI.3.1) (RI.3.3) (RI.3.8) (SL.3.3)</li> </ul>
<p>NJSL Standards</p>	<p>Classroom Applications</p>
<p>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.</p> <ul style="list-style-type: none"> <li>• Examples could include an unbalanced force on one side of a ball can make it start moving; and, balanced forces</li> </ul>	<p>Objectives: Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence, using fair tests in which variables are controlled and the number of trials considered. (3-PS2-1) (RI.3.1) (W.3.7) (W.3.8) (MP.2) (MP.5) (3.MD.A.2)</p> <ul style="list-style-type: none"> <li>• Conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.</li> </ul> <p>Make observations and/or measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon or test a design solution. (3-PS2-2) (W.3.7) (W.3.8)</p> <ul style="list-style-type: none"> <li>• Make observations and measurements of data of motion with predictable patterns.</li> </ul>

pushing on a box from both sides will not produce any motion at all.

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

### 3-PS2-2.

Make observations and/or measurements of an object's motion to provide evidence that a pattern can be used to predict future motion.

- Examples of motion with a predictable pattern could include a child swinging in a swing, a ball rolling back and forth in a bowl, and two children on a see-

Ask questions that can be investigated based on patterns such as cause and effect relationships. (3-PS2-3) (RI.3.1) (RI.3.3) (RI.3.8) (SL.3.3)

- Use questions (how, what, why, and when) to determine cause and effect relationships and interactions between two objects not in contact with each other.
- Determine how electric and magnetic forces between a pair of objects do not require the objects to be in contact with each other, depending on the properties of the object, distance apart, and forces between the two.

Define a simple problem that can be solved through the development of a new or improved object or tool. (3-PS2-4) (RI.3.1) (RI.3.3) (RI.3.8) (SL.3.3)

- Utilizing the performed investigations from above, determine how to create new or improved designs to resolve problems by applying scientific ideas.

Teaching Strategies/Materials:

Lesson Structure: Anticipatory Set, Mini-Lesson, Whole Group, Small Group, Independent Work, Closure

Strategies: Think-Pair-Share, Read Aloud, Jigsaw, Investigations, Guided Explorations, Projects

Materials: Mentor Texts, DVDs, Internet, Technology (Smart Board, student computers/laptops, PowerPoint, Websites, etc.), supplemental books, visual aids, manipulatives, supplemental materials for investigations

Differentiation Strategies/Modifications

SWD/ Students at risk of failure: 1:1 teacher redirect / re-teach, peer helper, visual aids, modified tests/quizzes, modified homework

Gifted/Enrichment: computer-based research, high level task, class presentation

saw.]

- [Assessment Boundary: Assessment does not include technical terms such as period and frequency.]

3-PS2-3.

Ask questions to determine cause and effect relationships of electric or magnetic interactions between two objects not in contact with each other.

- Examples of an electric force could include the force on hair from an electrically charged balloon and the electrical forces between a charged rod and pieces of paper; examples of a magnetic force could include the force between two permanent magnets, the force between an electromagnet and steel paperclips, and the force exerted by one magnet versus the force exerted by two magnets.

ELL: vocabulary support

Examples of cause and effect relationships could include how the distance between objects affects strength of the force and how the orientation of magnets affects the direction of the magnetic force.]

- [Assessment Boundary: Assessment is limited to forces produced by objects that can be manipulated by students, and electrical interactions are limited to static electricity.]

3-PS2-4.

Define a simple design problem that can be solved by applying scientific ideas about magnets.

- Examples of problems could include constructing a latch to keep a door shut and creating a device to keep two moving objects from touching each other.

Connections to other content areas, including 21<sup>st</sup> Century Skills:

Common Core State Standards Connections:

ELA/Literacy -

RI.3.1

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

RI.3.3

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

RI.3.8

Describe the logical connection between particular sentences and paragraphs in a text (e.g., comparison, cause/effect, first/second/third in a sequence).

W.3.7

Conduct short research projects that build knowledge about a topic.

W.3.8

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

SL.3.3

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

Mathematics -

MP.2

Reason abstractly and quantitatively.

MP.5

Use appropriate tools strategically.

3.MD.A.2

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

21<sup>st</sup> Century Skills –

9.2.4.A.1 Identify reasons why people work, different types of work, and how work can help a person achieve personal and professional goals.

9.2.4.A.2 Identify various life roles and civic and work- related activities in the school, home, and community.

9.2.4.A.3 Investigate both traditional and nontraditional careers and relate information to personal likes and dislikes.

9.2.4.A.4 - Explain why knowledge and skills acquired in the elementary grades lay the foundation for future academic and career success.

#### Unit Resources:

Pearson Realize Interactive Science for Third Grade, Chapter 1: Forces & Motions (Lesson 1: What is motion?, Lesson 2: How does force affect motion?, Lesson 3: What is gravity?)

#### Hands-on & Virtual Labs

#### STEM Quest PBL

- Websites:

- PBS Learning Media
- The Concord Consortium
- cK-12.org
- eGFI
- Earth Science Week
- Education Place
- <https://www.brainpop.com/science/motionsforcesandtime/>
- <http://studyjams.scholastic.com/studyjams/jams/science/forces-and-motion/force-and-motion.htm>
- [http://www.slideshare.net/crautry/force-and-motion-review-ppt-18860522?qid=ba7da813-41c1-4365-907d-0d51a1e2b173&v=default&b=&from\\_search=1](http://www.slideshare.net/crautry/force-and-motion-review-ppt-18860522?qid=ba7da813-41c1-4365-907d-0d51a1e2b173&v=default&b=&from_search=1)

#### Unit Assessment Opportunities:

- Journal Entries and Response Sheets
- Observations, Questioning, and discussions
- Comprehension Checks in literature
- Class Webs
- Presentations

- Collaboration
- Projects
- Rubrics (<http://www.nextgenscience.org/resources>)
- Unit Test
- Lesson Check
- Lesson Quiz
- Performance Expectations Activities
- Chapter Test

**FAIRFIELD TOWNSHIP SCHOOL  
Science Curriculum Guide Grade 3**

Subject: Science	Grade Level: 3
Unit: Earth's Systems	Pacing: 8 weeks
Essential Questions	Enduring Understandings
<p>What factors affect daily weather?</p> <p>What factors affect an area's climate?</p> <p>How can data be used to</p>	<p>ESS2.D: Weather and Climate</p> <ul style="list-style-type: none"> <li>● Scientists record patterns of the weather across different times and areas so that they can make predictions about what kind of weather might happen next. (3-ESS2-1) (MP.2) (MP.4) (MP.5) (3. MD.A.2) (3.MD.B.3)</li> <li>● Climate describes a range of an area's typical weather conditions and the extent to which those conditions vary over years. (3-ESS2-2) (RI.3.1) (RI.3.9) (W.3.8) (MP.2) (MP.4)</li> </ul>

<p>determine the climate of various regions?</p>	<p>ESS3.B: Natural Hazards</p> <ul style="list-style-type: none"> <li>• A variety of natural hazards result from natural processes. Humans cannot eliminate natural hazards but can take steps to reduce their impacts. (3-ESS3-1) (W.3.1) (W.3.7) (MP.2) (MP.4)</li> </ul>
<p>NJSL Standards</p>	<p>Classroom Applications</p>
<p>3-ESS2-1. Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season.</p> <ul style="list-style-type: none"> <li>• Examples of data could include average temperature, precipitation, and wind direction.</li> <li>• [Assessment Boundary: Assessment of graphical displays is limited to pictographs and bar graphs. Assessment does not include climate change.]</li> </ul> <p>3-ESS2-2. Obtain and combine information to describe climates in different regions of the world</p> <p>3-ESS3-1. Make a claim about the merit of a design solution</p>	<p>Objectives:</p> <p>Represent data in tables and various graphical displays (bar graphs and pictographs) to reveal patterns that indicate relationships. (3-ESS2-1) (MP.2) (MP.4) (MP.5) (3.MD.A.2) (3.MD.B.3)</p> <ul style="list-style-type: none"> <li>• Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season</li> </ul> <p>Obtain and combine information from books and other reliable media to explain phenomena. (3-ESS2-2) (RI.3.1) (RI.3.9) (W.3.8) (MP.2) (MP.4)</p> <ul style="list-style-type: none"> <li>• Using informational text complete a research activity to describe climates in different regions of the world.</li> </ul> <p>Patterns of change can be used to make predictions. (3-ESS2-1), (3-ESS2-2) (MP.2) (MP.4) (MP.5) (3. MD.A.2) (3.MD.B.3)</p> <ul style="list-style-type: none"> <li>• Use weather tools (barometers, weather vanes, rain gauge thermometers) to collect data to make predictions and patterns about what weather may come next.</li> </ul> <p>Make a claim about the merit of a solution to a problem by citing relevant evidence about how it meets the criteria and constraints of the problem. (3-ESS3-1) (W.3.1) (W.3.7) (MP.2) (MP.4)</p> <ul style="list-style-type: none"> <li>• Show and discuss how climates vary around the world due to different amounts of rain, varying temperatures, and wind patterns.</li> <li>• Using constructed models to replicate buildings and landforms/structures determine the effects of natural disasters and create a solution to reduce the hazards</li> </ul>

that reduces the impacts of a weather-related hazard.

- [Clarification Statement: Examples of design solutions to weather-related hazards could include barriers to prevent flooding, wind resistant roofs, and lightning rods.]

Teaching Strategies/Materials:

Lesson Structure: Anticipatory Set, Mini-Lesson, Whole Group, Small Group, Independent Work, Closure

Strategies: Think-Pair-Share, Read Aloud, Jigsaw, Investigations, Guided Explorations, Projects

Materials: Mentor Texts, DVDs, Internet, Technology (Smart Board, student computers/laptops, PowerPoint, Websites, etc.), supplemental books, visual aids, manipulatives, supplemental materials for investigations

Differentiation Strategies/Modifications

SWD/ Students at risk of failure: 1:1 teacher redirect / re-teach, peer helper, visual aids, modified tests/quizzes, modified homework

Gifted/Enrichment: computer-based research, high level task, class presentation

ELL: vocabulary support

Connections to other content areas, including 21<sup>st</sup> Century Skills:

ELA/Literacy -

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

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

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

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

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

Mathematics –

MP.2 Reason abstractly and quantitatively.

MP.4 Model with mathematics.

MP.5 Use appropriate tools strategically.

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

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

21<sup>st</sup> Century Skills –

9.2.4.A.1 Identify reasons why people work, different types of work, and how work can help a person achieve personal and professional goals.

9.2.4.A.2 Identify various life roles and civic and work- related activities in the school, home, and community.

9.2.4.A.3 Investigate both traditional and nontraditional careers and relate information to personal likes and dislikes.

9.2.4.A.4 - Explain why knowledge and skills acquired in the elementary grades lay the foundation for future academic and career success.

Unit Resources:

Pearson Realize Interactive Science for Third Grade, Chapter 6: Weather Patterns (Lesson 1: What is the water cycle? Lesson 2: What are weather and climate? Lesson 3: What tools are used to measure weather? Lesson 4: How can you stay safe in severe weather?)

Hands-on & Virtual Labs

STEM Quest PBL

- Websites:

- PBS Learning Media
- The Concord Consortium
- cK-12.org
- eGFI
- Earth Science Week

o Education Place

Unit Assessment Opportunities:

- Journal Entries and Response Sheets
- Observations, Questioning, and discussions
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**FAIRFIELD TOWNSHIP SCHOOL  
Science Curriculum Guide Grade 3**

Subject: Science	Grade Level: 3
Unit: Engineering Design	Pacing: 8 weeks
Essential Questions	Enduring Understandings
What are the steps to the engineering design process?	<p>ETS1.A: Defining and Delimiting Engineering Problems</p> <ul style="list-style-type: none"> <li>•Possible solutions to a problem are limited by available materials and resources (constraints). The success of a designed solution is determined by considering the desired features of a solution (criteria). 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. (3-5-ETS1-1)</li> </ul> <p>ETS1.B: Developing Possible Solutions</p> <ul style="list-style-type: none"> <li>•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. (3-5-ETS1-2)</li> <li>•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. (3-5-ETS1-2)</li> <li>•Tests are often designed to identify failure points or difficulties, which suggest the elements of the design that need to be improved. (3-5-ETS1-3)</li> </ul>

	<p>ETS1.C: Optimizing the Design Solution</p> <ul style="list-style-type: none"> <li>•Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and the constraints. (3-5-ETS1-3)</li> </ul>
<p>NJSL Standards</p>	<p>Classroom Applications</p>
<p>Students who demonstrate understanding can:</p> <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>	<p>Objectives:</p> <p>Asking Questions and Defining Problems</p> <p>Asking questions and defining problems in 3–5 builds on grades K–2 experiences and progresses to specifying qualitative relationships.</p> <ul style="list-style-type: none"> <li>•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. (3-5-ETS1-1)</li> </ul> <p>Planning and Carrying Out Investigations</p> <p>Planning and carrying out investigations to answer questions or test solutions to problems in 3–5 builds on K–2 experiences and progresses to include investigations that control variables and provide evidence to support explanations or design solutions.</p> <ul style="list-style-type: none"> <li>•Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence, using fair tests in which variables are controlled and the number of trials considered. (3-5-ETS1-3)</li> </ul> <p>Constructing Explanations and Designing Solutions</p> <p>Constructing explanations and designing solutions in 3–5 builds on K–2 experiences and progresses to the use of evidence in constructing explanations that specify variables that describe and predict phenomena and in designing multiple solutions to design problems.</p> <ul style="list-style-type: none"> <li>•Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design problem. (3-5-ETS1-2)</li> </ul>

Teaching Strategies/Materials:  
Lesson Structure: Objective, Connection, Teach, Engage, Link, Assess  
Strategies:  
Think-Pair-Share, Read Aloud, Jigsaw, Investigation, Guided Explorations, Data Collection,

Materials:  
Mentor Texts, Internet, Supplemental Resources.

Differentiation Strategies/Modifications (i.e. ESL, Special Education, Gifted & Talented):  
Extra Support: 1:1 teacher redirect/re-teach, peer helper  
Enrichment: Computer-Based research, class presentation  
Limited English Proficiency: Vocabulary Support, word/picture association, listening center (books online)

Connections to other content areas, including 21<sup>st</sup> Century Skills:

ELA/Literacy -

RI.5.1 Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text.

RI.5.1 Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.

RI.5.9 Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably.

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

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

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

Mathematics -

3.OA Operations and Algebraic Thinking.

MP.2 Reason abstractly and quantitatively.

MP.4 Model with mathematics.

MP.5 Use appropriate tools strategically.

Unit Resources:

Pearson Realize Interactive Science for Third Grade, Skills Handbook Part 1: The Nature of Science, Skills Handbook Part 2: Technology & the Design Process

Hands-on & Virtual Labs  
STEM Quest PBL

Earth-Friendly Buildings, Bridges and More by Etta Kaner  
Bridges! Amazing Structures to Design, Build & Test by Carol Johmann  
Maker Faire by Samantha Roslund  
Sky Boys How They Built the Empire State Building by Deborah Hopkinson & James Ransome  
The Boy Who Invented TV: The Story of Philo Farnsworth by Kathleen Krull

Websites for instructional use

Website with experiments

<http://tryengineering.org/lessons/playingwithparachutes.pdf>  
<http://www.hookedonscience.org/nextgenerationsciencestandards.html>

Unit Assessment Opportunities:

- Journal Entries and Response Sheets
- Observations, Questioning, and Discussions
- Data Collection & Representation
- Comprehension Checks in Literature
- Presentations
- Collaboration
- Unit Test
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- Lesson Quiz
- Performance Expectations Activities
- Chapter Test