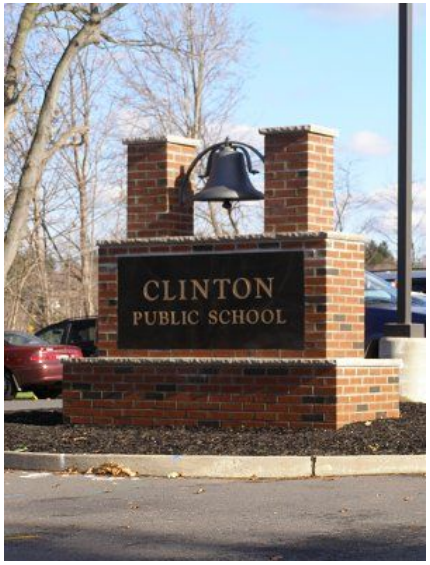
Clinton-Glen Gardner School District



Curriculum Management System

SCIENCE

Grade: 3

*** For adoption by all regular education programs as specified and for adoption or adaptation by all Special Education Programs in accordance with Board of Education Policy #2200.**

Board Approved: August 23, 2017

CLINTON-GLEN GARDNER SCHOOL DISTRICT

ADMINISTRATION

Dr. Seth Cohen, Superintendent/Principal
Mrs. Lisa J. Craft, Business Administrator
Mrs. Jacqueline Turner, Assistant Principal
Mrs. Jenine Kastner, Director of Special Services

BOARD OF EDUCATION

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Charles Sampson

Acknowledgments

The following individuals are acknowledged for their assistance in the preparation of this Curriculum Management System:

Writers' Names: **Hailey McGavisk**

Clinton-Glen Gardner School District

Mission

The Clinton-Glen Gardner School District, a community who values traditions, nurtures and cultivates each child to be a compassionate, curious, and creative thinker entrusted and empowered to build and lead the future.

Philosophy

Science, engineering, and technology influence and permeate every aspect of modern life. Some knowledge of science and engineering is required to engage with the major public policy issues of today as well as to make informed everyday decisions, such as selecting among alternative medical treatments or determining how to invest public funds for water supply options. In addition, understanding science and the extraordinary insights it has produced can be meaningful and relevant on a personal level, opening new worlds to explore and offering lifelong opportunities for enriching people's lives. In these contexts, learning science is important for everyone, even those who eventually choose careers in fields other than science or engineering.

The Next Generation Science Standards (NGSS) are K–12 science content standards. Standards set the expectations for what students should know and be able to do. The NGSS were developed by states to improve science education for all students.

A goal for developing the NGSS was to create a set of research-based, up-to-date K–12 science standards. These standards give local educators the flexibility to design classroom learning experiences that stimulate students' interests in science and prepares them for college, careers, and citizenship. The CPS Science Curriculum is designed to address the goals and philosophy of the New Jersey Next Generation Science Standards.

Grade 3
Science
Scope and Sequence

<table>
<tr><th colspan="2">Quarter I</th></tr>
<tr><td>Unit 1: Weather and Climate:
This unit is based on 3-ESS2-1, 3-ESS2-2, 3-ESS3-1, and 3-5-ETS1-1.
What is the typical weather near our home?
How can we protect people from weather-related hazards?</td><td>Unit 2: Force and Motion:
This unit is based on 3-PS2-1, 3-PS2-2.
How do equal and unequal forces on an object affect the object?
Can we use patterns that we observed to predict the future?</td></tr>
<tr><td>(The ones that apply for these units are in bold)

<u>21st Century Skills</u>
1. Creativity & Innovation
2. Critical Thinking & Problem Solving
3. Communication & Collaboration
4. Media Literacy
5. Information Literacy
6. Information, Communication & Technology</td><td><u>Cross Cutting Concepts</u>
1. Patterns
2. Cause and Effect
3. Scale, Proportion and Quantity
4. System and System Models
5. Energy and Matter: flows, cycles and conservation
6. Structure and Function
7. Stability and Change</td></tr>
<tr><td><u>21st Century Themes</u>
1. Global Awareness
2. Financial, Economic, Business and Entrepreneurial Literacy
3. Civic Literacy
4. Health Literacy
5. Environmental Literacy</td><td><u>Scientific and Engineering Practices</u>
1. Asking questions or defining a problem
2. Developing and using models
3. Planning and carrying out investigations
4. Analyzing and interpreting data
5. Using mathematics and computational thinking
6. Constructing explanations or designing a solution
7. Engaging in an argument from evidence
8. Obtaining, evaluating and communicating information</td></tr>
</table>

Technology Infusion

http://www.state.nj.us/education/, Internet, Web Quests, content-related websites, wireless laptop computers, Chromebooks, computer laboratory, classroom computers, SMART Boards, CDs, DVDs, webinars, video streaming, podcasting

Differentiation

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).•Provide opportunities for students to connect with people of similar backgrounds (e.g. conversations via digital tool such as SKYPE, experts from the community helping with a project, journal articles, and biographies). Provide multiple grouping opportunities for students to share their ideas and to encourage work among various backgrounds and cultures (e.g. multiple representation and multimodal experiences).•Engage students with a variety of Science and Engineering practices to provide students with multiple entry points and multiple ways to demonstrate their understandings.• Use project based science learning to connect science with observable phenomena.• Structure the learning around explaining or solving a social or community-based issue. • Provide ELL students with multiple literacy strategies.• Collaborate with after-school programs or clubs to extend learning opportunities.•Restructure lesson using UDL principles: (http://www.cast.org/our-work/about-udl.html#.VXmoXcfD_UA)

Assessment

District End of Unit Benchmark

Various opportunities during lab investigations for formative assessment and anecdotal notes. Foss Kit I-Investigations at the end of each investigation as benchmark. Review of student documentation of learning process in Science notebook and observations of approach to investigations as formative assessment.

During Work Period adjust lessons for individual students and small groups of students based on formative and summative data (Go back and re-teach for those that did not meet standard on benchmark and plan accordingly for those that exceeded benchmark)

Quarter II

Unit 3: Electrical and Magnetic Forces: **This unit is based on 3-PS2-3, 3-PS2-4, and 3-5-ETS1-1.** ● How can we use our understandings about magnets be used to solve problems? ● What are the relationships between electrical and magnetic forces?	

• How can we use our understandings about magnets be used to solve problems?	
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Quarter III

Unit 4: Traits:
This unit is based on 3-LS3-1 and 3-LS3-2.

- What kinds of traits are passed on from parent to offspring?
- What environmental factors might influence the traits of a specific organism?

Unit 5: Continuing the Cycle:
This unit is based on 3-LS1-1 and 3-LS4-2.

- Do all living things have the same life cycle?
- Are there advantages to being different?

(The ones that apply for these units are in bold)

21st Century Skills

1. Creativity & Innovation
2. **Critical Thinking & Problem Solving**
3. **Communication & Collaboration**
4. Media Literacy
5. **Information Literacy**
6. **Information, Communication & Technology**

Cross Cutting Concepts

1. **Patterns**
2. **Cause and Effect**
3. Scale, Proportion and Quantity
4. System and System Models
5. Energy and Matter: flows, cycles and conservation
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1. **Global Awareness**
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Quarter IV

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<td>Unit 6: Organisms and the Environment:
This unit is based on 3-LS2-1 and 3-LS4-3
● In a particular habitat, why do some organisms survive well, some survive less well, and some not survive at all?</td>
<td>Unit 7: Using Evidence to Understand Change in Environments:
This unit is based on 3-LS4-1, 3-LS4-4, and 3-5-ETS1-1.
● What do fossils tell us about the organisms and the environments in which they lived?
● What happens to the plants and animals when the environment changes?</td>
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Grade 3	**Topic: Unit 1: Weather and Climate**
Sept./Oct.	**3 to 4 weeks**
Essential Questions	How can you measure temperature accurately? What are typical weather conditions in our region? How do we describe different climates? How do people deal with natural hazards such as floods?
Disciplinary Core Concepts:	ESS2.D: Weather and Climate • Scientists record patterns of the weather across different times and areas so that they can make predictions about what kind of weather might happen next. (3-ESS2-1) • Climate describes a range of an area's typical weather conditions and the extent to which those conditions vary over years. (3-ESS2-2) ESS3.B: Natural Hazards • A variety of natural hazards result from natural processes. Humans cannot eliminate natural hazards but can take steps to reduce their impacts. (3-ESS3-1) (Note: This Disciplinary Core Idea is also addressed by 4-ESS3-2.)

How will they learn it? Learning Activities:	Investigation 3: Weather and Water Students compare weather data that they observe, and collect forecasts and historical weather data. They are introduced to water vapor and evaporation. They explore the effects of environmental conditions and surface area on the rates of evaporation and consider how evaporation and condensation contribute to the water cycle. Investigation 4: Seasons and Climate Students organize and analyze local daily weather data for the previous year. This leads to understanding the difference between weather and climate. They discuss engineering methods to deal with weather-related hazards.
Resources	**FOSS Resources:** **Science Resources Book:** “Vacation Aggravation” “Celsius and Fahrenheit” “Water: Hot and Cold” “Ice Is Everywhere” “Studying Weather” “Drying Up” “Surface-Area Experiment” “Condensation” “The Water Cycle” **Videos**: All about Meteorology Water Cycle **Online Activities:** “Measuring Temperature” “Reading a Thermometer” “Bottle Thermometer” “Density of Hot/Cold Water” “Expansion and Contraction of Water” “Weather Grapher” “Evaporation Experiment” “Water Cycle”
How do we know that they know it? Assessment	Benchmark assessments are short summative assessments given after each investigation. These I-Checks are actually hybrid tools: they provide summative information about students’ achievement, and because they occur soon after teaching each investigation, they can be used diagnostically as well. Reviewing specific items on an I-Check with the class provides additional opportunities for students to clarify their thinking. The embedded assessments are based on authentic work produced by students during the course of participating in the FOSS activities. Students do their science, and teachers review their notebook entries. Bullet points in the Guiding the Investigation tell you specifically what students should know and be able to communicate. If student work is incorrect or incomplete, you know that there has been a breakdown in the learning/communicating process. The assessment system then provides a menu of next-step strategies to resolve the situation. Embedded assessment is assessment for learning, not assessment of learning. Unit Post Test
Interdisciplinary	**ELA:** Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the

Connections	basis for the answers. (3-ESS2-2) RI.3.1 Compare and contrast the most important points and key details presented in two texts on the same topic. (3-ESS2-2) RI.3.9 Write opinion pieces on topics or texts, supporting a point of view with reasons. (3-ESS3-1) W.3.1 Conduct short research projects that build knowledge about a topic. (3-ESS3-1) W.3.7 Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories. (3-ESS2-2) W.3.9 **Mathematics:** Reason abstractly and quantitatively. (3-ESS2-1),(3-ESS2-2),(3-ESS3-1) MP.2 Model with mathematics. (3-ESS2-1),(3-ESS2-2), (3-ESS3-1) MP.4 Use appropriate tools strategically. (3-ESS2-1) MP.5 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-ESS2-1) 3.MD.A.2 Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step “how many more” and “how many less” problems using information presented in bar graphs. (3-ESS2-1) 3.MD.B.3
What will students be able to do as a result of the learning in this unit?	Students who understand the concepts can: • Make predictions using patterns of change. • Represent data in tables, bar graphs, and pictographs to reveal patterns that indicate relationships. • Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season. (Assessment of graphical displays is limited to pictographs and bar graphs. Assessment does not include climate change.) Examples of data could include: Average temperature, Precipitation, Wind direction Identify and test cause-and-effect relationships to explain change. • 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. • Make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard. Examples of design solutions to weather related hazards could include: Barriers to prevent flooding, Wind-resistant roofs, Lightning rods

Grade 3	**Topic: Unit 2: Motion and Force**
Nov./Dec.	**3 to 4 weeks**
Essential Questions	What happens when magnets interact with other magnets and with paper clips? How is the magnetic field affected when more magnets are added? What causes change of motion?
Disciplinary Core Concepts:	PS2.A: Forces and Motion • Each force acts on one particular object and has both strength and a direction. An object at rest typically has multiple forces acting on it, but they add to give zero net force on the object. Forces that do not sum to zero can cause changes in the object's speed or direction of motion. (Boundary: Qualitative and conceptual, but not quantitative addition of forces are used at this level.) (3-PS2- 1) • The patterns of an object's motion in various situations can be observed and measured; when that past motion exhibits a regular pattern, future motion can be predicted from it. (Boundary: Technical terms, such as magnitude, velocity, momentum, and vector quantity, are not introduced at this level, but the concept that some quantities need both size and direction to be described is developed.) (3-PS2-2) PS2.B: Types of Interactions • Objects in contact exert forces on each other. (3- PS2-1)
How will they learn it?	Investigation 1: Forces Students explore the forces of magnetism and gravity using magnets. Building on their experiences with

Learning Activities:	magnetic force, students explore other pushes and pulls, considering strength and direction and are introduced to the effects of balanced and unbalanced forces. Investigation 2: Patterns of Motion Students use a variety of systems to explore patterns of motion. Wheel-and-axel systems, flying spinners, and student-designed tops are used to investigate the interactions and variables involved in motion.
Resources	**FOSS Resources:** **Science Resources Book:** “Magnetism and Gravity” “What Scientists Do” “Change of Motion” “Patterns of Motion” “What Goes Around” **Videos**: All about Motion and Balance, All about Magnets **Online Activities:** “Magnetic Poles” “Roller Coaster Builder”
How do we know that they know it? Assessment	Benchmark assessments are short summative assessments given after each investigation. These I-Checks are actually hybrid tools: they provide summative information about students’ achievement, and because they occur soon after teaching each investigation, they can be used diagnostically as well. Reviewing specific items on an I-Check with the class provides additional opportunities for students to clarify their thinking. The embedded assessments are based on authentic work produced by students during the course of participating in the FOSS activities. Students do their science, and teachers review their notebook entries. Bullet points in the Guiding the Investigation tell you specifically what students should know and be able to communicate. If student work is incorrect or incomplete, you know that there has been a breakdown in the learning/communicating process. The assessment system then provides a menu of next-step strategies to resolve the situation. Embedded assessment is assessment for learning, not assessment of learning. Unit Post Test
Interdisciplinary Connections	**ELA:** Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers. RI.3.1 (3-PS2-1) Conduct short research projects that build knowledge about a topic. W.3.7 (3- PS2-1),(3-PS2-2) Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories. W.3.8 (3-PS2-1),(3-PS2-2) **Mathematics:** Reason abstractly and quantitatively. MP.2 (3-PS2-1) Use appropriate tools strategically. MP.5

	(3-PS2-1) 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.A.2 (3-PS2-1)
What will students be able to do as a result of the learning in this unit?	Students who understand the concepts are able to: • Identify cause-and-effect relationships. • Plan and conduct investigations collaboratively to produce data to serve as the basis for evidence. • Use fair tests in which variables are controlled and the number of trials considered. • Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object. (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 also limited to gravity being addressed as a force that pulls objects down.) Examples could include: An unbalanced force on one side of a ball can make it start moving. Balanced forces pushing on a box from both sides

Grade 3	**Topic: Unit 3: Electrical & Magnetic Forces**
Dec.	**2 weeks**
Essential Questions	How can we use our understandings about magnets be used to solve problems? What are the relationships between electrical and magnetic forces? How can we use our understandings about magnets be used to solve problems?
Disciplinary Core Concepts:	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. (3-PS2-3),(3-PS2-4) 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. (3-5-ETS1-1)
How will they learn it?	Investigation 3: Engineering Students tackle an engineering design challenge in incremental steps. They first design a cart that can roll “from

Learning Activities:	here to there," and then improve their designs to meet a specific distance challenge. Students continue with an investigation involving gravity and explore how start position on a ramp affects the distance the cart travels. The final challenge incorporates students' knowledge of magnetism into their cart design to meet new challenges. This investigation develops understanding of engineering design concepts and provides opportunities for students to engage in engineering practices.
Resources	**FOSS Resources:** **Science Resources Book:** "What Engineers Do" "Science Practices" "Engineering Practices" "Soap Box Derby" "The Metric System" "How Engineers and Scientists Work Together" **Online Activities:** "Measuring Length" "Measurement Logic"
How do we know that they know it? Assessment	Benchmark assessments are short summative assessments given after each investigation. These I-Checks are actually hybrid tools: they provide summative information about students' achievement, and because they occur soon after teaching each investigation, they can be used diagnostically as well. Reviewing specific items on an I-Check with the class provides additional opportunities for students to clarify their thinking. The embedded assessments are based on authentic work produced by students during the course of participating in the FOSS activities. Students do their science, and teachers review their notebook entries. Bullet points in the Guiding the Investigation tell you specifically what students should know and be able to communicate. If student work is incorrect or incomplete, you know that there has been a breakdown in the learning/communicating process. The assessment system then provides a menu of next-step strategies to resolve the situation. Embedded assessment is assessment for learning, not assessment of learning. Unit Post Test
Interdisciplinary Connections	**ELA:** Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers. (3-PS2-3) RI.3.1 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. (3-PS2-3) RI.3.3 Describe the logical connection between particular sentences and paragraphs in a text (e.g., comparison, cause/effect, first/second/third in a sequence). (3-PS2-3) RI.3.8 Ask and answer questions about information from a speaker, offering appropriate elaboration and detail. (3-PS2-3) SL.3.3 **Mathematics:** Reason abstractly and quantitatively. MP.2 (3-PS2-1) Use appropriate tools strategically. MP.5 (3-PS2-1) 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.A.2 (3-PS2-1)
What will students be able to do as a result of the learning in this unit?	Students who understand the concepts are able to: • Identify and test cause-and-effect relationships in order to explain change. • Ask questions that can be investigated based on patterns such as cause-and-effect relationships. • Ask questions to determine cause-and-effect relationships in electric or magnetic interactions between two objects not in contact with each other. (Assessment is limited to forces produced by objects that can be manipulated by students, and electrical interactions are limited to static electricity.) • Magnetic forces could include: The force between two permanent magnets; The force between an electromagnet and steel paperclips; The force exerted by one magnet versus the force exerted by two magnets. • Cause-and-effect relationships could include: How the distance between objects affects the strength of the force How the orientation of magnets affects the direction of the magnetic force. Students who understand the concepts are able to: • Define a simple problem that can be solved through the development of a new or improved object or tool. • Define a simple design problem that can be solved by applying scientific ideas about magnets (e.g., constructing a latch to keep a door shut or creating a device to keep two moving objects from touching each other). • Define a simple design problem that can be solved through the development of an object, tool, process, or system, and include several criteria for success and constraints on material, time, or cost.

Grade 3	**Topic: Unit 4: Traits**
January	**3 weeks**
Essential Questions	What kinds of traits are passed on from parent to offspring? What environmental factors might influence the traits of a specific organism?
Disciplinary Core Concepts:	LS3.A: Inheritance of Traits • Many characteristics of organisms are inherited from their parents. (3-LS3-1) • Other characteristics result from individuals' interactions with the environment, which can range from diet to learning. Many characteristics involve both inheritance and environment. (3- LS3-2) LS3.B: Variation of Traits • Different organisms vary in how they look and function because they have different inherited information. (3-LS3-1) • The environment also affects the traits that an organism develops. (3-LS3-2)
How will they learn it? Learning Activities:	Investigation 1: Origin of Seeds Students describe and compare seed properties. They investigate the effect water has on seeds by setting up seed sprouters and observing and recording changes over a week. Students investigate seed dispersal mechanisms of plants.
Resources	**FOSS Resources:** **Science Resources Book:** "The Reason for Fruit" "The Most Important Seed" "Barbara McClintock" "Nature

	Journal—How Seeds Travel" **Videos**: How Seeds Get Here . . . and There
How do we know that they know it? Assessment	Benchmark assessments are short summative assessments given after each investigation. These I-Checks are actually hybrid tools: they provide summative information about students' achievement, and because they occur soon after teaching each investigation, they can be used diagnostically as well. Reviewing specific items on an I-Check with the class provides additional opportunities for students to clarify their thinking. The embedded assessments are based on authentic work produced by students during the course of participating in the FOSS activities. Students do their science, and teachers review their notebook entries. Bullet points in the Guiding the Investigation tell you specifically what students should know and be able to communicate. If student work is incorrect or incomplete, you know that there has been a breakdown in the learning/communicating process. The assessment system then provides a menu of next-step strategies to resolve the situation. Embedded assessment is assessment for learning, not assessment of learning. Unit Post Test
Interdisciplinary Connections	**ELA:** Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers. (3-LS3-1),(3-LS3-2) RI.3.1 Determine the main idea of a text; recount the key details and explain how they support the main idea. (3-LS3-1),(3-LS3-2) RI.3.2 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. (3-LS3-1),(3-LS3-2) RI.3.3 Write informative/explanatory texts to examine a topic and convey ideas and information clearly. (3-LS3-1),(3-LS3-2),(3-LS4-2) W.3.2 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. (3-LS3-1),(3-LS3-2) SL.3.4 **Mathematics:** Reason abstractly and quantitatively. (3-LS3-1),(3-LS3-2) MP.2 Model with mathematics. (3-LS3-1),(3-LS3-2) MP.4 Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units—whole numbers, halves, or quarters. (3-LS3-1),(3-LS3-2) 3.MD.B.4
What will students be able to do as a result of the learning in this unit?	Students who understand the concepts can: • Sort and classify natural phenomena using similarities and differences. (Clarification: Patterns are the similarities and differences in traits shared between offspring and their parents or among siblings, with an emphasis on organisms other than humans). • Analyze and interpret data to make sense of phenomena using logical reasoning.

	• 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. (Assessment does not include genetic mechanisms of inheritance and prediction of traits, and is limited to non-humans.) Identify and test cause-and-effect relationships to explain change. • Use evidence (e.g., observations, patterns) to support an explanation. • Use evidence to support the explanation that traits can be influenced by the environment. Examples of the environment's effect on traits could include: Normally tall plants that grow with insufficient water are stunted.

Grade 3	**Topic: Unit 5: Continuing the Cycle**
February/March	**3 weeks**
Essential Questions	Do all living things have the same life cycle? Are there advantages to being different?
Disciplinary Core Concepts:	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. (3- LS1-1) LS4.B: Natural Selection • Sometimes the differences in characteristics between individuals of the same species provide advantages in surviving, finding mates, and reproducing. (3-LS4-2)
How will they learn it? Learning Activities:	Investigation 2: Growing Further Students examine germinated seeds to determine similarities and differences in the way the organisms grow. They set up a hydroponic garden to observe the life cycle of a bean plant. Through direct experience and readings, students learn about plant structures and functions.
Resources	**FOSS Resources:**

	Science Resources Book: “Germination” “Life Cycles” **Videos**: How Plants Get Food, All about Animal Life Cycles
How do we know that they know it? Assessment	Benchmark assessments are short summative assessments given after each investigation. These I-Checks are actually hybrid tools: they provide summative information about students’ achievement, and because they occur soon after teaching each investigation, they can be used diagnostically as well. Reviewing specific items on an I-Check with the class provides additional opportunities for students to clarify their thinking. The embedded assessments are based on authentic work produced by students during the course of participating in the FOSS activities. Students do their science, and teachers review their notebook entries. Bullet points in the Guiding the Investigation tell you specifically what students should know and be able to communicate. If student work is incorrect or incomplete, you know that there has been a breakdown in the learning/communicating process. The assessment system then provides a menu of next-step strategies to resolve the situation. Embedded assessment is assessment for learning, not assessment of learning. Unit Post Test
Interdisciplinary Connections	**ELA:** Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers. (3-LS4-2) RI.3.1 Determine the main idea of a text; recount the key details and explain how they support the main idea. (3-LS4-2) RI.3.2 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. (3-LS4-2) RI.3.3 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). (3-LS1-1) RI.3.7 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. (3-LS4-2) SL.3.4 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. (3-LS1-1) SL.3.5 Write informative/explanatory texts to examine a topic and convey ideas and information clearly. (3-LS4-2) W.3.2 **Mathematics:** Reason abstractly and quantitatively. (3-LS4-2) MP.2 Model with mathematics. (3-LS1-1), (3-LS4-2) MP.4 Number and Operations in Base Ten (3-LS1-1) 3.NBT Number and Operations—Fractions (3-LS1-1) 3.NF 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-LS4-2) 3.MD.B.3 Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale

	is marked off in appropriate units—whole numbers, halves, or quarters. (3-LS4-1) 3.MD.B.4
What will students be able to do as a result of the learning in this unit?	Students who understand the concepts can: Sort and classify organisms (inherited traits) using similarities and differences in patterns. • Make predictions using patterns of change. • Develop models to describe phenomena. • Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death. (I.e., Changes organisms go through during their life form a pattern.) (Assessment of plant life cycles is limited to those of flowering plants. Assessment does not include details of human reproduction.) • Identify cause-and-effect relationships in order to explain change. • Use evidence (e.g., observations, patterns) to construct an explanation. • Use evidence to construct an explanation for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing. Examples of cause-and-effect relationships could include: Plants that have larger thorns than other plants may be less likely to be eaten by predators. Animals that have better camouflage coloration than other animals may be more likely to survive and therefore more likely to leave offspring.

Grade 3	**Topic: Unit 6: Organisms and the Environment**
April/May	**3 weeks**
Essential Questions	In a particular habitat, why do some organisms survive well, some survive less well, and some not survive at all?
Disciplinary Core Concepts:	LS2.D: Social Interactions and Group Behavior • Being part of a group helps animals obtain food, defend themselves, and cope with changes. Groups may serve different functions and vary dramatically in size (Note: Moved from K–2). (3-LS2-1) LS4.C: Adaptation • For any particular environment, some kinds of organisms survive well, some survive less well, and some cannot survive at all. (3-LS4-3)
How will they learn it? Learning Activities:	Investigation 3: Meet the Crayfish Students observe and record some of the structures of crayfish and compare them to other organisms, then investigate crayfish behavior. They learn about adaptations of organisms in different environments and engage in a simulation activity to explore food chains.
Resources	**FOSS Resources:** **Science Resources Book:** “Crayfish” “Adaptations” “Life on Earth” “Inside a Snail’s Shell” (optional) “A Change in the Environment” “Food Chains”

	Videos: All about Animal Adaptations, All about Animal Behavior and Communication **Online Activities:** “Walking Stick Survival” “Life Cycles” “Crayfish vs. Snail vs. Mantis” “Where Does It Live? “What Doesn’t Belong?” “Habitat Gallery” “Organism Match”
How do we know that they know it? Assessment	Benchmark assessments are short summative assessments given after each investigation. These I-Checks are actually hybrid tools: they provide summative information about students’ achievement, and because they occur soon after teaching each investigation, they can be used diagnostically as well. Reviewing specific items on an I-Check with the class provides additional opportunities for students to clarify their thinking. The embedded assessments are based on authentic work produced by students during the course of participating in the FOSS activities. Students do their science, and teachers review their notebook entries. Bullet points in the Guiding the Investigation tell you specifically what students should know and be able to communicate. If student work is incorrect or incomplete, you know that there has been a breakdown in the learning/communicating process. The assessment system then provides a menu of next-step strategies to resolve the situation. Embedded assessment is assessment for learning, not assessment of learning. Unit Post Test
Interdisciplinary Connections	**ELA:** Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers. (3-LS2-1), (3-LS4-3) RI.3.1 Determine the main idea of a text; recount the key details and explain how they support the main idea. (3-LS4-3) RI.3.2 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. (3-LS2-1),(3-LS4-3) RI.3.3 Write opinion pieces on topics or texts, supporting a point of view with reasons. (3-LS2-1), (3-LS4-3) W.3.1 Write informative/explanatory texts to examine a topic and convey ideas and information clearly. (3-LS4-3) W.3.2 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. (3-LS4-3) SL.3.4 **Mathematics:** Model with mathematics. (3-LS3-1),(3-LS3-2) MP.4 Number and Operations in Base Ten. (3-LS2-1) 3.NBT
What will students be able to do as a result	Students who understand the concepts can: • Identify cause-and-effect relationships in order to explain change.

of the learning in this unit?	• Construct an argument with evidence - Construct an argument with evidence (e.g., needs and characteristics of the organisms and habitats involved) that in a particular habitat, some organisms can survive well, some can survive less well, and some cannot survive at all.

Grade 3	**Topic: Unit 7: Using Evidence to Understand Change in Environments**
May/June	**3 weeks**
Essential Questions	What do fossils tell us about the organisms and the environments in which they lived? What happens to the plants and animals when the environment changes?
Disciplinary Core Concepts:	LS4.A: Evidence of Common Ancestry and Diversity • Some kinds of plants and animals that once lived on Earth are no longer found anywhere. (3-LS4-1) • Fossils provide evidence about the types of organisms that lived long ago and also about the nature of their environments. (3-LS4-1) LS4.D: Biodiversity and Humans • Populations live in a variety of habitats, and change in those habitats affects the organisms living there. (3-LS4-4) 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.(secondary to 3-LS4-4) 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. (3-

	5-ETS1-1)
How will they learn it? Learning Activities:	Investigation 4: Human Body Students observe the articulated human skeletal system in action. A skeleton is a system of interacting bones. Humans have about 206 bones. Bones have several functions: support, protection, and movement. They learn about the number and kinds of bones in an organism are characteristics inherited from the parents of the organism and how muscles attach across joints to move bones. Students explore how fossils are important evidence about extinct organisms and past environments.
Resources	**FOSS Resources:** **Science Resources Book:** "The Human Skeleton" "Barn Owls" "Fossils" "Skeletons on the Outside" "Crayfish, Snails, and Humans" " Your Amazing Opposable Thumbs" **Videos**: All about Fossils **Online Activities:** "Mr. Bones"
How do we know that they know it? Assessment	Benchmark assessments are short summative assessments given after each investigation. These I-Checks are actually hybrid tools: they provide summative information about students' achievement, and because they occur soon after teaching each investigation, they can be used diagnostically as well. Reviewing specific items on an I-Check with the class provides additional opportunities for students to clarify their thinking. The embedded assessments are based on authentic work produced by students during the course of participating in the FOSS activities. Students do their science, and teachers review their notebook entries. Bullet points in the Guiding the Investigation tell you specifically what students should know and be able to communicate. If student work is incorrect or incomplete, you know that there has been a breakdown in the learning/communicating process. The assessment system then provides a menu of next-step strategies to resolve the situation. Embedded assessment is assessment for learning, not assessment of learning. Unit Post Test
Interdisciplinary Connections	**ELA:** Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers. (3-LS4-4) RI.3.1 Determine the main idea of a text; recount the key details and explain how they support the main idea. (3-LS4-1),(3-LS4-4) RI.3.2 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. (3-LS4-1),(3-LS4-4) RI.3.3 Write opinion pieces on topics or texts, supporting a point of view with reasons. (3-LS4-1),(3-LS4- 4) W.3.1 Write informative/explanatory texts to examine a topic and convey ideas and information clearly. (3-LS4-1),(3-LS4-4) W.3.2 Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories. (3-LS4-1) W.3.8 Conduct short research projects that use several sources to build knowledge through investigation of different aspects of a topic. (3-5-ETS1-1) W.5.7 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. (3-5-ETS1-1) W.5.8 Draw evidence from literary or informational texts to support analysis, reflection, and research (3-5-ETS1-1) W.5.9 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. (3-LS4-4) SL.3.4 **Mathematics:** Reason abstractly and quantitatively. (3-LS4-1),(3-LS4-4), (3-5- ETS1-1) MP.2 Model with mathematics. (3-LS4-1),(3-LS4-4), (3-5-ETS1-1) MP.4 Use appropriate tools strategically. (3-LS4-1), (3-5-ETS1-1) MP.5 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-LS4-2),(3-LS4-3) 3.MD.B.3 Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units—whole numbers, halves, or quarters. (3-LS4- 1) 3.MD.B.4 Operations and Algebraic Thinking (3-ETS1-1) 3-5.OA
What will students be able to do as a result of the learning in this unit?	Students who understand the concepts can: Describe a system in terms of its components and interactions. • Make a claim about the merit of a solution to a problem by citing relevant evidence about how it meets the criteria and constraints of a problem. • Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change. (Assessment is limited to a single environmental change and does not include the greenhouse effect or climate change.) Examples of environmental changes could include changes in: Land characteristics, Water distribution, Temperature, Food, or Other organisms. • Define a simple design problem that can be solved through the development of an object, tool, process, or system and that includes several criteria for success and constraints on materials, time, or cost. • Define a simple design problem reflecting a need or want that includes specified criteria for success and constraints on materials, time, or cost.